Catastrophizing life's problems:

On the relationship between attachment anxiety and belief in conspiracy theories

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To my late Nan and Grandad, this is for you.

Declaration of Authorship

The research reported in this thesis is my own, except where indicated, and has not been submitted for a higher degree at any other institution.

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Abstract

Research has shown that attachment anxiety predicts higher agreement with conspiracy theories. In this research, we aimed to examine this relationship further. Specifically, we investigated the importance of catastrophizing—viewing situations as considerably worse than they are—in explaining the relationship between attachment anxiety and belief in conspiracy theories. Chapter 1 provides an overview of the literature on the psychology of conspiracy theories and adult attachment theory. Then, across six studies (Chapter 2), we found that catastrophizing (regarding pain, stress, and social situations) explained the relationship between attachment anxiety and conspiracy beliefs. In two further studies (Chapter 3), we found that attachment anxiety and conspiracy beliefs were associated with communal orientation (the desire that one's needs should be met by others versus the desire to meet the needs of others), which was moderated by catastrophizing, across two studies. Finally, in two studies (Chapter 4), we found attachment anxiety to be partially associated with COVID-19 powerlessness and COVID-19 conspiracy beliefs, whereas attachment avoidance was shown to be consistently associated with them. Implications and recommendations for future research are discussed (Chapter 5), including the need for more experimental or longitudinal designs, and interventions that reduce catastrophic thinking with the aim of reducing the appeal of conspiracy theories.

Keywords: conspiracy beliefs, existential motives, attachment anxiety, catastrophizing

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Chapter 1: Conspiracy Beliefs and Attachment

Abstract

This chapter reviews research on the consequences of conspiracy beliefs, before outlining a recent theoretical framework which suggests that people are motivated to believe in conspiracy theories as a way to satisfy important psychological needs (e.g., the existential need to feel secure). The chapter then outlines theory and research on central tenets of attachment theory, including the dimensions of attachment anxiety and avoidance, and the regulatory strategies associated with these dimensions. Bringing these areas of research together, this chapter outlines how the attachment-anxious hyperactivating regulatory strategy of catastrophizing might explain the link between attachment anxiety and belief in conspiracy theories.

Conspiracy Theories

Conspiracy theories can be defined as plots by two or more typically powerful actors, which attempt to explain the causes of significant social and political events (Douglas et al., 2019). For example, popular conspiracy theories purport that the 9/11 terrorist attack on the Twin Towers was orchestrated by the U.S. government, the moon landings and data on climate change are a hoax, and vaccines cause autism (Douglas et al., 2015; Lewandowsky et al., 2013; Wood & Douglas, 2013). More recently, the COVID-19 pandemic has brought a flurry of new conspiracy theories to the front of public discourse, such that the virus is hoax or a bioweapon, and that it is a means for governments to exert total control over their populations (Douglas, 2021). These types of conspiracy theories can be believed by sizable proportions of populations (see Oliver & Wood, 2014). Social and political psychologists have therefore sought to answer whether conspiracy theories are harmful or not.

Belief in Conspiracy Theories: Harmless or Harmful?

Some scholars have argued that conspiracy theories have positive consequences, such that they may result in greater government transparency (Clarke, 2002; Swami & Coles, 2010) and ignite and spur on political debate (Miller, 2002). This suggests that conspiracy theories may be a positive force for democratic principles. Notwithstanding these possible positive effects, an overwhelming body of research suggests that conspiracy beliefs do more harm than good (for a review, see Douglas, 2021). Indeed, studies have consistently shown that belief in, or exposure to, different types of conspiracy theories are accompanied with a host of negative consequences. For example—prior to the COVID-19 pandemic—when people were exposed to anti-vaccine conspiracy theories they reported decreased vaccination intentions, compared to a control group (Jolley & Douglas, 2014a). Similar results were found for COVID-19 vaccine intentions among people who believed in COVID-19 vaccine conspiracy theories (Bertin et al., 2020). Similarly, belief in COVID-19 conspiracy theories

