The social psychological consequences of conspiracy theories

by

Daniel Jolley

School of Psychology

University of Kent, Canterbury

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Memorandum

The research presented in this thesis was conducted whilst the author was a full-time postgraduate student in the School of Psychology at the University of Kent, Canterbury.

With the exception of Study 1 that was submitted as part of the author's Master's degree, the author has not been awarded a degree by this university or any other university for the work included in this thesis. Study 1 was included in this thesis because Chapter 2 is the following published journal article:

Jolley, D., & Douglas, K.M. (2014a). The social consequences of conspiracism: Exposure to conspiracy theories decreases intentions to engage in politics and to reduce one's carbon footprint. *British Journal of Psychology*, *105*, 35-36. doi: 10.1111/bjop.12018

However, Study 1 should not be evaluated as part of this PhD.

The research outlined in Chapter 3 has also been published and is presented in this thesis as the following journal article:

Jolley, D., & Douglas, K. M. (2014b). The effects of anti-vaccine conspiracy theories on vaccination intentions. *PLoS ONE, 9* (2): e89177. doi: 10.1371/journal.pone.0089177

The research outlined in Chapter 4 has been submitted for publication in the following paper:

Jolley, D., Douglas, K.M., & Sutton, R. M. (submitted). *Blaming a few apples so save the barrel: The system-justifying function of conspiracy theories*.

Dedication

In memory of Betty Jolley.

This thesis is dedicated to you, Nan.

Acknowledgements

I am most grateful to Karen Douglas. This thesis would not have existed without her constant support, brilliant comments and compassion. Also, whilst he was not officially a part of the supervisory team, Robbie Sutton has provided endless encouragement throughout this doctorate. I am very fortunate to have been under the Douglas-Sutton wing. I would then like to thank members of the various lab groups I have been a part of, with special thanks to Mike Wood and Aleksandra Cichocka whose comments on my work have been invaluable. I would also like to thank the anonymous reviewers for their constructive feedback on two empirical chapters and who have also therefore helped shape this thesis.

PhDs can be seen as quite a lonely process. I however have been lucky to have an excellent support network, both within the School of Psychology and outside. I am grateful for the constant encouragement from ex-PhDers Rose, Jumana, Amy, Claire and Kat, who not only were PhD colleagues but have become some of my best friends. This is alongside Lynsey who is newer to the PhD bandwagon but has had no less of an impact on me (hey, shall we organise a conference?). Known as my "office ladies", Carly, Esme and Sarah (in no particular order) similarly became not just work colleagues but friends. The amount of hours lost in that office is something I would never change.

Throughout my postgraduate studies I sat on two national committees. These experiences have enriched the last couple of years and I have gained great enjoyment from being a part of them. Most importantly however, through these committee roles I have made several close friends. One group, referred to as "JAN-DK" have become a daily support throughout this write up phase. I know with certainty that without each of their support, this process would have been have been a lot more lonely. I have made four friends for life.

Last I would like to thank the people who I had to leave behind in order to complete this PhD. My sister, whilst you may have refused to read this thesis, you make me smile on a daily basis. Mom and Carl, "*everything will be fine*". I know you are always there and your positive outlook is always an inspiration. Dad, I won't refer to the nicknames that Jade, you and I use for each other, but your endless humour makes everything that little bit more enjoyable. Grandad and Nan, you are proud of whatever I undertake in life. Whilst it brings me great sadness that Nan is no longer with us, I know she would have been beside herself with pride. This thesis is dedicated to you, Nan.

Abstract

Conspiracy theories point accusing fingers at authorities, and offer alternatives to official explanations. Scholars have argued that in doing so, they may therefore subvert social systems and undermine confidence in established political, health and environmental positions. In this thesis we empirically put these arguments to the test. In four experiments, we found that exposure to conspiracy theories reduced people's intention to engage in (a) the political system, (b) environmentally-friendly initiatives and (c) childhood vaccination (Chapters 2 and 3). Ironically however, instead of undermining the social status quo, we found in four experiments that conspiracy theories appear to bolster satisfaction with social systems. They appear to do so because they explain tragedies, disasters and social problems on the actions of destructive individuals and groups, rather than inherent flaws in society. By drawing attention away from the deeper limitations of social systems, conspiracy theories may therefore reduce, rather than increase, the likelihood of social and political change (Chapter 4). Finally, we found that once people have been exposed to conspiracy theories, the negative effects are difficult to attenuate. In two experiments we tested interventions based on counter-arguments (e.g., that vaccines are safe instead of harmful) and a pre-warning that detailed people's tendency to rely on retracted information. However, both were found to be ineffective in improving intentions to vaccinate a fictional child (Chapter 5). Overall, the research outlined in this thesis highlights some of the potentially damaging consequences of conspiracy theories. This research opens up new avenues for enquiry and calls for ongoing investigations to address the growth of conspiracism in society.

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Introduction

Overview

Climate change is a hoax orchestrated by the world's scientists to secure research funding. Paul McCartney died in 1966 and was secretly replaced in the Beatles by a lookalike. Pharmaceutical companies and governments cover up evidence of harmful side effects of vaccines for financial gain. Shape-shifting reptilian people control our world by taking on human form and gaining power. Each of these is an example of what is known as a *conspiracy theory.* Conspiracy theories accompany many significant political and social events, such as the death of Diana, Princess of Wales (Douglas & Sutton, 2008; Wood, Douglas, & Sutton, 2012), the 9/11 terrorist attacks (Swami, Chamorro-Premuzic, & Furnham, 2010; Wood & Douglas, 2013), the assassination of U.S. President John F. Kennedy (McHoskey, 1995), and issues such as climate change (Lewandowsky, Oberauer, & Gignac, 2013a). Conspiracy theorising adopts a counterhegemonic stance where the conspiracy theories seek to challenge the orthodox explanation for an event (Gray, 2010; Sapountzis & Condor, 2013). In other words, conspiracy theories attempt to undermine or subvert social systems by highlighting inconsistencies or ambiguities in official accounts (e.g., Clarke, 2002; Fenster, 1999; Leman & Cinnirella, 2007). In doing so however, they may subvert social systems and undermine confidence in established positions on important topics such as climate science and vaccination. An aim of this thesis therefore, is to examine and attempt to address the social psychological consequences of conspiracy theories.

Belief in conspiracy theories is widespread in society, with polls consistently showing millions of people subscribing to these alternative viewpoints (Swami & Coles, 2010). For example, one survey revealed that a quarter of the U.K. population believe Princess Diana was assassinated rather than being killed in an unfortunate car accident (YouGov, 2012). Similarly, polls indicate that more than 60 per cent of Americans doubt the official account

that President Kennedy was assassinated by a lone gunman (e.g., Carlson, 2001; Goertzel, 1994; McHoskey, 1995; Swift, 2013), and more than 20% endorse the idea that there is a link between childhood vaccines and autism (Public Policy Polling, 2013). In another study, 48% of an African American sample agreed that HIV was a laboratory made virus, and 53% of the same sample agreed that a cure for AIDS is being withheld from the poor (Bogart & Thorburn, 2006).

Belief in conspiracy theories is not just limited to the U.K. and the U.S.A. Polls have reliably shown that belief in conspiracy theories occurs across the world (Sunstein & Vermeule, 2009). For example, a poll conducted in seven Muslim countries found that more than three quarters of respondents did not believe the 9/11 attacks were carried out by Arabs (Gentzkow & Shapiro, 2004). Similarly, in a survey conducted in 2008 of 16,063 people in 17 nations, such as China, Russia, France, Kenya, Mexico and South Korea, only 46% on average believed the official account that Al Qaeda was behind the 9/11 terrorist attacks, with the rest either believing it was the responsibility of the U.S. government, Israel, or indicating that they did not know (Allen, 2008).

It is therefore clear that large sections of the population across the world endorse conspiracy theories. With this in mind, it is paramount to understand why they resonate so much with the public. It is also vital to understand what their consequences could be. Until recently, however, there has been limited empirical research on conspiracy theories compared to other areas of social psychology (Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Swami & Coles, 2010). It is only within the last five years that conspiracy theories have received serious scholarly attention, with an increasing number of empirical studies now being published in scientific journals. Swami and Coles (2010) have even gone as far as to suggest that some academics may have been worried about being engaged with conspiracy

theories in case they were branded as conspiracy theorists themselves. Alternatively, researchers may have overlooked this area because conspiracy theories were thought to be ridiculous beliefs, held only by a small portion of the population (Sunstein & Vermeule, 2009), or simply harmless fun and therefore of little concern (Bratich, 2008; Clarke, 2002).

The growing body of psychological literature has focused mainly on the psychological characteristics and processes associated with belief in conspiracy theories. Conspiracy theories can however be viewed as attempts to undermine or subvert social systems as they offer alternatives to establishment narratives (e.g., Clarke, 2002; Sapountzis & Condor, 2013). In doing so, conspiracy theories may undermine confidence in establishment positions on important topics such as climate science and childhood vaccination (cf. Lewandowsky, Gignac, & Oberauer, 2013b). It is therefore important for researchers to consider the consequences of conspiracy theories. For example, it is plausible to suggest that if conspiracy theories do subvert social systems by offering alternatives to official explanations this may reduce the likelihood of people engaging in the political system, taking action against climate change or vaccinating children against diseases. Conspiracy theories may therefore have the power to damage important social systems that people rely on in their everyday lives. This thesis aims to put this assertion to the test and examine the impact of exposure to conspiracy theories on important behavioural intentions.

Conspiracy theories seeking to challenge the orthodox explanation for a significant event and instead offer alternative explanations may therefore stop people from engaging in behaviours that are needed for society to function. However, conspiracy theories appearing to be so critical of the government and subverting confidence in social institutions seem to be in conflict with the important motivation to maintain a positive view of society. System justification theory argues that people are motivated to perceive the system they live in as fair

and legitimate (Jost & Banaji, 1994; Jost & Burgess, 2000; Jost & Thompson, 2000). Threats to the fairness or legitimacy of social systems cause people to defend, bolster or rationalise the status quo (e.g., Jost, Pelham, Sheldon, & Sullivan, 2003). This thesis therefore aimed to investigate the novel proposal that whilst conspiracy theories may subvert or undermine important social systems, exposure to conspiracy theories may not decrease general satisfaction with social systems. In other words, we explored the idea that conspiracy theories might perform a system-justifying function that allows people to preserve the belief that the design of society is fair and legitimate. We propose that by blaming social problems on the actions of a destructive few, conspiracy theories allow people to maintain a positive view of society. In doing so however, conspiracy theories may enable people to justify inherent limitations of society such as inequality. This thesis therefore aimed to uncover the potential dangers of conspiracy theories. We tested the idea that conspiracy theories may stop people from engaging with important aspects of the social system, but that they also may allow people to justify rather than address inherent limitations within society as a whole.

After examining whether conspiracy theories may damage the social systems that people rely on in their everyday lives and can be a way to uphold unfair social systems rather than undermine them, the final aim of the thesis was to consider ways to address the potential detrimental consequences of conspiracy theories. To date, there has been limited discussion on how to address the impact of conspiracy theories. It is therefore important to investigate tools that may attenuate the potential detrimental consequences of conspiracy theories. To meet these aims, this opening chapter will present a broad introduction to the phenomenon of conspiracy theories. It first will discuss ways to define a conspiracy theory and reasons behind their continued popularity in the 21st century, leading to a review of the psychological literature examining beliefs in conspiracy theories. The chapter will end by introducing the current research programme.

An introduction to conspiracy theories

Definition of a conspiracy theory

Several definitions of the term *conspiracy theory* have been proposed (e.g., see Brotherton, 2013). ab) defined conspiracy theories broadly as attempts to explain the ultimate causes of events as secret plots by powerful forces rather than as overt activities or accidents. A second definition, which has been used in a variety of publications, defined a conspiracy theory as a proposed plot by powerful people or organisations working together in secret to accomplish some (usually sinister) goal (e.g., Coady, 2006; Douglas & Sutton, 2008; Goertzel, 1994; Wood et al., 2012). Finally, some scholars have defined conspiracy theories as false beliefs in which the ultimate cause of an event is believed to be due to a malevolent plot by multiple actors working together, usually unlawfully and in secret (Swami & Furnham, 2012; Swami, et al., 2013).

These three example definitions are similar in that they all focus on the actions of *powerful* others. This allows a clear difference to be highlighted between a conspiracy theory and what might be called a "mainstream" account. A conspiracy theory interprets an event as being orchestrated by a small group of powerful people in order to meet a secret goal, whereas a mainstream account may explain the cause of an event as being by a more mundane activity such as a simple accident with no malevolent intent. For example, conspiracy theories relating to the death of Princess Diana often suppose that she was murdered by the British government as opposed to being killed in an unfortunate car accident by a drunk driver. Therefore, taking into account the similarities of the varying definitions of a conspiracy theory, within this thesis we broadly define a conspiracy theory as explaining the causes of events as the actions of secret, powerful forces.

Popularity of conspiracy theories

Polls have indicated that beliefs in conspiracy theories are thriving in the 21st century (e.g., Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013). Interestingly, however, whilst beliefs in some conspiracy theories can be seen to maintain hold in the public consciousness, others never receive such popularity. For example, a Gallup Poll has found that in the last 50 years, on average, over 60% of respondents believed 'others' were involved in the assassination of President Kennedy, peaking at 81% in 2001 (Swift, 2013). The continued popularity of the J.F.K. conspiracy theory occurs despite significant evidence supporting the lone-assassin explanation. On the other hand, however, Public Policy Polling (2013) found that certain conspiracy theories were endorsed by only a small percentage of people. For example, only 4% of American respondents indicated belief that "lizard people" control our society; furthermore, only 5% in the same sample indicated they believed that Paul McCartney actually died in 1966.

In order to investigate why some conspiracy theories appear to be more popular than others, Grzesiak-Feldman and Suszek (2008) focused on people's perceptions of the conspirators behind the theories. It was found that conspiracy theories were considered to be more plausible if the proposed conspirators were a tightly formed group, such as Jews. In other words, the conspiracy theory was considered more plausible if the proposed conspirators were seen to have a high degree of cohesion, homogeneity and shared goals. Further, conspiracy theories can provide explanations for big events – for example, a conspiracy theory may be seen as more plausible when the event is disproportionately large (Leman & Cinnirella, 2007). Moreover, some conspiracy theories, such as anti-Semitic conspiracy theories, appear to be sensitive to situational factors such as war or elections (Byford & Billig, 2001; Kofta & Sedek, 2005). For example, Kofta and Sedek (2005) found

that the Jewish conspiracy theory which argues individuals of the Jewish faith are involved in international events, such as in banking institution, is activated in politically threatening situations, such as before parliamentary elections. Therefore, the size of the event, whether the proposed conspirators are a tightly formed group, and situational factors at the time such as war may promote belief in certain conspiracy theories.

Popular culture has also embraced conspiracy theories, which may help explain why some conspiracy theories continue to be popular in the 21st century. For example, conspiracy theories surrounding J.F.K. and 9/11 have been featured in a range of documentaries, films and books (see Byford, 2011). A search on Amazon.co.uk of the keywords "conspiracy theories" shows over 7, 600 results such as the 1997 film *Conspiracy Theory*, the 1991 film *J.F.K*, the popular drama *The X-Files*, and Jon Lewis' *The Mammoth Book of Cover-Ups.* Further, conspiracy theories are regularly referred to in popular TV programmes, such as in *Friends* references to the Moon landings (Bright, 2002) and an episode in the animated show *South Park* dedicated to the 9/11 conspiracy theories (Parker, 2006).

Conspiracy theories are also easily accessible on the Internet, which may be another contributing factor in helping to explain why conspiracy theories continue to be popular today. The Internet is used to assist with a variety of daily tasks, from work to hobbies. It is also crucially and increasingly used to form people's views about the world (Miller & Ryan, 2011), such as being able to access political news and information that can subsequently influence people's political views. For example, instead of people having to rely on information from newspapers, they can access political candidates' websites online, and watch videos of candidates' speeches (Discovery, 2014). It has even been suggested by some that Barack Obama won his American presidency by utilising the Internet to connect with millions of voters (Discovery, 2014). Moreover, when a significant event such as the death

of Princess Diana occurs it is also quick and easy to find an array of information about the event on the Internet. Under conditions of social anxiety and uncertainty, people are eager for explanations (Reid, 2010), which the Internet can quickly provide for them. For example, Leman (2007) reports that people were able to access conspiracy theories on websites built around the death of Princess Diana in 1997 in a matter of hours.

With the technological advances made in the last 10 years, conspiracy theories are now instantly available via sources such as blogs, Youtube videos and social media (e.g., Wood, 2013). For example, a survey of 153 YouTube videos matching the term "vaccination" and "immunization" revealed that half of the videos were not supportive of vaccination, and provided contradictory information to official sources (Keelan, Pavri-Garcia, Tomlinson, & Wilson, 2007). Researchers have also found that 43% of websites based around vaccination contained explicit anti-vaccination content, with many of these sites appearing in the top ten results for internet searches on vaccination (Davies, Chapman, & Leask, 2002; Nasir, 2000). It is possible to suggest therefore, that conspiracy theories today are more easily disseminated across digital channels than ever before (Coady, 2006).

In summary, conspiracy theories continue to be popular today with millions of people believing these alternative explanations for events (Swami & Coles, 2010). In order to explain such widespread belief in conspiracy theories today, scholars have suggested that the digital revolution may have helped (Clarke, 2007; Wood, 2013). This may be due, in part, to the Internet eliminating the conventional "gate-keepers", such as professional editors (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012, p. 110). Along the same lines, Bartlett and Miller (2011) found that young people are increasingly unable to recognise bias in Internet articles because they do not apply fact checks to the information they find. Moreover, young people, when searching for information, will not go to a varied number of

sources, but rather trust the first thing they find. Therefore, as noted by Bartlett and Miller (2011), people "are often influenced by information they should probably discard" (p. 3). Coupled with the ease of spread of conspiracy information on the Internet (Coady, 2006), such limited knowledge about how the online world works (i.e., how the top "hits" in a search engine are formed) may help explain why some conspiracy theories continue to persist in the 21st century. In other words, being exposed to such alternative views readily on the Internet, without the source of information being critically evaluated, may stimulate the continued popularity of the conspiracy theory. With belief in conspiracy theories being widespread, it is therefore important for psychologists to learn more about the personality characteristics associated with belief in conspiracy theories and the potential consequences that are associated with conspiracy theorising.

What do we know about the psychology of conspiracy theories to date?

In recent years, psychologists have learned a good deal about the individuals who endorse conspiracy theories. In this section, the existing research to date on the psychology of conspiracy theories will be outlined, including measures of conspiracy beliefs, investigations of psychological characteristics associated with conspiracy beliefs, and psychological processes associated with belief in conspiracy theories.

Measuring conspiracy beliefs

At present, several psychometric scales aim to measure the extent to which people endorse conspiracy theories. These usually consist of participants completing a short self-report questionnaire assessing belief in a number of conspiracy theories concerning real-world events. Common items in these scales include conspiratorial statements concerning the assassination of President Kennedy, the death of Princess Diana, and the NASA moon

landing (e.g., Abalakina-Paap et al., 1999; Darwin, Neave, & Holmes, 2011; Douglas & Sutton, 2011; Goertzel, 1994; Leman & Cinnirella, 2007; Swami et al., 2013). Participants typically rate their agreement with each item on a Likert-type rating scale ranging from strongly agree to strongly disagree. Douglas and Sutton (2011), however, refined this measure by asking participants to not only rate their agreement with each statement, but also to rate how convincing, worth considering, interesting and coherent they thought each statement was. A total measure of conspiracy theory endorsement was then calculated for each conspiracy statement across the five items.

New measures now exist that offer an alternative to the approach of using real-world events. Brotherton, French, and Pickering (2013) have argued that using specific historical events may limit the diverse sample of populations that the scale can be administered to, and may become outdated in changing trends of popular conspiracy theorising. Following this, several new scales have been developed, such as the *Generic Conspiracist Belief* scale (GCB) (Brotherton et al., 2013) and the *Conspiracy Mentality Questionnaire* (CMQ, Bruder et al., 2013). These scales assess belief about the typicality of conspiratorial activity, removed from the context of specific historical events. Items refer to "the government" and "significant events" in the place of specific entities or events (i.e., these items were non-event-based; Brotherton et al., 2013). In doing so, the authors suggest that their GCB measure will endure over time, and can be suitable for diverse populations (i.e., not culture specific; Brotherton, et al., 2013).

It is worth noting however, that the GCB scale has been found to correlate strongly with the *Belief in Conspiracy Theories Inventory* (BCTI, Swami, Chamorro-Premuzic & Furnham, 2010) which refers to real-world conspiracy theories. Thus, when looking at British and American samples at least, the scales may be equally useful. In summary, there

are a variety of different approaches to measure beliefs in conspiracy theories, with each approach holding their own advantages.

Demographics

There appear to be few socio-demographic factors that consistently predict conspiracy theory beliefs across studies. For example some researchers have found conspiracy theories to be associated with age (Swami, 2012), education level (Bird & Bogart, 2003; Oliver & Wood, 2014), annual income (Bird & Bogart, 2003), perceived importance of religion (Oliver & Wood, 2014), religiousness (Furnham, 2013), and political orientation (Furnham, 2013; Inglehart, 1987; Oliver & Wood, 2014). Others, however, have found conspiracy beliefs not to be limited to certain parts of society, with several studies reporting no gender, race, religious belief, intelligence or educational level differences in conspiracy belief (Abalakina-Paap et al., 1999; Crocker, Luhtanen, Broadnax, & Blaine, 1999; Darwin et al., 2011; Goertzel, 1994; Herek & Capitanio, 1994; Parsons, Simmons, Shinhoster, & Kilburn, 1999; Simmons & Parsons, 2005; Swami et al., 2011, 2013), or weak and/or inconsistent relationships (Goertzel, 1994; Swami et al., 2010; Swami, et al., 2011; Swami & Furnham, 2012).

Nonetheless, ethnicity does appear to be a robust predictor of conspiracy beliefs (e.g., Goertzel, 1994; Hoyt, et al., 2012). For example, Crocker et al. (1999) found belief in AIDS conspiracy theories to be more common amongst minority groups and especially Black populations. A potential reason could be due to the fact that minority groups already suffer from discrimination, and may therefore be more likely to distrust authorities. In support of this idea, Abalakina-Paap et al. (1999) found that African-Americans who believed they had been the victims of police harassment were more likely to endorse conspiracy theories. Along a similar vein, starting in 1932 and continuing for 40 years, the Public Health Service

working with the Tuskegee Institute (now known as Tuskegee University) studied the effects of syphilis on 600 black men – 399 with syphilis and 201 who did not have the disease. Those who had syphilis, unbeknown to them, had the treatment withheld in order for doctors to learn about untreated syphilis in rural African American men. As argued by Reid (2010), "it is clearly worth noting that governments do at least occasionally conspire against their own citizens" (p. 150). It may therefore be reasonable to suggest that minority groups may have developed beliefs in conspiracy theories because of real discrimination.

Structure of belief

Researchers have shown consistently that belief in one conspiracy theory is strongly predicted by belief in unrelated theories (Douglas & Sutton, 2008; Goertzel, 1994; Swami et al., 2010, 2011; Wood et al., 2012). For example, people who endorse conspiracy theories regarding the 9/11 terrorist attacks are likely to believe in other unrelated conspiracy theories such as President Kennedy not being killed by a lone gunman or that the Apollo moon landings were staged (Swami et al., 2010). Further, scholars have found that individuals who endorse real-world conspiracy theories are also more likely to endorse a fictional conspiracy theory made up for the purpose of a study (Swami et al., 2011; Leman & Cinnirella, 2013).

A variety of reasons for this phenomenon have been proposed, centred on broader belief systems and world views. For example, one possible suggestion is that somehow the beliefs in conspiracy theories support one another (Goertzel, 1994). In other words, each of the beliefs serve as evidence for other forms of conspiracy, and thus conspiracy can become the default explanation for any given event (Goertzel, 1994; Wood et al., 2012). Goertzel (1994) was the first to suggest that conspiracy beliefs may form part of a *monological belief system*, a suggestion that has since been empirically supported by others (e.g., Swami et al., 2010, 2011). Indeed, as noted by Wood et al. (2012), the fact that "one near-perfect

[conspiracy could be] successfully executed in secrecy suggests that many other plots are possible" (p. 767).

Interestingly, however, Wood et al. (2012) also found that people endorse mutually incompatible conspiracy theories of the same event. For example, participants who endorsed the belief that Osama bin Laden was already dead when the Americans reached his compound in Pakistan were also likely to believe he was still alive. Holding such a contradictory belief can therefore be seen to be at odds with the general idea of a monological belief system. Goertzel (1994) argued for example, that conspiracy theories are linked because they are in direct agreement and thus, the conspiracy beliefs support each other. The monological belief perspective therefore does not account for instances where people hold conspiracy beliefs that are mutually exclusive.

Sutton and Douglas (2014) have also suggested that the monological belief system perspective is not sufficient in explaining why people endorse several conspiracy theories at the same time. The authors note that there are other plausible mechanisms that hold conspiracy beliefs together, such as conspiracy theories addressing feelings of control (Whitson & Galinsky, 2008) and the tendency to project one's own moral leanings onto the alleged conspirators (Douglas & Sutton, 2011). Another explanation argues that beliefs in conspiracy theories are positively associated because both are associated with the view that authorities are engaged in a cover-up and are hiding something (Wood et al., 2012). Thus, conspiracist belief systems are driven not by direct relationships among individual theories as presented in the monological belief system perspective, but by agreement between individual theories and higher-order beliefs about the world. Wood et al. (2012) have provided evidence of this assertion by demonstrating beliefs in contradictory theories regarding Osama Bin Laden were explained by people endorsing the idea that the U.S government is hiding

important information about the raid that led to his death. Sutton and Douglas (2014) suggest that the associations between beliefs in conspiracy theories may even be explained by "an underlying individual difference variable, such as *conspiracism*" (p. 267). Overall, this research provides evidence that the message is not as important as the idea that authorities and officials are responsible for a cover-up.

Cognitive biases

Beliefs in conspiracy theories have also been found to be associated with biases in information processing that are automatic and thus unconscious. This section aims to provide an overview of each of the biases associated with conspiracy theorising.

Biased assimilation and attitude polarisation. Conspiracy theories may persist because people seek and interpret information in such a way as to confirm an existing preconception. In other words, new information is only sought in order to confirm one's initial beliefs, which subsequently protects the beliefs from critical evaluation. This process of biased assimilation is correlated with attitude polarisation (McHoskey, 1995). Put differently, one's initial position can be strengthened by uncritically accepting evidence that supports prior held beliefs. For example, when presented with mixed evidence, people have a tendency to uncritically accept evidence that is supportive of their prior viewpoint whilst discrediting evidence that argues against this existing preconception. By uncritically accepting evidence that is supportive of their viewpoint, this information further strengthens their beliefs. McHoskey (1995) suggested that a similar process of biased assimilation and attitude polarisation might happen with belief in conspiracy theories.

McHoskey (1995) empirically explored this assertion by first asking participants to indicate their belief in several conspiracy theories concerning the assassination of J.F.K.

Participants were then presented with evidence containing conspiracy theory arguments or anti-conspiracy arguments, before re-rating their belief in the J.F.K. conspiracy theory. Results revealed that those who initially indicated a higher belief in J.F.K conspiracy found arguments supporting this position to be more persuasive than evidence in favour of the long-gunman theory. McHoskey (1995) also exposed participants to mixed evidence containing both conspiracy theory arguments and anti-conspiracy arguments. Results demonstrated that people uncritically accepted evidence that was supportive of their prior belief, whilst scrutinising and discrediting any evidence that went against their initial position. In other words, those who held a conspiracy theory belief discredited evidence that argued in favour of the mainstream account. On the other hand, those who held mainstream beliefs discredited evidence that argued for the conspiracy account.

Similarly, Leman and Cinnirella (2013) found participants who indicated a higher belief in real world conspiracy theories were more likely to attribute a conspiracy theory to a fictitious account of an assassination, whereas nonbelievers believed it fitted better with a mainstream account. The research taken together suggests that the same piece of information can be taken to support contradictory beliefs held by different people. Put differently, when evidence contains both pro- and anti-conspiracy information for example, people accepted the body of evidence that supports their own pre-existing belief. These findings appear to confirm the relevance of biased assimilation and attitude polarisation in the maintenance of conspiracy theory beliefs.

Projection. The process of projection leads people to believe that others will generally think, feel and behave in the same way as they themselves do (Ames, 2004). This therefore allows people to make sense of the social environment when more reliable information is lacking (Ames, 2004). Douglas and Sutton (2011) have suggested belief in

conspiracy theories may be a product of this social cognitive tool where they use themselves as a reference point when trying to understand what others may have done. For example, people may be less likely to dismiss the hypothesis that government scientists created AIDS if they believe that they personally would be willing to create it. In other words, people holding the perception that "I would do it" leads them to perceive that "they did it" (Douglas & Sutton, 2011, p. 545).

To test this hypothesis, Douglas and Sutton (2011) conducted two studies. In the first study they measured the individual difference variable of Machiavellianism, which reflects a willingness to exploit others for personal gain and is therefore a reasonable indicator of a person's moral tendencies (Christie & Geis, 1970; Douglas & Sutton, 2011; Hodson, Hogg, & MacInnis, 2009). Participants were then asked to indicate their belief in a number of conspiracy theories and whether they would have participated in the alleged conspiracies if they were in the same position. Results revealed that Machiavellianism and greater personal willingness to conspire predicted stronger belief in conspiracy theories. Moreover, the relationship between Machiavellianism and belief in conspiracy theories was explained by participants' personal willingness to conspire. In other words, high Machiavellian participants were more likely to endorse the conspiracy theory account because they were more likely to perceive they would conspire themselves.

In the second study, Douglas and Sutton (2011) primed participants with their personal morality by asking them to recall a time when they behaved in a moral and decent manner (vs. a control). It was reasoned that in recalling a time when they behaved in a moral and decent manner, participants would perceive themselves as being unlikely to participate in conspiracy theories. Participants were then asked to indicate both their belief in conspiracy theories and their willingness to participate in each of the alleged conspiracies. They found

that the participants who were asked to write about a time they helped someone endorsed conspiracy theories to a lesser extent than those in the control condition. This relationship was fully explained by participants being less willing to have participated in the alleged conspiracies. This provides evidence that people believe in conspiracy theories to the extent that they think they, personally, would have been willing to conspire. As Douglas and Sutton (2011) note, projection may arise in conspiracy theories when there is little information available concerning the causes of a significant event. People therefore may use themselves as a reference point when faced with a conspiracy theory account.

Proportionality. The proportionality bias refers to "an irrational need to explain big and important events with proportionately big and important causes" (McCauley & Jacques, 1979, p. 637). It is argued that this occurs because people often prefer to make assumptions that significant events are likely to have been caused by something as equally significant (Kahneman & Tversky, 1972). To take the example of the death of Princess Diana, explaining her death as a simple car accident violates the principle of proportionality. However, explaining her death as a conspiracy, where members of the Royal Family murdered her, maintains proportionality between a big cause and a big consequence. Across a series of studies, the role of the proportionality bias in conspiracy belief has been tested. The first by McCauley and Jacques (1979) tested the hypothesis that people would prefer to believe a major cause is responsible for a major event. To test this, the authors presented participants with one of two newspaper headlines – one headline being "Man shoots at the President and misses" (minor consequence), and the second being "Man shoots at the President and kills him" (major cause). These scenarios therefore directly manipulated the size of the event where people were either told the president survived an assassination (i.e., a minor event) or the bullets killed him (i.e., major event), before indicting their belief that a conspiracy was involved in the President's death. Results demonstrated that the fatal

assassination was judged to be relatively more likely to be the result of a conspiracy (as opposed to a lone assassin) in comparison to the non-fatal attempt.

In explaining this finding, McCauley and Jacques (1979) suggested however, that rather than being influenced by a proportionality heuristic, the participants may have instead made a judgment about the expected competence of the assassin. In a follow up study, Leman and Cinnirella (2007) aimed to explore this alternative interpretation further by breaking the casual link between the competence of the assassin and the outcome. People therefore read one of four scenarios: the president is shot and dies (1; major event), the president is shot at but the bullets miss and he survives (2; minor event), the president is hit but he survives (3; minor event) or the president is shot at but the bullets miss; however, he dies of an unrelated cause (4; major event). The last scenario was the key condition, as this took into account the competence of the assassin, but the outcome was still the death of the President. Results demonstrated that participants were more likely to believe that a conspiracy was the cause of an event where the president had died (scenarios 1 and 4) than when he survived (scenarios 2 and 3). Leman and Cinnirella (2007) named this relationship the 'major event-major cause' bias in conspiracy thinking.

Recently, van Prooijen and van Dijk (2014) have found that this effect is moderated by perspective-taking. Across a series of studies, participants were asked to read about events with big consequences and causes which involved the death of an African country leader (versus an event with a minor consequence and/or cause). They found that conspiracy theories were more strongly endorsed when the participants took the perspective of the citizens of the African country. The researchers also tested an individual difference measure of perspective-taking abilities where no explicit instructions were given to take the perspective of the other group. In this study, participants were asked to take the "Reading the

Mind in the Eyes" test, which is designed to assess people's capacity to infer other people's mental states (van Prooijen & van Dijk, 2014). Results were in line with the previous studies and demonstrated that for people who had high perspective-taking ability, they indicated a stronger belief in conspiracy theories if the opposition leader died (major consequence) as opposed to lived (minor consequence). In the final study, the authors kept the big consequences constant, but measured participant's own desire to understand the causes of significant events. Results demonstrated that the effect of perspective-taking was explained by participants' own motivation to make sense of the event. Taken together, perspective taking was shown to increase conspiracy beliefs following a consequential event. This research therefore provides an explanation for why people endorse conspiracy theories following significant events, even when the event took place elsewhere in the world.

In summary, researchers have demonstrated that participants were more likely to believe that a fictional President was shot and killed by a gunman involved in a conspiracy, than an insane lone gunman (McCauley & Jacques, 1979; Leman & Cinnirella, 2007). Moreover, this preference to believe that a major event was caused by a major cause has been shown to be more prominent in people taking the perspective of another group (van Prooijen & van Dijk, 2014). If a major event has a minor cause, such as when a president is assassinated by a mentally unstable gunman or a drunk driver kills a princess, this can leave the relationship between cause and effect unpredictable, and this makes people feel uncomfortable (e.g., Leman, 2007). Some scholars argue that conspiracy theories are therefore mental shortcuts, which draw clear arrows between big causes and big effects (e.g., Leman & Cinnirella, 2007).

Conjunction fallacy. Finally, the conjunction fallacy is an error of probabilistic reasoning where people overestimate the likelihood of co-occurring events. Brotherton and

French (2014) developed several conspiratorial vignettes in order to test whether people who endorse conspiracy theories are particularly susceptible to this fallacy. They found that people who indicated stronger agreement with popular conspiracy theories, as well as generic conspiriacist ideas, made more conjunction errors. They suggest that this occurs because conspiracy believers have a "biased conception of randomness, where coincidences are rarely mere chance occurrences" (Brotherton & French, 2014, p. 246). Those who endorse conspiracy theories are more likely to see unrelated facts as being causally related by a conspiratorial plot. This can make them particularly susceptible to perceiving unrelated events as being related. The causal pathway, however, is not clear. As noted by Brotherton and French (2014), the conjunction fallacy could be caused by or cause endorsement of conspiracy theories, or potentially a reciprocal relationship may occur. Nonetheless, it is clear that such a fallacy could help a person make sense of uncertain events where there is no coherent explanation.

Personality

Another line of work has investigated the psychological makeup of people who endorse conspiracy theories. If we are all susceptible to the same cognitive biases, investigating common characteristics of conspiracy believers using an individual difference approach will help determine what type of person is more likely to endorse conspiracy theories. Initially a large amount of the early work investigating individual characteristics of those who endorse conspiracy theories classified conspiracy believers as paranoid individuals whose judgements are somehow "distorted" as a result of an "uncommonly angry mind" (Hofstadter, 1971, pp. 2-3) or as a product of psychopathology, paranoia or delusional ideation (e.g., Groh, 1987; Plomin & Post, 1997). A recent shift however, has directed focus away from the pathological perspective, as this account could be argued to be lacking when

considering how widespread conspiracy beliefs are in society (Sunstein & Vermeule, 2009; Swami & Coles, 2010; Waters, 1997). Indeed, it is unlikely that millions of conspiracy believers all suffer from serious pathological problems.

Darwin et al. (2011) found that subclinical paranoid and schizotypal personality traits were associated with stronger beliefs in conspiracy theories. It was argued that extreme forms of these personality traits may lead to maladaptive behaviours, but milder forms may be adaptive and make people suspicious in risky situations. Conspiracy theories may, therefore, be a consequence of this adaptive approach where mild paranoia makes people suspicious of those around them. Similarly, distrust in authority, low levels of interpersonal trust (e.g., institutions, neighbours, friends), anomie and cynicism have been associated with beliefs in conspiracy theories (e.g., Abalakina-Paap et al., 1999; Goertzel, 1994; Leman & Cinnirella, 2013; Swami et al., 2010). As noted by Darwin et al. (2011), these correlates are similar to paranoia, but are in a mild form. For example, it is plausible that mistrust may be a product of mild paranoia, where people high in both these traits may find conspiracy theories appealing since they are both distrusting and suspicious of those who are in a position of power.

Further, lower self-esteem, anxiety and right-wing authoritarianism (RWA) have been found to be associated with higher conspiracy beliefs (Abalakina-Paap et al., 1999; Goertzel, 1994; Grzesiak-Feldman, 2013; Swami et al., 2011). However, it should be noted that researchers have found contradictory findings when exploring self-esteem and RWA. For example, Swami (2012) found no relationship between self-esteem and conspiracy beliefs, and Leman and Cinnirella (2007) found no relationship between authoritarianism and conspiracy theorising. Moreover, the causal pathway between self-esteem, authoritarianism and belief in conspiracy theories is not clear. Without the casual evidence to show otherwise,

self-esteem for example may be a product of a combination of factors. Specifically, when a person feels anxious, this may lower self-esteem.

Scholars have also investigated the idea that those who endorse conspiracy theories are more open to experience, rather than being rigid and closed (e.g., Swami et al., 2010, 2011). However, whilst some researchers have found that beliefs in conspiracy theories are associated with openness to experience (Swami et al., 2011), others have found inconsistent relationships when using the Big-5 personality inventory, where statistically significant, but weak, relationships have been found with openness (Swami et al., 2010, 2013), or a failure to find a significant relationship at all (Bruder et al., 2013; Furnham, 2013; Imhoff & Bruder, 2014).

It is therefore unclear whether conspiracy theories reflect openness to experience. However, openness can be associated with such traits as superstition, beliefs in the paranormal and new age ideas, which each have been linked to belief in conspiracy theories (Darwin et al., 2011). Thus, whilst there is no direct reliable relationship between openness and conspiracy theories, other predictors such as belief in the paranormal can provide a tentative link between openness and conspiracy beliefs. Moreover, openness could be associated with the search for information. For example, Swami et al. (2010) found that individuals who endorse conspiracy theories relating to the 9/11 terrorist attacks report consuming more information about the theories. It is not clear, however, whether the trait of openness may mean that people are more likely to choose to seek out conspiracy information, or whether prior beliefs alone could explain this. Nonetheless, whilst the research is not conclusive, there is some evidence to suggest that openness may be a factor associated with belief in conspiracy theories.

Moreover, researchers have suggested that conspiracy theories may help people address feelings of powerlessness and a lack of control (Leman, 2007; Miller, 2002; Swami & Coles, 2010; Swami & Furnham, 2012). For example, Abalakina-Paap et al. (1999) found that measures of general powerlessness predicted stronger belief in conspiracy theories. Consistent with this correlational data, Whitson and Galinsky (2008) provided experimental evidence that lacking in control increases belief in conspiracy theories. To do this, they asked participants to remember a time when they were either in complete control of a situation or lacked it entirely. Results demonstrated that those who reminisced about a lack of control were more likely to interpret conspiracy theories in ambiguous stories they read, such as an office worker being denied promotion after a flurry of e-mails between the boss and another co-worker. In a follow up study, Whitson and Galinsky (2008) found if participants were able to gain a sense of control from a substitute route, such as a self-affirmation exercise, this made people less likely to attribute a conspiracy theory to ambiguous stories. To test this idea, the authors asked participants to first complete the recall task to induce a lack of control. They were then asked to complete a scale that focused on a value that they perceived to be most important (self-affirmation) or least important (no self-affirmation). Results demonstrated that those who completed the self-affirmation task perceived conspiracy theories to be less likely in the ambiguous stories in comparison to those who were not give an opportunity to self-affirm. These studies therefore provide evidence that conspiracy theorising may be a route to satisfy feelings of powerlessness and lack of control.

Conspiracy theories can also help people avoid feelings of uncertainty (van Prooijen & Jostmann, 2013; Whitson, Galinsky, & Kay, in press). For example, van Prooijen and Jostmann (2013) and Whitson, et al. (in press) found across their studies that people endorsed conspiracy theories when uncertainty was made salient. Previous research has indicated that

when uncertainty increases people pay closer attention to the morality of an authority's action (cf. van Prooijen & Jostmann, 2013). Thus, van Prooijen and Jostmann (2013) specifically wanted to test whether uncertainty increased the extent to which people interpreted signs of whether an authority is moral, and how this impacted their conspiracy theory beliefs. Across their studies therefore, the participants were given moral or immoral information whilst under conditions of uncertainty (vs. a control). Results revealed that morality influenced beliefs in conspiracy theories, but only when uncertainty was made salient. Along a similar vein, Whitson, et al. (in press) had participants recall uncertain (e.g., worried, surprised; vs. certain, e.g., angry, certain) emotions before reading an ambiguous scenario and rating their belief in a conspiratorial explanation. Results demonstrated that participants who recalled an uncertain emotion showed greater endorsement of conspiracy beliefs than participants who recalled a certain emotion. Together, these studies provide empirical evidence that conspiracy theories may be a response to people satisfying the need to avoid uncertainty.

Several lines of research therefore provide support for the view that conspiracy theories typically present subversive alternatives to establishment narratives. For example, endorsement of conspiracy theories is associated with traits such as anomie and political distrust (e.g., Abalakina-Paap, et al., 1999; Goertzel, 1994). Conspiracy theories questioning authorities and institutions may however contradict a well-documented motivation – system justification. System justification theory proposes that people are motivated to maintain positive views about social systems (e.g., Jost & Banaji, 1994; Jost & Burgess, 2000; Jost & Thompson, 2000). People consequently see the system that affects them as fair and legitimate and possess a motivation to defend and justify it. Scholars argue that system justification theory therefore accounts for a number of belief systems, such as: belief in a just world, power distance, right-wing authoritarianism and social dominance orientation (Jost & Hunyady, 2002). They suggest that each of these beliefs systems supply rationalisations for

different aspects concerning the status quo that individuals may feel compelled to defend and justify. People therefore may defend and justify their society if it is threatened, or they feel that they are dependent on it (e.g., Kay et al., 2009).

One possible answer to explain why people subscribe to conspiracy theories is that like system justification, conspiracy theories provide a route to satisfy important psychological needs such as allowing people to address feelings of powerlessness and control (Abalakina-Paap, et al., 1999; Whitson & Galinsky, 2008) and avoid feelings of uncertainty (van Prooijen & Jostmann, 2013; Whitson, et al., in press). In a similar vein, Whitson, et al. (in press) have argued that support for the current status quo, belief in conspiracy theories and embracing the paranormal may all be rooted in part, in the same underlying process. When addressing feelings of uncertainty therefore, people may turn to conspiracy theorising as a substitute route when system justification is untenable.

Alternatively, conspiracy beliefs may not be in conflict with system justification. It is plausible to propose that conspiracy theories instead may serve to uphold the perceived legitimacy of the status quo rather than undermine it. Conspiracy theories give believers someone tangible to blame instead of blaming it on impersonal forces (Goertzel, 2010). Thus, by deflecting blame for the causes of significant events on to a small number of people, conspiracy theories may enable people to maintain the belief that society is fair. Conspiracy theories may therefore function as a means to defend the current social system. In doing so, conspiracy theories may therefore be a route to satisfy psychological needs such as low self-esteem and feelings of powerlessness, lack of control, anxiety and uncertainty (Abalakina-Paap, et al., 1999; Goertzel, 1994; Grzesiak-Feldman, 2013; van Prooijen & Jostmann, 2013; Whitson & Galinsky, 2008; Whitson, et al., in press) *alongside* system justification. In sum,

there are grounds to predict that conspiracy theories may either undermine or bolster support for the status quo. To date however, no research has directly examined these predictions.