was found to be associated with decreased intentions to engage in behaviours that mitigate the spread of the virus (Biddlestone et al., 2020), as well as increased support for violence (Jolley & Patterson, 2020). Further, people exposed to climate change conspiracy theories were found to report decreased intentions to reduce their carbon footprint (Jolley & Douglas, 2014b; van der Linden, 2015). Furthermore, exposure to political conspiracy theories was found to negatively affect intentions to engage in politics (Jolley et al., 2014b). Finally, belief in organizational conspiracy theories have also been shown to have negative consequences, such as higher turnover intentions (Douglas & Leite, 2016). Taken together, these studies show that conspiracy theories tend to have negative consequences relative to their content, and therefore pose a risk to individuals and society at large.

Given these consequences, it is crucial to understand the psychological underpinnings of conspiracy beliefs, in order to better inform possible future interventions. The next section therefore discusses theoretical and empirical research which suggests that people may be motivated to believe in conspiracy theories in an attempt to address important psychological needs.

Belief in Conspiracy Theories is Motivated: Misguided Attempts to Satisfy Psychological Needs

Twenty years have passed since the 9/11 Twin Towers terrorist attack in United States, and conspiracy theories surrounding this tragic event have continued to persist (BBC, 2021). Similarly, the COVID-19 pandemic has also brought with it a new wave of conspiracy theories which do not appear to be abating (Douglas, 2021). In fact, a recent poll found that up to one in three American citizens believe in a conspiracy theory (IPSOS, 2020). With this in mind—and given the worrying consequences of conspiracy theories—it is no wonder that social and political psychologists have increased their research efforts to understand why conspiracy theories appeal to so many people. Indeed, as will be discussed, a culmination of

20 years of research into the psychology of conspiracy theories has helped scholars to come to a better theoretical understanding of why some people are drawn to conspiracy theories.

Piecing together decades of research, Douglas and colleagues' (2017) review of the literature arrived at the conclusion that some people may be drawn to conspiracy theories as an (often unconscious and misguided) attempt to satisfy important psychological needs. Specifically—drawing on past theorising on ideological beliefs (see Jost et al., 2008)—it was argued that people may be motivated to believe in conspiracy theories in an attempt to satisfy the following needs: (1) social—the need to feel positive about one's self and one's social groups; (2) epistemic—the need for a consistent and accurate understanding of the world; and (3) existential—the need to feel secure and in control of one's life. Inspired by, and in support of, this framework, other researchers have further elaborated on this motivated, needs-based perspective of conspiracy beliefs (see Biddlestone et al., 2021; van Prooijen, 2020).

Regarding the social motives associated with conspiracy beliefs, Biddlestone and colleagues (2021) provided further nuance by differentiating between individual, relational, and collective self-concepts. For instance, motives associated with the individual self are said to be linked to higher conspiracy beliefs as a means to deflect blame from personal shortcomings and bolster the self-image. For example, research has shown that narcissism (Cichocka et al., 2016) and need for uniqueness (Imhoff & Lamberty, 2017; Lantian et al., 2017) are associated with higher conspiracy beliefs. Relational self motives are said to be linked to higher conspiracy beliefs as they may provide the believer with social support by way of exchanging shared concerns with other believers. For example, high agreement with conspiracy beliefs has been associated with social exclusion (Poon et al., 2020). Finally, motives associated with the collective self are said to drive conspiracy beliefs in an attempt to defend the ingroup, by blaming outgroups for their misfortunes and to portray the ingroup in a more favourable light. For example, conspiracy beliefs have been associated with collective

narcissism (Cichocka et al., 2016) and perceived ingroup victimhood (Bilewicz et al., 2013). In all, belief in conspiracy theories appear to be borne out of a frustration of the three aforementioned social selves.