Psychological and social consequences of conspiracy theories

Conspiracy theories may undermine people's confidence in political systems, their trust in the workings of science, and their confidence and trust in medical establishments. Ironically however, it is plausible that conspiracy theories may actually bolster support for the status quo. Inadvertently this may enable people to justify rather than address limitations of society. Therefore, whilst conspiracy theories may be a route for people to address important psychological needs, the consequences of conspiracy theories could have a potentially detrimental impact to society. Some scholars have however suggested that conspiracy theories may be harmless fun and of little concern (Bratich, 2008; Clarke, 2002), with beliefs held only by a small number of the population (Sunstein & Vermeule, 2009). It was therefore thought that conspiracy theories would have little or no detrimental influence over society, as belief in conspiracy theories were seen to be foolish and illogical (e.g., Melley, 2002; Willman, 2002). As Douglas and Sutton (2008) also note, "the term itself is somewhat dismissive and pejorative" (p. 211). Indeed, whilst there has been no empirical evidence at present, a number of scholars have discussed the potential positive consequences of endorsing conspiracy theories. For example, Miller (2002) suggests that conspiracy theories can provide individuals with the opportunity to question the credibility of governments, which in normal circumstances would likely be denied to them. Moreover, as discussed earlier, conspiracy theories may serve to help people deal with a sense of powerlessness, uncertainty and lack of control when faced with significant events (Abalakina-Paap et al., 1999; van Prooijen & Jostmann, 2013; Whitson & Galinsky, 2008).

Scholars have also suggested that conspiracy theories can reveal actual anomalies in mainstream explanations (e.g., Clarke, 2002; Swami & Coles, 2010). Indeed, some conspiracy theories have been proven to be true such as the U.S. Department of Defence plans to orchestrate terrorism and blame it on Cuba, the Watergate scandal that involved a break-in at the Democratic National Committee headquarters where President Nixon's administration attempted to cover-up their involvement and the Tuskegee syphilis scandal where treatment was withheld from 399 Black men without their informed consent. Conspiracy theories may therefore allow people to question social hierarchies, which may encourage governments to be more transparent (see Swami & Coles, 2010). However, Brotherton (2013) argues that this may be a dubious assertion. In the case of the Watergate scandal, this conspiracy was uncovered due to the efforts of conventional journalists and academics or whistle blowers, rather than "obscure" conspiracy theorists (p.18). Thus, whilst conspiracy theories may allow people to challenge social hierarchies, the investigative activity of conspiracy theorists may not serve to successfully uncover real conspiracies.

This potentially ineffective investigative activity has the ability to elicit mistrust and divert attention from important scientific, political and societal issues (e.g., Fenster, 1999; van der Linden, 2013; Miller, 2002; Swami & Coles, 2010). Beliefs in conspiracy theories may therefore have potentially detrimental consequences for both the individual and wider society. For example, researchers have shown that endorsement of birth control and HIV/AIDS conspiracy theories, which propose that HIV/AIDS are a form of genocide against African Americans, are associated with increased negative attitudes towards contraceptive behaviours (e.g., the use of condoms; Bogart & Thorburn, 2006; Bird & Bogart, 2003). Indeed, negative attitudes towards condoms have been shown to partially explain the relationship between conspiracy beliefs and condom use (Bogart & Thorburn, 2006). Similar results have been found in research conducted by Hoyt et al. (2012), where HIV conspiracy

beliefs were associated with increased risk relating to HIV such as being more likely to avoid appropriate treatment behaviour. However, we are unable to establish the causal pathway from this research – belief in HIV conspiracy theories may lead to increased risky behaviour, or it may just be that those prone to such beliefs are also more likely to be risk takers. Nonetheless, this work suggests that conspiracy theories may have potentially negative consequences for the prevention of pregnancy and sexually transmitted illnesses.

Moreover, the former South African President Mbeki publicly stated that HIV is not the cause of AIDS and that antiretroviral (ARV) drugs are not useful in controlling the HIV infection (Chigwedere, Seage, Gruskin, Lee, & Essex, 2008). The South African government therefore declined to accept donations of ARV medication. It is plausible that such a public expression of conspiracy belief may have influenced the South African public's trust in biomedical claims (Rubincam, 2014). It has since been estimated that over 330,000 South Africans died between the years 2000-2005, which could have been due, in part, to the actions of the South African government (Chigwedere et al., 2008). This clearly highlights the implications and potentially widespread consequences of high-level officials endorsing a conspiracy account.

Conspiracist ideation in general also tends to be associated with a mistrust of science such as the rejection of climate science and the link between smoking and lung cancer (Lewandowsky, et al., 2013b). Similarly, Oliver and Wood (2014) have shown using four nationally representative surveys sampled between 2006 and 2011 that over half of the U.S. population endorses at least one medical conspiracy theory, such as the link between vaccines and autism. They also found that people who endorse such conspiracy theories are less likely to use traditional vaccines such as flu shots, and were more likely to indicate that they would trust medical advice from non-professionals such as friends and family. This demonstrates

that people who endorse medical conspiracy theories may be reluctant to follow trusted medical advice, which could have wider detrimental consequences for society as a whole, such as with the continued spread of curable illnesses.

Further, Swami (2012) has demonstrated that among a Malaysian Malay sample, belief in Jewish conspiracy theories were associated with greater racist attitudes concerning Chinese citizens. Golec de Zavala and Cichocka (2012) also found that belief in conspiracy theories about Jewish domination of the world was associated with anti-Semitic attitudes. Moreover, research by Imhoff and Bruder (2014) has shown that conspiracy mentality, which is a general tendency to believe in conspiracy theories, is a significant predictor of prejudices against a variety of high-power groups (e.g., Jews, Americans, capitalists). Barlow et al., (2012) also found that in a sample of White Americans, people who reported negative contact with Black Americans were found to express a higher level of doubt about Barack Obama's American citizenship and his eligibility to be President of the United States. This can suggest that conspiracy theories may be used as a way to justify and maintain conflict with a particular group (Crocker et al., 1999). In other words, conspiracy theories can be a way to express prejudice against a particular group (Barlow, et al., 2012).

Conspiracy theories can also change the way people think about events. Research more broadly exploring the influence of information has shown that external sources can play a critical role in shaping beliefs (cf. Swami et al., 2013). Based on this idea, Swami et al. (2013) argued that as attitude formation is rarely based on a critical review of all the relevant issues, the nature of information that an individual receives about a given phenomenon should have an impact on their attitudes. In testing this assertion empirically, Butler, Koopman and Zimbardo (1995) found that people who had viewed the film *J.F.K* – which highlights several prominent conspiracy theories surrounding the assassination of President

John F. Kennedy – were more inclined to disbelieve official accounts than those who had not yet viewed the film. Similarly, Swami et al. (2013) exposed people to either information that argued NASA faked the moon landing, text critical of the moon landing conspiracy account or a control condition where no information were provided. Results demonstrated that those who were exposed to the moon landing conspiracy theory indicated a higher level of belief that the landing was faked, relative to the other conditions.

Further, Douglas and Sutton (2008) found participants who read conspiracy information concerning the death of Princess Diana were more inclined to endorse conspiratorial explanations, even though they perceived that their beliefs had not changed, thus revealing the "hidden impact" (p. 217) of exposure to conspiracy information on people's attitudes. Conspiratorial explanations therefore being able to change people's attitudes has wide reaching implications when considering the ease of access to conspiracy theories within popular culture, such as in popular TV programs and on the Internet. In summary, conspiracy theories have often been argued to be trivial, harmless, or having potentially positive consequences. However, other research suggests that there may be serious negative consequences worthy of further investigation.

Ways to address the potential consequences of conspiracy theories

Conspiracy theories point accusing fingers at authority, and offer alternatives to official explanations (Gray, 2010; Sapountzis & Condor, 2013). In doing so however, they may subvert social systems and undermine confidence in established positions on important topics. In support of this view, the current research to date suggests that conspiracy theories undermining confidence in the working of science may have potentially detrimental consequences for HIV prevention and safe-sex practices (e.g., Bogart & Thorburn, 2006; Bird & Bogart, 2003; Hoyt et al., 2012). There is very little empirical evidence to date that has

directly investigated ways to address the impact of conspiracy information on attitudes and behavioral outcomes. However, Sunstein and Vermeule (2009) have provided some initial recommendations for intervention. They first recommend putting in place a possible ban on conspiracy theorising and imposing a tax for people who disseminate conspiracy theories. As these recommendations are somewhat unlikely to be put in to practice, their final recommendation that involves engaging in counter-speech against conspiracy theories to discredit and undermine them seems the most practical. They suggest that governmental officials might engage in the counter-speech themselves, or they could engage with private parties to engage in counter-speech on their behalf.

Sunstein and Vermeule (2009) also recommend that officials respond to more rather than fewer conspiracy theories. They suggest that silence to some conspiracy theories and not others may be interpreted as the government not being able to offer evidence to the contrary. Further, Sunstein and Vermeule (2009) suggest that officials should first aim to address belief in conspiracy theories with hard core extremists who supply conspiracy narratives. The authors hope that by planting doubts about theories in those who are hard core extremists, this will provide new ideas to these groups of people and introduce cognitive diversity. In this particular scenario, it may be more successful to elicit trusted private parties to introduce doubts about the conspiracy theories, rather than the governmental officials themselves. People may be suspicious of the counter-material being placed to cover the tracks of the conspirators (Sunstein & Vermeule, 2009). If the government is introducing this information themselves to hard core extremists it may be readily discredited. It is therefore recommended that the government takes care when doing this, as they cannot be seen to control the private party, but instead just provide them with information. It is not clear, however, how best to refute conspiracy theories with both the hard core suppliers and the mass public, and whether the government should respond with a single response or

multiple responses. Sunstein and Vermeule (2009) conclude that the choice of issuing a single or multiple responses may be a decision that the governmental officials need to make taking in to account resource constraints.

Government officials, however, have been seen in the past to dismiss providing a direct response (Sunstein & Vermeule, 2009). For example, when a fact sheet was issued concerning 9/11 and the conspiracy theories surrounding a controlled demolition, a government spokesman said: "[w]e realize this fact sheet won't convince those who hold to the alternative theories that our findings are sound. In fact, the fact sheet was never intended for them. It is for the masses who have seen or heard the alternative theory claims and want balance." (Dwyer, 2006, para. 12). As highlighted by Sunstein and Vermeule (2009), there could be costs by giving up on those who are hard core conspiracy theorists, and this "may actually spread the conspiracy theory further" (p. 23).

In summary, examining avenues to address the potential consequences of conspiracy theories is timely. This is because the research to date is suggesting that the consequences of conspiracy theories could be costly. For example, conspiracy theories may undermine confidence in the workings of science that may lead people to engage in more risky behaviours (e.g., Bird & Bogart, 2003; Bogart & Thorburn, 2006; Hoyt et al., 2012). It is plausible to propose therefore, that conspiracy theories may have other potential detrimental consequences such as reducing the likelihood of people engaging in carbon friendly behaviours and vaccinating their children against diseases. Conspiracy theories may have the power to damage the social systems that people rely on in their everyday lives. Ironically however, it is also plausible that conspiracy theories may bolster support for the current status quo instead of undermining it. Inadvertently this may then allow people to justify rather than address limitations in the social system. Taken together, this suggests that conspiracy

theories may reduce, rather than increase, the likelihood of social and political change. Future research is therefore needed to further investigate avenues to address the potentially detrimental consequences by testing the success of the recommendations presented by Sunstein and Vermeule (2009). By testing the effectiveness of these recommendations, a richer understanding of how to address conspiracy theories will be gained.

The current thesis

Scholars are learning more about the personality characteristics associated with conspiracy beliefs and the cognitive biases that are associated with conspiratorial thinking. Researchers are also beginning to consider the consequences of conspiracy theories. However, as the majority of studies have employed correlational designs, this has restricted researchers from further investigating the social psychological consequences of conspiracy theories. Examining the consequences of conspiracy theories is important as conspiracy theories can be viewed as attempts to undermine or subvert social systems. In doing so, conspiracy theories may undermine people's confidence in important topics such as childhood vaccination (cf. Lewandowsky et al., 2013b), which may then directly lead to people disengaging from important social systems, such as then not vaccinating their children against harmful diseases. In support of this view, researchers have found that conspiracy theories undermining confidence and trust in medical establishments may be associated with lack of condom use (Bird & Bogart, 2003; Bogart & Thorburn, 2006) and being more likely to avoid appropriate treatment behaviour of HIV (Hoyt et al., 2012). However, as this empirical work has been correlational, examinations of cause and effect are not possible.

In order to address this causation limitation, scholars are now starting to employ experimental approaches to study conspiracy theories (e.g., Butler et al., 1995; Douglas & Sutton, 2008; Swami et al., 2013). For example, using experimental methods has allowed

researchers to show that conspiracy theories can change the way people think about events, even when they are not aware of this happening (Douglas & Sutton, 2008). An aim of this thesis therefore was to utilise experimental methods in order to examine and attempt to address the social psychological consequences of conspiracy theories.

Conspiracy theories pointing accusing fingers at powerful authority figures may undermine people's confidence in political systems, their trust in the workings of science, and their confidence and trust in medical establishments. In this thesis, we aimed to empirically put this assertion to the test by exposing people to conspiracy theories and measuring their intention to engage in important aspects of society. In utilising experimental methods however, this opens up the possibility that such a design may have important ethical implications that should be considered. By exposing people to conspiracy theories, and potentially impacting their behavioural intentions, conspiracy theories may have a potentially significant impact on the person. This could be particularly worrisome when considering childhood vaccination. Conducting such experimental research is an important advancement in the field however, as due to the design of the study, using experimental methods enables us to test cause and effect. Yet as a consequence of utilising such a design, exposing people to conspiracy theories that may have detrimental consequences could put people at risk. It is therefore important that after each experimental period, the participants are fully debriefed. For example, after being exposed to anti-vaccine conspiracy theories, participants should be provided information that presents facts in favour of vaccines, and subsequently be pointed towards official sources for further information. By having such a strong debrief in place, the potential detrimental effects of being exposed to conspiracy theories should be reduced and thus not persist after the experimental period has ended.

If however exposure to conspiracy theories is found to undermine and subvert social systems, this may go against the well-documented social psychological motivation of system justification. System justification theory argues that people are motivated to hold positive views about existing social, economic and political arrangements, especially when they are dependent on those arrangements (e.g., Jost & Andrews, 2011; Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004; Kay, Jost, & Young, 2005; Kay, et al., 2009). Threats to the fairness of social systems cause people to defend, bolster or rationalise the status quo, even if at the expense of their objective social interests (Jost et al., 2004).

People may therefore endorse conspiracy theories as an alternative means to satisfy psychological needs such as powerlessness and lack of control (Abalakina-Paap, et al., 1999; Whitson & Galinsky, 2008) when system justification is untenable. On the other hand however, it is plausible that conspiracy theories may not actually be at odds with system justification. Alternatively, conspiracy theories may instead serve to uphold the perceived legitimacy of the status quo. Explaining tragedies as being caused by a malign few instead of wider society, may allow people to preserve the belief that society is fair and legitimate. In this thesis, we therefore tested this novel proposal that conspiracy theories instead of undermining the social system may allow people to justify it.

Conspiracy theories may therefore subvert and undermine important social systems. However, whilst this may be the case, conspiracy theories may not undermine people's overall sense that social systems are fair and appropriate and instead bolster people's satisfaction with the social status quo. Conspiracy theories may therefore stop people engaging with important aspects of society and lead them to justify rather than address limitations of the social system. It is therefore also important to consider how to address the impact of conspiracy theories on societal issues. To date however, there has been no

empirical research investigating tools that aim to attenuate the potential detrimental consequences of conspiracy theories on behavioural intentions. Exploring avenues to address the impact of conspiracy theories in this thesis is therefore timely.

In sum, employing experimental methods in this thesis will allow us to investigate the assertion that conspiracy theories may undermine people's confidence in important social systems. People need to vote, take action against climate change and have their children vaccinated, so disengagement is likely to be detrimental to society. Ironically however, it is plausible that conspiracy theories may not undermine people's overall sense that social systems are fair and appropriate. Utilising experimental methods will therefore allow us to uncover the dangers of conspiracy theories. Conspiracy theories may stop people from engaging with important aspects of society, but they could also be a way to justify inherent limitations of the social system. It is therefore important in this thesis to also explore avenues to address the potential detrimental consequences of conspiracy theories. Using an experimental approach will allow us to examine techniques that may attenuate the impact of exposure to conspiracy theories.

Research programme

To begin, Chapter 2 first examines the social consequences of exposure to conspiracy theories on engagement with the political system and taking action against climate change. In two studies, we exposed participants to conspiracy theories and measured their impact on behavioural intentions. Specifically, Study 1 aimed to investigate the consequences of being exposed to governmental conspiracy theories, such as the U.S. government being involved in the 9/11 terrorist attacks (vs. anti-conspiracy information), on intentions to engage in politics (e.g., intention to vote in the next general election). Study 2 then exposed people to climate change conspiracy theories, which argued that climate change is a hoax (vs. anti-conspiracy

information and a control), and measured their intention to engage in pro-environmental behaviours (e.g., using energy efficiently). We also measured people's intentions to engage in the political system. The chapter ends with a general discussion outlining the limitations, as well as the implications for this research where we highlight the potential impact that conspiracy theories can have on important social and environmental outcomes.

Chapter 3 aimed to further our understanding of the consequences of belief in, and exposure to, conspiracy theories by exploring the impact of anti-vaccine conspiracy theories on intended vaccination uptake. Study 3 investigated the relationship between belief in anti-vaccine conspiracy theories and vaccination intentions. Study 4 experimentally manipulated exposure to anti-vaccine conspiracy theories (vs. anti-conspiracy information and a control) and then measured people's intention to vaccinate a fictional child. A general discussion then outlines the limitations, as well as the implications of this research where we argue that conspiracy theories may be an obstacle to vaccine uptake.

The studies in Chapters 2 and 3 tested the idea that conspiracy theories may subvert social systems and undermine confidence in established political, health and environmental positions. Specifically, we tested the idea that conspiracy theories may damage important social systems that are needed for society to function. Importantly therefore, if conspiracy theories do undermine social systems, this would appear to be in conflict with the psychological need to maintain the belief that society is fair and legitimate (e.g., Jost & Banaji, 1994; Jost & Burgess, 2000; Jost & Thompson, 2000). In other words, people are motivated to hold positive views about the social, economic and political arrangements of society rather than to subvert it. In Chapter 4 therefore, we test the novel idea that conspiracy theories may not actually be *completely* subversive and instead perform a system-justifying function for people. By explaining events as the actions of a malign few, instead of broader

society, conspiracy theories may allow people to challenge institutions, whilst still upholding the belief that the social status quo is fair and legitimate. In four studies, this prediction was tested. Study 5 first explored the relationship between satisfaction with the status quo and conspiracy theory beliefs. In Study 6, we aimed to test the idea that if conspiracy theories perform a system-justifying function for people, conspiracy theories should be a direct response to system threat, and increase when the status quo is threatened. To do this, participants were exposed to a system threatening passage (vs. system affirming) before indicating their belief in conspiracy theories.

Next, in Study 7 we aimed to provide a direct test of the system-justifying function of conspiracy theories, where we manipulated system justification and conspiracy theories, then measured people's satisfaction with the status quo. Study 8 then aimed to test our proposed mechanism. We argue that by explaining the causes of tragedies, disasters and social problems as the actions of a malign few, conspiracy theories may allow people to maintain a positive view of society as a whole. In order to test this hypothetical process in Study 8, participants were first exposed to system threat and conspiracy theories (vs. control). We then asked participants to indicate whether they perceived small groups and individuals were responsible for social problems (e.g., pollution, inequality), before completing a measure of their satisfaction with the status quo. A general discussion then outlines the limitations, as well as the implications of this research where we argue conspiracy theories may function as a means to defend the current social system. However they do so in a way that appears to divert people from questioning inherent limitations of their society.

Conspiracy theories may influence people's intentions to engage in pro-social behaviours such as voting, vaccination, and reducing their carbon footprint. Conspiracy theories may therefore subvert or undermine important social systems. However, whilst this

may be the case, exposure to conspiracy theories may not decrease general satisfaction with social systems. Instead, conspiracy theories may bolster satisfaction with the status quo rather than undermine it because they explain troubling events as the actions of a small group of conspirators rather than problems inherent in society as a whole. In doing so however, conspiracy theories may not only stop people engaging with important aspects of society, but also be a way for people to justify inherent limitations of society. It is therefore important in Chapter 5 to examine ways to address the potentially detrimental impact of conspiracy theories on social systems. In Study 9, we investigated the use of counter-arguments (e.g., vaccines are safe) as a tool for intervention in alleviating the impact of anti-vaccine conspiracy theories on vaccination uptake. In this study, we varied the order of pro-conspiracy and anti-conspiracy arguments and measured people's intention to vaccinate.

In Study 10, we aimed to test a second intervention tool where we tested the prediction that providing people with a pre-warning before being exposed to conspiracy information would make people more vigilant to the information presented before them, and thus lessen the impact on vaccination intentions when exposed to conspiracy theories. To do this, people were first presented with a specific pre-warning (vs. general and control), which detailed people's continued reliance on information that has been retracted in order to make them more vigilant of the information they are being presented, before being asked to read pro-conspiracy followed by anti-conspiracy arguments. The participants then indicated their intention to vaccinate a fictional child. A general discussion then outlines the limitations, as well as the implications of this research where we argue conspiracy theories may be resistant to correction.

Finally, Chapter 6 summarises the aims and the main findings of the thesis. The implications and applications of the research are then discussed. The chapter concludes by

highlighting potential limitations of the research and how these have informed potential directions for future research.

Chapter 2 -

The effects of exposure to conspiracy theories on intentions to engage in the political system and take action against climate change

The studies presented in this chapter have been published in the following journal article:

Jolley, D., & Douglas, K.M. (2014a). The social consequences of conspiracism: Exposure to conspiracy theories decreases intentions to engage in politics and to reduce one's carbon footprint. *British Journal of Psychology*, *105*, 35-36. doi: 10.1111/bjop.12018

Chapter summary

The current studies explored the social consequences of exposure to conspiracy theories. In Study 1, participants were exposed to a range of conspiracy theories concerning government involvement in significant events such as the death of Diana, Princess of Wales. Results revealed that exposure to information supporting conspiracy theories reduced participants' intentions to engage in politics, relative to participants who were given information refuting conspiracy theories. This effect was mediated by feelings of political powerlessness. In Study 2, participants were exposed to conspiracy theories concerning the issue of climate change. Results revealed that exposure to information supporting the conspiracy theories reduced participants' intentions to reduce their carbon footprint, relative to participants who were given refuting information, or those in a control condition. This effect was mediated by powerlessness with respect to climate change, uncertainty, and disillusionment. Exposure to climate change conspiracy theories also influenced political intentions, an effect mediated by political powerlessness. The current findings suggest that conspiracy theories may have potentially significant social consequences, and highlight the need for further research on the social psychology of conspiracism.

Introduction

Conspiracy theories can be described as attempts to explain the ultimate causes of events as secret plots by powerful forces rather than as overt activities or accidents (McCauley & Jacques, 1979). For example, conspiracy theories relating to the death of Diana, Princess of Wales often suppose that she was murdered by the British government as opposed to being killed in an unfortunate car accident. These types of conspiracy theories are widespread, and accompany many significant political and social events, such as the death of Princess Diana (Douglas & Sutton, 2008; Douglas & Sutton, 2011), the 9/11 terrorist attacks (Swami et al., 2010) and the assassination of US President John F. Kennedy (McCauley & Jacques, 1979; McHoskey, 1995). Research has shown that conspiracy theories are becoming more popular, with interest in some conspiracy theories even increasing as the events become more distant (Goertzel, 1994). For example, a survey in 1963 found that 29% of respondents believed the official account that Lee Harvey Oswald acted alone in assassinating President Kennedy, but in 2001 only 13% of respondents believed the official account (Carlson, 2001). This finding points to the increasing popularity of conspiracy theories, and their persistence over time (Moore, 1990).

Although public interest in conspiracy theories may be increasing, there has been surprisingly limited empirical research examining the psychological underpinnings of beliefs in conspiracy theories (Abalakina-Paap, et al., 1999; Swami et al., 2010). Further, much of the work that does exist has categorised believers as paranoid individuals whose judgements are somehow "distorted" as a result of an "uncommonly angry mind" (Hofstadter, 1971, pp. 2-3) or as a product of psychopathology, paranoia or delusional ideation (e.g., Groh, 1987; Plomin & Post, 1997). However, this account may be too simplistic and incomplete considering how widespread conspiracy beliefs are in society (Sunstein & Vermeule, 2009;

Swami & Coles, 2010; Waters, 1997). It is difficult to imagine that millions of conspiracy believers all suffer significant psychological symptoms. More recent research has taken a less pathologizing perspective on conspiracy beliefs, demonstrating that there are several key sub-clinical correlates of conspiracy beliefs such as anomie, distrust in authority, political cynicism, powerlessness (Abalakina-Paap et al., 1999; Goertzel, 1994; Swami et al., 2010) and Machiavellianism (Douglas & Sutton, 2011).

Further, research suggests that conspiracy theories may change the way people think about social events. For example, after exposure to conspiracy theories about the death of Princess Diana, Douglas and Sutton (2008) found that participants were more inclined to endorse conspiratorial explanations, even though they perceived that their beliefs had not changed. Also, Butler, et al. (1995) found that people who had viewed the film *JFK* – which highlights several prominent conspiracy theories surrounding the assassination of President John F. Kennedy – were more inclined to disbelieve official accounts than those who had not yet viewed the film. These findings demonstrate that conspiracy theories can have a "hidden impact" (Douglas & Sutton, 2008, p. 217) on people's attitudes and raise an intriguing question – What social consequences might there be for people who are exposed to conspiracy theories?

Scholars have begun to consider what some of these consequences might be. It is argued that there may be both positive and negative consequences of being exposed to non-mainstream explanations. For example, conspiracy theories may allow individuals to question social hierarchies and as such encourage governments to be more transparent (e.g., Clarke, 2002; Fenster, 1999; Swami & Coles, 2010). Conspiracy theories can also reveal anomalies, inconsistencies or ambiguities in official accounts of events (e.g., Clarke, 2002) and may open up possibilities for political debate (Miller, 2002). Indeed, some conspiracy

theories reveal actual anomalies in mainstream explanations, such as in the US Department of Defence's plans to orchestrate acts of terrorism and blame them on Cuba (Swami & Coles, 2010). On the negative side, conspiracy beliefs are associated with negative attitudes toward human rights and civil liberties (Swami et al., 2012), and also racist attitudes (Swami, 2012). One prominent conspiracy theory proposes that birth control and HIV/AIDS are a form of genocide against African Americans (Bird & Bogart, 2003). Research has found that amongst African Americans, endorsement of this theory is associated with negative attitudes towards contraceptive behaviours, which can have potentially negative consequences for the prevention of pregnancy and sexually transmitted illnesses (Bogart & Thorburn, 2006). In the current research, we further explored the potential influence of conspiracy theories on behavioural intentions. To do so, we first focused on the influence of conspiracy theories on political engagement.

Political behaviours consist of actions such as voting, talking to others to persuade them to vote for a certain candidate, donating money to candidates or political groups, and wearing campaign stickers (Jenkins, Andolina, Keeter, & Zukin, 2003). Research has shown that such behaviours have decreased across the world over the last decade (Fiorina, 2002; Niemi & Weisberg, 2001; Rosenstone & Hansen, 1993; Putnam, 1995, 2000). For example, people are voting less than they did ten years ago, attending fewer political meetings, and forgoing wearing campaign stickers (Fiorina, 2002; Putnam, 1995, 2000). There can be many reasons for these changes, such as decreasing interest in politics or the election process, time constraints, or even people feeling that their vote would not make a difference (File & Crissey, 2010; Fiorina, 2002; Putnam, 1995, 2000). We argue that another key contributor to decreasing levels of political engagement may be the influence of exposure to conspiracy theories.

In the age of the Internet, people are constantly bombarded with information relating to conspiracy theories, and there is an increasing ease with which information about such theories can be distributed (Coady, 2006). We already know that exposure to conspiracy theories changes people's attitudes without their awareness (Douglas & Sutton, 2008). It is therefore plausible to propose that the ever-increasing presence of conspiracy theories – particularly about secret and sinister government operations – may influence people's intentions to engage in politics. For example, governmental conspiracy theories may discourage citizens from voting because they persuade people that the government is involved in shady deals and plots and that outcomes are therefore beyond their control. We explored this possibility with a wide range of prominent governmental conspiracy theories, examining the extent to which exposure to conspiracy theories influences political intentions.

For the first time, we also examined the potential factors that may mediate such effects. First, research has linked beliefs in conspiracy theories with low levels of trust (Goertzel, 1994; Abalakina-Paap et al., 1999). In addition, research has suggested that a possible reason for the observed drop in political engagement could be the decline in trust people have for each other and different institutions (e.g., Fiorina, 2002; Putnam, 1995, 2000; Shaffer, 1981). It is therefore possible that exposure to conspiracy theories influences political engagement because conspiracy theories negatively influence peoples' levels of trust. Second, feelings of powerlessness – specifically towards the government – were also explored as a potential mediator. As defined in Stern's (2000) Values-Beliefs-Norms theory of behaviour, powerlessness is referred to as the perception of being incapable of affecting an outcome by taking action. Research has demonstrated that powerlessness is associated with conspiracy beliefs (Abalakina-Paap et al., 1999). It is therefore possible that exposure to conspiracy theories increases feelings of powerlessness, which subsequently decreases intentions to engage in politics.

Third, we tested the potential mediating role of uncertainty towards the government, which is viewed as a product of the immediate situation or wider social context (De Cremer & Sedikides, 2005; Sorrentino & Roney, 2000). It has been argued that a situation may influence the degree of uncertainty a person experiences, and the way that it is expressed, so that uncertainty can change with the environment (Smith, Hogg, Martin, & Terry, 2007). It is therefore plausible to suppose that exposure to conspiracy theories increases uncertainty, and indeed uncertainty may be one reason why people endorse a wide range of conspiracy theories, even if they are contradictory (Wood, et al., 2012). This uncertainty may then lead to decreased intentions to become engaged in politics. Finally, we also explored the potential influence of disillusionment, which is the feeling of disappointment that something is not what it was believed or hoped to be. Research has shown that disillusionment after becoming aware of shortcomings may lead to a breakdown in engagement in a particular context (e.g., Niehuis & Bartell, 2006; Waller, 1938). It is therefore reasonable to suppose that exposure to conspiracy theories may increase feelings of disillusionment at being tricked and deceived by the government. This disillusionment may then lead to decreased intentions to become engaged in political processes.

There were therefore two aims of the first study. First, we explored the potential consequences of exposure to governmental conspiracy theories on intentions to engage in politics. To do so, we exposed participants to an article that (a) argued in favour of a series of governmental conspiracy theories, or (b) argued against the same conspiracy theories. Participants exposed to the pro-conspiracy arguments were expected to endorse governmental conspiracy theories more than those who had been exposed to the anti-conspiracy arguments. Further, we hypothesised that exposure to information supporting conspiracy theories should decrease intentions to engage in politics. Finally, the study directly tested four potential

mediators of this predicted effect – specifically, feelings of mistrust, powerlessness, uncertainty and disillusionment towards the government.

Study 1

Method

Participants and design

One hundred and sixty eight undergraduate and postgraduate research students (108 women and 60 men, M_{age} = 22.87, SD = 5.00) at a British university participated in the study. Participants were recruited via poster advertisements, emails and the use of the social networking site Facebook where they were invited to complete an online questionnaire. They did so voluntarily and without monetary or course credit incentives. The single independent variable was the nature of the article presented to participants (pro-conspiracy versus anti-conspiracy), and was manipulated between-subjects. A manipulation check measured participants' judgements that a series of governmental conspiracy theories are true. Participants also reported feelings of mistrust, powerlessness, uncertainty and disillusionment towards the government, which were measured as potential mediators for the predicted effect. Finally, a scale of intended political behaviour formed the dependent variable.

Materials and procedure

The online questionnaire was designed using the Qualtrics questionnaire design tool and first presented participants with an information page where they were asked to give their consent before beginning the questionnaire. On the following page, participants were presented with the manipulation. Two articles were used to either expose participants to information that supports conspiracy theories (pro-conspiracy condition) or that refutes

conspiracy theories (anti-conspiracy condition, see Appendix A for full wording). The pro-conspiracy article began by arguing that governments are involved in secret plots and schemes. It then continued to provide specific examples of conspiracy theories such as the death of Princess Diana and the London 7/7 terrorist bombing attacks. An extract from the conspiracy article is as follows:

> *"…To take the example of Princess Diana's death, it is no secret that the British government were discontented with Princess Diana's involvement with Dodi Fayed and also with her increasing involvement in politics… one must therefore question the claim that her death was simply a tragic accident…"*

The anti-conspiracy article was similar in content to the pro-conspiracy article but differed by using the same broad and specific examples to argue that governments are *not* involved in conspiracy theories. An extract from the anti-conspiracy theory article is as follows:

> *"…To take the example of Princess Diana's death, it is no secret that Princess Diana's popularity made some members of the government uneasy. However, there is no evidence at all to suggest that the British government were involved in her death... her death was simply a tragic accident... "*

The term 'conspiracy theory' was not mentioned in either of the articles. To check that the manipulation was successful, participants next rated the likelihood that a series of governmental conspiracy theories are true. These were adapted from previous research (Douglas & Sutton, 2008, 2011, $\alpha = .90$). There were 12 statements with a mix of general (e.g., "Governments are often involved in international plots and schemes", $\alpha = .80$) and specific (e.g., "The British government was involved in the death of Princess Diana", $\alpha = .90$) government conspiracy theories (see Appendix A). In each case, participants were asked to

rate the likelihood that each is true on a seven-point scale (*1 = extremely unlikely, 7 = extremely likely*).

A scale measuring mistrust towards four institutions (α = .85) was used from Van der Meer (2010). Participants indicated the extent to which they trusted each institution (e.g., "I have trust in Parliament", see Appendix A) on a six-point scale (*1 = strongly disagree, 6 = strongly agree*). A three-item scale measuring powerlessness towards the government (α = .82) was developed from Neal and Groat (1974) and Aarts and Thomassen (2008). Participants were asked to read the statements (e.g., "The world is run by the few people in power, and there is not much the little person can do about it", see Appendix A) and rate their agreement by answering on a six-point scale (*1 = strongly disagree, 6 = strongly agree*). A scale measuring a person's feelings of uncertainty, specifically concerning the government (α = .83) was adapted from the Attributional Confidence Scale (Clatterbuck, 1979) and consisted of four items (e.g., "The government is only run for the benefit of those in power", see Appendix A). Participants rated the extent that they agreed they could predict each behaviour on a six-point scale (*1 = strongly disagree, 6 = strongly agree*). High agreement demonstrates a greater prediction that the government would perform those behaviours, which therefore demonstrates a greater sense of uncertainty about the government as a whole. A scale was included to measure participants' feelings of disillusionment, specifically about the government (α = .76). This scale was adapted from Niehuis and Bartell (2006) and consisted of four statements (e.g., "I am very disappointed with the government", see Appendix A) where participants responded with the extent to which they agreed with each statement on a six-point scale (*1 = strongly disagree, 6 = strongly agree*).

Finally, the dependent variable measured participants' intended political engagement. Questions were reworded so that participants' responses reflected intended rather than

previous political engagement (Jenkins, et al., 2003; Pattie, Seyd, & Whiteley, 2003). There were seven statements in total asking participants about their intended behaviours over the next 12 months (e.g., "Will you vote in the next election?"; "Do you intend to contribute money to a candidate, a political party, or any organization that supports candidates?", α= .80, see Appendix A). Participants responded by indicating the extent that they intended to engage in each of the behaviours on a seven-point scale (*1 = definitely no, 7 = definitely yes*). At the conclusion of the study, the participants were debriefed in writing and were thanked for their participation.

Results

There were no significant effects involving participant gender, so this factor is not mentioned further. Further, participant age was not associated with any of the potential mediating variables or DVs and it is also not mentioned further.

Manipulation check

There was a significant difference between the two conspiracy conditions (pro-conspiracy versus anti-conspiracy) for endorsement of both general, $F(1, 166) = 16.70$, $p < .001$, $\eta^2 = .09$, and specific, $F(1, 166) = 16.65$, $p < .001$, $\eta^2 = .09$ government conspiracy theories. Participants who were exposed to information supporting conspiracy theories endorsed general ($M = 4.81$, $SD = 1.16$) and specific ($M = 2.85$, $SD = 1.50$) conspiracy theories more than those in the anti-conspiracy condition ($M = 4.04$, $SD = 1.16$; $M = 2.07$, $SD = 1.10$, respectively). The manipulation was therefore successful.

Government conspiracy theories and political engagement

A one-way ANOVA was conducted with article condition (pro- versus anti-conspiracy) as the independent variable, and political engagement as the dependent variable. As predicted, exposure to conspiracy theories influenced political intentions, $F(1, 166) = 9.51$, $p = .002$, $\eta^2 = .05$. Specifically, participants in the pro-conspiracy condition ($M = 2.67$, $SD = 1.09$) showed less intention to engage in political behaviours than those in the anti-conspiracy condition ($M = 3.20$, $SD = 1.22$).

Testing mediation

To test potential mediators of this effect, four separate ANOVAs were first conducted with conspiracy condition (pro- versus anti-conspiracy) as the independent variable in each case, and summed scores on all four potential mediators – mistrust, political powerlessness, uncertainty and disillusionment – as dependent variables. Results revealed that out of the four potential mediators, exposure to conspiracy theories only influenced powerlessness, $F(1, 166) = 13.07$, $p < .001$, $\eta^2 = .07$, and uncertainty, $F(1, 166) = 10.37$, $p = .002$, $\eta^2 = .06$. Participants in the pro-conspiracy condition felt more powerless ($M = 2.94$, $SD = 1.39$) and uncertain ($M = 4.31$, $SD = 1.04$) towards the government than those in the anti-conspiracy condition ($M = 2.29$, $SD = 1.09$; $M = 3.82$, $SD = 0.99$, respectively). There were no differences between the two conditions for mistrust, $F(1, 166) = 1.67$, $p = .198$, $\eta^2 = .01$ or, disillusionment, $F(1,166) = 2.48$, $p = .117$, $\eta^2 = .01$.

Each of the candidate mediators – political powerlessness and uncertainty – was then examined in a test of multiple mediation in order to explain the effect of the pro- versus anti-conspiracy information on intended political behaviours. This multiple mediation was carried out using Preacher and Hayes' (2008) bootstrapping method for indirect effects. This method

is based on between 5000-10000 bootstrap re-samples used to describe the confidence intervals of indirect effects in a manner that makes no assumptions about the distribution of the indirect effects. As argued by Hayes (2009; Hayes & Preacher, 2013), an indirect effect is estimated as being significant from the confidence intervals not containing a zero, as opposed to significance in the individual paths. This is due to the mediation model not being pertinent to whether the individual paths are either significant or non-significant. Results from the current study are presented in Table 1 and Figure 1.

First, there was a significant total indirect effect. Importantly, the specific indirect effect in this test indicated that political powerlessness was a significant mediator of the effect of pro- versus anti-conspiracy information on intended political behaviours, when controlling for uncertainty. However the specific indirect effect of uncertainty was not found to be a significant mediator, when controlling for political powerlessness. This provides evidence that political powerlessness was the driving mediator of the effect of exposure to conspiracy theories on intended political behaviours.

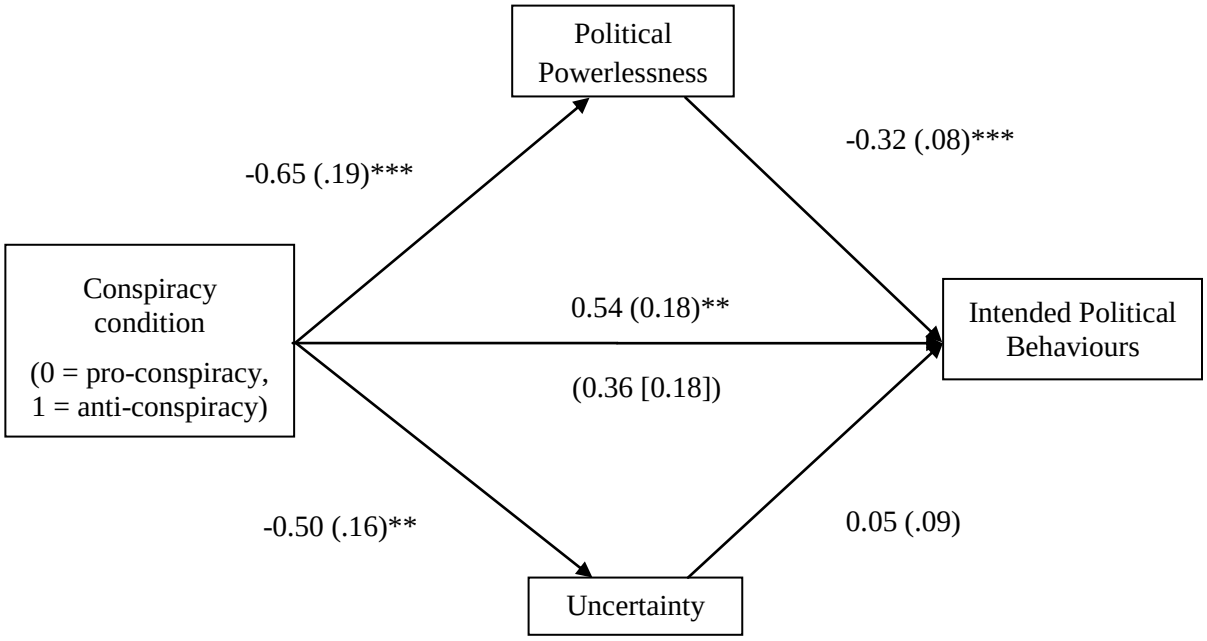
Table 1

Simple Mediation of the Indirect Effects of Conspiracy Condition (pro-conspiracy versus anti-conspiracy) on Political Behaviours through Feelings of Political Powerlessness and Uncertainty (N= 168; 5,000 bootstrap samples).

		BCa[a] 95% confidence interval (CI)	
	Point Estimate (s.e.)	Lower	Higher
Multiple indirect effects			
Political Powerlessness	**.21 (.08)**	**0.0831**	**0.4032**
Uncertainty	-.03 (.05)	-0.1512	0.0899
Total mediated effect	**.18 (.06)**	**0.0480**	**0.3531**

Note. Boldface type highlights a significant effect as determined by the BCa[a] 95% confidence interval (CI) which does not contain a zero.

[a] Refers to bias corrected and accelerated (BCa) bootstrapping confidence intervals (CI) that include corrections for both median bias and skew (see Efron, 1987).



Adj R^2 = .14, $F(3, 164) = 9.70$, $p < .001$

Figure 1. Multiple mediation test of the relationship between conspiracy condition (pro-conspiracy versus anti-conspiracy) and intended political behaviors.

Notes. $^{**}p < .05$. $^{***}p < .01$.

Discussion

In Study 1, we found that exposure to conspiracy theories influenced participants' intentions to engage in political processes such as voting. Demonstrating that exposure to conspiracy theories influences intended political engagement gives a hint to the extent to which conspiracy theories may be influential. Voting and other forms of political engagement are decreasing around the world (e.g., Fiorina, 2002), and revealing that intended political behaviours can be influenced by exposure to conspiracy theories suggests that decreased engagement could be due, in part, to how widespread conspiracy theories are in society (Swami & Coles, 2010). This study has also extended previous research investigating the impact of conspiracy theories (Butler et al., 1995; Douglas & Sutton, 2008). Here, it has

been demonstrated that while exposure to conspiracy theories can influence the extent to which the theory is endorsed, it can also influence a person's behavioural intentions.

Further, Study 1 demonstrated that feelings of powerlessness towards the government fully mediated the effect of pro- versus anti-conspiracy information on intended political behaviours. This suggests that being exposed to government conspiracy theories may increase feelings that one's actions will have little impact, which may subsequently lower one's intentions to engage in political behaviours. This line of reasoning is consistent with results from a recent American census (File & Crissey, 2010) – when asked why people did not vote, many responded with the reason that their vote would not make a difference.

This study also extends previous research that has revealed an association between powerlessness and endorsement of conspiracy theories. In the current study however, we demonstrated that exposure to conspiracy theories directly influenced participants' feeling of powerlessness towards the government. Previous research has only been able to demonstrate correlations between endorsement of conspiracy theories and powerlessness without indicating the direction of the relationship (e.g., Abalakina-Paap et al., 1999). Whilst some individuals may endorse conspiracies to reduce their feelings of powerlessness (Swami & Coles, 2010), it can be suggested from the current findings that exposure to conspiracy theories may also bring about feelings of powerlessness.

Although uncertainty was shown not to be a significant mediator of the relationship between exposure to conspiracy theories and political behaviour, participants who were exposed to conspiracy theories felt more uncertain towards the government than those exposed to an anti-conspiracy account. This also extends previous literature by providing evidence of a directional relationship between conspiracy beliefs and uncertainty. There were however no reported effects of exposure to conspiracy theories on mistrust and

disillusionment. This was an unexpected finding as previous research suggests that mistrust is associated with conspiracy beliefs (Abalakina-Paap et al., 1999). However, it may be difficult to manipulate mistrust and disillusionment by exposure to a wide variety of governmental conspiracy theories. Using this method, it is difficult to manipulate trust in one particular group because different groups are implicated in different conspiracy theories (e.g., US government, British government, specific politicians). Trust and disillusionment could perhaps be better influenced by exposure to specific conspiracy theories such as those related to climate change, that are associated with a single group of apparently dishonest individuals (i.e., climate scientists) rather than a wider group. We test this possibility in Study 2, which also serves to replicate and extend the findings of Study 1.

Study 2

In Study 2, we focused on the influence of climate change conspiracy theories on intentions to reduce one's carbon footprint. Specifically, we investigated whether conspiracy theories concerning the validity of scientific claims concerning climate change influence people's intentions to purchase energy efficient light bulbs or use other means of transport than driving a motor vehicle. Research has demonstrated that engagement with such behaviours – in a similar way to political engagement – is not sufficiently high in Western societies (e.g., Leiserowitz, 2003). For example, a recent Gallup Poll found that American respondents ranked the environment 15th (out of 15) of the most important problems today (Jones, 2011), and another Gallup Poll found that American respondents ranked climate change as the 12th most important (out of 13) environmental issues facing people today (Dunlap & Saad, 2001). This is intriguing, especially given that climate change is arguably the primary environmental risk confronting the world in the 21st century (Leiserowitz, 2003). Recent research has found an association between conspiracy beliefs in general and rejection

of climate science claims (Lewandowsky, et al., 2013a). We argue here that exposure to information that rejects climate science claims will adversely influence people's intentions to engage in climate friendly behaviours.

To test this prediction, we utilised a similar method to Study 1, exposing participants to climate change conspiracy theories (versus anti-conspiracy material), and measuring the extent to which participants intended to engage with efforts to reduce their carbon footprint. We also examined the influence of exposure to conspiracy theories on political intentions, using the same scale as used in Study 1. In doing so, it was possible to examine whether a type of conspiracy theory that does not explicitly accuse the government of any actions can also lead to political disengagement. This is an intriguing possibility because it points to the potential for conspiracy theorizing to form part of a political mindset – a set of beliefs that are associated with political suspicion and disbelief of official explanations. We also included the range of mediators tested in Study 1. Indeed, previous research has linked climate change behaviour to feelings of powerlessness (Aitken, Chapman, & McClure, 2011), uncertainty (e.g., de Kwaadsteniet, 2007; Hine & Gifford, 1996), and mistrust (MacGregor, Slovic, Mason, & Detweiler, 1994) and we examined here if climate change conspiracy theories influence intentions via these potential mediators.

Further, Study 2 provided a methodological refinement to Study 1 by including a control condition where participants were exposed to no information regarding conspiracy theories. Study 1 demonstrated a difference in political intentions between the pro- and anti-conspiracy conditions but it cannot be known for certain whether the pro-conspiracy condition decreased political intentions or whether the anti-conspiracy condition increased such intentions. A control condition allows us to be certain of the direction of the effect.

Method

Participants and design

Two hundred and fourteen undergraduate students (182 women and 32 men, M_{age} = 19.66, *SD* = 3.06) at a British university participated in an online experimental questionnaire. Participants received course credit in exchange for their participation. A timer was used to identify participants who had spent less than 30 seconds reading the manipulation and who had thus exceeded reading speed capabilities for upper college students (Speed Reading, 2014). Such participants were excluded from the analyses, and in total this was 11 participants from the pro-conspiracy condition and 12 from the anti-conspiracy condition. The final sample size used for data analysis was therefore 191 (164 women and 27 men, M_{age} = 19.75, *SD* = 3.21). There were 63 participants in the pro-conspiracy condition, 59 in the anti-conspiracy condition, and 69 in the control condition.

A single-factor independent variable (pro-conspiracy vs. anti-conspiracy vs. control) between-subject design was employed. A manipulation check measured participants' judgements that a series of climate change conspiracy theories are true. Participants reported feelings of climate powerlessness, uncertainty, disillusionment and trust towards different sources to tell the truth about climate change, which were measured as potential mediators for the predicted effect on climate change intentions. Participants also reported feelings of political powerlessness, which were measured as a possible mediator for the predicted effect of exposure to climate change conspiracy theories on political intentions. Finally, scales of intended climate change behaviours and intended political behaviours formed the two dependent variables.

Materials and procedure

As in Study 1, the online questionnaire was designed using the Qualtrics questionnaire design tool and first presented participants with an information page where they were asked to give their consent before beginning the questionnaire. On the following page, two articles were used to either expose participants to information that supports conspiracy theories (pro-conspiracy condition) or information that refutes conspiracy theories (anti-conspiracy condition) (see Appendix B for full wording). A control condition was also included, where no further information was given. The pro-conspiracy article began by arguing that climate change is a hoax. It then continued to provide specific examples of conspiracy theories such as that climate change scientists are just chasing funding and not all scientists agree with the climate change findings. An extract from the conspiracy article was as follows:

> *"…further, the idea of global warming holds little weight. Independent evidence shows that since 1940, global average temperatures fell for four decades. This presents a significant flaw in the official account…"*

The anti-conspiracy article was similar in content to the pro-conspiracy article but differed by arguing that climate change is *not* a hoax. An extract from the anti-conspiracy theory article was as follows:

> *"…further, evidence of global warming is robust. Independent evidence shows that the last two decades of the 20th century were the hottest in 400 years …. Numerous findings such as this present significant support for the official account…"*

The term 'conspiracy theory' was not mentioned in either of the articles. To check that the manipulation was successful, participants next rated the likelihood that a series of

climate change conspiracy theories are true. Those in the control condition also completed this manipulation check. These statements were adapted from previous research (Douglas & Sutton, 2011). There were seven statements in total (e.g., "Climate change is a hoax"; "The idea that the world is headed for catastrophic climate change is a fraud", $\alpha = .93$, see Appendix B). In each case, participants were asked to rate the likelihood that each is true on a seven-point scale (*1 = extremely unlikely, 7 = extremely likely*).

A scale was used to assess a person's feelings of powerlessness, specifically concerning climate change (Aitken et al., 2011). This scale consisted of three items (e.g., "I feel that my actions will not affect the outcome of climate change", $\alpha = .71$, see Appendix B) where participants indicted the extent to which they agreed to each statement on a six-point scale (*1 = strongly disagree, 6 = strongly agree*). A further scale measuring uncertainty about climate change was used from Aitken et al. (2011). The scale consisted of two items (e.g., "I feel uncertain as to whether climate change is a significant problem", $\alpha = .60$, see Appendix B) where participants indicted the extent to which they agreed to each statement on a six-point scale (*1 = strongly disagree, 6 = strongly agree*).

A scale was also included to measure participants' feelings of disillusionment, specifically towards climate change scientists. This scale was adapted from Niehuis and Bartell (2006) and consisted of four statements (e.g., "I am very disappointed with the climate change scientists", $\alpha = .77$, see Appendix B) where participants responded with the extent to which they agreed with each statement on a six-point scale (*1 = strongly disagree, 6 = strongly agree*). Further, a scale measuring trust towards a variety of sources to tell the truth about climate change was developed from Leiserowitz (2003). This scale consisted of seven trust sources (e.g., "Scientists and doctors", $\alpha = .65$, see Appendix B) where participants indicated the extent they trusted the source to tell the truth about climate change

on a six-point scale (*1 = strongly distrust, 6 = strongly trust*). Further, the three-item scale measuring powerlessness, specifically concerning politics, was used as in Study 1 (α = .68; see Appendix A).

The first dependent variable measured participants' intended climate change behaviours. Questions were adapted from previous research so that participant's responses reflected their intended behaviour (Leiserowitz, 2003). There were seven statements in total asking participants about their intended behaviours over the next 12 months (e.g., "Do you intend to use energy-efficiency as a selection criterion when buying a light bulb or household appliance"; "Do you intend to walk or cycle more than driving or using public transport?", α = .80, see Appendix B). Participants responded by indicating the extent that they intended to engage in each of the behaviours on a seven-point scale (*1 = definitely no, 7 = definitely yes*). The second dependent variable measured participants' intended political behaviours using the same questions as in Study 1 (α = .77, see Appendix A). At the conclusion of the study, the participants were debriefed in writing and were thanked for their participation.

Results

There were no significant effects involving participant gender, so this factor is not mentioned further. Further, participant age was not associated with any of the potential mediating variables or DVs and it is also not mentioned further.

Manipulation check

There was a significant difference in endorsement of climate change conspiracy theories between conditions, $F(2, 188) = 11.35$, $p < .001$, $\eta^2 = .11$. Endorsement of climate change conspiracies was significantly higher in the pro-conspiracy condition ($M = 3.23$, $SD = 1.69$) than the anti-conspiracy condition ($M = 2.31$, $SD = 1.01$, $p < .001$) and the control

condition (M = 2.57, SD = 1.13, p = .001). Endorsement of climate change conspiracy theories was not significantly higher in the anti-conspiracy condition relative to the control condition (p = .180). The manipulation was therefore successful.

Climate conspiracy theories and intended climate behaviours

Results revealed a significant difference in climate change intentions between conditions, $F(2, 188) = 3.67$, p = .027, η^2 = .04. Specifically, climate change intentions were significantly lower in the pro-conspiracy condition (M = 3.36, SD = 1.14) than the anti-conspiracy condition (M = 3.83, SD = 1.02, p = .019) and the control condition (M = 3.81, SD = 1.13 p = .021). Intentions to engage in climate-friendly behaviours were not significantly different in the anti-conspiracy condition relative to the control (p = .910).

Climate conspiracy theories and intended political behaviours

Results also revealed a significant difference in political intentions between conditions, $F(2, 188) = 5.93$, p = .003, η^2 = .06. Specifically, political intentions were significantly lower in the pro-conspiracy condition (M = 2.62, SD = 0.78) than the anti-conspiracy condition (M = 3.17, SD = 0.91, p = .003) and the control condition (M = 3.14, SD = 1.22, p = .003). Political intentions were not significantly different in the anti-conspiracy condition relative to the control (p = .884).

Testing mediation

Exposure to climate change conspiracy theories therefore influenced intentions to engage in both climate change and political behaviours. To test potential mediators of these two effects, separate ANOVAs were firstly conducted with conspiracy condition (pro-conspiracy versus anti-conspiracy versus control) as the independent variable, and summed

scores on all potential mediators for climate change behaviours (climate powerlessness, uncertainty, disillusionment and trust), and summed scores on the one potential mediator for political behaviours (political powerlessness) as dependent variables.

Results revealed a marginally significant difference in climate powerlessness between conditions, $F(2, 188) = 2.71$, $p = .069$, $\eta^2 = .03$. Specifically, climate powerlessness was significantly higher in the pro-conspiracy condition ($M = 3.39$, $SD = 1.20$) than the anti-conspiracy condition ($M = 2.91$, $SD = 1.08$, $p = .025$) and marginally significantly higher than the control ($M = 3.06$, $SD = 1.16$, $p = .100$). Powerlessness towards climate change was not significantly higher in the anti-conspiracy condition relative to the control condition ($p = .491$).

Results also revealed a marginally significant difference in uncertainty between conditions, $F(2, 188) = 2.61$, $p = .076$, $\eta^2 = .03$. Specifically, uncertainty was significantly higher in the pro-conspiracy condition ($M = 3.42$, $SD = 1.09$) than the anti-conspiracy condition ($M = 3.00$, $SD = 1.05$, $p = .031$) and marginally significantly higher than the control ($M = 3.10$, $SD = 1.06$, $p = .089$). Uncertainty was not significantly higher in the anti-condition relative to the control condition ($p = .590$).

Further, results revealed a significant difference in disillusionment between conditions, $F(2, 188) = 4.41$, $p = .013$, $\eta^2 = .05$. Specifically, disillusionment was significantly higher in the pro-conspiracy condition ($M = 2.72$, $SD = 1.00$) than the anti-conspiracy condition ($M = 2.28$, $SD = 0.87$, $p = .008$) and the control ($M = 2.33$, $SD = 0.92$, $p = .015$). Disillusionment was not significantly lower in the anti-conspiracy condition relative to the control condition ($p = .751$). There were no reported differences in trust across all combined sources between conditions, $F(2, 188) = 0.81$, $p = .448$, $\eta^2 = .00$.

Finally in relation to the mediator for the effect of conspiracy condition on intended political behaviours, results revealed a significant difference in political powerlessness between conditions, $F(2, 188) = 27.60$, $p < .001$, $\eta^2 = .23$. Specifically, powerlessness was significantly higher in the pro-conspiracy condition ($M = 3.59$, $SD = 0.69$) than the anti-conspiracy condition ($M = 2.78$, $SD = 0.75$, $p = .003$) and the control ($M = 2.70$, $SD = 0.81$, $p < .001$). Powerlessness was not significantly higher in the anti-conspiracy condition relative to the control condition ($p = .560$).

Each of the candidate mediators was then examined in a test of mediation in order to explain the effect of the conspiracy conditions (pro-conspiracy versus anti-conspiracy, versus control) on climate and political intentions separately. The mediators of climate powerlessness, uncertainty and disillusionment were examined in a test of multiple mediation in explaining climate change behavioural intentions. The mediator of political powerlessness was examined in a test of simple mediation in explaining political intentions. These multiple and simple mediations were carried out using Hayes and Preacher's (2013) bootstrapping method for indirect effects. This differed slightly from the method used in Study 1 as it allowed the mediations between the three conspiracy conditions to be tested by the use of indicator coding (see Table 2). The pro-conspiracy condition was coded as the representative condition, whereby controlling for pro-conspiracy condition to control (D^2) enabled the effect for pro-conspiracy condition to anti-conspiracy condition (D^1) to be explored, and vice versa. This indictor coding was automatically completed using the Hayes and Preacher's (2013) SPSS macro. Results from the current study are presented in Tables 3 and 4 and Figures 2 and 3, for climate change and political behaviours intentions, respectively.

Table 2

A Table of Indicator Coding (Referred to as 'D') used in the Multiple and Simple Hayes' and Preacher (2013) Bootstrapping Indirect Mediations for the Conspiracy Conditions (Pro-conspiracy versus Anti-conspiracy; versus Control) and either Intended Climate Change or Political Behaviours.

	Conspiracy Condition		
Indicator Coding	Pro-conspiracy	Anti-conspiracy	Control
D^1	0	1	0
D^2	0	0	1

Climate change behaviours. A multiple mediation analysis of the effect of pro-conspiracy versus anti-conspiracy condition on intended climate change behaviours (D^1) (when controlling for pro-conspiracy versus control, D^2) indicated that climate powerlessness, uncertainty and disillusionment (controlling for all three other mediators) significantly mediated this effect. Second, the effect for D^2 (controlling for D^1) concurred, which demonstrated that climate powerlessness, uncertainty and disillusionment were significant mediators of the effect of exposure to conspiracy theories on climate change behaviour (pro- versus anti-conspiracy conditions and pro-conspiracy versus control).

Intended political behaviours. A simple mediation of the effect of pro-conspiracy versus anti-conspiracy condition on intended political behaviours – testing the specific indirect effect for both D^1 (controlling for D^2) and D^2 (controlling for D^1) – indicated that political powerlessness significantly mediated this effect.

Table 3

Multiple Mediation of the Indirect Effects of Conspiracy Condition (using Indicator Coding, see Table 2) on Intended Climate Change Behaviors (DV) through Feelings of Climate Powerlessness ([a]), Uncertainty ([b]) and Disillusionment ([c]) (MVs) (N = 191; 10,000 bootstrap samples).

	Normal test theory						**Bootstrapping for indirect effects**		
	Mediator (*MV*)		Dependant (*DV*)					Monte Carlo 90% Confidence Intervals	
Indictor Coding	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
D^1	a^{1a}	-0.47 (.21)**	c^1	0.47 (.20)**	$c^{1'}$	0.19 (.18)	**0.19 (.09)**	**0.0438**	**0.3432**
	a^{1b}	-0.42 (.20)**					**0.06 (.08)**	**0.0409**	**0.3051**
	a^{1c}	-0.45 (.17)***					**0.04 (.07)**	**0.0641**	**0.3068**
D^2	a^{2a}	-0.33 (.20)*	c^2	0.50 (.19)**	$c^{2'}$	0.24 (.17)	**0.13 (.08)**	**0.0012**	**0.2706**
	a^{2b}	-0.32 (.19)*					**0.04 (.08)**	**0.0069**	**0.2605**
	a^{2c}	-0.40 (.16)**					**0.03 (.07)**	**0.0478**	**0.2780**
	'M*V*'				b^a	-0.39 (.07)***			
					b^b	-0.14 (.08)*			
					b^c	-0.08 (.09)			

Note. Boldface type highlights a significant effect as determined by the Monte Carlo 90% confidence interval (CI) which does not contain a zero.
*$p < .10$. **$p < .05$. ***$p < .01$.

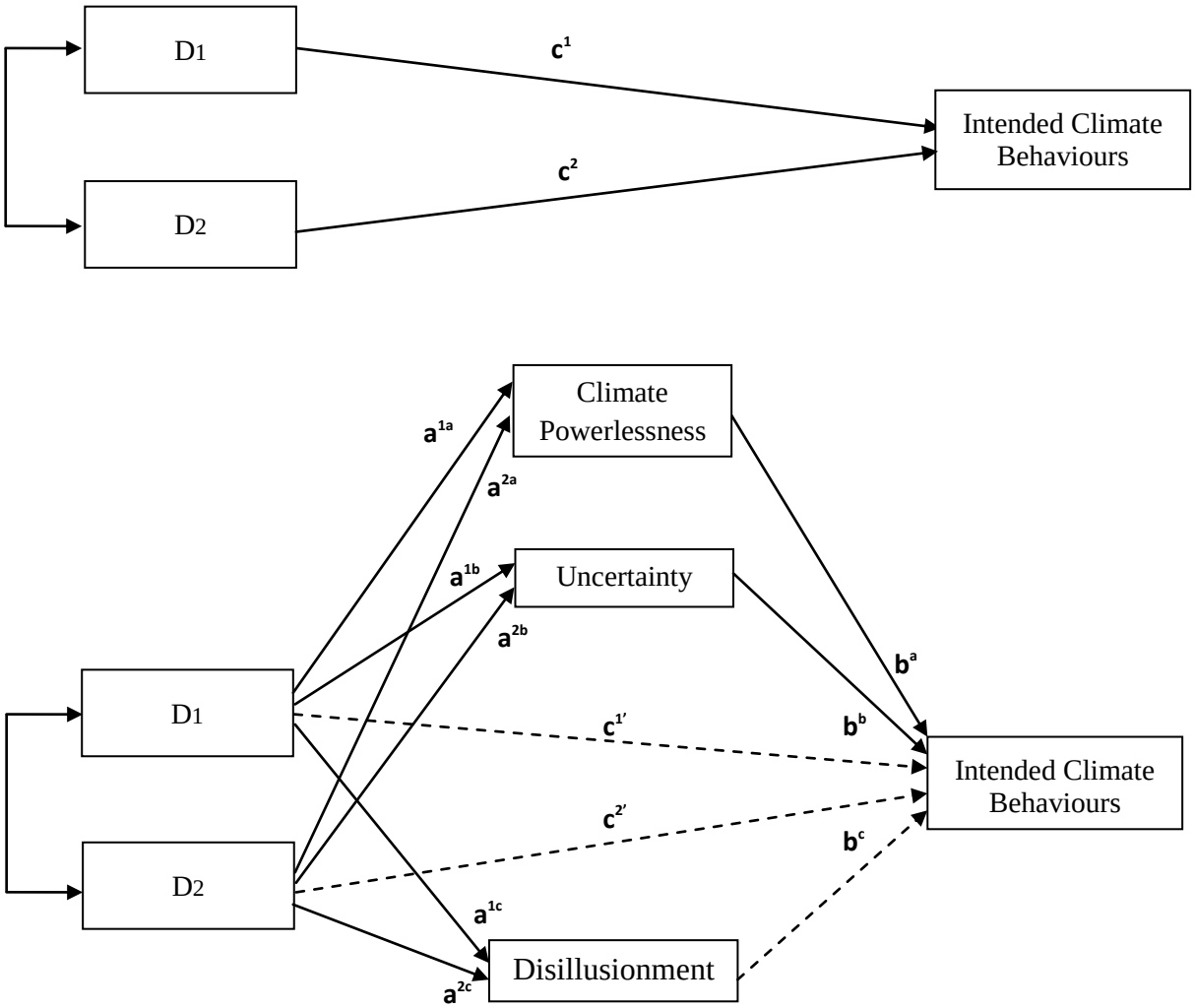


Figure 2. Multiple mediation test of the relationship between conspiracy condition (using indicated coding, see Table 2) and intended climate change behaviors.

Note. Dashed straight lines highlight non-significant *path* relationships and solid straight lines highlight significant *path* relationships.

Table 4

Simple Mediation of the Indirect Effects of Conspiracy Condition (using Indicator Coding, see Table 2) on Political Behaviours (DV) through Feelings of Political Powerlessness (MV) (N= 191; 5,000 bootstrap samples).

	Normal test theory								
	Mediator (*MV*)		Dependant (*DV*)				**Bootstrapping for indirect effects**		
								Monte Carlo 95% Confidence Intervals	
Indictor Coding	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
D^1	a^1	-0.81 (.14)***	c^1	0.54 (.18)**	$c^{1'}$	0.24 (.19)	**0.30 (.09)**	**0.1382**	**0.4916**
D^2	a^2	-0.89 (.13)***	c^2	0.52 (.17)**	$c^{2'}$	0.19 (.19)	**0.32 (.10)**	**0.1561**	**0.5369**
	'*MV*'				b	-0.37 (.09)***			

Note. Boldface type highlights a significant effect as determined by the Monte Carlo 95% confidence interval (CI) which does not contain a zero.

**$p < .05$. ***$p < .01$.

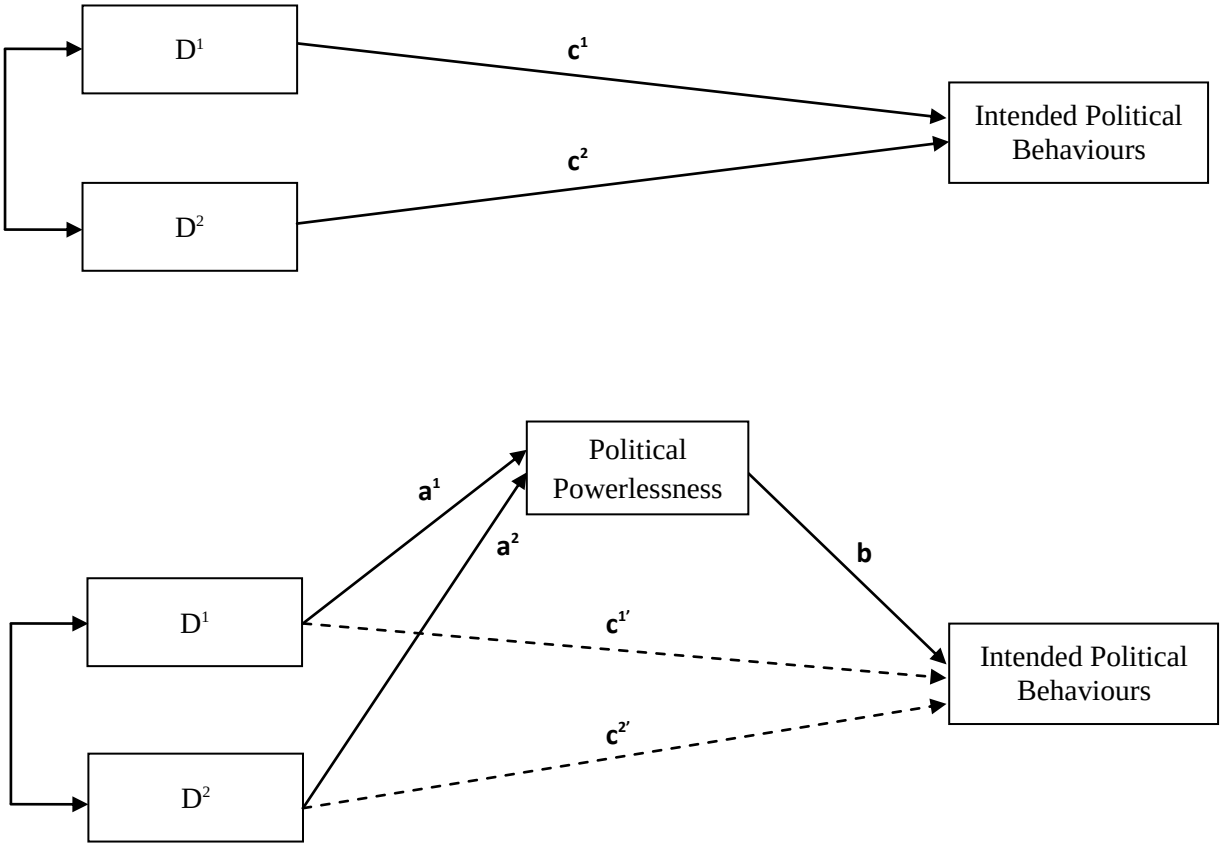


Figure 3. Simple mediation test of the relationship between conspiracy condition (using indicated coding, see Table 2) and intended political behaviors.

Note. Dashed straight lines highlight non-significant *path* relationships and solid straight lines highlight significant *path* relationships.

Discussion

In Study 2, participants were exposed to either a pro-conspiracy or anti-conspiracy account of events (plus a control condition). We measured participant's intentions to reduce their carbon footprint and to engage in politics, and found that exposure to climate change conspiracy theories reduced participants' intentions to engage in both types of behaviours.

The effect of exposure to conspiracy theories on intended climate change behaviours was mediated by climate powerlessness, uncertainty and disillusionment. Supporting the possibility that conspiracy theories in general may be associated with political cynicism, the effect of exposure to conspiracy theories on intended political behaviours was mediated by feelings of political powerlessness. That is, climate change conspiracy theories, that do not explicitly accuse the government, can lead to political disengagement through feelings of political powerlessness.

General discussion

Psychologists are learning more about the individual traits associated with beliefs in conspiracy theories (e.g., Abalakina-Paap et al., 1999; Douglas & Sutton, 2011; Goertzel, 1994; Swami, et al., 2010) and the extent to which conspiracy theories influence people's attitudes about significant social and political events (Butler et al., 1995; Douglas & Sutton, 2008). However, there is a need to understand what these beliefs entail. The current research sought to examine some of the potential consequences associated with exposure to conspiracy theories. Study 1 demonstrated that exposure to governmental conspiracy theories led to heightened feelings of political powerlessness, which reduced intentions to engage in politics. In Study 2, we showed that exposure to climate change conspiracy theories increased feelings of climate powerlessness, uncertainty and disillusionment, which in turn lowered intentions to reduce ones carbon footprint. Study 2 also demonstrated that exposure to climate change conspiracy theories, like governmental conspiracy theories in Study 1, led to feelings of political powerlessness, which reduced intentions to engage in politics. Overall, these studies demonstrate that exposure to conspiracy theories may have potentially detrimental effects. We know from previous research that engagement with politics and climate change is undesirably low in Western societies (e.g., Fiorina, 2002; Leiserowitz, 2003; Niemi &

Weisberg, 2001; Rosenstone & Hansen, 1993; Putnam, 1995, 2000). Conspiracy theories may be an important source of ongoing disengagement, and may even serve to increase disengagement.

The results of Study 2 suggest a further intriguing possibility. Specifically, we demonstrated that climate change conspiracy theories not only influenced intentions to engage in efforts to reduce one's carbon footprint, but also reduced intentions to engage in politics. That is, climate change conspiracy theories influenced intentions to engage in behaviour in a domain unrelated to the specific conspiracy theories themselves. Perhaps therefore, exposure to conspiracy theories in general is associated with a 'conspiratorial mindset' related to political beliefs and intentions. Potentially, other types of conspiracy theories may be related to feelings of political cynicism and powerlessness. Future research may endeavour to test this possibility, examining for example whether other types of conspiracy theories such as those related to AIDS and specific conspiracy theories about social groups (e.g., anti-Jewish conspiracy theories) influence political beliefs and political engagement rather than simply beliefs and behaviours associated with the specific conspiracy theories themselves. As Wood et al. (2012) have recently demonstrated, people are inclined to believe even contradictory conspiracy theories as long as they are supported by the notion of an overarching 'cover-up'. Likewise, political cynicism may form a fundamental basis of conspiracy theorizing.

The current findings revealed mixed results with respect to mediation. Specifically, climate powerlessness, uncertainty and disillusionment explained the effect of exposure to conspiracy theories on climate change intentions. However, only political powerlessness mediated the relationship between exposure to governmental conspiracy theories and the intention to engage with politics. These are intriguing findings, and point to the possibility

that variables such as uncertainty and disillusionment may indeed be manipulated by raising suspicion about the actions of a specific group. On the other hand, mediators such as powerlessness may be associated with more general conspiracism, and political cynicism. Future research may endeavour to examine if different mediational patterns hold for different types of conspiracy theories. It is also important to discuss potential reasons why, in the current research, conspiracy theories were not associated with mistrust. Indeed, this is inconsistent with previous research (e.g., Abalakina-Paap et al., 1999). It is possible that although conspiracy theories may lead to powerlessness, the same directional effect does not apply to mistrust. Perhaps instead, mistrust draws people towards conspiracy theories rather than being a consequence of being exposed to conspiracy theories. Unfortunately the current studies cannot address this possibility but future research may attempt to determine the causal direction of any relationship between mistrust and beliefs in conspiracy theories.

The research had some important limitations that should also be addressed in future research. First, it should be noted that although the effects observed in the current studies were statistically robust, the effect sizes were small (η^2 = .05 in Study 1; η^2 = .04 and η^2 = .06 in Study 2). This means that the proportion of variance in political intentions and climate change intentions explained by exposure to conspiracy theories was quite modest and that there are potentially many other factors that contribute to such intentions. Further, it is important to note that our findings were based on self-report measures of intentions to engage in political and climate change behaviours. As we know, intentions do not always translate into actual behaviours (e.g., LaPiere, 1934; Linn, 1965; Sheeran, 2002). Therefore, future work should examine how exposure to conspiracy theories influences actual political and climate change behaviours. Future research should also rely less on student samples that may not be representative of the population, and thus limit the generalizability of the current findings. In other words, with the data we have available, we are unable to conclude with

confidence that the findings reflect the general population in terms of level of demographic characteristics such as level of education and socioeconomic status. Future research should also therefore address the participant gender imbalance in the current studies.

Future research may also examine some of the potential positive consequences of conspiracy theories. For example, conspiracy theories may allow people to challenge existing social hierarchies and encourage government transparency (e.g., Clarke, 2002; Swami & Coles, 2010). More generally, previous research has tended to pathologize conspiracy beliefs, linking them with negative individual characteristics such as mistrust and anomie (e.g., Goertzel, 1994). While not disputing these findings, there are reasons to believe that positively valued individual differences may increase people's willingness to believe conspiracy theories. For example, conspiracy theories posit novel, often elaborate and unconventional explanations for events. Therefore, they may appeal to dispositionally creative (e.g., Carson, Peterson, & Higgins, 2005), curious (e.g., Flegg & Huskins, 1973), sensitive (e.g., Guarino, Roger, & Olason, 2007) or open-minded (e.g., Haiman, 1964) people. By examining such variables, we hope to achieve a more balanced and nuanced conceptualisation of conspiracy beliefs and begin to consider what some of their positive consequences might be.

Conclusion

Research exploring the consequences of conspiracy theories is timely because despite claims that they are harmful, especially in raising suspicion concerning scientific claims (e.g., Goertzel, 2010; Sunstein & Vermeule, 2009), there is little evidence supporting this claim. The current studies demonstrate that some wariness about conspiracy theories may indeed be warranted. Specifically, the current research provides evidence that exposure to conspiracy theories may potentially have important social consequences. People who were exposed to

conspiracy theories about both shady and suspicious government operations and that climate change is a hoax reported less intention to engage in the political system – an effect that occurred because conspiracy theories led to feelings of political powerlessness. Further, people who were exposed to conspiracy theories about climate change reported less intention to reduce their carbon footprint – an effect that occurred because conspiracy theories led to feelings of powerlessness and uncertainty towards climate change, and also feelings of disappointment in climate scientists. The current research therefore opens up a new line of research investigating the social consequences of an ever-growing climate of conspiracism.

Chapter 3 -

The effects of anti-vaccine conspiracy theories on vaccination intentions

The studies presented in this chapter have been published in the following journal article:

Jolley, D., & Douglas, K. M. (2014b). The effects of anti-vaccine conspiracy theories on vaccination intentions. *PLoS ONE, 9* (2): e89177. doi:10.1371/journal.pone.0089177

Chapter summary

The current studies investigated the potential impact of anti-vaccine conspiracy beliefs, and exposure to anti-vaccine conspiracy theories, on vaccination intentions. In Study 3, British parents completed a questionnaire measuring beliefs in anti-vaccine conspiracy theories and the likelihood that they would have a fictitious child vaccinated. Results revealed a significant negative relationship between anti-vaccine conspiracy beliefs and vaccination intentions. This effect was mediated by the perceived dangers of vaccines, and feelings of powerlessness, disillusionment and mistrust in authorities. In Study 4, participants were exposed to information that either supported or refuted anti-vaccine conspiracy theories, or a control condition. Results revealed that participants who had been exposed to material supporting anti-vaccine conspiracy theories showed less intention to vaccinate than those in the anti-conspiracy condition or controls. This effect was mediated by the same variables as in Study 3. These findings point to the potentially detrimental consequences of anti-vaccine conspiracy theories, and highlight their potential role in shaping health-related behaviors.

Introduction

The development of vaccines is one of the most important advances in the history of medicine, but in recent years, vaccination has declined in many regions of the world, especially in cases such as the combined Measles, Mumps and Rubella (MMR) vaccination (Health Protection Agency, 2008). One contributor to this particular decline appears to have been the publication of Andrew Wakefield's article in *The Lancet* in 1998 concerning a possible link between the MMR vaccination and the appearance of autism (Burgess, Burgess & Leask, 2006; Opel, Diekema, & Marcuse, 2011). Although the article has since been retracted, the research discredited and the author is no longer permitted to practice medicine, lingering doubts persist and in many regions of the world, MMR vaccination rates lie well below the recommended 95% uptake (Health Protection Service, 2013). In 2008, measles was declared to be endemic in the United Kingdom, 14 years after its spread was halted in the population (Health Protection Service, 2013). Several methods have shown promising improvements in vaccination intentions generally, such as using expert sources to persuade people toward vaccination (Hopfer, 2012) and emphasizing that vaccination is normative (Conroy et al., 2009). However, one potential obstacle to such interventions may be the popularity of anti-vaccine conspiracy theories. The current research investigates the influence of such conspiracy allegations on vaccination intentions.

Conspiracy theories are attempts to explain events as the secret acts of powerful, malevolent forces (Douglas & Sutton, 2011; Goertzel, 1994; McCauley & Jacques, 1979; Swami, & Coles, 2010; Wood, et al., 2012). For example, popular conspiracy theories allege that the 9/11 attacks were orchestrated by the US government, that Princess Diana was murdered by elements within the British establishment, and that the NASA moon landings were faked. Belief in conspiracy theories is widespread, with polls consistently indicating

that more than 60% of Americans believe some form of conspiracy was responsible for President John F. Kennedy's death (Swami, 2012). Further, polls demonstrate that more than 20% of respondents endorse the idea that there is a link between childhood vaccines and autism (Public Policy Polling, 2013). Many other anti-vaccine conspiracy theories have emerged in recent years (Kata, 2012; Offit, 2010). At the heart of the anti-vaccine conspiracy movement lays the argument that large pharmaceutical companies and governments are covering up information about vaccines to meet their own sinister objectives. According to the most popular theories, pharmaceutical companies stand to make such healthy profits from vaccines that they bribe researchers to fake their data, cover up evidence of the harmful side effects of vaccines, and inflate statistics on vaccine efficacy (Kata, 2012; Offit, 2010). Anti-vaccine conspiracy theories therefore reflect suspicion and mistrust of scientific research examining vaccine efficacy and safety. Conspiracist ideation in general tends to be associated with a mistrust of science such as the rejection of climate science and other scientific propositions such as the link between smoking and lung cancer (Lewandowsky, et al., 2013a). Along the same line, anti-vaccine conspiracy theories present an attempt to explain away overwhelming scientific evidence that vaccines are effective, safe, and necessary (Kata, 2010).

Although declining vaccination rates are undoubtedly a product of many contributing factors, it is important to consider the potential impact of conspiracy theories on vaccination intentions. In particular, parents who are faced with the decision to have their children vaccinated may be more likely to seek information about vaccines via the Internet than through their doctor (Downs, Bruine de Bruin, & Fischhoff, 2008). Parents who go to the Internet will find that some of the top "hits" for vaccine-related search terms is websites that propagate anti-vaccine conspiracy theories (Kata, 2012; Offit, 2010). Although many people are skeptical of anti-vaccine conspiracy allegations, recent research suggests that such

conspiracy theories tend to feature prominently in focus group discussions about vaccination (Mills, Jadad, Ross, & Wilson, 2005).

Further, recent findings suggest that people tend to be persuaded by conspiracy theories they are exposed to without being aware of it (Douglas, & Sutton, 2008). Also, exposure to conspiracy theories has been found to have detrimental effects in other domains, such as reducing pro-environmental intentions and willingness to engage in politics (Butler, et al., 1995; Jolley & Douglas, 2014a, see Chapter 2). In the health domain, one prominent conspiracy theory proposes that birth control and HIV/AIDS are forms of genocide against the African American community. Endorsement of these conspiracy theories amongst African Americans has been found to be associated with negative attitudes towards contraceptive behaviors, which may potentially expose people to the risk of unwanted pregnancies and sexually transmitted illnesses (Bird & Bogart, 2003; Bogart & Thorburn, 2006; Hoyt, et al., 2012). Directly relevant to the current investigation, it has recently been shown that endorsement of a variety of unrelated conspiracy theories is associated with negative attitudes toward vaccination (Lewandowsky, et al., 2013a).

An emerging literature therefore points to the potential dangers of conspiracy theories. The current research explores the possibility that anti-vaccine conspiracy theories may present a significant obstacle to vaccine uptake. Previously in Chapter 2, we investigated the role of exposure to conspiracy theories in the socio-political behavioral intention domain. In order to further our understanding of the potential consequences of conspiracy theories therefore, Chapter 3 aims to explore the impact of belief in, and exposure to, conspiracy theories on intended health behaviors. In the current research, we also examine some of the potential factors that may mediate such effects. First, perceiving danger in vaccines tends to be associated with reluctance to vaccinate (Wilson, 2000). For example, many people believe

that vaccines have dangerous side effects, and that exposure to the disease itself would often be preferable to the vaccination (Health Protection Service, 2013; Salmon, et al., 2009). Further, research suggests that perceived dangers play an important role in parental decisions to have their children vaccinated (Sporton & Francis, 2000). It is therefore possible that beliefs in conspiracy theories, or exposure to conspiracy theories, negatively influence people's attitudes about the dangers of vaccines, and their subsequent decision to vaccinate. Feelings of powerlessness were measured as a second potential mediator, which refers to the perception of being incapable of influencing an outcome by taking action (Stern, 2000). Research has demonstrated that powerlessness is associated with beliefs in conspiracy theories (Abalakina-Paap, et al., 1999; Jolley & Douglas, 2014a, see Chapter 2) and also that feelings of political powerlessness mediate the relationship between exposure to conspiracy theories and voting intentions (Jolley & Douglas, 2014a, see Chapter 2). It is therefore possible that beliefs in anti-vaccine conspiracy theories, and exposure to such theories, increase feelings of powerlessness about the ability to change health outcomes, which subsequently reduce vaccination intentions.

Third, the current research examined the potential mediating role of disillusionment, or the feeling of disappointment that something is not what it was believed or hoped to be. Previous research has demonstrated that exposure to conspiracy theories increases political disillusionment (Jolley & Douglas, 2014a, see Chapter 2), so it is reasonable to suppose that beliefs in anti-vaccine conspiracy theories or exposure to such theories may increase disillusionment with people responsible for the manufacture and administration of vaccines. This, in turn, may influence vaccination intentions. Finally, the current studies examined the potential mediating role of trust in authorities. Research has linked beliefs in conspiracy theories with low levels of trust (Abalakina-Paap et al., 1999; Goertzel, 1994). Further, distrust of medical information has been linked to reluctance to vaccinate (Kata, 2010).

Therefore, it is proposed here that beliefs in anti-vaccine conspiracy theories or exposure to such theories may decrease trust with medical officialdom and may, in turn, influence vaccination intentions.

In summary, the present research aims to explore the effect of anti-vaccine conspiracy beliefs on vaccination intentions. Two studies are presented, which test the predictions that belief in anti-vaccine conspiracy theories would be associated with decreased vaccination intentions (Study 3), and that exposure to anti-vaccine conspiracy theories would decrease vaccination intentions relative to an anti-conspiracy condition and control (Study 4). Both studies examined four potential mediators of the predicted effects.

Study 3

The first study employed a correlational design where participants were asked to rate the extent to which they agreed or disagreed with statements related to a range of anti-vaccine conspiracy theories. Participants, who were all parents, were then presented with a scenario depicting a fictitious child. Here, they were asked to imagine that they were faced with the decision to have this child vaccinated against a specific (made-up) disease. They were given some information about the disease and the vaccination and were asked to indicate their intention to have the child vaccinated.

Method

Participants and design

Eighty-nine British parents (80 women and nine men, M_{age} = 38.06, *SD* = 9.25) participated in the study. The parents had an average of 1.35 (*SD* = .59) children, with the mean age of their youngest child being 3.38 (*SD* = 1.33). Participants were invited to take

part in our study between September and December 2012 via poster advertisements across the University of Kent's Canterbury campus, and emails sent to both students within the School of Psychology and parents who were signed up to the Psychology's Child Development research group. We also utilised Facebook and Twitter to advertise the study. In all cases, participants were invited to complete an online questionnaire. They did so voluntarily and without incentive.

Anti-vaccine conspiracy beliefs were measured as the predictor variable and vaccination intentions as the criterion variable. Perceived dangers of vaccines, feelings of powerlessness, disillusionment, and trust in authorities were measured as potential mediators.

Materials and procedure

Participants indicated their informed consent before beginning the questionnaire. They were then asked to complete a scale measuring beliefs in anti-vaccine conspiracy theories. There were eight statements (e.g., "Vaccines are harmful, and this fact is covered up"; $\alpha = .85$, see Appendix C), where participants indicated their agreement on a seven-point scale in each case (1= *strongly disagree, 7 = strongly agree*).

Next, participants completed a scale measuring the perceived dangers of vaccines, adapted from existing materials (Betsch & Sachse, 2013). There were eight statements (e.g., "Vaccines lead to allergies", $\alpha = .86$, see Appendix D) where participants indicated their agreement on a seven-point scale (1= *strongly disagree, 7 = strongly agree*). A three-item scale measuring a person's feelings of powerlessness, specifically concerning vaccination was developed from previous research (Aitken, et al., 2011; Jolley & Douglas, 2014a, see Chapter 2). Participants were asked to read the statements (e.g., "I feel that my actions will

not stop the negative outcomes of immunisations", α = .82, see Appendix D) and rate their agreement on a six-point scale (*1 = strongly disagree, 6 = strongly agree*).

A scale was also included to measure participants' feelings of disillusionment, specifically towards those involved in vaccinations (e.g., the government, pharmaceutical companies). This scale was adapted from existing materials (Jolley & Douglas, 2014a, see Chapter 2; Niehuis & Bartell, 2006) and consisted of four statements (e.g., "I am very disappointed with those who are involved in immunisations (e.g., the government, pharmaceutical companies)", α = .89, see Appendix D) where participants indicated their agreement on a six-point scale (*1 = strongly disagree, 6 = strongly agree*). Further, trust towards authorities was measured by adapting items from existing scales (Jolley & Douglas, 2014a, see Chapter 2; Leiserowitz, 2003). There were two trust sources (corporations and government, Spearman-Brown Coefficient = .82, see Appendix D), where participants indicated the extent to which they trusted the source to tell the truth about vaccination on a six-point scale (*1 = strongly distrust, 6 = strongly trust*). The order of measures was counterbalanced.

Finally, participants were asked to imagine a scenario in which they were the parent of an infant (Sophie, aged 8 months, Betsch & Sachse, 2013; Betsch, Renkewitz, & Haase, 2013). They were informed that their doctor had provided them with information regarding the (fictitious) disease *dysomeria*. Dysomeria was described as a DS-virus spread by droplet infection, which may lead to serious consequences with symptoms such as fever and vomiting. Participants were then informed about the vaccination against dysomeria, and that it is recommend by the U.S. Centers for Disease Control and Prevention (CDC) for people of all ages (see Appendix C for full wording). After reading the scenario, participants were asked to indicate their intention to have the child vaccinated ("If you had the opportunity to

vaccinate your child (Sophie, aged 8 months) against dysomeria next week, what would you decide?"). Participants indicated their intention on a seven-point scale (*1 = definitely not vaccinate, 7 =definitely vaccine*). At the conclusion of the study, participants were debriefed and were thanked for their participation.