The second broad set of motives associated with increased conspiracy beliefs brought to light by Douglas and colleagues (2017)— epistemic motives—concerns how we understand and perceive the world we live in. That is, these motives pertain to our different thinking styles and cognitive biases. For example, conspiracy beliefs have been associated with lower analytical thinking (Barron et al., 2018) and belief in simple solutions for complex problems (van Prooijen, 2017). Further, improving people's analytical thinking skills has been shown to reduce conspiracy beliefs (Swami et al., 2014). Also, research has revealed that conspiracy beliefs are instead more driven by an intuitive (versus analytical) thinking style (Pytlik et al., 2020). Finally, conspiracy beliefs have been positively associated with a number of cognitive biases, including illusory pattern perception (van Prooijen et al., 2018), the conjunction fallacy (Brotherton & French, 2014), and the tendency to attribute agency where is does not exist (Douglas et al., 2016), to name a few. Taken together, this body of research demonstrates some of the different ways in which people perceive the world, showing that conspiracy beliefs tend to be motivated by biased and less cognitively taxing thinking patterns.

The final motive associated with conspiracy beliefs argued by Douglas and colleagues (2017), and the one most pertinent to the current thesis, is the existential motive to feel secure and in control. That is, people might be attracted to conspiracy theories in an attempt to alleviate these existential concerns. At this point, it is helpful to provide further nuance to this motive by making a distinction between external (i.e., situational threats, or subjective perceptions of external threat) and internal (i.e., ongoing mental distress) sources of threat (see Onraet et al., 2013) that motivate some people to believe in conspiracy theories. For

example, regarding external existential threat motives, studies have shown that people are more likely to believe in conspiracy theories when they feel economically deprived compared to the population (Bilewicz & Krzeminski, 2010), hold a worldview in which the world is competitive and ferocious (Hart & Graether, 2018; Pelligrini et al., 2019), and feel powerless in reducing the spread of COVID-19 (Biddlestone et al., 2020). Finally, regarding internal existential threat motives, studies have shown that belief in conspiracy theories is associated perceived stress (Swami et al., 2016), personal feelings of powerlessness (Abalakina-Paap et al., 1999), death anxiety (Newheiser et al., 2011), and general anxiety (Grzesiak-Feldman, 2007; 2013). Grzesiak-Feldman argued that her findings could be explained by a lack of cognitive control derived from feelings of anxiety, which can lead to the motivation to find a conspiring enemy as an attempt to make sense of one's situation (i.e., to lay blame on others for personal shortcomings).

People with relationship insecurities have also been shown to find conspiracy theories appealing. This internal existential threat motive is the central sub-motive under investigation in the current thesis. To date, only three studies in the literature have investigated the relationship between insecure attachment and belief in conspiracy theories. In a large epidemiologically representative sample of US participants, insecure attachment (anxiety and avoidance) was associated with higher conspiracy beliefs (Freeman & Bentall, 2017). In another study among Italian participants, attachment avoidance was associated with increased belief in conspiracy theories, as was—to a lesser extent—attachment anxiety (Leone et al., 2018). Finally, among US and UK participants, Green and Douglas (2018) found only attachment anxiety to be positively associated with belief in conspiracy theories. A consistent finding across all of these studies is that attachment anxiety is associated with higher conspiracy beliefs. Guided by adult attachment theory, Green and Douglas (2018) argued that this relationship could be explained by the tendency to catastrophize life's problems, in order

to elicit attention, support, and reassurance from significant others. This hypothesis, however, has yet to be empirically tested. The main aim of the current thesis, therefore, is to shed light on this gap in the literature. To meet this aim, the next section will turn to adult attachment theory to inform the following research question: does catastrophizing explain the link between attachment anxiety and belief in conspiracy theories?

Attachment

Attachment theory is one of the most comprehensive theories that psychology has to offer (Rholes & Simpson, 2004). Bowlby (1969, 1982) pioneered attachment theory, which argues that infants are biologically hardwired to seek proximity to primary caregivers when they feel distressed or threatened, described as the "attachment behavioural system". Ultimately, attachment-related behaviours, such as proximity seeking (behaviours that seek to restore closeness to attachment figures), are said to alleviate feelings of anxiety and distress by regaining a sense of "felt" security. It is further argued that the outcomes of such experiences during infancy and childhood create internal working models of the self and others that consist of expectations, emotions, and behavioural strategies, and such working models persist in later life. Indeed, these working models form a person's attachment orientation—relational expectations, emotions, and behaviour (Fraley & Shaver, 2000). Bowlby further postulated that attachment experiences influence individuals "from the cradle to the grave" (1979, p. 129). In support of this argument, longitudinal studies have found attachment orientations to be relatively stable from infancy to adulthood, with some fluctuations found dependent on life experiences, such as being in a relationship (Chopik et al., 2019; Fraley, 2002; Waters et al., 2000).