Results and discussion

For each variable, mean values were calculated by summing the individual scores and then dividing by the number of items. These mean scores were used in the statistical analyses. Descriptive statistics and correlations between variables are presented in Table 5. However, because the potential mediators were significantly correlated with each other, their factor structure was first examined via an exploratory factor analysis of the individual items using Varimax rotation. The same mediators were included in both Studies 3 and 4, so this analysis was conducted across data from both studies to increase power. The Kaiser-Meyer-Olkin (KMO) measure of sample adequacy was .93, exceeding the recommended value of .6 (Kaiser, 1970) and Bartlett's Test of Sphericity (Barlett, 1954) reached statistical significance, X^2 (136) = 4544.44, $p < .001$, indicating that the items had adequate common variance for factor analysis. Principal component analysis was then conducted, revealing four components with eigenvalues greater than 1 and extraction criterion of .30, explaining 52.5 per cent, 8.7 per cent, 8.7 per cent and 6.4 per cent of the variance respectively. The rotated solution revealed each component showing strong loadings, and all variables loading substantially on only one component. The results of this analysis therefore support the use of four separate mediators and are presented in Appendix D.

Table 5

Intercorrelations and Descriptive Statistics between Anti-Vaccine Conspiracy Beliefs and Vaccination Intentions, and Mediator Variables.

	M (*SD*)	1	2	3	4	5	6
(1) Anti-vaccine conspiracy belief	2.00 (*0.89*)	-	-.40***	.76***	.57***	.68***	-.46***
(2) Immunisation intention	5.63 (*1.42*)		-	-.49***	.29**	-.36***	.20¥
(3) Dangers	2.97 (*1.37*)			-	.58***	.60***	-.48***
(4) Powerlessness	3.16 (*1.54*)				-	.59***	-.31**
(5) Disillusionment	2.45 (*1.40*)					-	-.41***
(6) Trust in authorities	3.09 (*1.27*)						-

Notes. ¥ < *.10. * p< .05. **p* <. 01. ***p* <. 001.

Participant age and gender were not associated with any of the potential mediators or the dependent measure and were therefore not analysed further. As predicted, regression analyses revealed that anti-vaccine conspiracy beliefs were a significant negative predictor of vaccination intentions, $F(1, 87) = 15.97$, $p < .001$, $R^2 = .16$, $\beta = -.63$, $t = -3.10$, $p < .001$. Examining potential mediators of this effect, four separate regression analyses were conducted. As shown in Table 6, anti-vaccine conspiracy beliefs were a significant predictor of perceived dangers of vaccines, and feelings of powerlessness, disillusionment and trust in authorities, $F(5, 83) = 12.37$, $p < .001$, $R^2 = .58$; $F(5, 83) = 41.70$, $p < .001$, $R^2 = .32$; $F(5, 83) = 74.43$, $p < .001$, $R^2 = .46$; $F(5, 83) = 23.00$, $p < .001$, $R^2 = .20$, respectively.

Table 6

Four Separate Regressions Examining Anti-Conspiracy Belief as Predictor, and Four Mediator Variables as Criterions in Study 3.

	Criterion	*β*	*t*
1	Dangers	.76	10.98***
2	Powerlessness	.57	6.46***
3	Disillusionment	.68	8.63***
4	Trust in authorities	-.46	-4.80***

Note. ***p <. 001.

Testing mediation

To test the predicted pattern of mediation between anti-vaccine conspiracy beliefs and vaccination intentions, we used Hayes and Preacher's (2013) bootstrapping macro designed for SPSS to run a multiple mediation model. This method is a non-parametric test and therefore it does not violate assumptions of normality. The method is based on re-sampling a subset of the data many thousands of times, which subsequently creates a custom sampling distribution that is shaped like the data. This method encompasses two processes: first, the "direct effect" measures changes in the DV when the IV increases. In contrast, the "indirect effect" measures changes in the DV when the MV increases and the IV is fixed. The indirect effect is the test of mediation, and is our sole focus here. Bootstrapping therefore involves repeatedly estimating the indirect effect in each re-sampled data set. By repeating this process thousands of times, it builds an empirical approximation of the sampling distribution that constructs the confidence intervals (Hayes & Preacher, 2013**)**. In order to test the significance of the indirect effect, we used 5000 bootstrap re-samples to describe the

confidence intervals of indirect effects in a manner that makes no assumptions about the distribution of the indirect effects.

As argued by Hayes (2009), an indirect effect is estimated as being significant if the confidence intervals do not contain a zero, as opposed to significance in the individual paths. This is because the mediation model is not pertinent to whether the individual paths ("a" path (IV to mediator), "b" path (mediator to DV, controlling for the IV), "c" path (IV to DV) or "c'" path (IV to DV, controlling for the mediators)) are either significant or non-significant. Results from the current study are presented in Table 7 and Figure 4. The multiple mediation analysis of the effect of anti-vaccine conspiracy beliefs on vaccination intentions indicated that perceived dangers of vaccines and feelings of powerlessness, disillusionment and trust in authorities (controlling for each other) were each significant mediators of this effect.

Table 7

A Multiple Mediation Test of the Relationship between Anti-Vaccine Conspiracy Beliefs (IV; a) and Vaccination Intentions (DV; c) Through Perceived Dangers of Vaccines [(a)], and Feelings of Powerlessness [(b)], Disillusionment [(c)] and Trust in Authorities [(d)] (MVs; b) (N = 89; 5000 Bootstrap Samples).

Normal test theory						**Bootstrapping for indirect effects**		
Mediator (*MV*)			Dependant (*DV*)				Monte Carlo 95% Confidence Intervals	
Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
a^a	1.17 (.11)***	c	-0.63 (.16)***	c’	-0.02 (.26)	**-0.54 (.20)**	**-0.9439**	**-0.1603**
a^b	0.97 (.15)***					**0.04 (.18)**	**-0.8071**	**-0.1345**
a^c	1.06 (.12)***					**0.15 (.18)**	**-0.8595**	**-0.1481**
a^d	-0.65 (.14)***					**0.05 (.12)**	**0.0816**	**0.5780**
‘M*V*’				b^a	-0.46 (.16)***			
				b^b	0.04 (.12)			
				b^c	-0.14 (.14)			
				b^d	0.08 (.13)			

Notes. ***$p < .01$.

Boldface type highlights a significant effect as determined by the Monte Carlo 95% confidence interval (CI), which does not contain a zero.

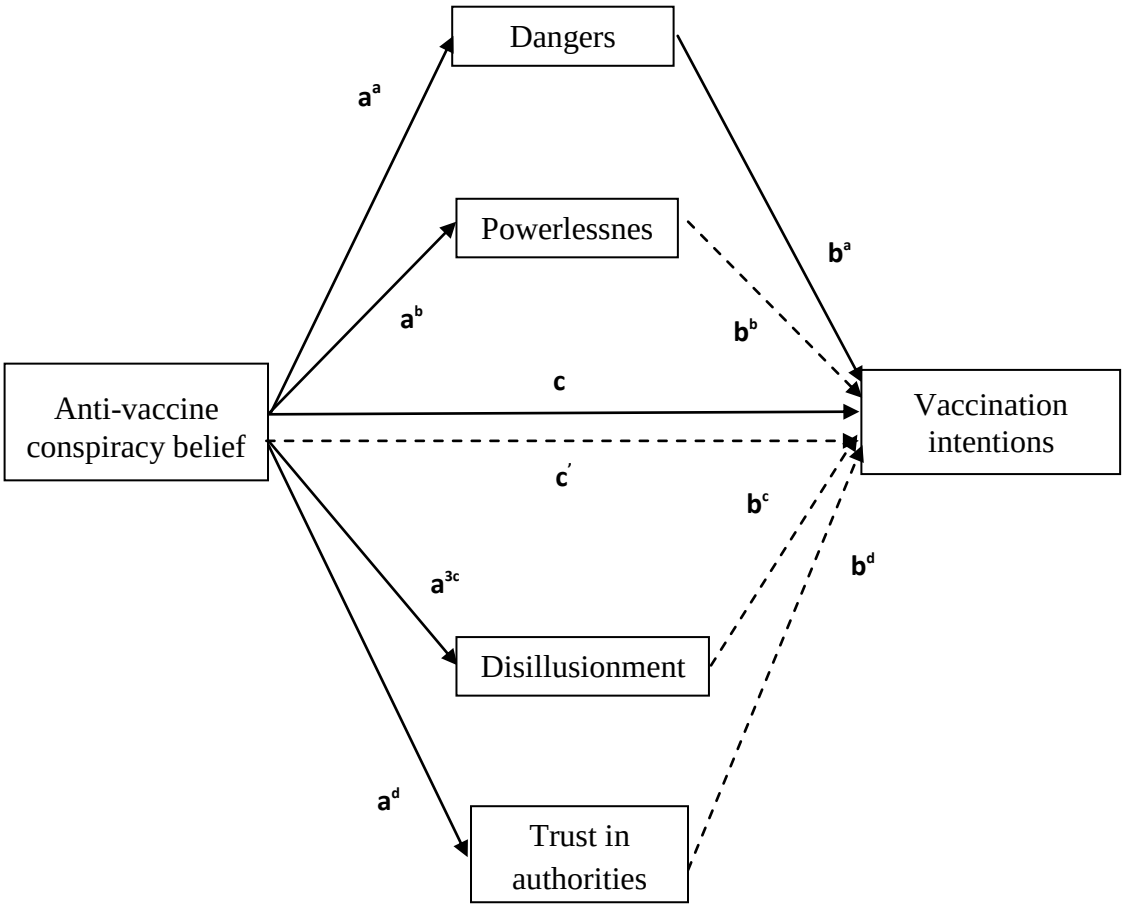


Figure 4. Multiple bootstrapping mediation test of the relationship between anti-vaccine conspiracy beliefs and vaccination intentions.

Note. Dashed lines highlight non-significant relationships and solid lines highlight significant relationships.

Therefore, as hypothesized, anti-vaccine conspiracy beliefs predicted vaccination intentions. Participants who endorsed anti-vaccine conspiracy theories to a greater extent indicated less intention to vaccinate. Further, anti-vaccine conspiracy beliefs were associated with three potential mediator variables that had been examined in previous research (Jolley & Douglas, 2014a, see Chapter 2) and also the perceived dangers of vaccines. When all factors were taken into account, each was a significant mediator of the relationship between anti-

vaccine conspiracy beliefs and vaccination intentions. Using an experimental design, Study 4 was designed to replicate and extend these findings by investigating the casual relationship between anti-vaccine conspiracy theories and vaccination intentions, via perceived dangers of vaccines, and feelings of powerlessness, disillusionment and mistrust in authorities.

Study 4

In Study 4, participants were exposed to material supporting anti-vaccine conspiracy theories (versus anti-conspiracy material, or a control condition). Participants were then asked to indicate their intention to have a fictitious child vaccinated as in Study 3. It was predicted that exposure to material supporting anti-vaccine conspiracy theories would negatively influence vaccination intentions, compared to the other conditions. The potential mediators examined in Study 3 were also measured. It was predicted that all variables would be associated with vaccination intentions, and that each would mediate the effect of exposure to conspiracy theories on vaccination intentions.

Method

Participants and design

Two hundred forty six participants (146 women and 100 men, M_{age} = 34.76, *SD* = 12.90) were recruited in April 2013 via Amazon's Mechanical Turk (MTurk). Participants were residents of the U.S.A. and received 70 cents in exchange for their participation. MTurk is an online crowdsourcing tool for collecting high-quality, inexpensive experimental data and it is widely used in psychological research (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Researchers have found MTurk workers to be at least as representative of the U.S. population as traditional internet subject pools, with gender,

race, age, and education matching the population more closely than internet samples in general (Paolacci, et al., 2010).

Two questions randomly placed within the questionnaire (e.g., "So we can be sure that you are reading the questions carefully, please answer "Strongly disagree" to this question") were included to identify participants who had rushed the questionnaire. Further, a timer was used to identify participants who had spent less than 30 seconds reading the vaccine-related material and who had thus exceeded reading speed capabilities for upper college students (Speed Reading, 2014). Participants who failed the screening were removed from analyses (26 participants from the pro-conspiracy condition, 19 from the anti-conspiracy condition and 13 from the control condition). The final sample size used for data analysis was therefore 188 (112 women and 76 men, M_{age} = 36.33, *SD* = 13.40). There were 60 participants in the pro-conspiracy condition, 62 in the anti-conspiracy condition, and 66 in the control condition. Within the final sample, 83 (44.15%) were parents, who had an average of 1.30 (*SD*: 0.54) children, with the youngest being 4.37 (*SD* = 1.10) years old.

A single-factor independent variable (pro-conspiracy vs. anti-conspiracy vs. control) between-subject design was employed. A manipulation check measured participants' judgements that a series of anti-vaccine conspiracy theories are true. As in Study 3, participants reported the perceived dangers of vaccines, and feelings of powerlessness, disillusionment, and trust in authorities. Finally, participants were again asked to indicate their intention to have a fictional child vaccinated.

Materials and procedure

As in Study 3, this was an online questionnaire in which participants were first asked to give their informed consent. Next, participants were either exposed to information that

supported anti-vaccine conspiracy theories (pro-conspiracy condition) or information that refuted conspiracy theories (anti-conspiracy condition) (see Appendix E for full wording). A control condition was also included, where no further information was given. Participants were randomly assigned to one of the three conditions. The pro-conspiracy article began by arguing that people within the vaccine industry are guilty of misrepresenting data. It then continued to provide specific examples such as the idea that hiding information about vaccines is purely motivated by profit and there is significant evidence that vaccines hurt more than they help. An extract from the pro-conspiracy article was as follows:

> *"…further, there is a significant amount of evidence that vaccines can hurt more than they help. For example, by the year 2002, tens of thousands of reactions to vaccines, including deaths, were reported. One must magnify these figures tenfold, because it is estimated that 90% of doctors do not report incidents…"*

The anti-conspiracy article differed by arguing that there are no reasons to doubt the efficacy and safety of vaccines. It then continued to provide specific examples such as the idea that the financial benefits of preventing illnesses far outweigh the profits made from vaccines and that there is little evidence to suggest that vaccines are harmful. An extract was as follows:

> *"…further, there is little evidence to suggest that vaccines are harmful. The side effects are minimal and whilst millions of people have been immunised over the years, less than .005% have ever had an adverse reaction to a vaccine..."*

The term 'conspiracy theory' was not mentioned in either of the articles. To check that the manipulation was successful, participants rated the likelihood that a series of anti-vaccine conspiracy theories are true. Those in the control condition also completed this manipulation check. There were eleven statements in total (e.g., "*Misrepresentation of the efficacy of*

vaccines is motivated by profit", α = .88, see Appendix E), where participants indicated their agreement on a seven-point scale (*1= strongly disagree, 7 = strongly agree*). Participants then indicated their perceived dangers of vaccines (α = .90), and feelings of powerlessness (α = .88), disillusionment (α = .93) and trust in authorities (Spearman-Brown Coefficient = .73) as in Study 3 (see Appendix C). The order of measures was counterbalanced. Participants next read the scenario as in Study 3 and indicated their intention to have a fictional child vaccinated against a made up disease (see Appendix C). At the end of the study, participants were told that the information presented in the article was fictional, and was written for the purposes of the study. Participants were also pointed towards websites containing factual information about vaccines, vaccine efficacy and vaccine safety before being thanked and paid for their participation.

Results and discussion

For each variable, mean values were calculated by summing the individual scores and then dividing by the number of items. These mean scores were used in the statistical analyses. None of the analyses were affected by the participants' status as parents or non-parents, nor their age or gender. These variables were therefore not analyzed further.

Manipulation check

There was a significant difference in endorsement of anti-vaccine conspiracy theories between conditions, $F(2, 185) = 13.79$, $p < .001$, $\eta^2 = .15$. Endorsement of anti-vaccine conspiracy theories was significantly higher in the pro-conspiracy condition ($M = 4.11$, $SD = 1.41$) than the anti-conspiracy condition ($M = 2.93$, $SD = 1.14$, $p < .001$) and the control condition ($M = 3.56$, $SD = 1.21$, $p = .014$). The manipulation was therefore successful. Endorsement of anti-vaccine conspiracy theories was significantly lower in the anti-

conspiracy condition than the control condition (p = .005). Because the anti-conspiracy condition reduced conspiracy beliefs below baseline, we report analyses comparing the pro-conspiracy condition to both the anti-conspiracy and control conditions.

Anti-vaccine conspiracy theories and vaccination intentions

As hypothesized, results revealed a significant difference in vaccination intentions across conditions, $F(2, 185) = 4.81$, $p = .009$, $\eta^2 = .05$. Vaccination intentions were significantly lower in the pro-conspiracy condition ($M = 4.87$, $SD = 1.74$) than the anti-conspiracy condition ($M = 5.69$, $SD = 1.31$, $p = .003$) and the control condition ($M = 5.47$, $SD = 1.50$, $p = .028$). Intentions were not significantly different between the anti-conspiracy condition and control ($p = .407$).

Testing mediation

To test potential mediators of this effect, separate ANOVAs were firstly conducted with conspiracy condition (pro-conspiracy versus anti-conspiracy versus control) as the independent variable, and mean scores on all potential mediators (perceived vaccine dangers, powerlessness, disillusionment and trust in authorities) as dependent variables. Results revealed a significant difference in perceived dangers of vaccines between conditions, $F(2, 185) = 7.61$, $p = .001$, $\eta^2 = .08$. Perceived dangers were higher in the pro-conspiracy condition ($M = 4.00$, $SD = 1.46$) than the anti-conspiracy condition ($M = 2.97$, $SD = 1.42$, $p < .001$) and the control condition ($M = 2.39$, $SD = 1.71$, $p = .021$). Perceived dangers were not significantly different between the anti-conspiracy and control conditions ($p = .110$).

Results also revealed a significant difference in powerlessness between conditions, $F(2, 185) = 3.44$, $p = .034$, $\eta^2 = .04$. Powerlessness was significantly higher in the pro-conspiracy condition ($M = 4.25$, $SD = 1.43$) than the anti-conspiracy condition ($M = 3.46$, SD

= 1.78, p = .008). Powerlessness was not significantly different between the pro-conspiracy and control conditions (p = .097), and the anti-conspiracy and control conditions (p = .327). There was a significant difference in disillusionment between conditions, $F(2, 185) = 7.46$, p = .001, η^2 = .08. Disillusionment was significantly higher in the pro-conspiracy condition (M = 3.65, SD = 1.71) than the anti-conspiracy condition (M = 2.52, SD = 1.78, $p < .001$). However, disillusionment was not significantly higher than the control (M = 3.11, SD = 1.55, p = .062). Disillusionment was significantly lower in the anti-conspiracy condition relative to the control condition (p = .041).

Finally, results revealed no significant difference in trust in authorities between conditions, $F(2, 185) = 2.32$, p = .101, η^2 = .03. However, trust was significantly lower in the pro-conspiracy condition (M = 2.60, SD = 1.01) than the control condition (M = 2.97, SD = 1.04, p = .048). Trust was not significantly lower in the pro-conspiracy condition relative to the anti-conspiracy condition (M = 2.66, SD = 1.07, p = .745), or anti-conspiracy and control (p = .101).

Each of the candidate mediators was then examined in a test of mediation in order to explain the effect of the conspiracy conditions (pro-conspiracy versus anti-conspiracy, versus control) on vaccination intentions. This was carried out using Hayes and Preacher's (2013) bootstrapping method for indirect effects, as in Study 3. However, the method differed slightly, allowing mediations between the three conspiracy conditions to be tested by the use of indicator coding. This was done using Hayes and Preacher's (2013) SPSS mediate macro. The pro-conspiracy condition was coded as the representative condition and was compared to the anti-conspiracy condition (D^1) and control (D^2) separately. The SPSS macro had one indicator variable (D^1, pro-conspiracy versus anti-conspiracy) as the IV, and the other as a covariate (D^2, pro-conspiracy versus control), before simultaneously swapping the variables

around to complete the second meditational analysis (D^2, pro-conspiracy versus control as the IV and D^1, pro-conspiracy versus anti-conspiracy as the covariate). This allows the mediational models to be tested whilst controlling for the effect of the parallel analysis, which is completed automatically by the SPSS macro. As in Study 3, an indirect effect is then estimated as being significant from the confidence intervals not containing a zero, as opposed to significance in the individual paths (Hayes, 2009). Results are presented in Table 8 and Figure 5.

Table 8

A Multiple Mediation Test of Conspiracy Condition (D^1, Pro-Conspiracy versus Anti-Conspiracy, versus D^2, Pro-Conspiracy versus Control) on Vaccination Intentions (DV) Through Perceived Dangers Of Vaccines [(a)], and Feelings Of Powerlessness [(b)], Disillusionment [(c)] and Trust in Authorities [(d)] (MVs) (N = 188; 5000 Bootstrap Samples).

	Normal test theory						**Bootstrapping for indirect effects**		
	Mediator (*MV*)			Dependant (*DV*)				Monte Carlo 95% Confidence Intervals	
Indictor Coding	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
D^1	a^{1a}	-1.13 (.29)***	c^1	0.83 (.28)***	$c^{1'}$	0.24 (.25)	**0.44 (.19)**	**0.1788**	**0.8192**
	a^{1b}	-0.79 (.30)**					**0.02 (.06)**	**0.0717**	**0.7069**
	a^{1d}	-1.13 (.30)***					**0.14 (.15)**	**0.1902**	**0.9100**
	a^{1e}	0.06 (.19)					0.00 (.02)	-0.205	0.1480
D^2	a^{2a}	-0.61 (.26)**	c^2	0.60 (.27)**	$c^{2'}$	0.27 (.24)	**0.27 (.15)**	**0.0401**	**0.5795**
	a^{2b}	0.37 (.19)**					0.01 (.02)	-0.0484	0.5274
	a^{2d}	-0.48 (.30)					0.01 (.09)	-0.0484	0.5274
	a^{2e}	0.37 (.19)[¥]					**0.01 (.04)**	**-0.3751**	**-0.0045**
	'M*V*'				b^a	-0.45 (.11)***			
					b^b	0.02 (.07)			
					b^c	-0.13 (.10)			
					b^d	0.01 (.10)			

Notes. [¥] $p < .10$. **$p < .05$. ***$p < .01$.

Boldface type highlights a significant effect as determined by the Monte Carlo 95% confidence interval (CI), which does not contain a zero.

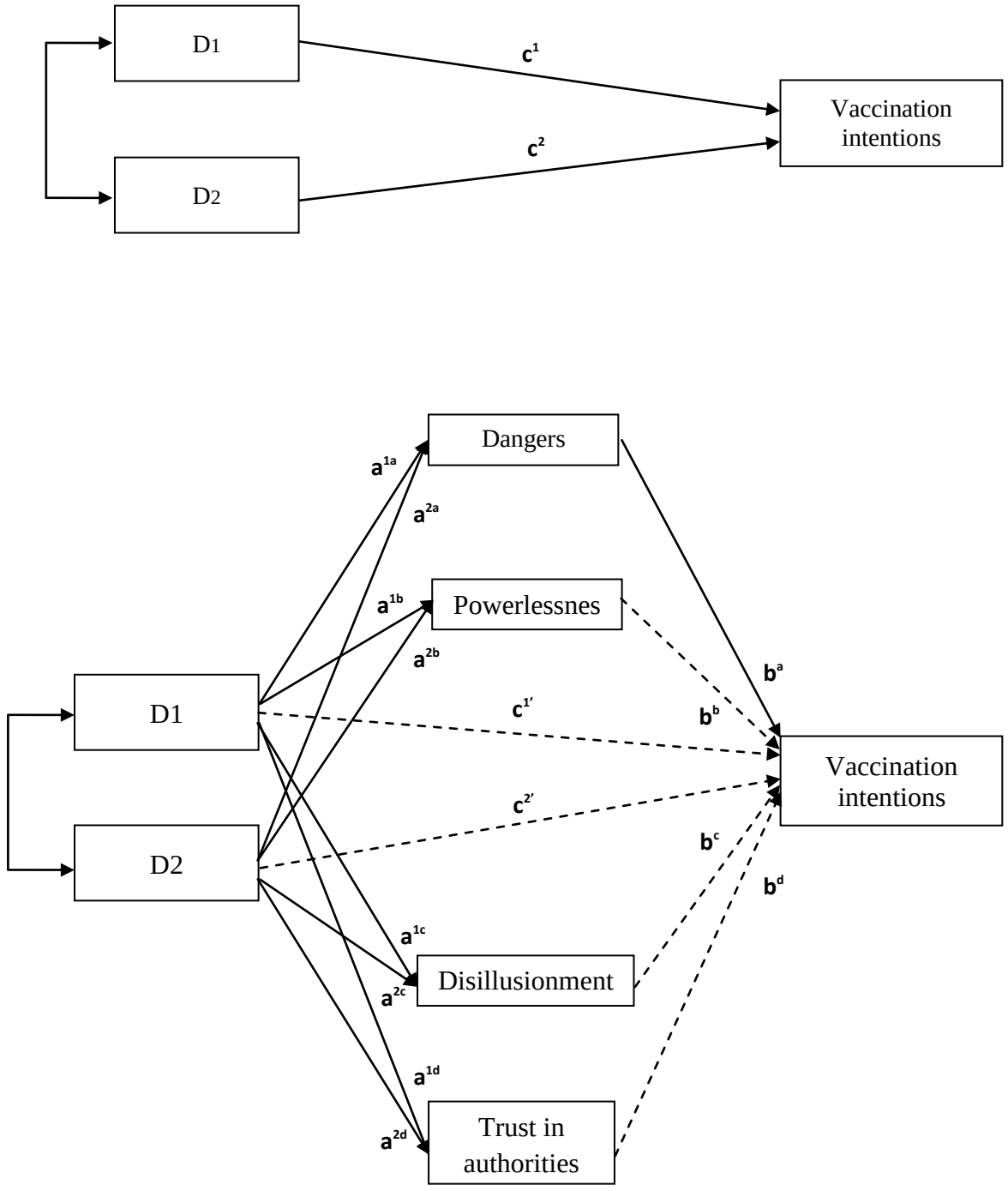


Figure 5. Multiple mediation test between conspiracy condition (using indicated coding) and vaccination intentions.

Note. Dashed straight lines highlight non-significant path relationships and solid straight lines highlight significant path relationships, which do not contain a zero.

The multiple mediation analysis of the effect of pro-conspiracy versus anti-conspiracy condition on vaccination intentions (D^1) (when controlling for pro-conspiracy versus control, D^2) indicated that perceived vaccine dangers, and feelings of powerlessness and disillusionment (controlling for all mediators) were mediators of this effect. Second, the effect for D^2 (controlling for D^1) indicated that perceived vaccine dangers and trust in authorities (controlling for all mediators) significantly mediated this effect.

Therefore, as expected, participants who were exposed to material supporting anti-vaccine conspiracy theories showed reluctance to have a child vaccinated compared to the other two conditions. The perceived dangers of vaccines were a consistent mediator across conditions. Further, feelings of powerlessness and disillusionment mediated the difference between the pro- and anti-conspiracy conditions, and mistrust in authorities mediated the difference between the pro-conspiracy and control conditions.

General discussion

The current research suggests that anti-vaccine conspiracy theories may have more than a trivial effect on vaccination intentions. In two studies, it has been demonstrated that beliefs in anti-vaccine conspiracy theories – such as the belief that research on vaccine efficacy is manipulated to make profits for pharmaceutical companies – are associated with reduced vaccination intentions. Further, the current research has demonstrated that exposure to anti-vaccine conspiracy theories directly affects vaccination intentions. Both effects were significantly mediated by the perceived dangers of vaccines. In Study 3, the effect was further mediated by feelings of powerlessness, disillusionment and mistrust in authorities. In Study 4, feelings of powerlessness and disillusionment mediated the difference between the pro- and anti-conspiracy conditions, and mistrust in authorities mediated the difference between the pro-conspiracy and control conditions. Therefore, overall, anti-vaccine

conspiracy theories appear to introduce undue suspicion about vaccine safety, and increase feelings of powerlessness and disillusionment, whilst decreasing trust in authorities, which in turn introduce reluctance to vaccinate. This work demonstrates empirically, and to our knowledge for the first time, that anti-vaccine conspiracy theories may therefore present an obstacle to vaccine uptake.

Although a variety of attempts to increase vaccination intentions have shown promising success in recent years (Hopfer, 2012; Conroy, et al., 2009), the current research suggests that future attempts to intervene on vaccine reluctance should also consider the role of conspiracy theorizing. Specifically, because beliefs in conspiracy theories in general are associated with a mistrust of scientific claims (Lewandowsky et al., 2013a, 2013b) interventions that cite claims by scientists and medical professionals may also meet with suspicion. Such attempts at intervention may therefore fail on people who are sympathetic to a variety of conspiracy claims (Kata, 2012; Offit, 2010).

Instead, successful interventions may focus on direct counter-arguments against the conspiracy allegations themselves (Sunstein & Vermeule, 2009). Indeed, the finding here that the anti-conspiracy condition – which directly refuted conspiracy allegations – reduced conspiracy beliefs below baseline, suggests that this may be a promising avenue for intervention. This could be further investigated by manipulating the source of the information presenting the counter-arguments against conspiracy allegations (e.g., governmental bodies, independent vaccine agencies, academic researchers). However, it is important to note that whilst the anti-conspiracy condition reduced conspiracy beliefs below baseline, this was not associated with increased intentions to vaccinate. This may be consistent with the argument that misinformation tends to be resistant to correction (Lewandowsky, et al., 2012). That is, once the very idea of a conspiracy has been mentioned

and has taken root, even strong counter-arguments may be unable to lead to behavioral action. Future research may therefore also consider the impact of the order in which misinformation and counter-arguments are presented. Further, future research may investigate the role of prior warnings and the continued influence of misinformation on behavioural intentions (Ecker, Lewandowsky, & Tang, 2010). Nevertheless, it is argued here that future interventions to increase vaccine uptake should address the impact of anti-vaccine conspiracy theories.

The current research had some important limitations that should also be addressed in future research. First, it is important to note that although the effects observed throughout this research were statistically robust, the effects sizes were small (e.g., $\eta^2 = .05$ for the effect of vaccine information on vaccination intentions in Study 4). This means that the proportion of variance in vaccine intentions explained by exposure to conspiracy theories was quite modest and there are potentially many other factors that contribute to vaccine intentions. Nonetheless, small reductions in uptake, especially in cases such as the MMR vaccine, can have large effects since the recommended uptake to ensure herd immunity is 95% (Health Protection Agency, 2008).

It should also be noted that endorsement of anti-vaccine conspiracy theories tended to be around or below the midpoint, except in the condition where participants were exposed to anti-vaccine conspiracy information ($M = 4.11$ on a 7-point scale in Study 4). Therefore, the participants were not strong endorsers of anti-vaccine conspiracy theories, meaning that different patterns of findings may emerge for those who do strongly endorse conspiracy theories. Similarly, different strategies for successful intervention may apply for people who hold strong anti-vaccine conspiracy beliefs than those who do not hold strong beliefs (Sunstein & Vermeule, 2009). Future research could consider these possibilities.

Further, the pattern of mediation is less clear in Study 4 than in Study 3 and future research may endeavour to uncover additional mediators or isolate one key mediator of the conspiracy-vaccination intention link. However, the current research has identified a number of factors that are influenced by exposure to conspiracy theories, which, in turn, influence vaccination intentions. Finally, the findings were based on self-report intentions to have a fictional child vaccinated against a made up disease. As is well known, intentions do not always translate into behaviors (LaPiere, 1934; Linn, 1965; Sheeran, 2002). Future research may therefore examine associations between anti-vaccine conspiracy beliefs and actual vaccination behavior. Future research could also examine larger samples and potentially identify the impact of conspiracy theories in geographical areas that have dangerously low vaccination uptake.

Future research may also focus on the individual difference characteristics that pre-dispose individuals to anti-vaccine conspiracy beliefs. Psychologists are learning more about the traits and characteristics associated with beliefs in conspiracy theories more generally, such as mistrust, anomie, political cynicism and Machiavellianism (Abalakina-Paap et al., 1999; Douglas & Sutton, 2008; Goertzel, 1994; Swami, et al., 2010), and it will be useful to know if the same, or different factors predict anti-vaccine conspiracy beliefs. Further, another avenue for intervening on vaccination reluctance may be to focus on individuals who possess the personal characteristics that make them receptive to conspiracy claims. Theorists note the possibility of directing anti-conspiracy information at potential consumers of conspiracy theories, in order to "inoculate" them against accepting such theories, and a method like this may also be effective in encouraging people to reject anti-vaccine conspiracy claims and promoting vaccine uptake (e.g., Sunstein, & Vermeule, 2009).

Conclusion

In conclusion, the current research suggests that anti-vaccine conspiracy theories may have significant and detrimental consequences. Specifically, they appear to reduce vaccination intentions by inducing undue concern about the dangers of vaccines, and increasing powerlessness, disillusionment, and mistrust. This research is timely in the face of declining vaccination rates, and recent outbreaks of vaccinated-against diseases such as measles. Indeed, at the time of writing this article, 1,325 people in Wales had contracted measles, and medical officials were becoming increasingly concerned about vaccination uptake in general across the United Kingdom (BBC News, 2013). The current research also speaks to a broader concern about conspiracy theorizing and science denial (Goertzel, 1994; Lewandowsky et al., 2013b; Sunstein & Vermeule, 2009). Ongoing investigations are needed to further identify the social consequences of conspiracism, and to identify potential ways to combat the effects of an ever-growing culture of conspiracism.

Chapter 4 -

The system-justifying function of conspiracy theories

The studies presented in this chapter have been submitted for publication in the following paper:

Jolley, D., Douglas, K. M., & Sutton, R. M. (submitted). *Blaming a few bad apples saves the barrel: The system-justifying function of conspiracy theories*.

Chapter summary

Four studies demonstrate that conspiracy theories may bolster, rather than undermine, support for the social status quo. In Study 5 (N = 98) beliefs in prominent conspiracy theories were positively associated with system-justifying beliefs. In Study 6 (N = 120), threatening (vs. affirming) the status quo in British society caused participants to endorse conspiracy theories. In Study 7 (N = 159), exposure to conspiracy theories increased satisfaction with the British social system after this had been experimentally threatened. In Study 8 (N = 109), this effect was mediated by the tendency for participants exposed (vs. not exposed) to conspiracy theories to attribute societal problems relatively more strongly to individuals rather than systemic causes. By blaming tragedies, disasters and social problems on the actions of a malign few, conspiracy theories can divert attention from the inherent limitations of social systems.

Introduction

Conspiracy theories blame significant events on the secret actions of powerful, malevolent and unjust actors (Douglas & Sutton, 2011; Goertzel, 1994; Wood, et al., 2012). They range from wildly implausible (e.g., the 2004 Indian Ocean tsunami was triggered by U.S. government scientists), through unlikely (e.g., the U.S. government orchestrated, or was complicit in, the 9/11 attacks), to demonstrably true (e.g., the Watergate, Iran-Contra, and Tuskegee syphilis scandals). Although their plausibility varies, one thing that they seem to have in common is that they are subversive. They point accusing fingers at authority, and offer alternatives to official explanations (Gray, 2010; Sapountzis & Condor, 2013). Their proponents often represent skeptics as gullible conformists, or "sheeple" (Natrass, 2012). Scholars have also written about conspiracy theories' capacity to confront social hierarchies and to offer alternative, subjectively empowering understandings of social reality (e.g., Gray, 2010; Sapountzis & Condor, 2013).

Several findings provide support for this view. Endorsement of conspiracy theories is robustly associated with anomie and political distrust (e.g., Abalakina-Paap, et al., 1999; Goertzel, 1994). Exposure to conspiracy theories undermines confidence in governmental positions on topics such as climate science, and compliance with officially encouraged actions such as voting and vaccinating children (Jolley & Douglas, 2014a, 2014b, see Chapters 2 and 3). Also, as might be expected of a subversive position, belief in conspiracy theories appears to be especially strong among members of disaffected minority groups (Crocker, et al., 1999). Entertaining conspiracy beliefs, then, would seem to be at odds with a well-documented motivation – system justification.

System justification theory proposes that people are motivated to hold positive views about existing social, economic and political arrangements (Jost & Andrews, 2011; Jost &

Banaji, 1994; Jost, et al., 2004; Kay, et al., 2005; Kay, et al., 2009). This motivation arises because system justification symbolically satisfies relational, epistemic, and existential needs. Threats to the fairness, integrity and legitimacy of social systems threaten these needs, causing people to defend, bolster or rationalize the status quo, even at the expense of their own interests (Jost et al., 2004). For example, people use stereotypes to justify status differences between groups (Hoffman & Hurst, 1990; Jost, 2001; Jost & Hunyady, 2002), and employ other ideological devices such as rationalization and outgroup favouritism to preserve the legitimacy of the social system (Jost & Hunyady, 2002).

Why do people subscribe to conspiracy beliefs when they appear to be so critical of authorities and institutions? One possible answer is that like system justification, conspiracy beliefs satisfy important psychological needs, allowing people to make sense of events (van Prooijen, 2012), avoid feelings of uncertainty (van Prooijen & Jostmann, 2013; Whitson, et al., in press), and address feelings of powerlessness (Abalakina-Paap, et al., 1999; Whitson & Galinsky, 2008). Conspiracy theorizing may represent a substitute route to these needs when system justification is untenable.

We propose an alternative possibility, which is that conspiracy theories may actually bolster support for the status quo. As noted by Goertzel (2010), "a conspiracy theory gives believers someone tangible to blame for their perceived predicament, instead of blaming it on impersonal or abstract social forces" (p. 494). In doing so, a conspiracy theory deflects blame for society's problems from the inherent features of social systems to the alleged malfeasance of small groups of people. Thus, conspiracy theories postulate that illegitimate and unjust factors influence people's lives, but nominate factors that are not inherent to social systems.

In this way, the motivated defence of social systems via conspiracy theories is analogous to the preservation of many cherished social beliefs. Subtyping preserves group stereotypes by categorizing people who defy them as members of special subgroups (Kunda & Oleson, 1995). Similarly, in order to defend beliefs that the world is just, people demonize wrongdoers, ascribing to them evil dispositions that make them unrepresentative of normal people (Ellard, Miller, Baumle, & Olson, 2002; Fouts, Callan, Piasentin, & Lawson, 2006). Likewise, people derogate deviant ingroup members more harshly than deviant outgroup members, in order, ironically, to preserve the belief that typical ingroup members are superior to typical outgroup members (Marques & Paez, 1994). In all these cases, people attribute disconfirmatory phenomena to particular causal factors such as individuals' personality traits. In so doing, people avoid revising beliefs about more general entities such as social groups.

In sum, there are grounds to predict that conspiracy theories may either undermine or bolster support for the status quo. However, no research has directly examined these predictions. We report four studies testing the novel proposal that conspiracy theories bolster (vs. undermine) support for the status quo. Study 5 tested the hypothesis that belief in conspiracy theories would be positively (vs. negatively) associated with a measure of system justification. Study 6 examined whether conspiracy theorizing would increase (vs. not increase) in response to "system threat" information. Study 7 tested the hypothesis that exposure to conspiracy theories would buffer (vs. aggravate) the negative effects of system threat on a measure of system justification. Study 8 examined the mediating role of the attribution of societal problems to individual perpetrators rather than social systems.

Study 5

This study examined the relationship between conspiracy belief and satisfaction with the status quo. Evidence of such a relationship would provide grounds for experimental

studies examining the effects of system threat and conspiracy theories on satisfaction with the status quo. If conspiracy theories tend to subvert the status quo, we can expect a negative correlation between these beliefs. If conspiracy theories help to uphold the status quo, this correlation should be positive.

Study 5 also measured values (Schwartz, 1992), reasoning that security, conformity and tradition (*conservation values*) are relevant to the idea of upholding positive perceptions of social systems. Values can be divided into two bipolar dimensions (Schwartz, 1992). The first contrasts *conservation* values with *openness to change values* (self-direction, stimulation, hedonism). The second contrasts *self-enhancement values* (achievement, power, hedonism - note that hedonism is typically included in both openness and self-enhancement values), with *self-transcendence values* (benevolence and universalism). We also measured need for cognitive closure (NFCC; Webster & Kruglanski, 1994), reasoning that this could be associated with belief in conspiracy theories that address uncertainty (van Prooijen & Jostmann, 2013). NFCC comprises five subscales of preference for order and structure, preference for predictability, discomfort with ambiguity, closed-mindedness, and decisiveness. We therefore test whether variations in values ad NFCC may predict system-justifying beliefs.

Method

Participants and design

Ninety-eight undergraduate students at a British University (25 men and 73 women, M_{age} = 20.38, *SD* = 4.38) participated in an online questionnaire. In this study and all other studies reported in this Chapter, the questionnaire management software Qualtrics was used. Participants received course credit in exchange for their participation. The university's

Psychology Ethics Committee approved this pilot study and all others reported in this report, and participants provided their written, informed consent. Belief in both real-world conspiracy theories and general notions of conspiracy were measured as the predictor variables, alongside values and NFCC, and satisfaction with the status quo was measured as the criterion variable.

Materials and procedure

Conspiracy beliefs were measured using a scale assessing belief in real-world conspiracy theories (Douglas & Sutton, 2011). There were 17 statements (e.g., "One or more rogue 'cells' in the British Secret Service constructed and carried out a plot to kill Princess Diana", 1 = *extremely unlikely*, 7 = *extremely likely*, α = .93, see Appendix F). Further, a scale was used to measure belief in general notions of conspiracy (Brotherton, et al., 2013). There were 15 statements (e.g., "The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret", 1 = *definitely not true*, 5 = *definitely true*, α = .94, see Appendix F).

Values were measured using the Schwartz value survey (Schwartz, 1992, 2005). Out of the 57 original items, 45 items were shown to have demonstrated nearly equivalent meaning across 65 nations (Schwartz, 1992, 1995; see Appendix G). These 45 items are used to index the ten values of power (e.g., "social power", α = .67); achievement (e.g., "successful", α = .70); hedonism (e.g., "pleasure", α = .53); stimulation (e.g., "daring", α = .68); self-direction (e.g., "creativity", α = .66); universalism (e.g., "broadminded", α = .76); benevolence (e.g., "helpful", α = .69); tradition (e.g., "humble", α = .72); conformity (e.g., "politeness", α = .66) and security (e.g., "family", α = .65). These indices were computed by averaging the importance ratings of the terms that represent each general value. Participants rated each specific term as a guiding principle in their own life on a 9-point scale from -1

(opposed to my principles) to 0 (not important) to 7 (of supreme importance). The asymmetry of the scale reflects the discriminations people naturally make when thinking about value importance, reflecting the desirable nature of values (Schwartz & Bardi, 2001). However, participants rarely use the ratings of -1 – hence the vast majority of responses range from zero to seven. Some people tend to rate all values as quite important whereas others tend to rate all values as moderately important (this is referred to as scale use tendency; Schwartz, 2005). In order to correct for this bias, we followed Schwartz's recommendation to ipsatize the value scores by centering them on the personal means of value importance ratings.

NFCC was measured using the revised Webster and Kruglanski (1994) questionnaire (see Appendix G). This scale included 41 items, where participants responded on a six-point scale from 1 (strongly disagree) to 6 (strongly agree). A higher score on this scale indicated a greater need for cognitive closure. In addition to summing all 41 items to produce a total NFCC score ($\alpha = .83$), five subsection scores were also calculated by summing the subscale items of preference for order and structure (e.g., "I think having clear rules and order at work is essential for success", $\alpha = .50$), preference for predictability (e.g., "When dining out, I like to go to places where I have been before so that I know what to expect", $\alpha = .50$), discomfort with ambiguity (e.g., "I don't like situations that are uncertain", $\alpha = .52$), closed-mindedness (e.g., "I dislike questions which could be answered in many different ways", $\alpha = .50$), and decisiveness (e.g., "When I have made a decision, I feel relieved", $\alpha = .73$)."

Finally, satisfaction with the status quo was measured using Kay and Jost's (2003) general system justification scale. Participants responded to eight items (e.g., "In general, I find society to be fair", 1 = *strongly disagree*, 9 = *strongly agree*, $\alpha = .80$, see Appendix G), with higher scores indicating greater support for the status quo. The order of the scales was

randomized. At the conclusion of the study, the participants were debriefed in writing and were thanked for their participation.

Results and discussion

There were no significant effects involving participants' gender or age, so these factors are not mentioned further. Intercorrelations and descriptive statistics are presented in Appendix H. Using oblique rotation (promax), we conducted an exploratory factor analysis of the individual items of belief in real-world conspiracy theories and general notions of conspiracy. The scales were also used in Study 6, so the analysis was conducted across data from this study and Study 6 in order to increase power. The Kaiser-Meyer-Olkin (KMO) measure of sample adequacy was .94, exceeding the recommended minimum of .60 (Kaiser, 1970) and Bartlett's Test of Sphericity (Barlett, 1954) reached statistical significance, X^2 (496) = 3869.50, $p < .001$, indicating that the items had adequate common variance for factor analysis. Principal component analysis revealed two factors with eigenvalues greater than one and extraction criterion of .30, explaining 43.38 per cent and 6.83 per cent of the variance respectively. Each component showed strong loadings on the rotated solution, and each item loaded substantially on the predicted scale, with the exception of two items from the real-world conspiracy scale which cross-loaded on the general notions of conspiracy (conspiracies about JFK and aliens). We note that reported results are not affected when these two items are omitted from the real-world conspiracy scale (see Appendix F for items and factor loadings). As predicted, belief in real-world conspiracy theories and general notions of conspiracy were positively correlated with satisfaction with the status quo, $r(98) = .23$, $p = .024$, $r(98) = .32$, $p < .001$, respectively. That is, participants who endorsed conspiracy theories perceived society to be fairer, more legitimate and more secure.

We also conducted a multiple regression with belief in real-world conspiracy theories as the target variable and the NFCC subscales, conservation/openness values, and system justification beliefs as predictors. The model was significant, $F(12, 85) = 3.52$, $p < .001$, Adj. $R^2 = .33$, and closed-mindedness ($\beta = .272$, $t = 2.05$, $p = .043$), self-direction ($\beta = -.24$, $t = -2.28$, $p = .025$), and system justification beliefs ($\beta = .28$, $t = 2.71$, $p = .008$) were significant predictors. We conducted the same regression, but with belief in general notions of conspiracy as the target variable. The model was significant, $F(12, 85) = 3.54$, $p < .001$, Adj. $R^2 = .33$, and closed-mindedness ($\beta = .31$, t = 2.30, $p = .024$), hedonism ($\beta = -.18$, $t = -1.77$, $p = .080$), self-direction ($\beta = -.27$, $t = -2.52$, $p = .014$), and system justification beliefs ($\beta = .37$, $t = 3.53$, $p = .001$) were significant predictors.

We then conducted a multiple regression with belief in real-world conspiracy theories as the target variable and the NFCC subscales, self-enhancement/self-transcendence values, and system justification beliefs as predictors. The model was significant, $F(11, 86) = 2.84$, $p < .001$, Adj. $R^2 = .27$, and discomfort with ambiguity ($\beta = -.24$, $t = -1.97$, $p = .052$), closed-mindedness ($\beta = .30$, $t = -2.21$, $p = .030$), and system justification beliefs ($\beta = .31$, $t = 2.67$, $p = .009$) were significant predictors. We conducted the same regression with belief in general notions of conspiracy as the target variable. The model was significant, $F(11, 86) = 3.44$, $p < .001$, Adj. $R^2 = .31$, and predictability ($\beta = -.05$, $t = -1.76$, $p = 082$), closed-mindedness ($\beta = .33$, $t = 2.50$, $p = .015$), universalism ($\beta = .21$, $t = 1.77$, $p = .081$), and system justification beliefs ($\beta = .39$, $t = 3.51$, $p = .001$) were significant predictors. Only system-justification and the NFCC subscale of closed-mindedness were therefore consistent predictors of conspiracy beliefs. Therefore, as predicted, this study provides preliminary evidence that conspiracy theories may serve a system-justifying function. Next, we experimentally examined whether belief in conspiracy theories responds to system threat.

Study 6

Previous work has demonstrated that system threat leads to increased efforts to defend the status quo. For example, Kay et al. (2005) asked participants to read one of two paragraphs designed to induce either low or high system threat. In the low system threat condition, participants read that people in the United States felt secure about the nation's condition, and that it was socially, economically and politically stable. In the high threat condition, participants read that people in the United States felt disappointed with the nation's condition, and that it was failing socially, economically and politically. Compared to participants in the low threat condition, participants under high system threat derogated victims of misfortune and idealized the recipients of good fortune. This manipulation has also been shown to motivate social cognition that restores the psychological legitimacy of the status quo, including attraction to women who embody sexist ideals (Lau, Kay, & Spencer, 2008), and approval of gender inequality in the attainment of management positions (Kay et al., 2009).

In the current study therefore, we employed a system threat manipulation (Kay & Jost, 2003) previously shown to immediately decrease general satisfaction with the status quo (Kay et al., 2005). If conspiracy theories similarly enable people to affirm the status quo, then conspiracy belief should increase under system threat. The opposite prediction holds if, instead, conspiracy theories undermine support for the status quo, in which case they should be rejected as additional system threats. Moreover, we also examined whether variations in conspiracy belief as direct responses to threat vary according to values and NFCC.

Method

Participants and design

One hundred twenty participants (52 men, 68 women, M_{age} = 34.54, *SD* = 10.08) were recruited via Crowd Flower, a crowdsourcing site similar to Amazon's Mechanical Turk. Participants were residents of the United Kingdom, and received a small monetary payment in exchange for their participation. The study was a between-groups design with two levels (system threat: threat vs. affirming). Both the NFCC subscales and values scale were completed before the system threat manipulation, which then formed our moderator variables.

Materials and procedure

After giving consent, participants were first presented with either the NFCC subscales of predictability and closed-mindedness that were shown to be associated with system-justifying beliefs in Study 5, or the Portrait Values Questionnaire (PVQ), which measures 10 values in total. The two scales were counterbalanced. The NFCC subscales of closed-mindedness (α = .60) and predictability (α = .62) were identical to the ones used in Study 5 (see Appendix G). However, instead of using the Schwartz values questionnaire, we elicited a shorter measure concerning the PVQ. The PVQ scale is adopted from Schwartz's work on the basic human values, as used in Study 5 (Schwartz, 2003). It contains 21 statements about a person, where participants were asked to rate how similar this person is to them on a six-point scale (1 = very much like me, 6 = Not like me at all).

The PVQ scale is split into the ten different values, consisting of power ("It is important to them to be rich. They want to have a lot of money and expensive things"; "It is important to them to be in charge and tell others what to do. They want people to do what

they say", Spearman-Brown Coefficient = .53), achievement ("It's important to them to show their abilities. They want people to admire what they do"; "Being very successful is important to them. They like to impress other people", Spearman-Brown Coefficient = .62), hedonism ("Having a good time is important to them. They like to "spoil" themselves"; "They seek every chance they can to have fun. It is important to them to do things that give them pleasure", Spearman-Brown Coefficient = .62), stimulation ("They like surprises and is always looking for new things to do. They think it is important to do lots of different things in life"; "They look for adventures and like to take risks. They want to have an exciting life", Spearman-Brown Coefficient = .54), and self-direction ("Thinking up new ideas and being creative is important to them. They like to do things in their own original way"; "It is important to them to make their own decisions about what they do. They like to be free to plan and to choose their activities for themselves", Spearman-Brown Coefficient = .50).

It also consists of universalism ("It is important to them to listen to people who are different from them. Even when they disagree with them, they still want to understand them"; "They strongly believe that people should care for nature. Looking after the environment is important to them"; "They think it is important that every person in the world be treated equally. They want justice for everybody, even for people they doesn't know", Spearman-Brown Coefficient = .67), benevolence ("It's very important to them to help the people around them. They want to care for their well-being"; "It is important to them to be loyal to their friends. They want to devote themselves to people close to them", Spearman-Brown Coefficient = .77), tradition ("It is important to them to be humble and modest. They try not to draw attention themselves"; "Religious belief is important to them. They try hard to do what their religion requires", Spearman-Brown Coefficient = .50), conformity ("They believe that people should do what they're told. They think people should follow rules at all times, even when no-one is watching"; "It is important to them always to behave properly.

They want to avoid doing anything people would say is wrong", Spearman-Brown Coefficient = .66) and security ("It is important to them that the government insure their safety against all treats. They want the government to be strong so it can defend its citizens"; "It is very important to them that their country be safe from threats from within and without. They are concerned that social order be protected", Spearman-Brown Coefficient = .66).

Next, adapting a procedure developed by Kay et al. (2005), participants were asked to read and memorize details of a journalistic paragraph that described the social, economic, and political circumstances in the United Kingdom as either problematic (system threat) or not (system affirming). Participants assigned to the system threat condition read the following:

> *These days, many people feel disappointed with the nation's condition. Many citizens feel that the country has reached a low point in terms of social, economic, and political factors. People do not feel as safe and secure as they used to, and there is a sense of uncertainty regarding the country's future. It seems that many countries in the world, such as the United States and Western European, nations, are enjoying better social, economic, and political conditions than the UK. More and more British citizens express a willingness to leave the UK and immigrate* [*sic*] *to other nations.*

Participants in the system affirming condition read the following

> *These days, despite the difficulties the nation is facing, many people feel satisfied with the nation's condition. Many citizens feel that the UK has reached a stable point in terms of social, economic, and political factors. People feel safer and securer than they used to, and there is a sense of confidence and optimism regarding the country's future. It seems that compared with many countries in the world the social, economic, and political conditions in the UK are relatively good. Fewer and fewer British citizens express a willingness to leave the UK and immigrate* [*sic*] *to other nations.*

Participants were then asked to complete the same conspiracy theory belief items as used in Study 5, in which they rated their agreement with real-world conspiracy theories ($\alpha = .91$), and general notions of conspiracy ($\alpha = .95$, see Appendix F). At the conclusion of the study, the participants were debriefed in writing and were thanked for their participation.

Results and discussion

There were no significant effects involving participants' gender or age, so these factors are not mentioned further. Intercorrelations and descriptive statistics are presented in Appendix I. One-way analyses of variance (ANOVAs) showed that as predicted, exposure to system threat influenced belief in both real-world conspiracy theories and general notions of conspiracy, $F(1,118) = 4.36$, $p = .039$, $\eta^2 = .04$; $F(1,118) = 5.32$, $p = .023$, $\eta^2 = .05$, respectively. Specifically, endorsement of real-world conspiracy theories and general notions of conspiracy were significantly higher in the system threat condition ($M = 3.79$, $SD = 1.34$; $M = 3.25$, $SD = 0.98$, respectively) than the system affirming condition ($M = 3.31$, $SD = 1.16$; $M = 2.85$, $SD = 0.96$, respectively). Moderation analysis was also conducted to examine whether variations in conspiracy belief as a direct response to threat vary according to values and NFCC. No significant effects were found. These were therefore not included in Studies 7 and 8[1].

Overall, this finding further supports the idea that conspiracy theories may perform a system-justifying function. However, it does not show that adopting conspiracy theories helps people defend the system from threat. Instead, system threat may have driven participants toward conspiracy theories as an alternative route to the satisfaction of

[1] We also replicated the effect of system threat on conspiracy beliefs in a separate study ($N = 79$, 11 men and 68 women, $M_{age} = 19.63$) without measuring values and NFCC. System threat increased belief in real-world conspiracies and general notions of conspiracy, $F(1,77) = 4.82$, $p = .031$, $\eta^2 = .06$; $F(1,77) = 11.44$, $p = .001$, $\eta^2 = .15$, respectively.

psychological needs such as control (cf. Whitson et al., in press). To resolve this ambiguity, it was necessary to experimentally examine the effects of conspiracy theorizing on satisfaction with the status quo.

Study 7

This study manipulated system threat, and also exposed (vs. did not expose) participants to conspiracy theories. If conspiracy theories help people defend the system from threat, the adverse effects of system threat on satisfaction with the status quo should be attenuated when conspiracy theories are also presented (i.e., under system threat, higher satisfaction from participants exposed, vs. not exposed, to conspiracy theories). If instead, conspiracy theories offer an alternative route to psychological needs under system threat, then the adverse effects of system threat on satisfaction with the status quo should be *amplified* by exposure to them (i.e., under system threat, lower satisfaction from participants exposed, vs. not, to conspiracy theories).

Method

Participants and design

One hundred ninety undergraduate students from a British University (24 men and 166 women, M_{age} = 19.99, *SD* = 5.32) received course credit in exchange for their participation. Given the significant length of the conspiracy theory manipulation (which was 580 words long and took *M* = 182.98 [*SD* = 167.33] seconds to read), and the system threat or affirming paragraphs (which were each 97 words long and took *M* = 52.67 [*SD* = 114.71] and *M* = 51.80 [*SD* = 76.51] seconds to read, respectively), a timer was used to identify participants who had not read both the manipulations fully, by spending less than 60 seconds reading the conspiracy manipulation material and less than 10 seconds reading either the

system threat or affirming paragraph and who had thus exceeded reading speed capabilities for upper college students (Speed Reading, 2014). The 29 participants (16% of total sample) who failed the screening were removed from the analyses. The final sample size used for data analysis was 159 (21 men and 139 women, M_{age} = 20.00, *SD* = 5.30).

The study consisted of a 2 (system threat: threat/affirming) x 2 (exposure to conspiracy theories: conspiracy/control) between-subjects design. The dependent measure was participants' satisfaction with the status quo (Kay & Jost, 2003).

Materials and procedure

Participants were first presented with the system threat (vs. affirming) manipulation, as in Study 6. We then manipulated exposure to conspiracy theories by adapting a manipulation used by Douglas and Sutton (2008). Experimental participants were asked to read and memorize a piece of text concerning a conspiracy involving the death of Princess Diana. Control participants proceeded directly to the dependent measures. The conspiracy text included a series of eight bullet points outlining arguments that Princess Diana's death was not an accident (see Appendix J for full wording). The term conspiracy theory was not mentioned. For example:

> *"Concern has been raised about the rapid disposal of the bodies of Diana and Dodi. Diana had no post mortem prior to burial in Althorp. Victims of sudden death require a post mortem by law in the UK."*

> *"Immediately after the crash news was broadcast, witnesses appeared on US TV saying that they heard an explosion or bang before they heard the car crash. Was this a gunshot, or a bomb?"*

Finally, satisfaction with the status quo was measured using Kay and Jost's (2003) general system justification scale (α = .63, see Appendix G). At the conclusion of the study, the participants were debriefed in writing and were thanked for their participation.

Results and discussion

There were no significant effects involving participants' gender or age, so these factors are not mentioned further. There was also no significant main effect of system threat, $F(1, 156) = 0.08$, $p = .782$, partial $\eta^2 = .000$, but there was a marginally significant main effect of exposure to conspiracy theories, $F(1, 156) = 2.808$, $p = .096$, partial $\eta^2 = .018$. As expected however, a two-way ANOVA revealed a significant interaction between system threat and exposure to conspiracy theories, $F(1, 156) = 7.70$, $p = .006$, partial $\eta^2 = .054$ (see Figure 6). Planned comparisons revealed a significant simple main effect of exposure to conspiracy theories when participants had been exposed to system threat, $F(1,77) = 8.90$, $p = .004$, partial $\eta^2 = .13$, such that those in the system threat condition who were exposed to conspiracy theories reported higher satisfaction with the status quo ($M = 4.95$, $SD = 0.60$, $n = 39$), than those in the control condition ($M = 4.48$, $SD = 0.80$, $n = 40$). There was, however, no simple main effect of exposure to conspiracy theories in the system affirming condition, $F(1, 79) = 0.68$, $p = .410$, partial $\eta^2 = .006$.

Further analyses revealed a significant simple main effect of system threat in the conspiracy condition, $F(1,75) = 4.06$, $p = .047$, partial $\eta^2 = .066$, such that those in the conspiracy condition who were exposed to system threat reported higher satisfaction with the status quo ($M = 4.95$, $SD = 0.60$, $n = 39$), than those in the system affirming condition ($M = 4.68$, $SD = 0.56$, $n = 38$). Moreover, analyses revealed a marginally significant simple main effect of system threat in the no conspiracy condition, $F(1,81) = 3.90$, $p = .052$, partial $\eta^2 = .048$, such that participants exposed to system threat reported lower satisfaction with the

status quo (M = 4.48, SD = 0.80, n = 40), than those in the system affirming condition (M = 4.81, SD = 0.71, n = 43).

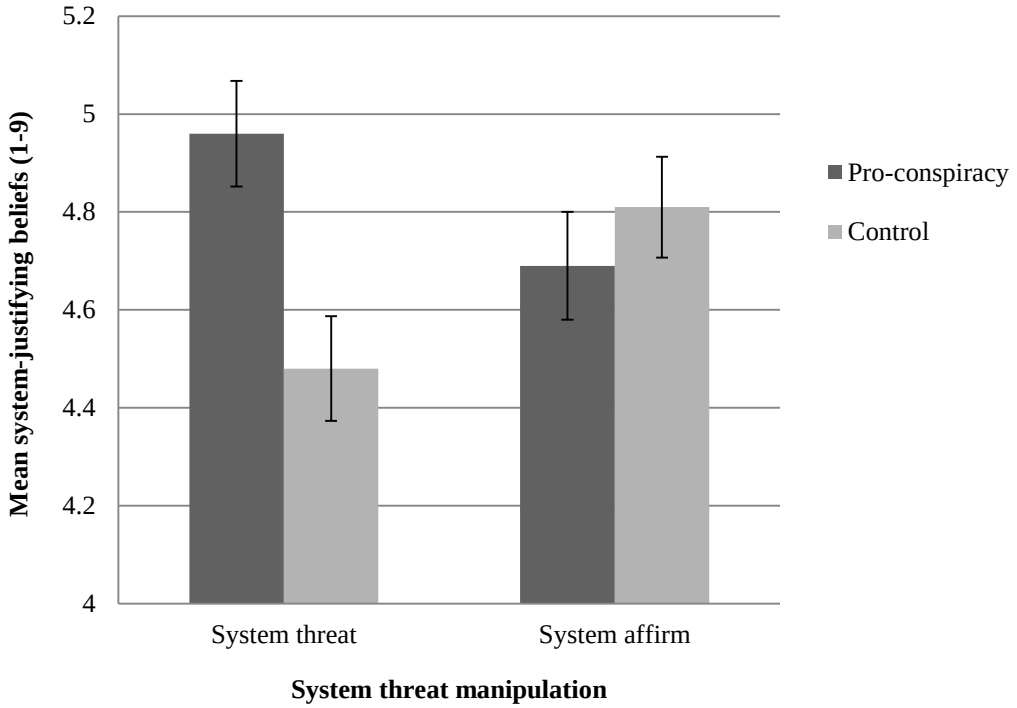


Figure 6. Mean system-justifying beliefs as determined by exposure to conspiracy theories and system threat manipulation. Error bars represent standard error of the mean.

Participants under conditions of system threat reported the status quo as more legitimate after exposure to conspiracy theories. In the context of threat to the social order, conspiracy theories may therefore allow people to preserve their sense that the social system is legitimate. The final study tested our proposed mechanism – that conspiracy theories allow people to maintain positive views about social systems because they attribute negative events in society to a small number of conspirators rather than broader social systems.

Study 8

We expected to observe an indirect causal path in which participants exposed to conspiracy theories (vs. control) would be more likely to attribute societal problems to the

actions of individuals and small groups than to inherent flaws in society, and in turn, to express increased satisfaction with the status quo.

Method

Participants and design

One hundred sixty six participants (76 men and 88 women, 1 transgender/other, and 1 undisclosed, M_{age} = 36.07, *SD* = 12.04) were recruited via Crowd Flower as in Study 1. Participants were residents of the United Kingdom, and received a small monetary payment in exchange for their participation. As in Study 7, given the significant length of the conspiracy theory manipulation (which was 580 words long and took *M* = 132.47 [*SD* = 553.00] seconds to read), combined with the system threat manipulation (which was 97 words long and took *M* = 32.71 [*SD* = 22.90] seconds to read), a timer was used to identify participants who had not read the manipulations fully, by spending less than 60 seconds reading the conspiracy manipulation material and less than 10 seconds reading the system threat manipulation and who had thus exceeded reading speed capabilities for upper college students (Speed Reading, 2014). The 57 participants (34% of total sample) who failed the screening were removed from analyses. The final sample size entered in data analysis was 109 (51 men, 57 women and 1 transgendered/other, M_{age} = 37.66, *SD* = 12.32). There were 51 participants in the pro-conspiracy condition and 58 in the control.

The study consisted of a two-group (exposure to conspiracy theories: conspiracy/control) between-subjects design where all participants were exposed to system threat. The dependent measure was again participants' satisfaction with the status quo (Kay & Jost, 2003). The proposed mediator variable was the extent to which participants attributed

societal problems to individuals and small groups or to problems inherent in society as a whole.

Materials and procedure

All participants were first presented with the system threat information as in the previous studies. Participants were then exposed to a text highlighting various conspiracy theories about the death of Princess Diana (vs. control), as in Study 7 (see Appendix J). Next, to measure the proposed mediator, participants were presented with nine problems that are facing society today (pollution, poverty, unemployment, inequality, crime, discrimination, overpopulation, conflict and war). They were then asked to indicate the extent to which they thought these problems were caused by individuals or society ("Please indicate the extent to which you think these problems are due to the actions of individuals and small groups in society or due to fundamental flaws inherent in UK society, such as flawed laws, values, norms, institutions, or its political and economic system"; 1 = *individuals and small groups*, 9 = *flaws in UK society*, $\alpha = .78$, see Appendix K). Finally, satisfaction with the status quo was again measured using Kay and Jost's (2003) scale ($\alpha = .81$, see Appendix G). At the conclusion of the study, the participants were debriefed in writing and were thanked for their participation.

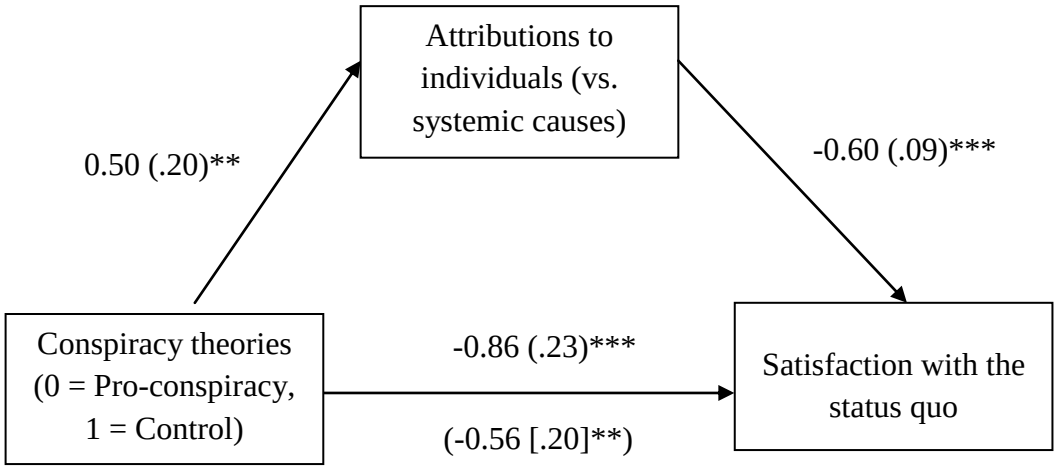
Results and discussion

There were no significant effects involving participants' gender or age, so these factors are not mentioned further. Two separate one-way ANOVAs were conducted with exposure to conspiracy theories (conspiracy vs. control) as the independent variable, and satisfaction with the status quo and attributions for social problems as the two dependent variables. As predicted, exposure to conspiracy theories influenced both satisfaction with the

status quo and participants' attributions for social problems, $F(1, 107) = 13.55$, $p <. 001$, $\eta^2 = .13$; $F(1, 107) = 5.18$, $p = .025$, $\eta^2 = .06$, respectively. Specifically, participants who were exposed to conspiracy theories reported higher satisfaction with the status quo ($M = 4.87$, $SD = 1.16$), than those in the control condition ($M = 4.01$, $SD = 1.27$). Further, participants who were exposed to conspiracy theories attributed societal problems less strongly to systemic flaws in British society ($M = 5.77$, $SD = 0.87$), than those in the control condition ($M = 6.24$, $SD = 1.21$). Put differently, their attributions shifted toward blaming individual actions for these problems.

Testing mediation

To test the predicted pattern of mediation between exposure to conspiracy theories and satisfaction with the status quo via attributions for social problems, we used Preacher and Hayes' (2008) bootstrapped procedure to run a simple mediation model (5000 re-samples). An indirect effect is estimated as being significant if the 95% confidence intervals (CIs) do not contain a zero. Results for this mediational model (see Figure 7) demonstrated a significant indirect effect of exposure to conspiracy theories and system justification beliefs through attributions for significant social problems (Point Estimate = -0.30 (*SE* = .13*), LLCI* = -0.5667 to *ULCI* = -0.0621).



Adj R^2 = .10, $F(2,51) = 13.97$, $p < .001$

Figure 7. Mediation model of the relationship between exposure to conspiracy theories and satisfaction with the status quo through attributions for social problems.

Notes. ***p*<.05. ****p*<.001.

Under system threat, exposure to conspiracy theories increased satisfaction with the status quo relative to a control condition. This effect was mediated by participants' attributions for social problems. Those who were exposed (vs. not exposed) to conspiracy theories more strongly attributed problems to individuals or small groups. Conspiracy theories may therefore enable people to justify social systems by suggesting that social problems are the fault of a small number of people rather than inherent flaws in their society.

General discussion

Intuition, popular belief, proponents, and several scholars suggest that conspiracy theories have the power to subvert social systems (e.g., Gray, 2010; Sapountzis & Condor, 2013). Although some research shows that conspiracy belief undermines trust in and compliance with authority (e.g., Abalakina-Paap, et al., 1999; Goertzel, 1994; Jolley &

Douglas, 2014a, see Chapter 2), its effect on overall perceptions of the legitimacy of social systems had not been researched previously. The present results suggest that far from undermining system justification, conspiracy theories may actually bolster the social status quo. Conspiracy belief was found to increase when the legitimacy of social systems was threatened (Study 6). Exposure to conspiracy theories was shown to buffer satisfaction with the status quo from threat (Study 7), and was shown to do so via an indirect causal path in which it caused people to increasingly attribute society's problems to malevolent individuals, rather than systemic causes (Study 8).

Conspiracy theories therefore appear to function as a means to defend the current social system. In this respect they join the ranks of other system-justifying processes such as complementary stereotyping of the poor, sexist ideology, and just world belief (Calogero & Jost, 2011; Hoffman & Hurst, 1990; Jost, 2001; Jost & Hunyady, 2005). Conspiracy theories, to be sure, cast doubt on the motives and legitimacy of people in authority positions. They draw attention to some of the most tragic and worrisome events of modern life. However they do so in a way that appears to divert people from questioning inherent limitations of their society.

It is important to acknowledge some limitations of the current research. We note that although the effects reported here are statistically robust, they are relatively small. Further, participants were British, and were presented with a single, uniquely British, example of alleged conspiracy (Studies 7 and 8). Also, the participants contained relatively few genuine adherents of conspiracy theories. This leaves open the (plausible) prospect that fervent commitment to conspiracy theories, as opposed to exposure or openness to them, radicalizes political opinion and motivates social change (Uscinski & Parent, 2014). Strong commitment to conspiracy theories may lead people to believe that corruption and malice are endemic across different branches of the social system, and so make it incoherent to

psychologically quarantine them by blaming individuals for society's problems. We therefore cannot be confident about the extent to which the present results will generalize to other populations and other conspiracy theories.

In a similar vein, a further limitation concerns the falsifiability of our findings. For example, a conspiracy theory can be defined as explaining the causes of a significant event as the actions of a small group of secret, powerful forces (e.g., McCauley & Jacques, 1979). Moreover, we propose that conspiracy theories perform a system-justifying function because similarly people explain negative events in society as being caused by a small group of people. However, this definition opens up the question of how *small* these groups of people may be as for the proposed process to work; these groups need to be relatively small and unrepresentative of wider society. Yet, people, in particular minority groups may hold the belief that corruption within the police for example is widespread and not just limited to certain secret, powerful individuals who are in charge due to their experiences of being victims of police harassment (cf. Abalakina-Paap et al., 1999).

Further, people who endorse the idea that Jewish people are involved in important international events may not limit this to being only orchestrated by powerful individuals, but instead believe corruption is widespread amongst all Jewish people. Research by Golec de Zavala and Cichocka (2012) for example; provide support for this idea, where they found that belief about Jewish domination was associated with anti-Semitic attitudes concerning Jewish people in general. Thus, this suggests that all Jewish people and not just those who are thought to be secret and powerful may be implicated in these conspiracy theories. Therefore, similarly with people who have fervent commitment to conspiracy theories in general, such a belief that many individuals are involved in corruption may deem the system-justifying function of conspiracy theories for these particular people not sustainable. Future research

should therefore test the system-justifying function with varying conspiracy theories, such as those associated with anti-Semitic attitudes.

Although boundary conditions are not yet known, the present results clearly show that sometimes conspiracy theories strengthen rather than weaken support for extant social systems. This entails that conspiracy theories are not *necessarily* subversive, and poses a new research challenge – to determine when and how conspiracy theories do, and do not, buttress the status quo. For example, while conspiracy theories may bolster support for the social system very generally, they encourage subversive opinions at a more specific level (e.g., distrust of political leaders and scientific orthodoxy). Such views may have the effect of motivating social change even if people do not express general objections to the status quo. However, Jolley and Douglas (2014a, see Chapter 2) have shown that exposure to conspiracy theories weakens political engagement. This suggests an additional mechanism by which conspiracy theories may reduce, rather than increase, the likelihood of social and political change.

Conclusion

The present results, and the present analysis of the function of conspiracy theories, resonate with an important distinction made by political scientists, but paid little attention by psychologists. Specifically, trust in governments can be distinguished sharply from support for systems of government (Citrin, 1974; Easton, 1975; Levi & Stoker, 2000). Thus, "individuals can express a sense of pride in their political system while at the same time exhibiting very low trust in government" (Muller, Jukam, & Seligson, 1982, p. 242). Indeed Muller et al. found that illegitimate forms of political dissent were predicted not by distrust in government but by rejection of the political system. Measures of trust in government have been shown to have a robust, negative relation to conspiracy belief (e.g., Abalakina-Paap et

al., 1999; Goertzel, 1994). However, instead of assessing fundamental rejection or even distrust of the political system, such scales may only pick up "evaluations of the general performance of various incumbents, who are vaguely called to mind by the collective term 'politicians' or 'the government'" (Easton, 1975, p. 45). The present results suggest that by pointing fingers at individuals – even groups of individuals charged with operating the system – conspiracy theories may exonerate the system, just as blaming a driver for a car crash shifts blame from the car.

Chapter 5 -

Attenuating the potentially harmful effects of conspiracy theories

Chapter summary

The current studies aimed to test whether using anti-conspiracy arguments (e.g., that vaccines are safe instead of harmful), and giving people a pre-warning that details the persistent influence of retracted misinformation (e.g., that people continue to refer to information even after it has been retracted), may be effective in addressing the potentially detrimental consequences of conspiracy theories. In Study 9, the order participants were exposed to information (pro-conspiracy vs. anti-conspiracy) was varied to examine if presenting anti-conspiracy information up front, or after pro-conspiracy information, reduces the impact on vaccination intentions. Results demonstrated however, that pro-conspiracy information, regardless of when it was presented, still reduced intentions to vaccinate a fictional child – an effect mediated by belief in anti-vaccine conspiracy theories and the perception that vaccines are dangerous. To strengthen the anti-conspiracy argument, in Study 10 participants were first exposed to either a general or specific warning that detailed people's tendency to rely on information even when it has been retracted (or a control), before being asked to read pro-conspiracy, followed by anti-conspiracy, arguments. There were no significant differences between conditions. This suggests that the potentially harmful effects of conspiracy theories may be resistant to correction. Ongoing investigations are therefore needed to design interventions that aim to address the potentially detrimental impact of conspiracy theories.

Introduction

Conspiracy theories are often portrayed as being foolish and illogical (e.g., Melley, 2002; Shermer, 1997; Willman, 2002) and belief in conspiracy theories is often presumed to be reserved for a small minority of paranoid individuals on the outer fringes of society (Sunstein & Vermeule, 2009). If this is the case, conspiracy theories may be unlikely to have any influence on society as a whole. However, as polls consistently show, conspiracy theories are not just limited to a small portion of the population but instead millions of people subscribe to these alternative viewpoints (e.g., Sunstein & Vermeule, 2009; Swami & Coles, 2010). In order to understand more about their potential consequences, researchers have found that exposure to conspiracy theories can reduce people's intentions to engage in the political system, reduce their carbon footprint and reduce their intention to vaccinate a fictional child against a made up disease (Jolley & Douglas, 2014a, 2014b, see Chapters 2 and 3). Whilst research has therefore shown that exposure to conspiracy theories can have potentially detrimental consequences, little is known about how to address these consequences and reduce the impact of conspiracy theories. This is the aim of the research outlined in the current chapter.

Sunstein and Vermeule (2009) were the first to recommend a number of different potential avenues to address the effects of conspiracy theories. Their initial recommendation was that governments might ban conspiracy theorising, or impose some kind of tax, financial or otherwise, on those who disseminate conspiracy theories. Whilst this would be a hands-on approach to pro-actively deal with conspiracy theories, it is likely that such a government response would be met with great resistance due to its unethical nature - this type of approach would undermine people's free speech. Sunstein and Vermeule (2009) also suggested that governments could engage in *cognitive infiltration* of the groups that produce conspiracy

theories. A tactic for doing this may be for "government agents (and their allies) [to] enter chat rooms, online social networks, or even real-space groups and attempt to undermine percolating conspiracy theories by raising doubts about their factual premises, causal logic, or implications for action, political or otherwise" (Sunstein & Vermeule, 2009, p.225). The aim of this approach is that by planting doubts about conspiracy theories directly within conspiracy circles, cognitive diversity will be introduced that would aim to break up the "crippled epistemology of conspiracy-minded groups" (Sunstein & Vermeule, 2009, p.227). Put differently, planting doubts about conspiracy theories will introduce new ideas to these conspiracy-minded groups.

A further recommendation by Sunstein and Vermeule's (2009) is similar to cognitive infiltration, but instead of infiltrating conspiracy-minded groups, governments might engage in issuing public anti-conspiracy arguments to specific conspiracy theories. Governments could either do this on their own or alternatively elicit credible private parties formally or informally to issue anti-conspiracy arguments on their behalf. The aim of this approach would be to direct anti-conspiracy information at potential consumers of conspiracy theories in order to 'inoculate' them against accepting such theories (Sunstein & Vermeule, 2009). The authors suggest that governments should issue a response to more, rather than fewer, conspiracy theories. By responding to many conspiratorial explanations for past events and current controversies, people cannot interpret silence as government acceptance or involvement in the conspiracy, or their inability to offer refuting arguments.

Sunstein and Vermeule (2009) note, however, that conspiracy theories may be extremely resistant to correction, and "contrary evidence can usually be shown to be a product of the conspiracy itself" (p.210). In other words, providing an alternative account may lead conspiracy theory believers to believe that the conspirators are deliberately taking

the focus away from the conspiracy theory in order to cover their tracks (Sunstein & Vermeule, 2009). This type of assertion is troubling, as one of Sunstein and Vermeule's (2009) recommendations for intervention is directly based on the use of anti-conspiracy arguments. It is suggested therefore, that such an approach may be met with suspicion. Nonetheless, out of the selection of recommendations provided by Sunstein and Vermeule (2009), examining the use of anti-conspiracy arguments as a tool for attenuating the impact of conspiracy theories is a promising starting point.

In order to empirically explore the success of using anti-conspiracy arguments as an avenue to counteract the potential effects of conspiracy theories, Banas and Miller (2013) first asked participants to watch a 40-minute chapter from the 9/11 Truth conspiracy theory film, *Loose Change: Final Cut*. Participants were then exposed to either a factual anti-conspiracy argument against the 9/11 conspiracy theory where the message focused on the factual errors in the movie (e.g., providing no evidence of explosives), or a logical based anti-conspiracy argument that attempted to show that the 9/11 conspiracy theory was not logically sound (e.g., that the theory lacks parsimony). A control condition was also utilised where no anti-conspiracy material was provided. Afterwards, participants indicated their belief in theory that the United States government participated in a conspiracy to perpetrate the attack on 9/11. Results demonstrated that both treatment conditions reduced belief in the 9/11 conspiracy theory relative to the control message. However, the fact-based message was shown to be more effective than the logic-based argument in reducing belief in the 9/11 conspiracy theory. The authors' note this could be because "applying logic to a problem might be more challenging than understanding that the facts being presented are incorrect" (Banas & Miller, 2013, p. 199). These results highlight the potentially promising avenue of using a fact-based anti-argument to address the impact of conspiracy theories.

Jolley and Douglas (2014b, see Chapter 3) investigated the impact of conspiracy theories on *both* beliefs and behavioural intentions. Participants were exposed to either pro-conspiracy information, which argued in favour of anti-vaccine conspiracy theories, or anti-conspiracy information, which argued a fact-based anti-conspiracy argument against anti-vaccine conspiracy theories. A control condition was also included where no further information was given. Results revealed that exposure to anti-conspiracy information reduced belief in anti-vaccine conspiracy theories relative to a control condition. Like in Banas and Miller's (2013) research, these findings therefore show that conspiracy beliefs may be reduced when anti-conspiracy arguments are utilised. However, the results also indicated that exposure to anti-conspiracy information did not improve *intentions* to vaccinate a fictional child in comparison to the control condition.

Therefore, whilst both Banas and Miller (2013) and Jolley and Douglas (2014b, see Chapter 3) demonstrate the promise of using anti-conspiracy arguments in reducing belief in conspiracy theories, the use of anti-conspiracy arguments may not necessarily improve behavioural intentions. Jolley and Douglas (2014b, see Chapter 3) therefore provide the first empirical evidence of the assertion by Sunstein and Vermeule (2009) that conspiracy theories may potentially be resistant to correction. Jolley and Douglas further assert, "once the very idea of a conspiracy has been mentioned and taken root, even strong [anti-conspiracy] arguments may be unable to lead to behavioural action" (p. 8). Addressing the potential impact of conspiracy theories may therefore present a difficult and significant challenge for researchers.

However, whilst suspicion of anti-conspiracy material could be a contributing factor in explaining why conspiracy theories may be resistant to correction (Sunstein & Vermeule, 2009), another factor could be the content of the material itself. For example, research has

shown that if material presented first is relatively controversial, interesting, and familiar to the audience, this tends to produce a *primacy effect* (i.e., the first arguments presented have an advantage; e.g., Furnham, 1986; Rosnow, 1966; Rosnow & Robinson, 1967). This may be because the audience starts with a high level of interest that decreases over time (Gass & Seiter, 2010). If the material is relatively noncontroversial, uninteresting, and unfamiliar to the audience however, this tends to produce a *recency effect* (i.e., the later arguments presented have an advantage) because the information presented afterwards may instead gain the audience's interest (Gass & Seiter, 2010). Conspiracy theories are controversial and interesting by nature. They posit novel, often elaborate and unconventional explanations for events. Moreover, as noted by Reid (2010), "conspiracy theories are emotionally laden, and their discovery can be gratifying" (p. 148). They concern topics such as childhood vaccination that provoke social anxiety which conspiracy theorising may be able to address. Perhaps therefore, being presented with an anti-conspiracy argument in any order will be less persuasive than conspiracy theories. Conspiracy theories simply may be more controversial, interesting, familiar and therefore influential than arguments designed to refute them.

The success of using anti-conspiracy arguments could however be enhanced if the content is repeated or otherwise strengthened (Lewandowsky, et al., 2012). For example, Ecker, Lewandowsky, Swire, and Chang (2011) presented participants with a series of statements concerning a fictional warehouse fire that had taken place. Across a series of different experimental conditions, participants were given varying amounts of information about the event. Some participants read statements that included the suggestion that volatile materials were found at the scene, with this information being presented once or repeated three times. However, half of the participants who were told that volatile materials were found at the scene, were also told shortly afterwards that this information had since been retracted and that no volatile materials were actually found at the scene. This retraction was

presented to the participant either once or repeated three times. A control condition was also employed where no statements referring to volatile materials were presented to the participants. After reading statements concerning the event, participants were given an open-ended questionnaire asking inference and fact questions about the event, such as relating to what could have caused the fire. Results demonstrated that if misinformation concerning the event was presented repeatedly, repeating the retraction helped reduce the extent to which people referred to the retracted misinformation when questioned about the fire (i.e., referring to the volatile materials being a cause of the fire). However, when the misinformation was presented only once, people continued to refer to the misinformation to the same extent if the retraction was presented once or three times.

The research by Ecker, et al. (2011) therefore demonstrates that repeating the retraction only appears to attenuate people's continued reliance on the misinformation if the misinformation is also repeated. A potential reason for this may be that by repeating the misinformation in retractions this may "paradoxically enhance the impact of misinformation" (Lewandowsky, et al., 2012, p. 117). In a similar vein, researchers Eakin, Schreiber and Sergent-Marshall (2003) showed that when participants were given an immediate post-misinformation warning about the effects of misinformation (i.e., that people continue to refer to retracted misinformation), participants were more able to resist the misinformation, but only when the misinformation was presented once (low accessibility, versus several times – high accessibility). It therefore appears that combining refuting messages with a warning may be a successful avenue to intervention, but only if the misinformation is presented once.

In general, however, warnings seem to be more effective when they are administered before the misinformation than afterwards (e.g., Lewandowsky, et al., 2012). Loftus (2005) argued that this occurs because if the warning is given after the misinformation, the

misinformation has already been incorporated into memory**.** People have an expectation that the information they will be presented with will be valid. Thus, being given a warning can change this expectation as the recipient now more closely monitors incoming messages (Lewandowsky et al., 2012). In other words, being given a warning may induce a temporary state of skepticism and prompt the recipient to become more vigilant, and they suppress the misinformation that has been presented (Eakin et al., 2003; Lewandowsky et al., 2012; Loftus, 2005). Schul (1993) found support for this idea – people were shown to take longer to process misinformation when they were given a warning, suggesting that they were taking more care when considering the content of the information.

Researchers have also explored the effectiveness of utilising either a specific or a general warning as a tool to relieve the persistent influence of retracted misinformation. For example, Ecker, et al. (2010) told participants that the victims of a fictional minibus accident were a group of elderly people, before revoking this information and arguing that the victims were not elderly people after all. However, some participants were asked to read either a specific or general warning before receiving this correction. In the specific warning condition, the warning provided an example of jurors still relying on evidence that has been deemed inadmissible. The idea behind employing a specific warning was based on the assumption that using explicit examples of people continuing to rely on retracted misinformation will enable people to become more vigilant to the information that they are being presented. In the general warning condition, participants were just told that facts are not always checked – the aim of this was to induce alertness. A control condition was also utilised where no warning was provided before the retraction. Participants then answered several questions about the event. It was found that a warning presented before misinformation that provided specific examples, rather than a general warning, was more effective in reducing people referring to the victims of the minibus accident being elderly

people. Research therefore demonstrates that using a specific pre-warning alongside refuting information can be an effective way to reduce reliance on misinformation.

The research outlined in the current chapter aims to first provide a direct test of the use of anti-conspiracy arguments in addressing the potentially detrimental consequences of conspiracy theories. Specifically, we aimed to test whether the order of pro-conspiracy and anti-conspiracy information lessened the impact of conspiracy theories. We used the context of anti-vaccine conspiracy theories as in Studies 3 and 4. In previous research, we have only been able to speculate that the use of anti-conspiracy information would be effective in improving vaccination intentions (Jolley & Douglas, 2014b, see Chapter 3). The current investigation therefore aims to provide a more stringent examination of this hypothesis by varying the order of pro-conspiracy and anti-conspiracy information and measuring how the order of presentation may influence people's intention to vaccinate. Considering previous research however, it is also plausible to suggest that being presented with an anti-conspiracy argument in any order may be less persuasive than conspiracy theories due to (a) people being suspicious of the anti-conspiracy material, and (b) the content of the message.

Second, the research outlined in this chapter aims to test a method of strengthening the anti-conspiracy material used to address the potential impact of conspiracy theories. Specifically, in Study 10 participants were given a warning explaining that people tend to rely on information even when it has been retracted, prior to being exposed to conspiracy information and anti-conspiracy arguments. We predicted that giving people a warning might make them more vigilant to the information they are being presented and thus consider all evidence that is presented in front of them. Moreover, the warning may induce a temporary state of skepticism, which could maximize people's ability to discriminate between true and false information (Lewandowsky et al., 2012). This in turn may therefore

strengthen the anti-conspiracy material and render the conspiracy theories less persuasive on behavioural intentions. The type of warning was also varied. In doing so, we wanted to provide further evidence that a specific warning may be more effective than a general warning in eliciting attitude change (e.g., Ecker et al., 2010). Specifically, we therefore provided a direct comparison between two different types of warnings (general and specific) in order to test which warning was the most successful in lessening the impact of conspiracy theories on behavioural intentions.

Finally, the research outlined in the current chapter examines some of the factors that have been found to be a direct response to exposure to anti-vaccine conspiracy information, specifically belief in anti-vaccine conspiracy theories and people's perceptions that vaccines are dangerous (Jolley & Douglas, 2014b, see Chapter 3). We aim to test whether both the order of information, and also being given a pre-warning, may reduce belief in conspiracy theories and the perception that vaccines are dangerous. In previous research (Jolley & Douglas, 2014b, see Chapter 3), belief in conspiracy theories was treated as a manipulation check measure in order to test whether exposure to conspiracy theories elicits a conspiracy belief as predicted. However, we suggest that belief in conspiracy theories could itself be utilised as a mediator variable to help explain the relationship between exposure to conspiracy theories, anti-conspiracy arguments and vaccination intentions. In other words, we are not testing the success of the manipulation but the impact of combining both pro-conspiracy and anti-conspiracy arguments has on belief in conspiracy theories, which in turn may influence intentions to vaccinate a fictional child. Moreover, previous research has shown that conspiracy theories increase people's perception that vaccines are dangerous (Jolley & Douglas, 2014b, see Chapter 3). It is therefore plausible to suggest that exposure to conspiracy theories would first cause an increase in one's belief in conspiracy theories, which would then in turn increase perceptions that vaccines are dangerous, leading to a lesser

intention to vaccinate. In this current chapter, we therefore also aim to test this proposed serial mediation model in explaining the impact of conspiracy theories and anti-conspiracy arguments on intentions to vaccinate.