Attachment theory for adulthood appears to have sweeping applications, from emotion, cognition, behaviour in close relationships (Cassidy & Shaver. 2008), to—as outlined previously—belief in conspiracy theories (Freeman & Bentall, 2017; Green &

Douglas, 2018; Leone et al., 2018). To better understand the relationship between attachment anxiety and conspiracy beliefs, the next section outlines theory and research on the orthogonal orientations of attachment anxiety and avoidance, the attachment regulatory strategies relevant to these orientations, before arguing how the attachment-anxious hyperactivating mechanism of catastrophizing can shed light on conspiracy beliefs.

Mental Representations of Self and Others: Attachment Anxiety and Avoidance

As described above, Bowlby (1969, 1982) argued that early interactions with primary caregivers create mental representations (or "working models") of the self and others. These working models were said to be determined by attachment figure availability, responsiveness, and supportiveness (Bowlby, 1973). This section will now describe the journey that attachment researchers have taken in order to be able to measure these internal working models in adults, which make up people's individual differences in attachment orientation.

Ainsworth and colleagues (1978) were the first to find evidence of different types of working models in infants: *secure* attachment, which is the result of consistent emotional and physical responsiveness, *anxious* attachment, which is the result of inconsistent emotional and physical responsiveness, and *avoidant* attachment, which is the result of consistent emotional and physical unavailability. Progressing this research by examining attachment in adulthood, George and colleagues (1985) created the Adult Attachment Interview, which asked interviewees about their early relationships with attachment figures. This method was also able to uncover similar patterns of attachment in adulthood as described above, but also a fourth pattern—unresolved/disorganised (or, fearful-avoidant), which was associated with loss of, or abuse from, attachment figures (Main & Solomon, 1986).

Hazan and Shaver (1987) later conceptualized adult romantic love as an attachment process, by employing a self-report measure which captured the three original attachment

patterns found by Ainsworth and colleagues (1978). This self-report measure provided participants with a description of attachment to choose from that best described them: secure— “I find it relatively easy to get close to others and am comfortable depending on them and having them depend on me. I don't often worry about being abandoned or about someone getting too close to me”; avoidant— “I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close, and often, love partners want me to be more intimate than I feel comfortable being”; and anxious— “I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to merge completely with another person, and this desire sometimes scares people away”. This approach was criticised by Bartholomew (1990) as it did not capture the fourth attachment pattern that was established by the Adult Attachment Interview (Goerge et al., 1985). Further, instead of categorizing forms of attachment, Bartholomew argued that attachment patterns in adulthood result from a combination of positive and negative mental representations of the self and others, thus spurring the debate as to whether attachment is best conceptualised as categorical (secure, anxious, dismissing-avoidant, and fearful-avoidant) or within a two-dimensional space (model of the self and model of others; Fraley & Waller, 1998).

Brennan and colleagues (1998) examined self-reports measures of attachment by psychometrically analysing the items and scales of self-report attachment available at the time. Their factor analysis revealed two major higher-order factors: attachment anxiety and avoidance. Attachment anxiety—representing an internal model of the self—is characterised by a fear of rejection and abandonment in close relationships (e.g., “I often worry that my partner will not want to stay with me”), whereas attachment avoidance—representing an internal model of others—is characterised by discomfort in close relationships and reluctance

in depending on others (e.g., "I don't feel comfortable opening up to romantic partners"). Scoring low on these two dimensions represents a secure attachment, whereas scoring high on both dimensions represents the fourth attachment pattern mentioned previously, fearful-avoidant. This measure has been used hundreds of times since its inception, and has been found to have consistently high reliability. Indeed, a meta-analysis—involving 503 published studies—found the average Cronbach alpha coefficient for attachment anxiety and avoidance to be .89 and .90, respectively (Graham & Uterschute, 2015).