In summary, the present research tested methods designed to attenuate the impact of conspiracy information. Two studies tested the prediction that pro-conspiracy information may have more impact on vaccination intentions than refuting information whenever it is presented (Study 9), but if a specific pre-warning about misinformation effects is provided beforehand, this may attenuate the impact (Study 10). Both studies examined two potential mediators of the predicted effects.

Study 9

In this study, we aimed to examine if the order in which people are exposed to conspiracy information and anti-conspiracy arguments has an impact on intended vaccine uptake. Using an experimental design, participants were asked to read either one of five pieces of information: (1) information in favour of anti-vaccine conspiracy theories, followed by information refuting them (pro-conspiracy/anti-conspiracy), (2) information refuting anti-vaccine conspiracy theories, followed by information in favour (anti-conspiracy/pro-conspiracy), (3) pro-conspiracy information only, (4) anti-conspiracy information only, or (5) a control condition. Participants were then asked to rate their belief in a series of anti-vaccine conspiracy theories and the extent to which they perceived vaccines to be dangerous. Finally, participants were presented with a scenario depicting a fictitious child. They were asked to imagine that they were faced with the decision to have this child vaccinated against a specific (made up) disease as in Chapter 3. They were then given some information about the disease and the vaccination and were asked to indicate their intention to have the child vaccinated.

We predicted that exposure to conspiracy information in any order would be more impactful than anti-conspiracy material. We based this prediction on Sunstein and Vermeule's (2009) suggestion that people may be suspicious of the anti-conspiracy material, but also because the content of the conspiracy information may be more persuasive. Further, we predicted that exposure to conspiracy theories would increase belief in anti-vaccine conspiracy theories, which in turn would increase the perception that vaccines are dangerous. We tested this in a serial mediation model, and predicted that increased belief in anti-vaccine conspiracy theories may lead to the perception that vaccines are dangerous which subsequently reduces intentions to vaccinate a fictional child.

Method

Participants and design

Two hundred and sixty seven participants (97 women and 170 men, M_{age} = 31.73, *SD* = 9.93) were recruited via Amazon's Mechanical Turk (MTurk). Participants were residents of the U.S.A. and received 75 cents in exchange for their participation. At the end of the questionnaire, participants were asked if they devoted their full attention to the study and if there were any distractions present during the study. Participants who rated four and above (out of five, with five indicating no attention and many distractions) on the attention check questions were removed from analyses. The final sample size used for data analysis was therefore 260 (95 women and 165 men, M_{age} = 31.90, *SD* = 9.96). There were 51 participants in the pro-conspiracy/anti-conspiracy condition, 50 in the anti-conspiracy/pro-conspiracy condition, 55 participants in the pro-conspiracy condition, 52 in the anti-conspiracy condition, and 52 in the control condition. In the final sample, 131 (50.4%) were parents, who had an average of 1.16 (*SD* = 0.46) children, with the youngest being 3.46 (*SD* = 1.37) years old.

A single-factor independent variable (pro-conspiracy/anti-conspiracy vs. anti-conspiracy/pro-conspiracy vs. pro-conspiracy vs. anti-conspiracy vs. control) between-subject design was employed. Participants reported their belief in anti-vaccine conspiracy theories and perceptions that vaccines are dangerous, and were then asked to indicate their intention to have a fictional child vaccinated.

Materials and procedure

Participants indicated their informed consent before beginning the questionnaire. Next, participants were randomly assigned to one of the five experimental conditions. The pro-conspiracy and anti-conspiracy articles were identical in all conditions, which were taken from previous research (Jolley & Douglas, 2014b, see Chapter 3, see Appendix E). The order of exposure to this information was the only element manipulated. The term 'conspiracy theory' was not mentioned in either of the articles. In this current investigation, our aim was to examine the success of presenting anti-conspiracy arguments before, or after pro-conspiracy arguments. It was therefore not necessary to measure the success of the manipulations as in previous investigations. Instead, we utilised the manipulation check measure from previous research that asks participants to indicate their anti-vaccine conspiracy theory beliefs as a mediator variable in our current investigation ($\alpha = .79$; Jolley & Douglas, 2014b, see Study 4, Chapter 3, see Appendix E).

Participants then indicated the extent to which they felt that vaccines were dangerous ($\alpha = .94$), followed by reading the scenario as in Studies 3 and 4 (Chapter 3) and indicating their intention to have a fictional child vaccinated against a made up disease (see Appendix C). At the end of the study, participants were told that the information presented in the article was fictional, and was written for the purposes of the study. Participants were also pointed

towards websites containing factual information about vaccines, vaccine efficacy and vaccine safety before being thanked and paid for their participation.

Results and discussion

For each variable, summing the individual scores and then dividing by the number of items calculated mean values. These mean scores were used in the statistical analyses. Descriptive statistics for each variable are presented in Table 9. None of the analyses were affected by the participants' status as parents or non-parents, nor their age or gender. These variables were therefore not analysed further.

Table 9

Descriptive Statistics between Conspiracy Conditions and Vaccination Intentions, and Mediator Variables.

Condition	**Means *(SD)***		
	Anti-vaccine conspiracy belief	Perceived dangers of vaccines	Intention to vaccinate
Pro/Anti	4.23 *(0.91)*	4.04 (*1.45*)	4.80 (*1.77*)
Anti/Pro	3.94 (*1.00*)	3.63 (*1.56*)	5.04 (*1.69*)
Pro	4.47 (*0.81*)	4.50 (*1.26*)	4.42 (*1.76*)
Anti	3.38 (*1.02*)	2.92 (*1.57*)	5.60 (*1.49*)
Control	3.83 (*1.12*)	3.55 (*1.62*)	5.50 (*1.21*)

Notes. Pro/anti = Pro-conspiracy/Anti-conspiracy condition. Anti/Pro = Anti-conspiracy/Pro-conspiracy condition. Pro = Pro-conspiracy condition. Anti = Anti-conspiracy condition.

Anti-vaccine conspiracy theories and vaccination intentions

As hypothesised, results revealed a significant difference in vaccination intentions across conditions, $F(4, 255) = 5.00$, $p = .001$, $\eta^2 = .07$. Vaccination intentions were significantly lower in the pro-conspiracy condition than the anti-conspiracy condition ($p < .001$) and the control condition ($p < .001$). Intentions were not significantly different between the anti-conspiracy condition and control ($p = .718$). This replicates the previous work by Jolley and Douglas (2014b, see Chapter 3), where participants who were exposed to material supporting anti-vaccine conspiracy theories showed reluctance to have a child vaccinated compared to the other two conditions.

Further, vaccinations intentions were significantly lower in the pro-conspiracy/anti-conspiracy condition than the anti-conspiracy condition ($p = .016$) and the control condition ($p = .022$). Intentions were not significantly different between the pro-conspiracy/anti-conspiracy and anti-conspiracy/pro-conspiracy ($p = .458$) and the pro-conspiracy conditions ($p = .263$). Moreover, vaccination intentions were marginally significantly lower in the anti-conspiracy/pro-conspiracy condition than the anti-conspiracy condition ($p = .081$). However, vaccinations intentions were significantly higher than in the pro-conspiracy condition ($p = .047$). Intentions were not significantly different between the anti-conspiracy/pro-conspiracy and pro-conspiracy/anti-conspiracy ($p = .458$) and the control conditions ($p = .119$). It therefore appears that pro-conspiracy information presented in any order reduces intentions to vaccinate a fictional child in comparison to anti-conspiracy information only. Interestingly however, vaccination intentions were improved when exposed to pro-conspiracy information only. This suggests that the use of anti-conspiracy material may be still be a promising tool for intervention

Testing mediation

To test potential mediators of these effects, separate ANOVAs were firstly conducted with conspiracy condition (pro-conspiracy/anti-conspiracy versus anti-conspiracy/pro-conspiracy versus pro-conspiracy versus anti-conspiracy versus control) as the independent variable, and summed scores on the two potential mediators (belief in anti-vaccine conspiracy theories and perceived vaccine dangers of vaccines) as dependent variables. Results revealed a significant difference in belief in anti-vaccine conspiracy theories between conditions, $F(4, 255) = 9.46$, $p < .001$, $\eta^2 = .13$. Belief in anti-vaccine conspiracy theories was significantly higher in the pro-conspiracy condition than the anti-conspiracy condition ($p < .001$) and the control condition ($p = .001$). Belief in anti-vaccine conspiracy theories was also significantly lower in the anti-conspiracy than the control condition ($p = .017$). This similarly replicates the previous work conducted by Banas and Miller (2013) and Jolley and Douglas (2014b, see Chapter 3).

Further, belief in anti-vaccine conspiracy theories was significantly higher in the pro-conspiracy/anti-conspiracy condition than in the anti-conspiracy condition ($p < .001$) and the control condition ($p = .043$). Belief in anti-vaccine conspiracy theories was not significantly different between the pro-conspiracy/anti-conspiracy condition and anti-conspiracy/pro-conspiracy ($p = .140$) and the pro-conspiracy condition ($p = .211$). Moreover, belief in anti-vaccine conspiracy theories was significantly higher in the anti-conspiracy/pro-conspiracy condition than the anti-conspiracy condition ($p = .004$). However, belief in anti-vaccine conspiracy theories was significantly lower in the anti-conspiracy/pro-conspiracy condition than the pro-conspiracy condition ($p = .006$). Belief in anti-vaccine conspiracy theories was not significant different between the anti-conspiracy/pro-conspiracy and pro-conspiracy/anti-conspiracy condition ($p = .140$) and the control condition ($p = .597$).

Results also revealed a significant difference in belief in perceived dangers of vaccines between conditions, $F(4, 255) = 8.32$, $p < .001$, $\eta^2 = .12$. Participants in the pro-conspiracy condition perceived vaccines to be more dangerous than the anti-conspiracy condition ($p < .001$) and the control condition ($p = .001$). The perception that vaccines are dangerous was also significantly lower in the anti-conspiracy than the control condition ($p = .031$). This, again, replicates the previous work by Jolley and Douglas (2014b, see Chapter 3).

Finally, the perception that vaccines are dangerous was significantly higher in the pro-conspiracy/anti-conspiracy condition than the anti-conspiracy condition ($p < .001$) and marginally significantly higher than in the control condition ($p = .098$). The perception that vaccines are dangerous was not significantly different between the pro-conspiracy/anti-conspiracy and anti-conspiracy/pro-conspiracy condition ($p = .171$) and the pro-conspiracy condition ($p = .110$). Moreover, the perception that vaccines are dangerous was significantly higher in the anti-conspiracy/pro-conspiracy than the anti-conspiracy condition ($p = .017$). However, the perception that vaccines are dangerous was significantly lower in the anti-conspiracy/pro-conspiracy than the pro-conspiracy condition ($p = .003$). The perception that vaccines are dangerous was however not significantly different between the anti-conspiracy/pro-conspiracy and pro-conspiracy/anti-conspiracy condition ($p = .171$) and the control condition ($p = .787$).

Each candidate mediator was then examined in a test of serial mediation in order to explain the effect of the conspiracy condition (pro-conspiracy/anti-conspiracy versus anti-conspiracy/pro-conspiracy versus pro-conspiracy versus anti-conspiracy versus control) on vaccination intentions. This was carried out using Hayes' (2013) bootstrapping method for

indirect effects, using the macro Process, Model 6 with two serial mediators. A conceptual diagram can be found in Figure 8.

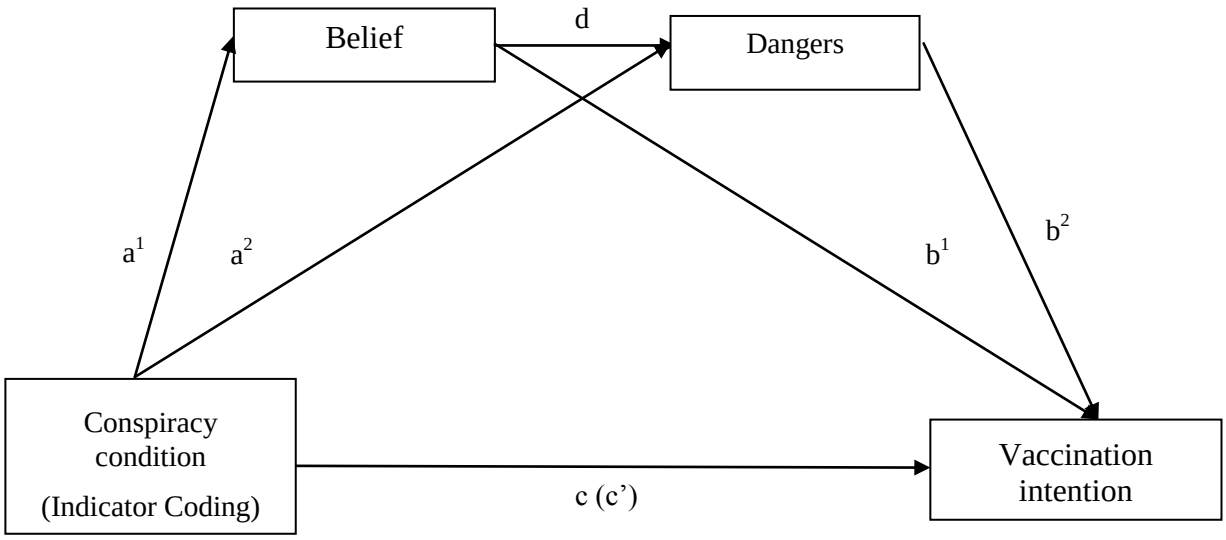


Figure 8. A conceptual diagram of the serial mediation analysis performed in Study 9.

First, the pro-conspiracy condition was coded as the representative condition and compared to both anti-conspiracy and control conditions (see Table 10). Both mediation models were significant, with pro-conspiracy information increasing belief in anti-vaccine conspiracy theories, which directly increased belief in perceived dangers of vaccines, and subsequently reduced intentions to vaccinate a fictional child (see Table 11). This replicates and extends previous research (Jolley & Douglas, 2014b, see Chapter 3) by providing empirical evidence that belief in conspiracy theories directly influence people's perceptions that vaccines are harmful, which reduces intention to vaccinate a fictional child.

Table 10

A Table of Indicator Coding (Referred to as 'D') used in the Hayes' (2013) Serial Mediation Analysis using Process (Model 6) for the Conspiracy Conditions (Pro-conspiracy versus Anti-conspiracy; versus Control) and Vaccination Intention.

Indicator Coding	**Conspiracy Condition**		
	Pro-conspiracy	Anti-conspiracy	Control
D^1	0	1	0
D^2	0	0	1

Table 11

Multiple Serial Mediation of the Indirect Effects of Conspiracy Condition (using Indicator Coding, see Table 10) on Immunisation Intentions (DV) through Belief in Anti-vaccine Conspiracy Theories and Perceived Dangers of Vaccines (MVs) (N = 260; 5,000 bootstrap samples).

	Normal test theory								**Bootstrapping indirect effect**		
	Anti-vaccine belief (*MV*)		Dangers (*MV*)		Dependant (*DV*)					Monte Carlo 95% Confidence Intervals	
Indictor Coding	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
D^1	a^{1a}	-0.85 (.16)***	a^{2a}	-0.06 (.13)	c^1	0.82 (.26)**	$c^{1'}$	0.31 (.25)	**0.45 (.16)**	**0.1692**	**0.8031**
D^2	a^{1b}	-0.39 (.16)**	a^{2b}	-0.03 (.10)	c^2	0.73 (.27)**	$c^{2'}$	0.49 (.24)	0.**20 (.11)**	**0.0220**	**0.4521**
'MV' to DV	b^1	-0.05 (.17)	b^2	-0.41 (.11)***							
						'MV' to 'MV'	d	1.29 (.05)***			

Notes. Boldface type highlights a significant effect as determined by the Monte Carlo 95% confidence interval (CI), which does not contain a zero.

**$p < .05$. ***$p < .01$.

Second, the pro-conspiracy/anti-conspiracy condition was coded as the representative group and compared to all other conditions (see Table 12). The mediation model between pro-conspiracy/anti-conspiracy and anti-conspiracy information and the control condition was significant. The same pattern was demonstrated as in the previous analysis. There was no significant mediation between pro-conspiracy/anti-conspiracy and anti-conspiracy/pro-conspiracy and pro-conspiracy conditions (see Table 13).

Third, we then performed the same analysis but with anti-conspiracy/pro-conspiracy condition coded as the representative group and compared to all other conditions (see Table 14). The mediation model between anti-conspiracy/pro-conspiracy and anti-conspiracy information was significant. The same pattern was demonstrated as in the previous analyses. However, the mediation model between the anti-conspiracy/pro-conspiracy and pro-conspiracy information condition was also significant, but in the opposite direction. In this case, exposure to anti-conspiracy information, then pro-conspiracy information (in comparison to pro-conspiracy information) reduced belief in anti-vaccine conspiracy theories, which reduced feelings of perceived dangers of vaccines, subsequently improving behavioural intentions. There were no significant mediations between anti-conspiracy/pro-conspiracy and pro-conspiracy/anti-conspiracy and the control condition (see Table 15).

Table 12

A Table of Indicator Coding (Referred to as 'D') used in the Hayes' (2013) Serial Mediation Analysis using Process (Model 6) for the Conspiracy Conditions (Pro-conspiracy/Anti-conspiracy; versus Anti-conspiracy/Pro-conspiracy versus Pro-conspiracy versus Anti-conspiracy versus Control) and Vaccination Intention.

	Conspiracy Condition				
Indicator Coding	Pro-conspiracy/anti-conspiracy	Anti-conspiracy/pro-conspiracy	Pro-conspiracy	Anti-conspiracy	Control
D^1	0	1	0	0	0
D^2	0	0	1	0	0
D^3	0	0	0	1	0
D^4	0	0	0	0	1

Table 13

Multiple Serial Mediation of the Indirect Effects of Conspiracy Condition (using Indicator Coding, see Table 12) on Immunisation Intentions (DV) through Belief in Anti-vaccine Conspiracy Theories and Perceived Dangers of Vaccines (MVs) (N = 260; 10,000 bootstrap samples).

	Normal test theory								**Bootstrapping indirect effect**		
	Anti-vaccine belief (*MV*)		Dangers (*MV*)		Dependant (*DV*)					Monte Carlo 90% Confidence Intervals	
Indictor Coding	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
D^1	a^{1a}	-0.29 (.19)	a^{2a}	-0.04 (.16)	c^1	0.24 (.31)	$c^{1'}$	.06 (.29)	0.15 (.07)	-0.0373	0.3922
D^2	a^{1b}	0.24 (.19)	a^{2b}	0.16 (.16)	c^2	-0.39 (.31)	$c^{2'}$	-0.18 (.29)	-0.12 (.09)	-0.3496	0.0421
D^3	a^{1c}	-0.85 (.19)***	a^{2b}	-0.03 (.17)	c^3	0.80 (.31)**	c^3	0.31 (.30)	**0.43 (.17)**	**0.1437**	**0.8226**
D^4	a^{1d}	-0.39 (.19)**	a^{2b}	0.01 (.17)	c^4	0.70 (.31)**	c^4	0.48 (.29)	**0.20 (.12)**	**0.0235**	**0.4116**
'MV' to DV	b^1	-0.05 (.17)	b^2	-0.40 (.11)***							
					'MV' to 'MV'		d	1.28 (.05)***			

Notes. Boldface type highlights a significant effect as determined by the Monte Carlo 90% confidence interval (CI), which does not contain a zero.

**$p < .05$. ***$p < .01$.

Table 14

A Table of Indicator Coding (Referred to as 'D') used in the Hayes' (2013) Serial Mediation Analysis using Process (Model 6) for the Conspiracy Conditions Anti-conspiracy/Pro-conspiracy; versus Pro-conspiracy Pro-conspiracy/Anti-conspiracy versus Anti-conspiracy versus Control) and Vaccination Intention.

	Conspiracy Condition				
Indicator Coding	Pro-conspiracy/anti-conspiracy	Anti-conspiracy/pro-conspiracy	Pro-conspiracy	Anti-conspiracy	Control
D^1	1	0	0	0	0
D^2	0	0	1	0	0
D^3	0	0	0	1	0
D^4	0	0	0	0	1

Table 15

Multiple Serial Mediation of the Indirect Effects of Conspiracy Condition (using Indicator Coding, see Table 14) on Immunisation Intentions (DV) through Belief in Anti-vaccine Conspiracy Theories and Perceived Dangers of Vaccines (MVs) (N = 260; 5,000 bootstrap samples).

	Normal test theory								**Bootstrapping indirect effect**		
	Anti-vaccine belief (*MV*)		Dangers (*MV*)		Dependant (*DV*)					Monte Carlo 95% Confidence Intervals	
Indictor Coding	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Path	Coeff. (s.e.)	Point Estimate (s.e.)	Lower	Upper
D^1	a^{1a}	0.23 (.18)	a^{2a}	0.02 (.15)	c^1	-0.29 (.31)	$c^{1'}$	-0.15 (.29)	-0.12 (.11)	-0.3008	0.0322
D^2	a^{1b}	0.47 (.18)**	a^{2b}	0.18 (.15)	c^2	-0.67 (.30)**	$c^{2'}$	-0.34 (.28)	**-0.24 (.12)**	**-0.5175**	**-0.0507**
D^3	a^{1c}	-0.62 (.19)***	a^{2b}	-0.01 (.16)	c^3	0.51 (.31)*	c^3	0.17 (.29)	**0.31 (.14)**	**0.1149**	**0.5735**
D^4	a^{1d}	-0.16 (.19)	a^{2b}	0.03 (.15)	c^4	0.41 (.31)	c^4	0.34 (.28)	0.08 (.11)	-0.1242	0.3192
'MV' to DV	b^1	-0.04 (.17)	b^2	-0.40 (.11)***							
						'MV' to 'MV'	d	1.28 (.05)***			

Notes. Boldface type highlights a significant effect as determined by the Monte Carlo 95% confidence interval (CI), which does not contain a zero.

*p < .10. **p < .05. ***p < .01.

Therefore, as hypothesised, conspiracy theories presented in any order appeared to be more impactful than information arguing against conspiracy theories. Participants who were exposed to conspiracy theories indicated less intention to vaccinate a fictional child in comparison to those who received anti-conspiracy arguments only. This relationship was explained by belief in anti-vaccine conspiracy theories and the extent to which participants perceived vaccines to be dangerous. Specifically, exposure to conspiracy theories increased belief in anti-vaccine conspiracy theories, which in turn increased people's perception that vaccines are dangerous, resulting in a lesser intention to vaccinate a fictional child. However, when anti-conspiracy arguments were presented first, participants indicated a higher intention to vaccinate in comparison to pro-conspiracy information only. This effect was significantly mediated by a lower belief in anti-vaccine conspiracy theories leading to lower feelings of perceived dangers of vaccines.

Overall, this research provides further evidence that conspiracy theories may be difficult to correct. This may be due to people being suspicious of the anti-conspiracy message (Sunstein & Vermeule, 2009) or the content of the conspiracy theory message being more persuasive (e.g., due to the messages' controversial and interesting content, cf. Gass & Seiter, 2010; Haugtvedt & Wegener, 1994). However, the anti-conspiracy material (followed by pro-conspiracy information) did appear to improve intentions for people who were only exposed to pro-conspiracy information. This suggests that the use of anti-conspiracy material may be still be a promising tool for intervention. It is plausible to suggest that if the anti-conspiracy material can instead be strengthened, using such an intervention tool could still have the potential to make the conspiracy information less persuasive. Therefore, in order to strengthen the anti-conspiracy material, in Study 10 we employed a pre-warning before participants were presented with the conspiracy theory information. In doing this, we aimed

to investigate a novel avenue to intervention, predicting that a pre-warning presented before being exposed to conspiracy information and anti-conspiracy arguments may make people more vigilant and consider all pieces of information presented to them. We also wanted to investigate the success of employing a general or specific warning. The general warning stated that facts are not always checked. The specific warning always began with the general but then described instances of people relying on incorrect information such as within juries. Our aim was to provide further evidence supporting the conclusion that a specific warning is more effective in eliciting attitude change than a general warning (e.g., Ecker et al., 2010).

Study 10

Research suggests that being given a pre-warning may induce a temporary state of skepticism and prompt the recipient to become more vigilant of the information they are presented with (Lewandowsky et al., 2012). Further, being given a warning that provides specific details of people relying on retracted misinformation has been shown to be more effective than a general warning designed to induce alertness (Ecker et al., 2010). In Study 10, we aimed to investigate if such a tool that may induce a temporary state of skepticism could render conspiracy information less persuasive. In doing so, the warning may strengthen the anti-conspiracy message. In this study therefore, participants were exposed to a general (i.e., facts are not always checked) or specific (i.e., beginning with the general warning but then providing examples of people relying on retracted misinformation) pre-warning, or a control condition where no warning was given. Participants were then asked to read material supporting anti-vaccine conspiracy theories, followed by anti-conspiracy material (pro-conspiracy/anti-conspiracy condition, as used in Study 9). Finally, participants were asked to rate their belief in anti-vaccine conspiracy theories, perceptions that vaccines

are dangerous, and to indicate their intention to have a fictitious child vaccinated, as in Study 9.

It was predicted that exposure to a specific pre-warning would attenuate the impact of conspiracy information, in comparison to a general pre-warning and control. In other words, being exposed to a warning would render the conspiracy theory information less persuasive and improve people's intentions to vaccinate a fictional child. We predict this relationship would be explained by both a reduced belief in anti-vaccine conspiracy theories and perception that vaccines are dangerous.

Method

Participants and design

Two hundred and eleven participants (127 women and 84 men, M_{age} = 35.04, *SD* = 10.90) were recruited via Amazon's Mechanical Turk (MTurk). Participants were residents of the U.S.A. and received 75 cents in exchange for their participation. At the end of the questionnaire, participants were asked if they devoted their full attention to the study and if there were any distractions present during the study. Participants who rated four and above (out of five) to the attention check questions were removed from analyses. We also included a timer to identify participants who had exceeded reading speed capabilities for upper college students by reading either the specific warning (95 words) in less than 10 seconds or the general warning (38 words) in less than 5 seconds and combined pro-conspiracy and anti-conspiracy manipulations (367 words) in less than 40 seconds (Speed Reading, 2014). The final sample size used for data analysis was therefore 130 (78 women and 52 men, M_{age} = 36.11, *SD* = 11.58). There were 48 participants in the specific-warning condition, 39 in the general warning condition, and 43 in the control condition. In the final sample, 74 (51.7%)

were parents who had an average of 1.14 (*SD* = 0.42) children, with the youngest being 4.24 (*SD* = 1.12) years old.

A 3-group design (pre-warning: specific-warning versus general-warning versus control) where all participants were in the same conspiracy condition (conspiracy condition: pro-conspiracy/anti-conspiracy condition), between-subject design was employed. Participants reported their belief in anti-vaccine conspiracy theories, the extent to which they perceived vaccines to be dangerous, and were finally asked to indicate their intention to have a fictional child vaccinated.

Materials and procedure

Participants provided their informed consent before beginning the questionnaire. Next, participants were randomly assigned to one of the three experimental conditions, which were adapted from previous research (Ecker, et al., 2010). Participants were either given a specific pre-warning about misinformation, a general pre-warning, or were in a control condition where no warning was given. In the specific pre-warning condition, participants were given information about the lasting effects of misinformation where examples of its operation were provided:

> *"In their desire to sensationalise, the media sometimes does not check facts before publishing information that turns out to be inaccurate. Research has shown that people continue to rely on inaccurate information in the media once they have read it. One example is the fact that some people today still believe that Iraq had weapons of mass destruction even though none were found. Also, many people believe inaccurate information about the Holocaust, despite evidence that six million Jewish people lost*

their lives and despite an official apology from Germany. It is therefore important to read the following information and answer the questions at the end carefully."

In the general warning condition, the warning stated that sometimes reported "facts" are not double-checked before the media releases them:

"In their desire to sensationalise, the media sometimes does not check facts before publishing information that turns out to be inaccurate. It is therefore important to read the following story and answer the questions at the end carefully."

The term 'conspiracy theory' was not mentioned in either of the articles. All participants were then exposed to information in favour of anti-vaccine conspiracy theories, followed by information refuting them, as in Study 9. Participants were then asked to indicate their anti-vaccine conspiracy belief ($\alpha = .94$), perception that vaccines are dangerous ($\alpha = .93$), and vaccination intentions, as in Study 9 (see Appendix E and Appendix C, respectively). At the end of the study, participants were told that the information presented in the article was fictional, and was written for the purposes of the study. Participants were also pointed towards websites containing factual information about vaccines, vaccine efficacy and vaccine safety before being thanked and paid for their participation.

Results and discussion

For each variable, summing the individual scores and then dividing by the number of items calculated mean values. These mean scores were used in the statistical analyses. None of the analyses were affected by the participants' status as parents or non-parents, nor their age or gender. These variables were therefore not analysed further. Results however did not reveal a significant difference in anti-vaccine beliefs, perception that vaccines are dangerous or vaccination intentions across conditions, $F(2, 127) = 0.16$, $p = .857$, $\eta^2 = .00$; $F(2, 127) =$

0.63, $p = .534$, $\eta^2 = .00$; $F(2, 127) = 0.88$, $p = .416$, $\eta^2 = .00$, respectively (see Table 16 for descriptive statistics). Therefore, even after being given a pre-warning about the effects of misinformation, the impact of conspiracy theories on behavioural intentions was not reduced. Moreover, exposure to a pre-warning did not reduce participants' beliefs in anti-vaccine conspiracy theories or the extent to which they perceived vaccines to be dangerous. No further meditational analyses were therefore conducted.

Table 16

A Table of Descriptive Statistics of All Variables per Condition (Specific Warning, General Warning and Control) in Study 10.

Condition	**Means *(SD)***		
	Anti-vaccine belief	Perceived dangers	Intention measure
Specific warning	3.57 (*1.40*)	3.00 (*1.23*)	5.04 (*1.45*)
General warning	3.72 (*1.75*)	3.11 (*1.51*)	5.21 (*1.20*)
Control	3.73 (*1.69*)	3.33 (*1.50*)	4.81 (*1.33*)

General discussion

The studies outlined in this chapter suggest that conspiracy theories may be resistant to correction, even after using methods that have been previously shown to be effective in eliciting attitude change. In Study 9, anti-vaccine conspiracy theories presented in any order were shown to have more impact on behavioural intentions than anti-conspiracy arguments. This relationship was explained by an increased belief in anti-vaccine conspiracy theories and the perception that vaccines are dangerous. In Study 10, even when participants were given a

pre-warning detailing people's continued reliance on retracted misinformation (specific or general) before anti-conspiracy material, this did not reduce the impact of exposure to conspiracy information. Therefore, in the present chapter, anti-vaccine conspiracy theories were shown to be more influential on behavioural intention outcomes than anti-conspiracy arguments, even when people were warned about the ongoing effects of relying on retracted misinformation. This research demonstrates that the potential detrimental impact of conspiracy theories may therefore be difficult to counteract.

Our work has replicated and extended previous research examining the role of anti-vaccine conspiracy theories on behavioural intention outcomes (Jolley & Douglas, 2014b, see Chapter 3). First, we showed that exposure to pro-conspiracy information reduced peoples' intentions to vaccinate a fictional child, relative to an anti-conspiracy condition, or a control. We extended this finding by testing a serial mediation model, and found that exposure to conspiracy theories increased belief in anti-vaccine conspiracy theories leading to an increase in the perception that vaccines are dangerous, which consequently reduced one's intention to vaccinate a fictional child. Of relevance to this current investigation, anti-vaccine conspiracy theories were also shown to be more influential on behavioural intention outcomes than anti-conspiracy arguments in any order they were presented.

As suggested by Sunstein and Vermeule (2009), suspicion of anti-conspiracy material may help explain why the conspiracy theories were resistant to correction in this investigation. For example, when people were presented with the anti-conspiracy-material they may have believed that the conspirators themselves to cover their tracks planted the material. However, a further contributor may also be due to the content of the material being presented. Previous research has indicated that relatively controversial and interesting information tends to produce a primacy effect (Gass & Seiter, 2010; Haugtvedt & Wegener,

1994). For example, Lana (1964) found a significant primacy effect for a high-controversy issue (nuclear weapons), but not for a low-controversy issue (Picasso). This may also be the case for conspiracy theories, since conspiracy theories are relatively controversial and interesting by nature. Moreover, conspiracy theories offer novel explanations for tragedies that people are eager for explanations. Conspiracy theories are also emotionally laden as they concern topics that provoke widespread social anxiety (Reid, 2010), such as concerning childhood vaccination. The content of conspiracy theories may therefore be more persuasive than anti-conspiracy arguments designed to refute them.

It is therefore important for future research to examine ways to strengthen anti-conspiracy arguments in order to make them more persuasive than conspiracy theory accounts. One simple way would be to make the anti-conspiracy argument equally as interesting and controversial as the conspiracy theory account. For example, in the context of vaccines, more background could be provided surrounding Andrew Wakefield's 1998 article in *The Lancet* and how the research was discredited and that the author is no longer permitted to practice medicine. For example, this may involve a discussion on Wakefield's undisclosed financial conflicts of interests, failed replications of Wakefield's findings, and his work ultimately being identified as an elaborate fraud. Providing more contextual details may make the anti-conspiracy argument account more interesting to the reader than just supplying the facts. Previous research has also shown that refuting information not only needs to provide opposing arguments, but argue *against* the misinformation (Gass & Seiter, 2010). Researchers have found that non-refutation counter-arguments (i.e., opposing arguments mentioned, but not arguing against the initial argument presented) are less effective than refutation counter-arguments (Allen, 1991, 1993, 1998; Allen, et al., 1990; O'Keefe, 1999). It is therefore plausible to suggest that an anti-conspiracy argument that clearly argues *against* the conspiracy theory (as opposed to just presenting the anti-conspiracy information)

may be more successful in attenuating the influence of conspiracy theories. An anti-conspiracy argument that directly refutes conspiracy theories could therefore be tested as a means to combat the impact of conspiracy theories in future research.

Along the same lines, it is interesting to note that exposure to anti-conspiracy arguments followed by conspiracy information improved intentions to vaccinate a fictional child compared to exposure to pro-conspiracy information only. Although the intention to vaccinate was still below the anti-conspiracy only and control conditions, exposure to anti-conspiracy arguments improved intentions in comparison to conspiracy information only. This points to the possibility that if the anti-conspiracy arguments can be strengthened as proposed in this chapter, the use of anti-conspiracy arguments may still have the potential to be used as a tool for intervention in addressing conspiracy theories. Nonetheless, our findings demonstrate that a *traditional* anti-conspiracy argument where the anti-conspiracy account is only presented and not explicitly arguing against the conspiracy theory may not be sufficient to counteract the impact of conspiracy theories in general.

Other limitations of the current research should be considered in future investigations. For example, the interventions tested here were based on anti-vaccine conspiracy theories only and it is therefore not possible to conclude that all conspiracy theories may be resistant to correction. It is plausible to propose that anti-vaccine conspiracy theories may be more persuasive than other types of conspiracy theories. Indeed, the conspiracy theory statements used in the present study discussed childhood vaccinations, which could be *more* emotionally laden than other conspiracy theories. Future research could therefore examine the success of utilising traditional anti-conspiracy arguments with other types of conspiracy theories and their potential behavioural outcomes, such as climate change conspiracy theories and pro-environmental behaviours.

Alongside developing anti-conspiracy arguments to be more interesting and to argue explicitly *against* conspiracy theories, future research could examine enhancing anti-conspiracy arguments by manipulating how they are presented to the reader. We know that certain sources are trusted more than others as a means to acquire information on a variety of topics. For example, people are more likely to seek information about vaccines via the Internet than through their doctor (Downs, et al., 2008). Varying the source of the counter-material could highlight which sources are therefore most trustworthy, and thus will have the most weight in making the counter-argument credible to the reader. In doing so, this will allow the intervention tool of anti-conspiracy arguments that was first suggested by Sunstein and Vermeule (2009), to be further explored. Utilising anti-conspiracy arguments as a means for intervention appears to be the method as recommended by Sunstein and Vermeule (2009) that has the most promise. Banning conspiracy theorising for example, is somewhat impractical and the recommendation of cognitive infiltration is similar to presenting conspiracy consumers with anti-conspiracy arguments. Therefore, strengthening an anti-conspiracy argument may be the most successful intervention recommendation to further explore in future research.

Future research could therefore also look into presenting anti-conspiracy material on other media platforms and measure how varying the source of information can lessen the impact of conspiracy theories on behavioural intentions. For example, the anti-conspiracy material text could be accompanied by images, or presented in a video or podcast format. Previous research has shown that anti-conspiracy arguments concerning the NASA moon landing accompanied by photographs reduced conspiracy beliefs below baseline (Swami, et al., 2012). It may therefore be useful in future research to investigate the success of combining text and images in anti-conspiracy arguments in order to investigate how such tools may improve behavioural intentions after exposure to conspiracy theories.

Conclusion

In conclusion, the current research suggests that conspiracy theories may be more powerful than anti-conspiracy arguments whenever they are presented. Specifically, conspiracy information appeared to reduce vaccination intentions by increasing belief in anti-vaccine conspiracy theories, which in turn increased concerns about the dangers of vaccines. This can have an alarming impact upon society, as even if people are presented with an anti-conspiracy argument and a pre-warning, conspiracy theories may still be resistant to correction. Ongoing investigations are therefore needed to develop interventions that are specifically designed for this type of persuasion.

Chapter 6 -

The social psychological consequences of conspiracy theories:

General discussion, conclusions and future directions

Overview

Beliefs in conspiracy theories are blooming in the 21st century and accompany a large proportion of significant social and political events (Bruder et al., 2013; Swami & Coles, 2010). In recent years, scholars have made great strides in understanding the psychological factors associated with beliefs in conspiracy theories. Researchers are also starting to consider the consequences that may be associated with conspiracy theorising. Examining the consequences of conspiracy theories is an important area of investigation, as conspiracy theories can be viewed as attempts to undermine or subvert social systems. They offer alternatives to official explanations and undermine people's confidence in political systems and scientific findings (Gray, 2010; Sapountzis & Condor, 2013). In support of this view, research has shown that conspiracy theories are associated with anomie and political distrust (Abalakina-Paap et al., 1999; Goertzel, 1994), and that conspiracy theorising is especially strong among members of minority groups (Crocker, et al., 1999). Researchers have also found that conspiracy theories undermining people's confidence in scientific findings may be associated with lack of condom use (Bird & Bogart, 2003; Bogart & Thorburn, 2006) and people potentially avoiding appropriate treatment of HIV (Hoyt et al., 2012). However, because the research to date has been largely correlational, examinations of cause and effect are not possible. An aim of the research outlined in this thesis therefore concerned utilising experimental methods to examine and attempt to address the social psychological consequences of conspiracy theories.

The studies reported in Chapters 2 and 3 put to test the assertion that conspiracy theories appearing to subvert or undermine important social systems may lead to potentially detrimental consequences for society. We found that either belief in, or exposure to, conspiracy theories negatively influenced people's likelihood of engaging with important

aspects of society such as the political system, taking action against climate change and having their children vaccinated. Ironically however, instead of undermining the social system, conspiracy theories were found to increase support for the social status quo (Chapter 4). By blaming the causes of significant events on a small number of people, as opposed to society as a whole, conspiracy theories may enable people to maintain the belief that society is fair. By bolstering support for social systems however, conspiracy theories may lead people to justify rather than address limitations of society. Conspiracy theories may therefore be similar to other system-justifying processes such as complementary stereotyping, sexist ideology and just world beliefs, which reduce the likelihood of social and political change (Calogero & Jost, 2011; Hoffman & Hurst, 1990; Jost, 2001; Jost & Hunyady, 2005). In the final studies outlined in this thesis, we also found that once people are exposed to conspiracy theories, their effects might be difficult to counteract (Chapter 5). In two experiments we tested interventions based on counter-arguments (e.g., that vaccines are safe instead of harmful) and a pre-warning that detailed people's tendency to rely on retracted information. However, both were found to be ineffective in improving intentions to vaccinate a fictional child.

The research outlined in this thesis has therefore uncovered the potential dangers of conspiracy theories. They may stop people from engaging with important aspects society and be a way to mask some of the deeper limitations of social systems. Moreover, once exposed to conspiracy theories, their effects might be difficult to counteract. This final chapter will first provide a summary of each of the empirical studies. Potential implications and applications of the research findings will then be discussed. The chapter will end by discussing the potential limitations that affect the external validity of the conclusions, and how considering these limitations has inspired ideas for future research.

Summary of empirical studies

In Chapters 2 and 3, we sought to investigate whether belief in, and exposure to conspiracy theories would stop people from potentially engaging in important aspects of society that are needed for society to function. Conspiracy theories can be viewed as attempts to undermine or subvert social systems by pointing accusing fingers at authority and offering alternatives to official explanations (Gray, 2010; Sapountzis & Condor, 2013). In doing so however, they may undermine people's confidence in political systems, their trust in the workings of science, and their confidence and trust in medical establishments. We therefore aimed to put this assertion to the test and empirically examine whether belief in, or exposure to conspiracy theories would reduce people's intention to engage in the political system, take action against climate change and vaccinate a fictional child. In Study 1, participants were exposed to information in favour of governmental conspiracy theories (e.g., that the British government were involved in the death of Princess Diana) or anti-conspiracy material arguing in favour of the mainstream account (e.g., Princess Diana's death was simply a tragic accident), before indicating their intention to engage in politics in the future (e.g., their intention to vote in the next election). Results demonstrated that people who were exposed to pro-conspiracy information indicated less intention to engage in the political system relative to those exposed to information refuting conspiracy claims – an effect mediated by increased feelings of political powerlessness.

Using a similar experimental design, Study 2 tested the impact of climate change conspiracy theories on pro-environmental intentions. Participants were exposed to information in favour of climate change conspiracy theories (e.g., arguing that climate change is a hoax) or information arguing against climate conspiracy claims. We also included a control condition where participants read no information. Participants were then asked to

indicate their intention to take action toward reducing their carbon footprint (e.g., using energy-efficiency as a selection criterion when buying a light bulb or household appliance). Results demonstrated that people who were exposed to climate change conspiracy information showed less intention to engage in pro-environmental behaviours, relative to the other conditions. This effect was explained by increased feelings of powerlessness, disillusionment, mistrust and uncertainty.

In Study 2, we also measured participants' intention to engage in the political system and their feelings of political powerlessness. In doing so, we aimed to explore whether a conspiracy theory that does not explicitly accuse the government can also lead to political disengagement. Results demonstrated that people who were exposed to climate change conspiracy theories also indicated less intention to engage with the political system (i.e., they indicated that they would be less likely to vote), relative to the other conditions – an effect again explained by feelings of political powerlessness. This research points to the possibility that conspiracy theorising may form part of a *political mindset* – a set of beliefs that are associated with political suspicion and disbelief of official explanations. Wood et al. (2012) found that people are inclined to believe even contradictory conspiracy theories as long as they are supported by the notion of an overarching 'cover up'. Political cynicism may also form a fundamental basis of conspiracy theorising. Along the same lines, Imhoff and Bruder (2014) argue that conspiracy theories can be seen as a generalised political attitude. Our results therefore provide support that exposure to conspiracy theories may be associated with a political mindset related to political beliefs and intentions.

In Chapter 3, we aimed to explore the consequences of belief in, and exposure to, anti-vaccine conspiracy theories. Previous anecdotal evidence has indicated that anti-vaccine conspiracy theories may have detrimental consequences for vaccination uptake. In Study 3,

we presented the first empirical test that aimed to examine the potential association between belief in anti-vaccine conspiracy theories and vaccination intentions. It was found that participants who indicated higher beliefs in anti-vaccine conspiracy theories showed less intention to vaccinate a fictional child – an effect mediated by the perception that vaccines are dangerous, mistrust, powerlessness and disillusionment. The aim of Study 4 was to confirm the casual pathway between conspiracy theories and vaccine uptake. We exposed participants to either information in favour of anti-vaccine conspiracy theories, information critical of anti-vaccine conspiracy theories, or a control condition where no information was presented. Compared to the other two conditions, participants who were exposed to pro-conspiracy information showed a reduced intention to vaccinate. This effect was again mediated by the perception that vaccines are dangerous, mistrust, powerlessness and disillusionment. Overall, these studies suggest that anti-vaccine conspiracy theories may undermine people's confidence in vaccination. Belief in, and exposure to, anti-vaccine conspiracy theories may therefore be an obstacle to vaccine uptake.

In Chapters 2 and 3, we have shown that exposure to conspiracy theories appear to subvert or undermine important social systems, mainly because conspiracy theories make people feel that their actions will not make a difference. If people do not vote, take action against climate change or vaccinate their children, then this could have detrimental consequences on society. Conspiracy theories may damage the social systems that are needed for society to function. Importantly therefore, conspiracy theories may be in conflict with the important social-psychological need of system justification. System justification theory argues that people are motivated to maintain a positive view of the social system rather than subvert it (e.g., Jost & Banaji, 1994; Jost & Burgess, 2000; Jost & Thompson, 2000). Threats to the fairness of social systems cause people to defend, bolster or rationalise the status quo (Jost et al., 2004). To explore this possibility further, we examined in Chapter

4 whether conspiracy theories may either uphold or undermine the social status quo. One prediction is that people may endorse conspiracy theories because whilst they may undermine the social status quo, conspiracy theories could be a substitute route to meet important needs such as power and control (Abalakina-Paap, et al., 1999; Whitson & Galinsky, 2008) when system justification is unattainable. An alternative prediction is that conspiracy theories may actually bolster the perceived legitimacy of the social status quo. Conspiracy theories give believers someone to blame instead of impersonal or abstract forces (Goertzel, 2010), which deflects blame for society's problems on to a small number of people. In other words, conspiracy theories may bolster satisfaction with the status quo because they explain troubling events as the actions of a small group of conspirators rather than problems inherent in society as a whole.

In performing this system justifying function, however, conspiracy may not only force people to disengage with important social systems but stop people from addressing the limitations of their society as a whole. Conspiracy theories may therefore prevent people from engaging with important aspects of society that are necessary for society to function effectively whilst appearing to mask some of the deeper limitations of society. This system-justifying function may cause people to uphold unfair social systems because when system justification beliefs increase, feelings of moral outrage, guilt and frustration are reduced (Jost & Hunyady, 2005; Wakslak, Jost, & Chen, 2007). This suggests that by reducing emotional distress in people, the system-justifying function shrinks the demands for social change to perceived injustices or inequalities that are present in society (Jost & Hunyady, 2005; Wakslak, et al., 2007). Put differently, because people do not feel as outraged, guilty or frustrated by issues such as gender inequality, the demand for change is lessened. The system-justifying function of conspiracy theories may therefore similarly reduce feelings of

moral outrage, guilt and frustration, which shrinks the demands for social change. In a series of studies in Chapter 4, the system-justifying function of conspiracy theories was tested.

In Study 5, we aimed to provide an initial test of the association between satisfaction with the status quo and conspiracy theories. Results demonstrated that those who endorsed conspiracy theories to a greater extent were more satisfied with the social system. We argue that this is because conspiracy theories perform a system-justifying function that allows people to maintain a positive view of society. Conspiracy theories therefore appear to uphold the status quo rather than subvert it. In Study 6, we manipulated the motive to justify the social system by having participants read a paragraph stating that British society is unsafe and insecure (system threat) vs. safe and secure (system affirming). By using such a manipulation, we aimed to investigate the relationship between satisfaction with the status quo and belief in conspiracy theories (Study 5), by examining whether belief in conspiracy theories responds to system threat. Results showed that people who were exposed to system threat indicated a higher level of belief in conspiracy theories relative to those in the system affirming condition. Conspiracy theories were therefore found to increase when the legitimacy of the social system was threatened. This further supports the idea that conspiracy theories may perform a system-justifying function for people.

The aim of Study 7 was to provide a direct test of the system-justifying function of conspiracy theories. In this study we aimed to provide a more stringent test of the system-justifying function of conspiracy theories because in Study 6 the results do not necessarily demonstrate that conspiracy theories help defend the system from threat. Conspiracy theories could have just been alternative routes to the satisfaction of psychological needs such as control (cf. Whitson et al., in press) after being exposed to threat. We therefore measured people's system-justifying beliefs as a function of both system threat and exposure to

conspiracy theories. System threat was manipulated (threat vs. affirm) and participants were also exposed to conspiracy theories (vs. control). In the conspiracy condition, we exposed participants to conspiracy theories about the death of Princess Diana. Results demonstrated that under conditions of system threat, participants reported the status quo as more legitimate after exposure to conspiracy theories. In other words, exposure to conspiracy theories in the context of threat to the social order allowed people to maintain the belief the social system in which they live is legitimate and fair. Exposure to conspiracy theories therefore buffered the effect of the system threat manipulation and allowed people to preserve their sense that the social system is legitimate.

In Study 8, we aimed to test our proposed mechanism to explain why conspiracy theories perform a system-justifying function for people. We propose that this process is explained by blaming the causes of social problems on the actions of a small few; conspiracy theories may therefore divert attention from the inherent limitations of social systems. We tested this mechanism by first exposing all participants to system threat then conspiracy theories (vs. control). Participants were then asked to rate the extent to which they believed that various social problems (e.g., pollution, inequality) were due to the actions of individuals or fundamental flaws in society. Participants who were threatened and exposed to conspiracy theories (vs. control) indicated greater satisfaction with the status quo – an effect mediated by the perception that individuals are responsible for social problems. Therefore, by describing social events as the actions of isolated groups, conspiracy theories may allow people to maintain the belief that the social system is safe and secure.

Conspiracy theories can be viewed as attempts to undermine or subvert social systems as they highlight inconsistencies or ambiguities in official accounts (e.g., Clarke, 2002; Fenster, 1999; Leman & Cinnirella, 2007). In providing evidence of this assertion, we found

that when people are exposed to conspiracy theories this reduced the likelihood of people engaging with the political system, taking action against climate change and vaccinating children. However, whilst conspiracy theories may subvert and undermine confidence in important social systems, they ironically do not undermine people's overall sense that social systems are fair and appropriate. Instead, conspiracy theories appear to bolster satisfaction with the social system because they explain troubling events as the actions of a small group of conspirators rather than problems inherent in society as a whole. The research described in this thesis has therefore demonstrated some of the potential dangers of conspiracy theories. They may not only stop people from engaging with important aspects of society, but they can be a way of justifying rather than addressing the limitations of social systems. With this in mind, it is important to consider ways to address the potential impact of conspiracy theories on engagement with important aspects of society that enable society to function.

In Chapter 5, we therefore aimed to address the potential detrimental consequences of conspiracy theories impacting important social systems. Sunstein and Vermeule (2009) were the first to recommend the use of anti-conspiracy arguments as a tool to address conspiracy theories. In Chapters 2 and 3, we have previously used counter-arguments in our investigations; however, they were only used as a comparison tool when assessing the impact of the pro-conspiracy arguments. For this purpose therefore, we did not examine the effectiveness of counter-arguments as an intervention tool but instead they were only used to compare differences between pro-conspiracy arguments and anti-conspiracy arguments on behavioural intentions. In Study 9, we therefore aimed to investigate the usefulness of anti-conspiracy arguments as a means to lessen the impact of conspiracy theories on intentions to engage with important social activities.

In Study 9, we investigated the impact of anti-conspiracy arguments as a means to attenuate the effects of anti-vaccine conspiracy theories on people's intentions to vaccinate a fictional child. The order in which participants were presented with both pro-conspiracy conspiracy theories and anti-conspiracy arguments was varied. We also exposed some participants to conspiracy information and anti-conspiracy arguments in the absence of each other. Further, a control condition was included where no further information was given. Results demonstrated that whenever conspiracy information was presented, this information had more impact on behavioural intentions than material that argued against conspiracy theories. Participants who were exposed to conspiracy theories in any order indicated a lesser intention to vaccinate a fictional child – an effect explained by belief in conspiracy theories and the perception that vaccines are dangerous. This study suggests that the use of anti-conspiracy arguments that oppose conspiracy theories may not be a successful avenue for intervention.

In Study 10, we therefore aimed to strengthen the anti-conspiracy material in order to make the conspiracy theories less persuasive. Specifically, we used a technique that involved giving people a pre-warning that detailed the persistent influence of retracted information before being presented with pro-conspiracy and anti-conspiracy arguments. In this study we tested the prediction that giving people a warning may make them more vigilant to the information they are presented and thus consider all pieces of information presented to them (Lewandowsky et al., 2012). We predicted that this would lead to the participants being less persuaded by the conspiracy theory account. Therefore, in Study 10, people were first given a specific warning that detailed the tendency for people to rely on retracted information (vs. a general warning or a control), before being exposed to conspiracy theories, followed by counter-arguments. Results demonstrated that there were no differences between any of the conditions. Being provided with a specific or general warning did not lessen the impact of

the conspiracy theory information on people's vaccination intentions. Taken together, the results of Studies 9 and 10 therefore suggest that conspiracy theories may be resistant to correction. Tools that are successful in eliciting attitude change in other domains did not attenuate the impact of conspiracy theories on behavioural intentions. Although further research is required, these results suggest that established attitude change interventions might therefore not be a successful tool to address the impact of conspiracy theories.

Implications of the current research

The research outlined in this thesis has found that exposure to conspiracy theories may stop people from engaging with important aspects society such as voting, vaccination and reducing their carbon footprint. Ironically however, whilst conspiracy theories undermine confidence in particular social systems, they do not undermine people's overall sense that the social systems are fair and legitimate. In doing so, conspiracy theories may consequently mask some of the deeper limitations of society. This highlights the potential dangers of conspiracy theories, as they may not only undermine confidence in particular social systems but be a way for people to justify unfairness within societies. Moreover, once exposed to conspiracy theories, their effects might be difficult to counteract. In the final studies outlined in this thesis, conspiracy theories were shown to be resistant to correction. Taken together, the findings outlined in this thesis demonstrate that conspiracy theories cannot necessarily be dismissed as trivial. In the next section, we highlight some of the significant implications of this research.

Consequences of conspiracy theories

The literature to date exploring the psychology of conspiracy theories has not provided empirical evidence that conspiracy theories have any *direct* consequences for

individuals or societies. For example, whilst work conducted by Bogart and colleagues (Bogart & Thorburn, 2006; Bogart, Wagner, Galvan, & Banks, 2010; Bogart, Galvan, Wagner, & Klein, 2011) have shown an association between belief in conspiracy theories and risky behaviours such as lack of condom use, the causal pathway is not clear. For example, belief in conspiracy theories may lead to heighted risky behaviours, or alternatively, those who engage in more risky behaviours may also be more likely to endorse conspiracy theories. Our work, for the first time, has utilised experimental methods to explore the causal pathway between exposure to conspiracy theories and behavioural intentions. We have shown that exposure to conspiracy theories can undermine people's confidence in the social systems that are required for society to function effectively.

Across the studies presented in Chapters 2 and 3, we have contributed to scientific knowledge on the effects of conspiracy theories on social, political and health-related intentions (Butler et al., 1995; Douglas & Sutton, 2008; Swami et al., 2013). We have shown that exposure to conspiracy theories not only changes the way people think about events, but also influences people's behavioural intentions to engage in politics, to reduce their carbon footprint, and to vaccinate children against disease. The possibility that conspiracy theories may influence other behaviours is also likely. For example, conspiracy theories may reduce support for the Royal Family by increasing negativity towards them being a part of British society and also worsen relations between different groups of people by increasing levels of prejudice and ambivalent stereotypes. Our research highlights that conspiracy theories are not trivial notions and should therefore not be taken lightly. Ultimately, conspiracy theories may have the potential to influence a wide range of behavioural outcomes. Everyday exposure to conspiracy information may therefore have significant consequences and it is therefore vital that individuals have the skills and ability to differentiate between accurate information and information derived from conspiracy theorising.

However, this is not always simple. For example, Bartlett and Miller (2011) showed that children's ability to recognise bias and verify sources on the Internet (as rated by their teachers) is fairly limited. Therefore, if people are unable to recognise bias in Internet articles and thus freely accept conspiracy theories as fact, everyday exposure to conspiracy theories could lead to disengagement from important aspects of society that people rely on in their everyday lives. Our research therefore speaks to the importance of developing interventions that can tackle conspiracy theories in society. Without further consideration being given to conspiracy theories by psychologists, everyday exposure to conspiracy theories may result in people continuing to disengage from important societal issues.

The number of people voting in elections and taking action against climate change is decreasing around the world (e.g., Fiorina, 2002; Leiserowitz, 2003). Moreover, despite scientists' calls for urgent action, climate change has slipped to the bottom of the list of American priorities, with a further poll in 2009 indicating that 41% of American respondents believe the environment is actually getting better (Paw Research Center, 2009; Silver, 2009). Our research therefore suggests that decreased engagement with important social systems could be due, in part, to how widespread conspiracy theories are in society (Swami & Coles, 2010).

The empirical work in this thesis has also shown that exposure to conspiracy theories may stop people from engaging with aspects of society that are needed for society to function, mainly because they feel powerless that their actions will not make a difference. Specifically, throughout Chapters 2 and 3 we measured feelings of powerlessness in different forms such as people perceiving that their vote will not influence politics (Study 1), ability to prevent climate change (Study 2) or alter health outcomes (Studies 3 and 4). Throughout these studies, we have therefore demonstrated that exposure to conspiracy theories can

directly increase feeling of powerlessness over one's actions making a difference in different social systems. This extends our understanding of the association between conspiracy theories and powerlessness as previously only correlational associations have been demonstrated (Abalakina-Paap et al., 1999). Our data provides evidence that powerlessness could be a direct response of being exposed to conspiracy theories. It is plausible to suggest however, that a reciprocal relationship may occur between belief in conspiracy theories and powerlessness. Whilst some people may endorse conspiracy theories to reduce their feelings of powerlessness, our research demonstrates that exposure to conspiracy theories may also bring about feelings of powerlessness.

System justification theory

Our early findings suggest that conspiracy theories may subvert or undermine important social systems. In support of this, we found conspiracy theories may stop people from engaging with important aspects of society, such as voting, taking action against climate change and vaccinating children. However, conspiracy theories may not necessarily be *completely* subversive as we also found exposure to conspiracy theories did not decrease general satisfaction with social systems. Instead, conspiracy theories appear to bolster satisfaction with the status quo because they explain troubling events as the actions of a small group of conspirators rather than problems inherent in society as a whole. Our findings therefore support the theory that people are motivated to maintain a positive view of social systems (Jost & Banaji, 1994; Jost & Burgess, 2000; Jost & Thompson, 2000). According to system justification theory, threats to the fairness or legitimacy of social system therefore cause people to defend, bolster or rationalise the status quo (e.g., Jost, et al., 2003). Proponents of the theory argue that this motivation comes from the desire to decrease any threat or anxiety that may arise from being part of a system that at times can be unfair (Jost &

Hunyady, 2002; Kay et al., 2009). Across the studies presented in Chapter 4 therefore, we have contributed to scientific knowledge by demonstrating that conspiracy theories may be a means to defend the current status quo.

To the list of other system-justifying processes, we can therefore add conspiracy theories as a means to defend the current social system. For example, people may use stereotypes to justify status differences between groups of people (Hoffman & Hurst, 1990; Jost, 2001; Napier, Mandisodza, Andersen, & Jost, 2006) and engage in outgroup favouritism to preserve the legitimacy of the existing social system (Jost & Hunyady, 2002). Other ideologies and belief systems can also be used to satisfy this motivation such as belief in a just world, benevolent sexism and political conservatism (Jost & Hunyady, 2005). Belief in conspiracy theories may therefore perform a similar function for people.

Under conditions of social anxiety and uncertainty surrounding a significant event such as the death of Princess Diana, people are eager for explanations (Reid, 2010). Such significant events can also threaten our perceptions of fairness in society. We have shown, for the first time, that conspiracy theories may therefore not only address feelings of anxiety and uncertainty (e.g., van Prooijen, 2012), but can allow people to fulfil the motivation to perceive the system in which they live as fair and legitimate. By blaming significant events on a malign few, conspiracy theories can allow people to affirm the perception that society overall is fair. Moreover, previous experimental evidence examining system justification theory has mainly focused on stereotyping behaviours and relations between groups (e.g., Jost & Burgess, 2000; Jost & Kay, 2005). In the current thesis, we found that exposure to system threat and conspiracy theories increased satisfaction with the status quo. Our research therefore provides further empirical support to system justification theory by demonstrating that people may use conspiracy theories as a way to maintain a positive view of society when

threatened. In summary, the present results support the theory that people are motivated to justify the current status quo. By endorsing conspiracy theories when social systems are threatened, conspiracy theories may be another mechanism in how people can maintain an overall sense that social systems are fair and appropriate.

Addressing the consequences of conspiracy theories

Across Chapters 2, 3 and 4, we have highlighted the potential dangers of conspiracy theories, as they may not only make people engage less, but actually may mask some of the deeper limitations of society. To date however, there has been limited empirical work that aimed to combat the effects of conspiracy theories. Sunstein and Vermeule (2009) were the first to recommend a number of different potential avenues to address the effects of conspiracy theories, such as the use of anti-conspiracy arguments. Recently Banas and Miller (2013) have empirically explored this suggestion by examining whether anti-conspiracy arguments can attenuate the impact of exposure to conspiracy theories on changing people's attitudes. To test this, the authors asked people to watch a 40-minute chapter from the 9/11 Truth conspiracy theory film, *Loose Change: Final Cut* before they were exposed to anti-conspiracy arguments. Results revealed that people's belief that the United States government participated in a conspiracy to perpetrate the attack on 9/11 was reduced when exposed to anti-conspiracy arguments. Our work however, for the first time, investigated the impact of anti-conspiracy arguments on *both* beliefs and behavioural intentions. We found that whilst exposure to anti-conspiracy information reduced beliefs in conspiracy theories, anti-conspiracy arguments did not improve *intentions* to vaccinate a fictional child in comparison to the control condition. Our research therefore adds to scientific knowledge by demonstrating that conspiracy theories may actually be difficult to counteract even when using the recommendation by Sunstein and Vermeule (2009) of anti-conspiracy information.

It is possible however to potentially strengthen the anti-conspiracy information. In the final study of the thesis therefore, we examined the effectiveness of strengthening the anti-conspiracy information by using techniques that have been shown to elicit attitude change in other domains (see Lewandowsky et al., 2012). Specifically, participants were given a warning explaining that people tend to rely on information even when it has been retracted, before they were asked to read pro-conspiracy and anti-conspiracy arguments. The novel idea behind this method was that the warning may induce a temporary state of skepticism, which may mean the person would be more likely to consider all the information presented in front of them (Lewandowsky et al., 2012). This technique however was also found to be ineffective in strengthening the anti-conspiracy argument, and thus lessening the impact of conspiracy theories on vaccination intentions. Our research therefore highlights for the first time, that once the very idea of a conspiracy has taken root, even tools that have been shown to be successful in eliciting attitude change in other domains may be unsuccessful in lessening the impact of conspiracy theories on vaccination uptake.

Across the studies presented in Chapter 5 therefore, we tested two methods to address the impact of conspiracy theories on behavioural intentions. However, our research demonstrated that an approach that uses anti-conspiracy arguments may not be a quick fix to intervene upon anti-vaccine conspiracy theories. Sunstein and Vermeule (2009) did note that conspiracy theories may be extremely resistant to correction. They suggest that conspiracy theorists may be suspicious of the anti-conspiracy arguments because they may believe the conspirators are just trying to cover their tracks. The empirical evidence providing support for Sunstein and Vermeule's (2009) assertion that conspiracy theories may be tricky to attenuate is perhaps therefore not too surprising.

Our finding that conspiracy theories may potentially be difficult to attenuate is also consistent with the notion that misinformation does tend to be resistant to correction (Lewandowsky et al., 2012). Lewandowsky et al. (2012) suggested that once a piece of misinformation has been accepted to be true, it is highly resistant to change. For example, in courtroom settings Fein, McCloskey and Tomlinson (1997) found that jurors who were asked to disregard a piece of inadmissible evidence were still influenced by the retracted evidence despite claiming they were not. Our research therefore further supports the notion that misinformation tends to be resistant to correction.

In summary, this thesis has extended scientific knowledge examining the effects of misinformation. We found that even using typical attitude change interventions, the effects of conspiracy theories persist. This further supports the notion that misinformation is resistant to correction (Lewandowsky, et al., 2012). Our research has also provided the first direct test of Sunstein and Vermeule's (2009) recommendation for addressing conspiracy theories on behavioural intentions. This research opens up a new line of research investigating how to intervene on the impact of conspiracy theories.

Applications of the current research

Conspiracy theories have been shown to negatively influence the likelihood that people will engage with important social systems. We have also found that once people have been exposed to conspiracy theories, their effects are difficult to attenuate. In this section, we discuss how the findings from this thesis may be applied to address public disengagement with important pro-social behaviours.

The key application of this thesis is to illustrate to officials and policy makers that conspiracy theorising could be a factor that is contributing to the decline in engagement with

numerous important social systems (e.g., Fiorina, 2002; Leiserowitz, 2003). For example, results from an American census of people who did not vote found that the reason was based on their perception that their vote would not make a difference (File & Crissey, 2010). We know already that feelings of powerlessness are associated with belief in conspiracy theories (Abalakina-Paap et al., 1999). Our research has furthered our understanding by demonstrating that powerlessness is also a response to being exposed to conspiracy theories (Jolley & Douglas, 2014a, see Chapter 2). It is therefore plausible that the perception held by people that their vote would not make a difference could be a factor, in part, caused by conspiracy theories. Therefore, officials and policy makers may not only need to improve people's perceptions that their vote matters, but also tackle conspiracy theories that may directly cause people to believe that their actions will not make a difference. Our research therefore calls for officials to consider the influence of conspiracy theories when aiming to address decreasing voter turnout.

Along a similar vein, our research also highlights the importance of taking into account conspiracy theorising when trying to tackle the declining number of people engaging in pro-environmental behaviours. In Study 2, we demonstrated that conspiracy theories could potentially stop people from engaging with efforts to reduce their carbon footprint, such as using energy efficiently. Providing people who endorse climate change conspiracy theories with information about how to reduce their carbon footprint (e.g., providing people with an energy-saving checklist or information about how best to recycle; Center for Research on Environmental Decisions, 2009) may go unnoticed for these people. In other words, people who endorse conspiracy theories may feel like these behaviours do not require their attention, even when presented with contrary information, because they feel uncertain that climate change exists and that their actions will not make a difference for something that might not be happening. In support of this view, scholars have found that uncertainty and powerlessness

are reasons provided for climate change inaction (e.g., Aitken, et al., 2011; Corner, 2014). Moreover, in our research we found that feelings of uncertainty and powerlessness were a direct response to exposure to conspiracy theories (Jolley & Douglas, 2014a, see Chapter 2). Officials and policy makers may therefore not only need to address feelings of uncertainty and powerlessness, but also conspiracy theorising which may be an important barrier to people engaging in pro-environmental initiatives.

In Studies 3 and 4 we also demonstrated that belief in, and exposure to, anti-vaccine conspiracy theories can reduce people's intentions to vaccinate a fictional child. This work empirically demonstrates, for the first time, that anti-vaccine conspiracy theories may present an obstacle to vaccine uptake. Similarly with voter turnout and pro-environmental initiatives, one of the primary applications of this work relates to informing attempts to increase vaccination uptake. Anti-vaccine conspiracy theories reflect suspicion and mistrust of scientific research examining vaccine efficacy and safety. Moreover, conspiracist ideation has been found to be associated with a mistrust of science such as the rejection of climate science (Lewandowsky, et al., 2013a). Along the same lines, distrust of medical information has been linked to reluctance to vaccinate (Kata, 2010). In our research, we have found that a feeling of mistrust is associated with belief in, and exposure to, anti-vaccine conspiracy theories (Jolley & Douglas, 2014b, see Chapter 3). Therefore, a policy that involves a meeting with a health care professional in order to tackle decreasing vaccine uptake (e.g., Fine-Goulden, 2010) may not be successful for parents who hold anti-vaccine conspiracy beliefs due to their suspicion and mistrust of scientific research. Policy makers and officials therefore must not only take into account mistrust of scientific research but also addressing conspiracy theories when aiming to address deceasing vaccine uptake.

In each of the different behavior domains therefore, the consistent application of our work is that conspiracy theorising should be taken into account when considering ways to tackle disengagement with these important societal issues. This opens the question of how best to deal with conspiracy theories. This thesis has also demonstrated however, that once people have been exposed to conspiracy theories, their effects are difficult to attenuate. Specifically, we have shown that providing people with anti-conspiracy arguments and a pre-warning about the persistent effects of misinformation did not attenuate the impact of conspiracy theories. Therefore, providing information about why someone should recycle to help reduce their carbon footprint or asking parents to attend a meeting with health care professional to discuss the benefits of vaccination may be unsuccessful for those who endorse conspiracy theories. Instead, providing this information may be ignored because people who endorse conspiracy theories may be suspicious of the information being planted to cover the tracks of the conspirators and thus discredit it (Sunstein & Vermeule, 2009).

Our empirical finding also supports an assertion by Kata (2010) who argued, "given [the] lack of trust [concerning vaccines], providing more "education" will be ineffective" (p. 1714). Specifically, in our research, we found that feelings of mistrust were a direct response of exposure to anti-vaccine conspiracy theories (Jolley & Douglas, 2014b, see Chapter 3). Future research should therefore examine strengthening the anti-conspiracy message with the aim of attenuating feelings of mistrust caused by exposure to conspiracy theories, which may subsequently improve vaccination uptake. For example, a strengthened anti-conspiracy message could *argue* against the conspiracy account and not just present the anti-conspiracy argument (cf. Gass & Seiter, 2010). In practice for example, during a health care meeting, the health professional could address the anti-vaccine conspiracy theory and provide explicit refuting information for varying points of the conspiracy argument. By engaging in an open dialogue, this may help reduce the suspicion that the material has merely been planted and

thus the effects of the conspiracy theory on feelings of mistrust, and subsequent vaccination intentions may be attenuated. This approach will therefore also provide the person with more "education" concerning vaccination, whilst at the same time addressing their feelings of mistrust.

As noted in a report by the Center for Research on Environmental Decisions (2009), there is no "one-size-fits-all" approach to communicating information about climate change (p. 44). This assertion could also be applied to techniques that aim to address getting people involved in the political system and vaccinating their children. As there is no approach that fits all, it is important that interventions are therefore developed that aim to tackle conspiracy theories. If such interventions are not developed, the potential detrimental effects of conspiracy theories may continue to persist. An approach such as explicitly arguing against conspiracy theories could therefore be a tool that policy makers and officials could use when aiming to tackle declining engagement in important social systems that may be due to people's belief in conspiracy theories.

In summary, this thesis has highlighted the potential detrimental impact of belief in, and exposure to, conspiracy theories. If someone is not taking action to reduce their carbon footprint or vaccinating their children against harmful diseases, this may have detrimental consequences for us all. It is therefore important for officials and policy makers to take into account conspiracy theorising, and more importantly how best to deal with these alternative viewpoints when aiming to address disengagement with a variety of important societal issues.

Limitations and future directions

Like any other programme of research, the current work has several limitations that may be addressed in future investigations. A primary limitation is the use of self-reported

scales to measure intentions to engage in politics, reduce one's carbon footprint and vaccinate a fictional child. It is widely known that intentions do not always lead to real behaviours. Empirical research on attitude-behaviour inconsistencies can be traced back to LaPiere's (1934) classic study on racial prejudice. It was found that when a Chinese couple visited more than 250 restaurants, coffee shops and hotels, they received service 95% of the time without hesitation. However, in response to a letter of inquiry, 92% of the establishments replied saying they would not accept members of the Chinese race. Further, Sheeran (2002) found that between 26-57% of respondents failed to carry out their intention to use condoms, to undergo a cancer screening, or to exercise, despite stating this on a self-report measure. It is therefore necessary to note that whilst conspiracy theories may reduce intentions to vote, vaccinate and reduce one's carbon footprint, there is no guarantee that this would lead onto actual behavioural changes. Further investigation is needed to examine the direct consequences of conspiracy theories on people's intentions and behaviours. For example, within a controlled setting, participants could be exposed to conspiracy theories before being asked to sign up or donate money to an environmental group. This would help to establish whether conspiracy theories do bring about changes in behaviour and not just changes in attitudes or intentions.

Similarly, in Studies 3, 4, 9 and 10, participants were presented with a fictional disease called *dysomeria* whose symptoms could result in fever and vomiting, before being asked to indicate their intention to have a fictional child vaccinated. However, the bulk of infant vaccines are developed for much more serious illnesses (e.g., HBV, DTaP, IPV), and as such, the consequences of vaccine refusal are much more serious. This relatively benign choice for an invented disease that concerns only symptoms such as fever and vomiting as opposed to life threatening consequences could have affected the participants' responses. In future research therefore, parents' beliefs in anti-vaccine conspiracy theories could be

measured before indicating whether their children have received vaccinations against more significant harmful diseases. Whilst this would provide an indication to the impact of conspiracy theories on real vaccination behaviors, determining cause and effect would not be possible.

In order to explore the direct impact of conspiracy theories on vaccination uptake parents could be exposed to conspiracy theories before their real behavioral outcomes are measured. Although this approach is likely to reveal the most reliable evidence of the impact of conspiracy theories on vaccination behaviour, ethical considerations would obviously prevent such a study from being conducted. Alternatively, a longitudinal design could be utilized. Parents could indicate their belief in anti-vaccine conspiracy theories over a period of time leading up to the recommended age for a child to have a particular vaccination (e.g., between 12 and 13 months is the recommend age for a child to have the MMR vaccine; NHS, 2014). After the recommended vaccination period has passed, parents could be asked to indicate whether their child had been vaccinated. Therefore, due to the scope of the longitudinal design, the study is more likely to suggest cause-and-effect than a cross-sectional study.

Another limitation of the present research relates to the sizes of the effects observed. In all of the studies, whilst the effect sizes were robust, they were quite small (e.g., $\eta^2 = .05$ for the effect of vaccine information on vaccination intentions in Study 8; Cohen, 1977). In the case of Study 8, this indicates there are undoubtedly other factors that contribute to parents' vaccination decisions other than conspiracy theories. For example, socioeconomic status (SES), education or personal vaccination history may act as moderators or mediators in the observed relationships. Nonetheless, our research highlights the impact that exposure to conspiracy theories can have on vaccination intentions. For most vaccines, such as the MMR

vaccine, the desired level of herd immunity is 95%, so even small decreases in vaccination uptake can have a significant impact. Therefore, whilst the effects demonstrated across the thesis may be fairly small statistically, conspiracy theories may still have an important role to play in parents' decisions to vaccinate or not to vaccinate their children.

Similarly, the effects shown in the current research could be moderated by several other contributing factors. Whilst we included measures of participants' age and gender, other potentially important factors were not considered. For example, in Study 8 participants' responses could have been affected by a number of factors which were not considered in the analyses including: i) personal vaccination history, ii) history of vaccinating their own children, iii) time since child's last vaccination, iv) SES, v) participant education, and possibly other factors. These factors may have made the impact of exposure to anti-vaccine conspiracy theories more or less pronounced for some people. For example, a parent who has had recent experience of vaccination that has had no adverse reactions may be less susceptible to the viewpoint that evidence concerning the success of vaccines is forged. Future research should therefore take in to account such factors when measuring the impact of anti-vaccine conspiracy theories.

Further, whilst a variety of samples were recruited, consisting of both British students and community samples such as British UK parents (Study 3) and U.S. citizens (Study 8), all participants were recruited from Western cultures. Therefore, the effects shown here may not be replicated across different cultures. For example, belief in anti-vaccine conspiracy theories was seen to reduce vaccination intentions in a British (Study 3) and American (Study 4) sample, but it is unclear whether this finding may apply in other countries. Lechuga, Swain, and Weinhardt (2011) found that predictors of vaccination intentions varied cross-culturally due to variations in social norms. Similarly, culture could therefore moderate the

influence of conspiracy theories on intentions. Conducting an international survey exploring the impact of conspiracy theories on vaccination behaviours would enable direct comparisons to be made between different cultures. Further, the belief that HIV was manufactured in a laboratory is widespread among African Americans, and is associated with increased risky behaviours such as lack of condom use (Bird & Bogart, 2003; Bogart & Thorburn, 2006). Future research could examine the extent to which this conspiracy theory generalises to other groups, enabling researchers to further understand whether the consequences of conspiracy theories may be culture dependant.

Moreover, in Studies 7 and 8 British participants were asked to read a single excerpt that alleged a conspiracy was involved in the death of Princess Diana. Across these two studies we found that being exposed to Princess Diana conspiracy theories buffered satisfaction with the status quo from threat. However, it is not possible to conclude with confidence that the present result will generalise to other types of conspiracy theories or populations. Another limitation relates to the methodology. Throughout this thesis, we exposed people to conspiracy theories then immediately measured their belief in conspiracy theories. In Chapters 2, 3 and 5, we then measured behavioural intention outcomes. In Chapter 4, we measured participants' satisfaction with the social status quo. In the present data, therefore, it is not possible to conclude whether the impact of being exposed to conspiracy theories would endure for a longer period of time than the experimental session. Future research could therefore investigate the time period that exposure to conspiracy theories can be seen to influence behavioural outcomes, such as re-testing participants' intentions over a period of time.

Further, across all studies, we found that belief in conspiracy theories tended to be around or below the midpoint. For example, in Study 3 the mean anti-vaccine conspiracy

belief was 2.00 on a 7-point scale. This shows that the participants recruited were not strong endorsers of conspiracy theories, meaning that different patterns of findings may emerge for those who do strongly endorse conspiracy theories. However, where participants were exposed to conspiracy theories the conspiracy belief did rise above the midpoint (e.g., *M* = 4.81 on a 7-point governmental conspiracy theory scale in Study 1, 4.11 and 4.47 on a 7-point anti-vaccine belief scale in Studies 4 and 9, respectively). Therefore, taken together the current research suggests that the patterns shown for those who are weak and strong endorsers of conspiracy theories may actually be similar. Specifically, both people who indicated a weak belief in anti-vaccine conspiracy theories (Study 3) and those who after exposure to anti-vaccine conspiracy theories indicated a stronger belief (Studies 4 and 9) demonstrated a lesser intention to have a fictional child vaccinated. Nonetheless, future research could aim to recruit a sample that contains people who are strong and weak endorser of conspiracy theories in order to examine whether the relationship between conspiracy theories and reduced intentions to vaccinate is consistent for both types of respondents. Future research could also further explore this possibility with other types of conspiracy theories and behavioural outcomes, such as those concerning climate change conspiracy theories.

Similarly, in Study 5 the mean belief in real world conspiracy theories was 3.00 (on a 7-point scale) and 2.56 for general notions of conspiracy (on a 7-point scale). This also leaves open the plausible prospect that strong endorsers of conspiracy theories may radicalise political opinion and motivate social change (Uscinski & Parent, 2014), as opposed to bolstering the satisfaction with the current status quo. Put differently, people who believe that corruption is present among several different elements of the social system may make it increasingly difficult for them to blame only a small number of individuals for society's

problems. Future research could therefore also aim to recruit a sample that is strong endorsers of conspiracy theories to test this possibility.

In Chapter 5, we also investigated two tools that may be used as interventions to combat the effects of anti-vaccine conspiracy theories on behavioural intentions. We found that both a pre-warning and anti-conspiracy arguments were unsuccessful at lessening the impact of anti-vaccine conspiracy theories on intended vaccine uptake. However, this effect may be due to a weakness in the anti-conspiracy material utilised in the study. Previous research has shown that refuting information not only needs to provide opposing arguments, but *argue* against the misinformation (Gass & Seiter, 2010). Therefore, the anti-conspiracy material being used in the present study could have been stronger. A second limitation is that only one type of conspiracy theory was examined. Anti-vaccine conspiracy theories may be particularly emotionally charged as they are aimed at parents and concern children, thus the conspiracy theory account could have been more persuasive than others such as UFO sightings. Future research could therefore investigate the possibility that anti-conspiracy arguments being ineffective in addressing conspiracy theories is something peculiar to anti-vaccine conspiracy theories. To do this, future research could investigate the success of using anti-conspiracy arguments with an array of different conspiracy types and behavioural intentions (e.g., governmental, environmental).

In addition to the methodological refinements outlined above, the current research opens up several new lines of research. Specifically, future research could further investigate the consequences of conspiracy theories for the individual and society, the social psychological needs they meet, and ways to address their potentially harmful consequences. For example, previous research has shown that exposure to conspiracy theories can change people's attitudes without them being aware (Douglas & Sutton, 2008). In this thesis, we

have shown that exposure to conspiracy theories can potentially stop people from engaging with the political system, climate science and vaccinating children against diseases. Future research could therefore examine whether exposure to conspiracy theories may not only influence one's attitudes without them being aware, but also negatively influence their behavioural intentions. This type of future investigation may involve people being exposed to conspiracy theories and then rating their own and other's intentions to engage in important aspects of society such as pro-environmental behaviours. It is plausible to predict that people may rate their own attitudes and behavioural intention as being less influenced than others (Douglas & Sutton, 2008). Such an empirical investigation could further support the evidence that conspiracy theories can have a hidden impact.

Conspiracy theories' influence upon other behavioural domains could also be examined. For example, some people believe that members of the establishment were involved in the death of Princess Diana (e.g., see Douglas & Sutton, 2008; Wood et al., 2012) or that members of the Royal family are shape-shifting reptilian humanoids (Time, 2014). Endorsing such an alternative view-point may lead to people feel more negative towards to the Royal Family and be less favourable of them continuing to be part of British society. A recent poll found that only 53% of British respondents felt that if Britain did not have the Royal family the British nation would be worse off, with the rest indicting that the British nation would actually be better off (14%), that it would not make a difference (23%) or that they did not know (10%, Hennessy, 2013). It is plausible that conspiracy theories may therefore play a role in only just over half of respondents indicating that the British nation would be *worse* off. This is therefore an important issue to further explore. Future research could therefore examine whether belief in conspiracy theories may lead to the belief for example, that the Royal Family are no longer needed, thus further undermining an established social system.

Conspiracy theories could also influence attitudes towards groups of people and relations between groups. For example, polls have shown that individuals of the Jewish faith are thought to be involved in important institutions, such as in banking institutions, including the theory that world banking is dominated by the Rothschild Family (Foxman, 2008; Levy, 2005). It is plausible that conspiracy theories could therefore influence attitudes held towards people of the Jewish faith. Previous research has supported this possibility. For example, Golec de Zavala and Cichocka (2012) found that belief in conspiracy theories about Jewish domination of the world were associated with anti-Semitic attitudes. Other researchers have similarly found that conspiracy theories could be a way to express prejudice against a particular group (e.g., Barlow, et al., 2012; Imhoff & Bruder, 2014). As this work however has only employed correlational designs, future research could examine the impact of exposure to conspiracy theories about certain groups on explicit and implicit levels of prejudice. Such an investigation would help to uncover the impact that conspiracy theories may have on people's prejudices towards other groups.

It is also plausible to suggest that conspiracy theories may play an important role in determining perceptions of groups. For example, some groups are seen as warm (but less competent; e.g., elderly, homosexuals) and others are seen as competent (but less warm; e.g., business people, Asians). Others, however, are seen as both cold and incompetent (e.g., uneducated, poor) or warm and competent (e.g., heterosexuals, Whites; Fiske, 2012). Conspiracy theories concerning group of people such as theories that suggest people of the Jewish faith are involved in conspiracies, may impact ambivalent stereotypes held about those groups of people. Future research could therefore examine whether people who endorse the idea that people of the Jewish faith are involved in conspiracies view Jewish people as competent, but less warm and people of other religions such as Christians as both competent and warm. Such an investigation may also utilise experimental methods where

people are exposed to anti-Semitic conspiracy theories before indicting ambivalent stereotypes they hold for people from different groups (e.g., Jewish people, Christians). Such a study will therefore allow us to examine whether conspiracy theories can influence not only attitudes and behavioural intentions, but also ambivalent stereotypes held about a group.

Holding ambivalent stereotypes about social groups may also help people legitimate the status quo, and thus discourage people from challenging unequal systems (Durante, et al., 2012; Jost & Kay, 2005). In this thesis, conspiracy theories were also found to perform a similar system-justifying function for people. If conspiracy theories are therefore able to influence people's ambivalent stereotypes held of social groups as proposed, ambivalent stereotypes may indirectly explain the relationship between conspiracy theories and satisfaction with the status quo. Put differently, belief in conspiracy theories may impact ambivalent stereotypes held about a particular social group (e.g., people of the Jewish faith are seen as competent but less warm), which then may help people maintain the view that society is fair and legitimate. In certain scenarios therefore, the system-justifying function of ambivalent stereotypes could be caused in part, by conspiracy theories. Future research could test such a possibility by exposing people to anti-Semitic conspiracy theories before measuring their perceptions of groups and satisfaction with the status quo.

Future research could also further examine the system-justifying function of conspiracy theories by examining people's perceptions of inequality within society. Such a scale as the *Economic System Justification* scale (Jost & Thompson, 2000) or the *Gender-specific System Justification* scale (Jost & Kay, 2005) could be used to provide other more specific measures of system justification. The aim of using these measures would to further test the system-justifying function of conspiracy theories. One consequence of the motive to justify the current social system is that this may result in upholding unfair social systems.

This is because the system-justifying function decreases feelings of moral outrage, guilt and frustration (Jost & Hunyady, 2005; Wakslak, et al., 2007). This therefore means people are unlikely to demand social change because they do not feel as outraged, guilty or frustrated by it. As conspiracy theories have been shown to perform a system-justifying function for people, this may inadvertently decrease emotional distress in people and consequently allow people to uphold unjust systems. By employing other more specific measures of system justification, this possibility can be further explored. Specifically, if conspiracy theories allow people to justify, rather than undermine the current social status quo, people may legitimise economic and gender inequality when exposed to conspiracy theories. By performing such an empirical investigation that includes other specific measures, this will allow us to further examine the system-justifying function of conspiracy theories.

Conspiracy theories may also help meet other important social-psychological needs. For example, it has been suggested that conspiracy theories allow people to maintain a sense of control and meaning (Newheiser, Farias, & Tausch, 2011). With this in mind, conspiracy theories may help people cope with feelings of anxiety. We know that under conditions of social anxiety and uncertainty, people are eager for explanations (cf. Reid, 2010). It is possible that conspiracy theories allow people to meet this need and thus reduce feelings of anxiety and uncertainty (e.g., van Prooijen, 2012). Such a possibility could be examined in future research where a person's degree of anxiety is measured after being exposed to conspiracy theories. If conspiracy theories enable people to deal with anxiety, then levels of anxiety should reduce as a response to being exposed to conspiracy theories. By examining other psychological needs that may be met by conspiracy theories a greater understanding of the function of conspiracy theories will be gained.

Whilst it is important for future research to examine the function of conspiracy theories, scholars also need to consider in future research how to address the potentially detrimental consequences of conspiracy theories (e.g., Jolley & Douglas, 2014a, 2014b, see Chapter 2 and 3). In the current thesis, we found that even when people were presented with anti-conspiracy arguments and a pre-warning detailing people's tendency to rely on retracted information, conspiracy theories may still be resistant to change. It is therefore timely to examine ways to attenuate the impact of conspiracy theories. One potential way, as discussed in Chapter 5, is to strengthen the anti-conspiracy arguments by making the material as equally interesting and controversial as the conspiracy theory account. This material could then be integrated in the original conspiracy account and explicitly argue *against* the conspiracy theory (cf. Allen, 1991, 1993, 1998; Allen, et al., 1990; Johnson & Seifert, 1994, 1999; O'Keefe, 1999). Such a strengthened counter-argument could be tested as a means to combat the impact of conspiracy theories in future research.

Rubincam (2014) suggests that people who subscribe to HIV and AIDS conspiracy theories may be open to learning more about the official explanation of the origins of HIV and AIDS. This may mean therefore, that if anti-conspiracy can be strengthened as suggested, the use of such a tool for intervention may be successful in eliciting behaviour change. Specifically, Rubincam found that African respondents' belief in HIV and AIDS conspiracy theories is based not only on a lack of HIV knowledge, but because they do not understand the scientific explanations for HIV. The participants pointed to ongoing confusion and uncertainty about the origins of the virus and the existence of a cure. Rubincam suggests that this uncertainty and confusion does not necessarily stem from rejection of the science, but more people's scepticism of biomedical assertions. She argues that researchers should therefore first strive to reconnect people's perception and the official scientific claims in order to resolve confusion and increase their trust in biomedical claims.

Moreover, in Rubincam's sample the respondents indicated some flexibility and open-mindedness to new information about HIV. This research suggests that if the use of counter-arguments can be strengthened, people who endorse HIV conspiracy theories may be open to considering this new information.

Further, interventions to deal with conspiracy theories could focus on teaching people new skills, such as 'digital literacy' (Miller & Ryan, 2011). It is known that conspiracy theories are distributed easily across digital channels, and are regularly featured within popular culture, such as in TV programs, films and books (see Byford, 2011). It is also known that exposure to conspiracy theories can change the way people think without them being aware (Douglas & Sutton, 2008), and can potentially lead to disengagement from important elements of the social system (Jolley & Douglas, 2014a, 2014b, see Chapters 2 and 3). It is therefore important for psychologists to deal with conspiracy theories that are distributed on the Internet. One way, as recommended by Miller and Ryan (2011), is to teach traditional critical thinking and online knowledge in schools. This may involve teaching young people that top "hits" in a search engine do not mean they are the most trusted sources. Further, people could be taught to evaluate all evidence in a given topic before making a decision, thus developing their critical thinking abilities. It would be fruitful for future research to therefore empirically test the success of such recommendations.