Taken together, attachment in adulthood is best conceptualised as an orthogonal relationship between the two dimensions of attachment anxiety and avoidance. The next section discusses the attachment regulatory strategies associated with these dimensions, and how the strategies associated with attachment anxiety might be able to shed light on its relationship with belief in conspiracy theories.

The Adult Attachment Regulatory System

Drawing together the theoretical perspectives of attachment theorists (e.g., Ainsworth, 1991; Bowlby, 1969, 1982; Cassidy & Kobak, 1988; Main, 1995), Mikulincer and Shaver (2017) proposed a model of attachment-system functioning in adulthood. They argued that the attachment-system is activated when an individual is in distress (from real or perceived threats), which motivates them to restore a sense of security by gaining proximity to external or internalized (mental representations) attachment figures, and that different attachment patterns of anxiety and avoidance give rise to different regulatory strategies for this process. Individuals with secure attachment (low anxiety and avoidance)—for whom proximity seeking *is* perceived as viable—tend to employ *security-based* strategies, where the goal is to form and maintain close bonds with others and personal adjustment through the use adaptive coping strategies. For example, secure (vs. insecure) attachment has been associated with the use of instrumental and emotional support from attachment figures and professional sources

(Mikulincer & Florian, 1997; Larose et al., 1999). Further, Mikulincer and Shaver (2017) argued that repeated positive experiences with attachment figures have an enduring effect on attachment-secure persons interpersonal behaviours, termed the *broaden-and-build* cycle of attachment security (see also Mikulincer & Shaver, 2020). That is, repeated availability and responsiveness from attachment figures provides individuals with a reservoir of procedural knowledge for managing their emotion regulation and ways of coping with stress.

When proximity seeking viability is perceived as not possible or unreliable, secondary strategies (deactivating and hyperactivating, respectively) might be employed to alleviate feelings of distress (Cassidy & Kobak, 1988; Shaver & Mikulincer, 2002). These strategies have been compared to the distinction between fight or flight (Main, 1990): *deactivating strategies*, representing a flight response, are associated with decreased efforts in proximity-seeking, whereas *hyperactivating strategies*, representing a fight response, are associated with increased efforts in proximity-seeking.

Individuals high in attachment avoidance—for whom proximity seeking is *not* perceived as viable—tend to employ deactivating strategies. The main goals for these strategies are: (1) to maintain distance in relationships, feel in control, and excessive self-reliance; and (2) deny neediness and vulnerability and avoid negative emotional states. For example, studies have consistently shown that individuals high in attachment avoidance have lower support-seeking tendencies (Frías et al., 2014; Jerome & Liss, 2005; Mikulincer & Florain, 1999; Pierce & Lydon, 1998). Further, attachment avoidance has been associated with distancing coping strategies, such as suppression, stress denial, and cognitive disengagement (Feeny & Ryan, 1994; Lopez et al., 2001). Importantly, Mikulincer and Shaver (2017) argue that negative states and emotions are incongruent with the goals of deactivating strategies, which translates into individuals high in attachment avoidance downplaying their distress and their need to seek proximity.