Alongside presenting people with anti-conspiracy arguments or teaching them new skills, the psychological needs that conspiracy theories satisfy could be addressed. For example, research has shown that conspiracy beliefs allow people to make sense of events (van Prooijen, 2012), avoid feelings of uncertainty (van Prooijen & Jostmann, 2013; Whitson, et al., in press), and address feelings of powerlessness and lack of control (Abalakina-Paap, et al., 1999; Whitson & Galinsky, 2008). By satisfying these important psychology needs by a

substitute route to conspiracy theorising, this may reduce people's beliefs in conspiracy theories. In considering this idea, the empirical work by Whitson and Galinsky (2008) is particularly relevant here. The authors found that participants who were asked to remember a situation when they lacked control were more likely to interpret conspiracy theories in ambiguous stories they read. In a follow up study however, they examined whether a person taking part in a self-affirmation exercise may increase feelings of control, which may subsequently reduce belief in conspiracy theories. In testing this assertion, participants were first asked to complete the recall task that aimed to induce a lack of control. Participants then completed a scale that focused on a value that they perceived to be most important (self-affirmation) or least important (no self-affirmation). Results demonstrated that those who completed the self-affirmation task perceived conspiracy theories to be less likely in the ambiguous stories in comparison to those who were not give an opportunity to self-affirm. Future research could therefore investigate whether such a technique as self-affirmation may help lessen the impact of conspiracy theories on behavioural intention outcomes.

Moreover, throughout this thesis the psychological factor of powerlessness has been associated with disengagement from important social systems (Jolley & Douglas, 2014a, 2014b, see Chapter 2 and 3). Following a similar vein to the work conducted by Whitson and Galinsky (2008), making people feel more powerful could attenuate the impact of exposure to conspiracy theories. For example, power could be manipulated by asking participants to imagine themselves as a managing director in an organisation (e.g., Guinote, Weick, & Cai, 2012) or when either striking a powerful pose or making a powerful hand gesture (Strelan, Weick, & Vasiljevic, 2014). Utilising such a manipulation makes the participant perceive that they are in a position of power. By experimentally inducing a feeling of power, people may be less likely to subscribe to conspiracy theories. Powerlessness can also be a direct response to being exposed to conspiracy theories (Jolley & Douglas, 2014a, 2014b, see

Chapter 2 and 3). Being made to feel powerful after exposure to conspiracy theories may therefore allow people to deal with feeling of powerlessness as a direct response to conspiracy theories. This in turn may attenuate the impact of being exposed to conspiracy theories on behavioural intentions.

In summary, it may be possible for future research to test a combination of the recommendations above. Teaching people critical thinking and online literacy in the first instance may promote more careful evaluation of evidence on the Internet. Next, the factors that make people more susceptible to endorsing conspiracy theory accounts could be addressed, such as increasing people's feeling of control and power. In the case of dealing with specific conspiracy theories, the use of strengthened anti-conspiracy knowledge could also be utilised. The ultimate aim would be to allow policy makers and officials to choose from a bank of tools and potential interventions that they could implement to help reduce the potential impact of conspiracy theories on society.

Concluding remarks

Conspiracy theories can be seen as attempts to undermine or subvert social systems. They challenge authorities on important topics such as climate science and childhood vaccination and offer unofficial explanations. An aim of this thesis was therefore to examine and attempt to address the social psychological consequences of conspiracy theories undermining people's confidence in important social systems. We found that exposure to conspiracy theories reduced people's intentions to engage in the political system, take action against climate change and have a fictional child vaccinated. Ironically however, whilst conspiracy theories may lead to disengagement with important facets of society, they do not necessarily undermine people's overall sense that social systems are fair and appropriate.

Instead, conspiracy theories appear to bolster support for the social status quo because they attribute society's problems to individual perpetrators rather than social systems.

This thesis therefore highlights the potential dangers of conspiracy theories as they may not only stop people from engaging with important aspects of society, but may lead them to justify rather than address limitations of the social system. Conspiracy theories may therefore reduce, rather than increase, the likelihood of social and political change. Further, the research outlined in this thesis also found that once people have been exposed to conspiracy theories, their effects may be resistant to correction. Addressing the potential detrimental consequences of conspiracy theories is therefore an ongoing challenge that future research should aim to address.

Whilst conspiracy theories were once seen to be harmless fun and of little concern (Bratich, 2008; Clarke, 2002), the research outlined in this thesis has highlighted the alarming impact that exposure to conspiracy theories may have on important societal issues. It has also demonstrated that once people have been exposed to conspiracy theories, the effects may be difficult to attenuate. In sum, conspiracy theories appear to prevent people from engaging with important aspects of society but at the same time seem to divert attention from the inherent limitations of society as a whole. Ultimately therefore, this thesis demonstrates the role that conspiracy theorising may play in potentially damaging the social systems that allow us to progress and prosper.

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Appendix A – Manipulation and scales used in Study 1

Pro-conspiracy manipulation excerpt used in Study 1

Please read the short excerpt from a recent Internet article discussing the causes of significant international events.

Should we be suspicious of government operations? For example, did the United States government orchestrate the 9/11 attacks on the Twin Towers? Was the British government involved in the death of Diana, Princess of Wales? Questions such as these are widespread in the media and on the Internet, but should we pay any attention to them?

The answer is YES. There are many good reasons to question official accounts.

To take the example of Princess Diana's death, it is no secret that the British government were discontented with Princess Diana's involvement with Dodi Fayed and also with her increasing involvement in politics. Three days before her death, Princess Diana was reported saying that the government was "hopeless". This made politicians who were already baying for her blood becoming ever more strident with a number of negative comments being made towards her, such as "What was this woman doing meddling in politics, why didn't she stick to old ladies and little children. She is a 'loose cannon'". One must therefore question the claim that her death was simply a tragic accident. The recent inquest into her death also raises significant questions about the official account. Perhaps unsurprisingly therefore, a recent BBC news poll of 1,024 adults showed that an overwhelming majority of 61% believed that the government had some involvement in Princess Diana's death and a further 17% were unsure. Only 22% of respondents believed that her death was an accident.

The evidence to support alternative accounts for major world events is not restricted to the example of Princess Diana's death. To give another example, the British government has been linked to the 7/7 London terrorist attacks. It is said that the government were involved to gain extra support for the war in Iraq. Indeed, there are inconsistencies and basic mistakes in the official accounts and the current ongoing inquests are revealing information that is inconsistent with the official accounts. For example, the inquests recently revealed evidence of significant British intelligence failings that may have contributed to the attacks.

Over the years, many governments have been implicated in major social events. For example, it is argued that the U.S. government was involved in the 9/11 attacks on the Twin Towers. Indeed, there is evidence to support this claim…*[article continues]*

Anti-conspiracy manipulation excerpt used in Study 1

Please read the short excerpt from a recent Internet article discussing the causes of significant international events.

Should we be suspicious of government operations? For example, did the United States government orchestrate the 9/11 attacks on the Twin Towers? Was the British government involved in the death of Diana, Princess of Wales? Questions such as these are widespread in the media and on the Internet, but should we pay any attention to them?

The answer is NO. There are very few reasons to question official accounts.

To take the example of Princess Diana's death, it is no secret that Princess Diana's popularity made some members of the government uneasy. However, there is no evidence at all to suggest that the British government were involved in her death. In fact, most politicians embraced her popularity and her increasing involvement in politics. For example, one prominent politician said that "we should be applauding what she's doing. She is using her popularity and power to do some good in this world". It has also come to light that the government openly welcomed intervention by the Princess in different policies. Her death was simply a tragic accident. The recent inquest into her death also puts to bed any questions about the official account. Perhaps unsurprisingly therefore, a recent BBC news poll of 1,024 adults showed that only 22% believed that the government had any involvement Princess Diana's death and a further 17% were unsure. An overwhelming majority of 61% of respondents believed that her death was an accident.

The lack of evidence to support alternative accounts for major world events is not restricted to the example of Princess Diana's death. To give another example, the British government has been linked to the 7/7 London terrorist attacks. It is said that the government were involved to gain extra support for the war in Iraq. However, there is no evidence to support this account and the current ongoing inquests are revealing only information that is consistent with the official accounts. For example, the inquests recently ruled out any British intelligence involvement in the attacks.

Over the years, many governments have been implicated in major social events. For example, it is argued that the U.S. government was involved in the 9/11 attacks on the Twin Towers. However, there is no support for this claim…*[article continues]*

Governmental conspiracy theory scale used in Study 1

Please read the statements below and rate the likelihood that each is true.

Governments are often involved in the causes of significant international events.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Governments often hide information from the public.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Governments are often involved in international plots and schemes.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Governments are often involved in conspiracies.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Government agencies hold more information on citizens than is legally allowed.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

The British government was involved in the death of Princess Diana.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

The British government was involved in the 7/7 London terrorist attacks.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

The U.S. government was involved in the 9/11 terrorist attacks.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

The U.S. government faked the moon landings.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

The U.S. government was involved in the assassination of John F. Kennedy.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Governments cover up alien landings.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Governments have deliberately spread HIV amongst ethnic minorities.

Extremely unlikely 1 2 3 4 5 6 7 Extremely likely

Mistrust scale used in Study 1

Please rate the extent to which you agree or disagree with each statement.

I have trust in the legal system.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I have trust in parliament.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I have trust in the police.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I have trust in the civil service.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Feelings of powerlessnes scale used in Study 1

Please rate the extent to which you agree or disagree with each statement.

It's foolish to vote as it won't make a difference.

Strongly disagree 1 2 3 4 5 6 Strongly agree

The world is run by the few people in power, and there is not much the little guy can do about it.

Strongly disagree 1 2 3 4 5 6 Strongly agree

The average citizen can have an influence on government decisions.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Feelings of uncertainity scale used in Study 1

Please rate the extent to which you agree or disagree that you can predict each statement.

The government is only run for the benefit of those in power.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Public officials don't care much what people like me think.

Strongly disagree 1 2 3 4 5 6 Strongly agree

A large number of individuals in the government are crooked.

Strongly disagree 1 2 3 4 5 6 Strongly agree

The government only pays attention to what you think around election time.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Feelings of disillusionment scale used in Study 1

Please rate the extent to which you agree or disagree with each statement.

I am very disappointed with the government.

Strongly disagree 1 2 3 4 5 6 Strongly agree

The government is no longer as important to me as it used to be.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I feel tricked, cheated or deceived by the government.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I have given up on the government.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Intentions to engage in the political system used in Study 1.

Please answer the following questions relating to your plans to engage in various activities within the next 12 months

We know that most people don't vote in all general elections. Usually between one-quarter to one-half of those eligible actually come out to vote. Could you state whether you intend to vote in the next general election?

Definitely no 1 2 3 4 5 6 7 Definitely yes

When there is an election taking place in the future do you intend to talk to people about it and try to show them why they should vote for or against one of the parties or candidates?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Do you intend to wear a campaign button, put a sticker on your car, or place a sign in front of your house in the next election?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Within the next 12 months, do you intend to contribute money to a candidate, a political party, or any organization that supports candidates?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Within the next 12 months, do you intend to spend time participating in any community service or volunteer activities? *(By volunteer activity, this means actually working in some way to help others for no pay)*

Definitely no 1 2 3 4 5 6 7 Definitely yes

As you read each of the statements below, can you state if you intend to volunteer for this type of group or organization within the next 12 months?

A political organization.

Definitely no 1 2 3 4 5 6 7 Definitely yes

Candidates running for office.

Definitely no 1 2 3 4 5 6 7 Definitely yes

Appendix B – Manipulation and scales used in Study 2

Pro-conspiracy manipulation excerpt used in Study 2

Please read this short excerpt from a recent Internet article about climate change.

Should we be suspicious of the official story about climate change? Should we consider the proposal that climate scientists adjust their data to show evidence of global warming?

Promoters of ideas such as this raise several questions. For example, are climate scientists' research efforts motivated by the chase for research funds? Are Western environmentalists promoting expensive solar and wind power over cheaper fossil fuels in Africa as a way to hold African countries back from industrialising? Do some climate scientists actually refute official reports from the United Nations concluding that humans are causing climate change?

Questions such as these are widespread in the media and on the Internet, but should we pay any attention to them?

The answer is YES. There are many reasons to doubt scientific claims of the existence of climate change.

For example, funds for research related to global warming are increasing and "it is now one of the best funded areas of science" according to one leading scientist. The same scientist has also observed that funding is rapidly withdrawn if the research findings do not concur with the official account.

Further, the idea of global warming holds little weight. Independent evidence shows that since 1940, global average temperatures fell for four decades. This presents a significant flaw in the official account, because the worldwide economic boom that followed the end of World War II produced more carbon dioxide than ever before, and therefore should have meant a rise in global temperatures — this did not happen.

A large international report supporting the official account presents data from a panel of over 2,500 of the world's leading scientists. However, the report has been labelled a "sham" by a leading professor who argues that the report includes the names of scientists who disagreed with what was written in the report and who have since resigned from the panel. The professor goes on to say that some of the people named in the report are not even scientists.

Perhaps unsurprisingly, therefore, a recent news poll of 1,024 adults showed that an overwhelming majority of 61% believed that climate change is a hoax and a further 17% were unsure. Only 22% of respondents believed the official account of climate change.

In addition, another major reason why people should doubt the official reports that argue that global warming is happening and it is being caused by humans is that….*[article continues]*

Anti-conspiracy manipulation excerpt used in Study 2

Please read this short excerpt from a recent Internet article about climate change.

Should we be suspicious of the official story about climate change? Should we consider the proposal that climate scientists adjust their data to show evidence of global warming?

Promoters of ideas such as this raise several questions. For example, are climate scientists' research efforts motivated by the chase for research funds? Are Western environmentalists promoting expensive solar and wind power over cheaper fossil fuels in Africa as a way to hold African countries back from industrialising? Do some climate scientists actually refute official reports from the United Nations concluding that humans are causing climate change?

Questions such as these are widespread in the media and on the Internet, but should we pay any attention to them?

The answer is NO. There are very few reasons to doubt scientific claims of the existence of climate change.

For example, funds for research related to global warming are increasing and "it is now one of the best funded areas of science" according to one leading scientist. The same scientist has argued that only the best, most impartial research is funded and much knowledge is gained from the research.

Further, evidence of global warming is robust. Independent evidence shows that the last two decades of the 20th century were the hottest in 400 years and possibly for several millennia. Numerous findings such as this present significant support for the official account and there is clear evidence showing that the causes of increased temperatures are increased concentrations of greenhouse gases in the atmosphere.

A large international report supporting the official account presents data from a panel of over 2,500 of the world's leading scientists. The findings in the report have not been disputed by any national or international scientific organisation. All scientists named on the report agreed that in the past 200-plus years, mean global temperatures have been rising, and that human activity is a significant contributing factor.

Perhaps unsurprisingly, therefore, a recent news poll of 1,024 adults showed that an overwhelming majority of 61% believed that climate change is a reality and a further 17% were unsure. Only 22% of respondents disbelieved the official account of climate change.

In addition another major reason why people should not doubt the official reports that argue that global warming is happening and it is being caused by humans is that…*[article continues]*

Belief in climate change conspiracy theories scale used in Study 2

Please rate the extent to which you agree with each of the following statements.

Climate change is a hoax.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Climate change has been made up by climate researchers to chase funding.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

The official United Nations reports about climate are deliberately inaccurate.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Scientists are creating panic about climate change because it is in their interests to do so.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

"Climate change" is a myth promoted by the government as an excuse to raise taxes and curb people's freedom.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

The "science" behind climate change is at least dubious.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

The idea that the world is headed for catastrophic climate change is a fraud.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Feelings of powerlessness scale used in Study 2

Please rate the extent to which you agree with each of the following statements.

I feel that climate change is too big for my actions to have an impact.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I feel that my actions will not affect the outcome of climate change.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I feel that my contribution is just a drop in the ocean and so is insignificant.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Feelings of uncertainty scale used in Study 2

Please rate the extent to which you agree with each of the following statements.

I feel uncertain about the best options to contribute to reducing climate change.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I feel uncertain as to whether climate change is a significant problem.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Feelings of disillusionment scale used in Study 2

Please rate the extent to which you agree with each of the following statements.

I am very disappointed with climate science researchers

Strongly disagree 1 2 3 4 5 6 Strongly agree

Climate science researchers are no longer as important to me as they used to be.

Strongly disagree 1 2 3 4 5 6 Strongly agree

I feel tricked, cheated or deceived by climate science researchers

Strongly disagree 1 2 3 4 5 6 Strongly agree

I have given up on climate science researchers.

Strongly disagree 1 2 3 4 5 6 Strongly agree

Mistrust scale used in Study 2

Please rate the extent to which you trust or distrust the following groups to tell you the truth about climate change.

Corporations

Strongly distrust 1 2 3 4 5 6 Strongly trust

National government

Strongly distrust 1 2 3 4 5 6 Strongly trust

Scientists and doctors

Strongly distrust 1 2 3 4 5 6 Strongly trust

Religious organizations

Strongly distrust 1 2 3 4 5 6 Strongly trust

Family and friends

Strongly distrust 1 2 3 4 5 6 Strongly trust

Environmental organizations

Strongly distrust 1 2 3 4 5 6 Strongly trust

Media

Strongly distrust 1 2 3 4 5 6 Strongly trust

Intention to engage in carbon friendly behaviours used in Study 2

Next, please rate the extent to which you intend to take part in each of the following behaviors in the next 12 months.

Do you intend in the next 12 months to use energy-efficiency as a selection criterion when buying things such as light bulbs, household appliances, motor vehicles?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Do you intend in the next 12 months to explore purchasing energy from an alternative source (wind, solar, geothermal, biomass)?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Do you intend in the next 12 months to walk or cycle more than driving or using public transport?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Do you intend in the next 12 months to plant a tree?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Do you intend in the next 12 months to join, donate money to, or volunteer with an organization working on issues related to global warming?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Do you intend in the next 12 months to make your views on global warming clear to politicians?

Definitely no 1 2 3 4 5 6 7 Definitely yes

Appendix C: Scales used in Study 3 (and 4, 9 and 10)

Belief in anti-vaccine conspiracy theories scale used in Study 3

Please rate the extent to which you agree with each of the following statements.

Immunisations allow governments to track and control people.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Vaccines are harmful, and this fact is covered up.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Tiny devices are placed in in vaccines to track people.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Pharmaceutical companies, scientists and academics work together to cover up the dangers of vaccines.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Vaccines are not tampered with.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

The government is trying to cover up the link between vaccines and autism.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Tiny devices are implanted in vaccines for use in mind control experiments.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

The flu vaccine allows the government to monitor the elderly through the implantation of tiny tracking devices.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Pharmaceutical companies, scientists and academics cover up the fact that child immunisation is harmful.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Fictional vaccination scenario and intention to vaccinate used in Studies 3, 4, 9 and 10

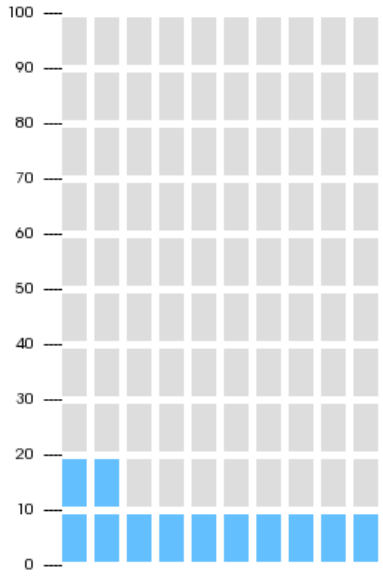
Please now imagine that you are the parent of an infant (Sophie, 8 months).

Your doctor has provided you with the following information regarding the disease *dysomeria* and mentioned that there is a vaccination available.

Dysomeria: The DS-virus is a contagion spread by droplet infection. Early symptoms are fever and vomiting. Meningitis and impairment of motor and sensory functions are also common. In some cases, the DS-virus leads to permanent paralysis.

There is a vaccination against *dysomeria*. This vaccination effectively protects against infection and is highly recommended by the Centers for Disease Control and Prevention (CDC) for people of all ages.

Adverse events such as fever, rash, restlessness and dizziness have been reported following 12% of all vaccinations (indicated by the darker rectangles in the graph below). In 88% of all cases, no side effects occurred (gray rectangles).



If you had the opportunity to vaccinate your child (Sophie, 8 months) against ***dysomeria*** **next week, what would you decide?**

Definitely not vaccinate	1	2	3	4	5	6	7	Definitely vaccinate

Appendix D: Items and factor loadings of the four mediator variables in Study 3 and 4 (and 9 and 10)

Items	1 Perceived dangers*	2 Powerlessness	3 Disillusionment	4 Trust in authorities
I feel uncertain about the potential side-effects of immunisations.	.84			
I feel uncertain about the safety of immunisations.	.83			
A large number of early vaccinations expose an infant's immune system to avoidable risks.	.74			
Multiple vaccines overwhelm the infant's immune system.	.74			
The side-effects of vaccinations are unforeseeable.	.71			
Vaccines lead to allergies.	.67			
I feel uncertain about the motives of those involved in immunisations (governments, pharmaceutical companies etc.).	.61			
Vaccinations cause the illnesses they are intended to protect against.	.61			
I feel that immunisation concerns are too big for my actions to have an impact.		.84		
I feel that my actions will not stop the negative outcomes of immunisations.		.84		
When it comes to immunisations, I feel powerless.		.83		

I have given up on those who are involved in immunisations (e.g., the government, pharmaceutical companies, etc.).	.85	
Those who are involved in immunisations (e.g., the government, pharmaceutical companies, etc.) are no longer important to me as they used to be.	.83	
I feel tricked, cheated or deceived by those who are involved in immunisations (e.g., the government, pharmaceutical companies, etc.)	.77	
I am very disappointed with those who are involved in immunisations (e.g., the government, pharmaceutical companies, etc.)	.71	
Corporations		.91
National government		.88

Notes. *Perceived dangers of vaccines scale was used in Studies 3, 4, 9 and 10.

Appendix E – Manipulation and scales used in Study 4 (and 9 and 10)

Pro-conspiracy manipulation excerpt used in Studies 4, 9 and 10

Please read this short excerpt from a recent Internet article about vaccines. We will ask you some questions about the excerpt later in the study, so please read it carefully.

Should we be suspicious of vaccines? Should we consider the proposal that those in power, whether governments or pharmaceutical companies, hide crucial information about vaccines from the public?

Several specific questions have been raised about vaccines. For example, are people within the industry faking data on vaccine efficacy? Do vaccines hurt more than they help? Is the industry deceiving people purely to make a profit?

Questions such as these are widespread in the media and on the Internet, but should we pay any attention to them?

The answer is YES. There are many reasons to think twice about vaccines.

For example, people within the vaccine industry are guilty of misrepresenting data on the efficacy of vaccines. Evidence suggests that diseases such as smallpox and paralytic polio have not been eradicated by vaccines. They have simple been renamed and these diseases still exist among the population.

Further, there is a significant amount of evidence that vaccines can hurt more than they help. For example, by the year 2002, tens of thousands of reactions to vaccines, including deaths, were reported. One must magnify these figures tenfold, because it is estimated that 90% of doctors do not report incidents.

Perhaps unsurprisingly, therefore, a recent news poll of 1,024 adults showed that an overwhelming majority of 61% believed that vaccines were harmful and a further 17% were unsure. Only 22% of respondents believed the official account that vaccines are safe.

Hiding information about vaccines is purely motivated by profit. The increase in government recommended vaccines for children has more than doubled since 1985, making pharmaceutical companies very wealthy. The profit margins made by pharmaceutical companies are extremely high. According to market research, vaccine sales will more than double this year, from $19 billion in 2012 to $39 billion in 2013. This is nearly five times the $8 billion in vaccine sales in 2004.

There are other reasons to doubt the efficacy and safety of vaccines… [*article continues]*

Anti-conspiracy manipulation excerpt used in Studies 4, 9 and 10

Please read this short excerpt from a recent Internet article about vaccines. We will ask you some questions about the excerpt later in the study, so please read it carefully.

Should we be suspicious of vaccines? Should we consider the proposal that those in power, whether governments or pharmaceutical companies, hide crucial information about vaccines from the public?

Several specific questions have been raised about vaccines. For example, are people within the industry faking data on vaccine efficacy? Do vaccines hurt more than they help? Is the industry deceiving people purely to make a profit?

Questions such as these are widespread in the media and on the Internet, but should we pay any attention to them?

The answer is NO. There is no reason to think twice about vaccines.

For example, there is convincing and accurate evidence for the success of vaccines. Diseases such as smallpox and paralytic polio have been completely eradicated by vaccines. These once fatal diseases no longer exist among the population.

Further, there is little evidence to suggest that vaccines are harmful. The side effects are minimal and whilst millions of people have been immunized over the years, less than .005% have ever had an adverse reaction to a vaccine.

Perhaps unsurprisingly, therefore, a recent news poll of 1,024 adults showed that an overwhelming majority of 61% believed that vaccines are safe and only a further 17% were unsure. Only 22% of respondents believed that vaccines were harmful and unsafe.

The financial benefits of preventing illnesses far outweigh the profits made from vaccines by pharmaceutical companies. For example, in 2001, routine childhood immunisation in the USA was estimated to save over $40 billion per birth-year cohort in overall social costs including $10 billion in direct health costs. The government recommends vaccines for children to improve public health and save money, not to make a profit.

There are other reasons to doubt the efficacy and safety of vaccines… [*article continues]*

Belief in anti-vaccine conspiracy theories scale used in Studies 4, 9, and 10

Please rate the extent to which you agree with each of the following statements.

Many diseases, said to have been eradicated by vaccines, are still around today.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Misrepresentation of the efficacy of vaccines is motivated by profit.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Vaccines are harmful, and this fact is covered up.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Vaccine safety data is often fabricated.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Immunising children is harmful and this fact is covered up.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

People are deceived about vaccine safety.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Pharmaceutical companies cover up the dangers of vaccines.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

People are deceived about vaccine efficacy.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Vaccines are not harmful.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Vaccine efficacy data is often fabricated.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

People are deceived about vaccine safety.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Appendix F - Items and factor loadings of the two conspiracy theory scales used in Studies 5 and 6

Items	**1 General notions**	**2 Real-world conspiracy**
A lot of important information is deliberately concealed from the public out of self-interest.	.93	
The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret.	.84	
Certain significant events have been the result of the activity of a small group who secretly manipulate world events.	.80	
A small, secret group of people is responsible for making all major world decisions, such as going to war.	.74	
The government uses people as patsies to hide its involvement in criminal activity.	.74	
New and advanced technology which would harm current industry is being suppressed.	.72	
The spread of certain viruses and/or diseases is the result of the deliberate, concealed efforts of some organisation.	.72	
The power held by heads of state is second to that of small unknown groups who really control world politics.	.71	
The government permits or perpetrates acts of terrorism on its own soil, disguising its involvement.	.68	
Groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public.	.67	
Some UFO sightings and rumours are planned or staged in order to distract the public from real alien contact.	.66	
Secret organisations communicate with extraterrestrials, but keep this fact from the public.	.64	
Evidence of alien contact is being concealed from the public.	.61	
Experiments involving new drugs or technologies are routinely carried out on the public without their knowledge or consent.	.60	
Technology with mind-control capacities is used on people without their knowledge.	.50	

"Climate change" is a myth promoted by the government as an excuse to raise taxes and curb people's freedom.		.85
The "science" behind climate change is at least dubious.		.74
Scientists are creating panic about climate change because it is in their interests to do so.		.73
Business enemies of Dodi Fayed and his father Mohammed Al Fayed assassinated Dodi, with the death of Princess Diana a cover up for their operation.		.73
A government exercise was behind the suicide at Jonestown.		.73
The attack on the Twin Towers was not a terrorist action but a governmental conspiracy.		.73
The idea that the world is headed for catastrophic climate change is a fraud.		.72
One or more rogue 'cells' in the British Secret Service constructed and carried out a plot to kill Princess Diana.		.71
There was an official campaign by MI6 to assassinate Princess Diana, sanctioned by elements of the establishment.		.70
The American moon landings were faked.		.70
Princess Diana had to be killed because the British government could not accept that the mother of the future king was involved with a Muslim Arab.		.68
Princess Diana's death was an accident.		.59
Princess Diana faked her own death so she and Dodi could retreat into isolation.		.56
The AIDS virus was created in a laboratory.		.56
The European Union is trying to take control of the United Kingdom.		.48
Governments are suppressing evidence of the existence of aliens.	.62	.47
There was no conspiracy involved in the assassination of John. F. Kennedy.	.46	.30

Appendix G – Scales used in Studies 5, 7 and 8

Values scale used in Study 5

Please now rate how important each value is for you as a guiding principle in YOUR life.

Try to distinguish as much as possible between the values by using all the ratings. You will, of course, need to use ratings more than once.

HOWEVER, TRY TO USE THE RATING 'OF SUPREME IMPORTANCE' NO MORE THAN TWICE.

Before you begin reading, please read the values in each list. Next please choose the one that is most important to **you** by making a note of it at the beginning of each of the two lists. Then rate its importance (usually 6 or 7). Next, choose the value least important to you in each of the two lits and make a note of this at the beginning of each of the two lists Then rate it (usually as 0 or 1) according to its importance. Afterwards, please rate the rest of the values in the two lists.

VALUES LIST 1

The most important value in list 1: _____ Rating: ____

The least important value in list 1: _____ Rating: ____

EQUALITY (equal opportunity for all)

-1 0 1 2 3 4 5 6 7
Opposed to my principles — Not important — Of supreme importance

SOCIAL POWER (control over others, dominance)

-1 0 1 2 3 4 5 6 7
Opposed to my principles — Not important — Of supreme importance

PLEASURE (gratification of desires)

-1 0 1 2 3 4 5 6 7
Opposed to my principles — Not important — Of supreme importance

FREEDOM (freedom of action and thought)

-1 0 1 2 3 4 5 6 7
Opposed to my principles — Not important — Of supreme importance

SOCIAL ORDER (stability of society)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

AN EXCITING LIFE (stimulating experiences)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

POLITENESS (courtesy, good manners)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

WEALTH (material possessions, money)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

NATIONAL SECURITY (protection of my nation from enemies)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

RETURNING FAVORS (avoiding debt)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

CREATIVITY (uniqueness, imagination)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

A WORLD AT PEACE (without war and conflict)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

RESPECT FOR TRADITION (preservation of time-honored customs)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

SELF-DISCIPLINE (self-restraint, resistance to temptation)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

FAMILY SECURITY (safety for loved ones)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

UNITY WITH NATURE (fitting into nature)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

A VARIED LIFE (filled with challenge, novelty and change)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

WISDOM (a mature understanding of life)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

AUTHORITY (the right to lead or command)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

A WORLD OF BEAUTY (beauty of nature and the arts)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

SOCIAL JUSTICE (correcting injustice, care for the weak)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

VALUES LIST 2

The most important value in list 2: _____ Rating: ____

The least important value in list 2: _____ Rating _____

INDEPENDENT (self-reliant, self-sufficient)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

MODERATE (avoiding extremes of feeling & action)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

LOYAL (faithful to my friends, group)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

AMBITIOUS (hard-working, aspiring)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

BROADMINDED (tolerant of different ideas and beliefs)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

HUMBLE (modest, self-effacing)

-1 0 1 2 3 4 5 6 7
Opposed to my principles Not important Of supreme importance

DARING (seeking adventure, risk)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

PROTECTING THE ENVIRONMENT (preserving nature)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

INFLUENTIAL (having an impact on people and events)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

HONORING PARENTS AND ELDERS (showing respect)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

CHOOSING MY OWN GOALS (selecting own purposes)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

CAPABLE (competent, effective, efficient)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

ACCEPTING MY PORTION IN LIFE (accepting life's circumstances)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

HONEST (genuine, sincere)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

OBEDIENT (dutiful, meeting obligations)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

HELPFUL (working for the welfare of others)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

ENJOYING LIFE (enjoying food, sex, leisure, etc.)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

DEVOUT (holding to religious faith & belief)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

RESPONSIBLE (dependable, reliable)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

CURIOUS (interested in everything, exploring)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

FORGIVING (willing to pardon others)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

SUCCESSFUL (achieving goals)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

CLEAN (neat, tidy)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

SELF-INDULGENT (doing pleasant things)

-1	0	1	2	3	4	5	6	7
Opposed to my principles	Not important							Of supreme importance

NFCC scale used in Study 5

Please rate the extent to which you agree with each of the following statements.

I think that having clear rules and order at work is essential for success.

Strongly disagree 1 2 3 4 5 Strongly agree

Even after I've made up my mind about something, I am always eager to consider a different opinion.

Strongly disagree 1 2 3 4 5 Strongly agree

I don't like situations that are uncertain.

Strongly disagree 1 2 3 4 5 Strongly agree

I dislike questions which could be answered in many different ways.

Strongly disagree 1 2 3 4 5 Strongly agree

I like to have friends who are unpredictable.

Strongly disagree 1 2 3 4 5 Strongly agree

I find that a well ordered life with regular hours suits my temperament.

Strongly disagree 1 2 3 4 5 Strongly agree

When dining out, I like to go to places where I have been before so that I know what to expect.

Strongly disagree 1 2 3 4 5 Strongly agree

I feel uncomfortable when I don't understand the reason why an event occurred in my life.

Strongly disagree 1 2 3 4 5 Strongly agree

I feel irritated when one person disagrees with what everyone else in a group believes.

Strongly disagree 1 2 3 4 5 Strongly agree

I hate to change my plans at the last minute.

Strongly disagree 1 2 3 4 5 Strongly agree

I don't like to go into a situation without knowing what I can expect from it.

Strongly disagree 1 2 3 4 5 Strongly agree

When I have made a decision, I feel relieved.

Strongly disagree 1 2 3 4 5 Strongly agree

When I am confronted with a problem, I'm dying to reach a solution very quickly.

Strongly disagree 1 2 3 4 5 Strongly agree

When I am confused about an important issue, I feel very upset.

Strongly disagree 1 2 3 4 5 Strongly agree

I would quickly become impatient and irritated if I would not find a solution to a problem immediately.

Strongly disagree 1 2 3 4 5 Strongly agree

I would rather make a decision quickly than sleep over it.

Strongly disagree 1 2 3 4 5 Strongly agree

Even if I get a lot of time to make a decision, I still feel compelled to decide quickly.

Strongly disagree 1 2 3 4 5 Strongly agree

I think it is fun to change my plans at the last moment.

Strongly disagree 1 2 3 4 5 Strongly agree

I enjoy the uncertainty of going into a new situation without knowing what might happen.

Strongly disagree 1 2 3 4 5 Strongly agree

My personal space is usually messy and disorganized.

Strongly disagree 1 2 3 4 5 Strongly agree

In most social conflicts, I can easily see which side is right and which is wrong.

Strongly disagree 1 2 3 4 5 Strongly agree

I almost always feel hurried to reach a decision, even when there is no reason to do so.

Strongly disagree 1 2 3 4 5 Strongly agree

I believe that orderliness and organization are among the most important characteristics of a good student.

Strongly disagree 1 2 3 4 5 Strongly agree

When considering most conflict situations, I can usually see how both sides could be right.

Strongly disagree 1 2 3 4 5 Strongly agree

I don't like to be with people who are capable of unexpected actions.

Strongly disagree 1 2 3 4 5 Strongly agree

I prefer to socialize with familiar friends because I know what to expect from them.

Strongly disagree 1 2 3 4 5 Strongly agree

I think that I would learn best in a class that lacks clearly stated objectives and requirements.

Strongly disagree 1 2 3 4 5 Strongly agree

When thinking about a problem, I consider as many different opinions on the issue as possible.

Strongly disagree 1 2 3 4 5 Strongly agree

I like to know what people are thinking all the time.

Strongly disagree 1 2 3 4 5 Strongly agree

I dislike it when a person's statement could mean many different things.

Strongly disagree 1 2 3 4 5 Strongly agree

It's annoying to listen to someone who cannot seem to make up his or her mind.

Strongly disagree 1 2 3 4 5 Strongly agree

I find that establishing a consistent routine enables me to enjoy life more.

Strongly disagree 1 2 3 4 5 Strongly agree

I enjoy having a clear and structured mode of life.

Strongly disagree 1 2 3 4 5 Strongly agree

I prefer interacting with people whose opinions are very different from my own.

Strongly disagree 1 2 3 4 5 Strongly agree

I like to have a place for everything and everything in its place.

Strongly disagree 1 2 3 4 5 Strongly agree

I feel uncomfortable when someone's meaning or intention is unclear to me.

Strongly disagree 1 2 3 4 5 Strongly agree

I always see many possible solutions to problems I face.

Strongly disagree 1 2 3 4 5 Strongly agree

I'd rather know bad news than stay in a state of uncertainty.

Strongly disagree 1 2 3 4 5 Strongly agree

I do not usually consult many different opinions before forming my own view.

Strongly disagree	1	2	3	4	5	Strongly agree

I dislike unpredictable situations.

Strongly disagree	1	2	3	4	5	Strongly agree

I dislike the routine aspects of my work (studies).

Strongly disagree	1	2	3	4	5	Strongly agree

Satisfaction with the status quo used scale in Study 5, 7 and 8.

Please rate the extent to which you agree with each of the following statements.

In general, I find society to be fair.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

In general, the United Kingdom political system operates as it should.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

British society needs to be radically restructured.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

The United Kingdom is the best country in the world to live in.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

Most policies serve the greater good.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

Everyone has a fair shot at wealth and happiness.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

Our society is getting worse every year.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

Society is set up so that people usually get what they deserve.

Strongly disagree	1	2	3	4	5	6	7	8	9	Strongly agree

Appendix H: Intercorrelations and descriptive statistics for Study 5

Intercorrelations and descriptive statistics between conspiracy beliefs, system justification and NFCC sub-scales for Study 5

	M (*SD*)	1	2	3	4	5	6	7	8
(1) Real world conspiracy belief	3.00 (*1.09*)	-	.82*	.23*	-.03	-.17¥	-.16	.20*	.16
(2) General notions of conspiracy	2.56 (*0.83*)		-	.32**	.01	-.17¥	-.03	.19¥	-.18¥
(3) System justification	5.43 (*1.12*)			-	-.20*	-.09	.01	-.31*	.06
(4) Order and structure	3.08 (*0.40*)				-	.33**	.47***	.52***	.45***
(5) Preference for predictability	3.13 (*0.31*)					-	.44***	.28**	.26*
(6) Discomfort with ambiguity	3.35 (0.46)						-	.32**	.46***
(7) Closed-mindedness	3.00 (0.*46*)							-	.58***
(8) Decisiveness	3.34 (*0.65*)								-

Notes. ¥ < *.10. * p< .05. **p* <. 01. ****p* <. 001.

Intercorrelations and descriptive statistics for conspiracy beliefs, system justification and values for Study 5

	M (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Real world conspiracy belief	3.00 (*1.09*)	-	.82***	.23*	.07	-.11	-.05	-.13	-.36***	.02	.20*	.23*	.25*	.02
(2) General notion of conspiracy	2.56 (*0.83*)		-	.32**	-.01	-.08	-.11	-.12	-.28**	.19¥	.06	.12	.09	.04
(3)System justification	5.43 (*1.12*)			-	-.34**	-.09	-.02	.-.07	.03	.31*	.20*	-.11	-.05	-.16
(4) Power	3.79 (*1.34*)				-	.08	.22*	.01	-.38***	-.51***	-.08	.16	.01	.06
(5) Achievement	5.60 (*0.88*)					-	.08	-.09	.10	-.14	-.18¥	-.17	-.08	.05
(6) Hedonism	5.36 (*0.90*)						-	.10	-.17¥	-.18¥	-.04	-.09	-.09	-.15
(7) Stimulation	5.19 (*1.17*)							-	.01	.02	-.14	-.28*	-.32***	-.19¥
(8) Self-direction	5.90 (0.*85*)								-	.11	-.15	-.27*	-.33***	-.05
(9) Universalism	5.57 (0.*96*)									-	-.15	-.40***	-.41***	-.29
(10) Benevolence	5.40 (0.*88*)										-	.33***	.30*	-.27*
(11) Tradition	4.97 (0.*95*)											-	.43***	-.16
(12) Conformity	5.20 (*1.06*)												-	-.12
(13) Security	5.61 (*0.98*)													-

Notes. ¥ *< .10. * p< .05. **p <*. 01. ***p <*. 001.

Appendix I: Intercorrelations and descriptive statistics for conspiracy beliefs and values combined across conditions for Study 6

	M (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(1) Real world conspiracy belief	3.55 (*1.27*)	-	.85	.41***	.36***	-.01	.05	-.01	.04	.16¥	.23*	.23*	.03	.10	.12
(2) General notion of conspiracy	3.05 (*0.98*)		-	.36***	.36***	-.01	.05	.01	-.03	.07	.15	.15	-.01	.11	.06
(3) Predictability	3.24 (*0.58*)			-	.71***	-.08	-.08	-.09	-.03	.02	.08	.01	-.01	-.01	-.07
(4) Closed-mindedness	3.34 (*0.60*)				-	-.06	-.08	-.09	-.08	-.04	.02	-.05	-.17¥	-.06	-.07
(5) Power	3.26 (*1.21*)					-	.66***	.52***	.37***	.26**	.16 ¥	.14	.22*	.59***	.41***
(6) Achievement	2.90 (*1.12*)						-	.60***	.54***	.40***	.36***	.36***	.28*	.43***	.66***
(7) Hedonism	3.05 (*1.16*)							-	.56***	.43***	.36***	.35***	.31***	.39***	.44***
(8) Stimulation	2.89 (*1.15*)								-	.63***	.52***	.39***	.14	.21*	.31***
(9) Self-direction	2.53 (*1.12*)									-	.74***	.56***	.32***	.24*	.49***
(10) Universalism	2.44 (*1.09*)										-	.71***	.40***	.28*	.60***
(11) Benevolence	2.35 (*1.21*)											-	.57***	.34***	.63***
(12) Tradition	2.80 (*1.04*)												-	.60***	.62***
(13) Conformity	3.16 (*1.24*)													-	.51***
(14) Security	2.63 (*1.24*)														-

Notes. ¥ < .10. * *p*< .05. **p <. 01. ***p <. 001.

Appendix J – Manipulation used in Studies 7 and 8

Pro-conspiracy manipulation excerpt used in Studies 7 and 8.

Please read the following excerpt, which has been taken from a British newspaper. You will be asked to answer some questions about this excerpt shortly.

Many believe that Princess Diana's death was not an accident. Additional information has been discussed that casts doubt on the conclusion that Diana's death was accidental. Some of this information is presented below.

Concern has been raised about the rapid disposal of the bodies of Diana and Dodi. Diana had no post mortem prior to burial in Althorp. Victims of sudden death require a post mortem by law in the UK.

The missing white Fiat Uno is often mentioned. With such a large-scale investigation by French authorities could only secret agents have evaded the police's net around Paris? We know the car hit the Mercedes used by Diana and Dodi, thanks to traceable paint marks on the Mercedes. Witnesses refer to the car lurching around the road at varying speeds as both it and the Mercedes entered the tunnel.

The misinformation surrounding Henri Paul (the Mercedes driver) is enormous. First he was said to be driving at up to 120mph, but recent reports by professional crash investigators suggest 60mph and even less on impact. Initial reports claim that Henri Paul was drunk. It is accepted that he had two drinks at the Ritz, but no other evidence has emerged to support this claim, beyond questionable results from a blood test from his corpse. The results are questionable because it is common for the alcohol levels to rise in bodies after death, regardless of consumption. The test also showed a very high level of carbon monoxide (20%) in his blood. Experts say that this would have incapacitated him before he set off on his fatal journey, and yet the hotel video evidence shows him walking around and talking normally. It is also thought that he may have been an alcoholic. However, as a pilot he passed a rigorous health check two days before the accident and his liver showed no sign of damage on the post mortem. Then there is the question of the multiple bank accounts Paul held, with balances showing income far in excess of his £20,000 salary as acting head of security at the Ritz. Some friends have suggested that he was a long term 'sleeper' agent for a secret service agency, almost certainly French intelligence.

Trevor Rees Jones (Fayed's bodyguard) was the only survivor. One time member of Her Majesty's armed forces, rumours suggest that he may have been a 'sleeper' agent for MI5 or MI6, particularly as the establishment were keen to keep tabs on Mohammed Al Fayed. It is interesting that he was the only person in the car to wear a seat belt.

Immediately after the crash news was broadcast, witnesses appeared on US TV saying that they heard an explosion or bang before they heard the car crash. Was this a gunshot, or a bomb?

Other witnesses describe an extremely bright white light, much stronger than a photographer's flashbulb, illuminating the tunnel before the crash sound. Powerful, anti personnel flash-guns are available to private citizens for as little as £250. The security forces

have access to much stronger tools, all of which are capable of blinding a victim for several minutes- easily enough to cause a fatal crash.

Paparazzi witnesses, who were initially blamed for the crash, agree that the bikes were not close enough to the Mercedes in the tunnel to have actually interfered with its progress.

Just 6 hours before she died, Diana let slip to Daily Mail reporter Richard Kray that she was about to withdraw completely from public life.

Appendix K – Scale used in Study 8

Attribution of causes of problems that are facing society today used in Study 8

Listed below are some common problems that are facing society today. Please indicate the extent to which you think these problems are due to the actions of individuals or small groups in society OR fundamental flaws inherent in UK society such as flawed laws, values, norms, institutions, or its political and economic system.

Pollution

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Poverty

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Unemployment

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Inequality

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Crime

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Discrimination

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Overpopulation

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society

Conflict and war

1 2 3 4 5 6 7 8 9
Individuals and small groups Flaws in UK society