The central focus of the current thesis is on attachment anxiety, and in the case for individuals with this attachment pattern—for whom proximity seeking is perceived as *uncertain*—they tend to employ *hyperactivating* strategies. The goal of these strategies is to elicit attention, support or protection from seemingly irresponsive attachment figures. This involves exaggerating the presence and catastrophizing the seriousness of psychological and physical threats, as well as their inability to cope with life's demands, and intensifying their apparent distress. For example, people high in attachment anxiety were shown to catastrophize expressions of hurt when their relationship was threatened, as an apparent attempt to induce guilt in their partner to get a reassuring reaction (Overall et al., 2014). The tendency to catastrophize is not limited to threats to relationships, however. Indeed, individuals high in attachment anxiety have been shown to catastrophize an array of different issues and situations, and their inability to cope with them, such as combat training (Mikulincer & Shaver, 1995), pain (Mikulincer & Florian, 1998; Tremblay & Sullivan, 2010), parenthood (Alexander et al., 2001), divorce (Birnbaum et al., 1997), negative emotions (Cloitre et al., 2008; Creasy, 2002), and stressful events (Hodby et al., 2007; Schottenbaur et al., 2006; Wei et al., 2006), to name a few. It should be noted, however, that the findings on the relationship between attachment anxiety and support-seeking tendencies are mixed. Indeed, several studies have shown a positive relationship (e.g., Jerome & Liss, 2005; Vogel & Wei, 2005), whereas others have found a negative relationship (e.g., Halpern et al., 2012; Nam & Lee, 2015) or no relationship at all (e.g., Karantzas & Cole, 2011; Pierce & Lydon, 1998). These mixed findings may reflect attachment-anxious persons' ambivalence towards support-seeking, in that they intensely desire support but have doubts about other people's availability. Importantly, Mikulincer and Shaver (2017) argue that negative states and emotions are congruent with the goals of hyperactivating strategies, which translates into

individuals high in attachment anxiety catastrophizing their distress as an attempt to maximise their chances of proximity seeking.

The next section synthesises relevant parts of the literature reviewed thus far and argues that the hyperactivating mechanism of catastrophizing might plausibly explain the link between attachment anxiety and belief in conspiracy theories.

Catastrophizing the Existence of Conspiracy Theories

Of the three studies that have examined the relationships between different attachment patterns and belief in conspiracy theories, all have found attachment anxiety to be associated with conspiracy beliefs, but neither have examined a possible mechanism that explains this relationship (Freeman & Bentall, 2017; Green & Douglas, 2018; Leone et al., 2018). The main objective of the current thesis, therefore, is to understand why this relationship exists. As reviewed above, recent theorising suggests that people may be motivated to believe in conspiracy theories as a way to satisfy important psychological needs, including the need to feel secure (Douglas et al., 2017). Similarly, individuals with insecure attachment are motivated to alleviate their distress through the use of various strategies, dependent on their attachment pattern (Mikulincer & Shaver, 2017). Drawing on these two arguments, the overarching aim of the current thesis was to uncover—using a range of different approaches—whether conspiracy theory endorsement forms part of the hyperactivating strategies (e.g., catastrophizing) adopted by attachment-anxious persons.

Endorsement of conspiracy theories appears to be congruent with the goals of the hyperactivating strategies found to be associated with attachment anxiety. Indeed, as discussed previously, attachment-anxious persons are motivated to catastrophize life's problems (Mikulincer & Shaver, 2017). In this light, endorsement of conspiracy theories may be another means to catastrophize about the world in general (Green & Douglas, 2018).

Therefore, agreement with conspiracy theories might be associated with the tendency to catastrophize. Additionally, according to the goals of hyperactivating strategies, the aim of catastrophizing is to elicit attention, support or protection from seemingly irresponsive attachment figures (Mikulincer and Shaver, 2017). With this in mind too, it might be the case that people—most likely attachment-anxious catastrophizers—who have a higher motivation to have their needs met, versus meeting the needs of others, will also be drawn to conspiracy theories. This would suggest that conspiracy theories might provide attachment-anxious persons with a way of garnering the attention and care they desire, by catastrophizing the existence of conspiracy theories. Finally, Green and Douglas found attachment anxiety to be associated with belief in general and specific conspiracy theories. Therefore, it seems reasonable to assume that attachment-anxious persons could also be more likely to agree with COVID-19 conspiracy theories, which might be underpinned by exaggerated feelings of powerlessness in being able to limit the spread of COVID-19 (Biddlestone et al., 2020).

With all of the above considered, it seems reasonable to predict that the relationship between attachment anxiety and belief in conspiracy theories could be explained by the tendency to catastrophize. Attachment-anxious persons have been shown to exaggerate the threats they face and their inability to cope with them, and conspiracy theories may provide these individuals with another means to catastrophize and appear helpless and vulnerable to the supposed ills of the word. A second prediction that could be made is that expressing such concerns about the world via conspiracy theories might also be associated with the motivation to have one's needs met versus meeting the needs of others. That is, individuals high in attachment anxiety might catastrophize the existence of conspiracy theories in order to elicit attention, support, and protection from attachment figures. A third prediction that could be made is that attachment anxiety might also be associated with belief in COVID-19

conspiracy theories, which could be explained by the tendency to feel powerless in being able to limit the spread of the virus.

These predictions are examined in the present thesis in the empirical studies that follow.

Overview of Studies

In six cross-sectional studies (Chapter 2), we investigated whether catastrophizing can explain the link between attachment anxiety and belief in conspiracy theories. Specifically, drawing on Mikulincer and Shaver's (2017) model of attachment regulatory strategies, we hypothesised that attachment anxiety (but not avoidance) would be associated with higher catastrophizing (a *hyperactivating* regulatory strategy), which in turn would predict belief in conspiracy theories. Operationalisation of catastrophizing varied across studies: intensity of daily hassles (Study 1), pain (Study 2) and stress (Studies 3, 5, and 6) catastrophizing, and looming cognitive style (Studies 4, 5, and 6).

In another two cross-sectional studies (Chapter 3), we expand on these findings to further delineate the mechanism of catastrophizing, focusing on pain (Study 7) and stress (Study 8) catastrophizing. Specifically, we examined whether motivations surrounding having one's needs met versus meeting the needs of others (self-orientated versus selfless communal orientation, respectively) help to further explain the relationships between attachment anxiety, catastrophizing, and conspiracy beliefs. In the final two studies (Chapter 4), we broaden our focus to both general and specific (COVID-19) conspiracy theories, and examine whether feelings of powerlessness in being able to limit the spread of COVID-19 further explain the link between attachment anxiety and belief in conspiracy theories.

The majority of the participants in these studies (Studies 1, 2, 3, 4, 5, 7, & 8) were recruited via online crowdsourcing platforms (i.e., MTurk and Prolific) and paid for their

time. However, one participant recruitment issue in this field of research is the "access problem", where conspiracy theory believers tend to be averse to being studied, because of their distrust towards researchers (Franks et al., 2017). With this in mind, in some studies (Studies 6, 9, & 10) we recruited participants from social media (i.e., Reddit and Facebook), on a voluntary basis. Conspiracy theories are often shared on these platforms (Cinelli et al., 2020), so we hoped to recruit a wider range of conspiracy believers by extending our participant recruitment to social media.

Further, as discussed previously, whereas attachment anxiety was shown to be an important predictor of conspiracy beliefs for British and American participants (i.e., suggesting that catastrophizing is at play; Freeman & Bentall, 2017; Green & Douglas, 2018), attachment avoidance was found to be the more important predictor among Italians (i.e., suggesting deactivating strategies are at play; Leone et al., 2018). In all studies, however, we focus on the relationships of interest in the context of UK and USA, where catastrophizing would most likely explain the relationship between attachment anxiety and conspiracy beliefs.

Furthermore, in all studies we examined general conspiracy beliefs, and only in the last two studies (Chapter 4) did we additionally examine belief in specific conspiracy theories (i.e., "Covid-19 is a hoax"). Previously, we found attachment anxiety to predict both general and specific conspiracy beliefs (Green & Douglas, 2018). There are a couple of reasons why we mainly focused on attachment anxiety and catastrophizing's relationships with general (versus specific) conspiracy beliefs. First, some research has shown that general versus specific conspiracy beliefs are associated with different outcomes. Indeed, a meta-analysis examining the association between lack of control and conspiracy beliefs found there to be an effect with specific conspiracy theories only (Stojanov & Halberstadt, 2020). In one example, manipulation of political powerlessness had an effect on conspiracy theories about Jewish

people (Kofta et al., 2020, Studies 1, 2 & 3), as did personal powerlessness (Study 4). The current research is focused on internal threat motives (i.e., attachment anxiety), and thus an examination of general conspiracy beliefs seems more fitting. That is, external threats (e.g., political powerlessness) appears to be more associated with specific (versus general) conspiracy beliefs. Second, general conspiracy beliefs still appear to be the most robust correlate of specific conspiracy beliefs (e.g., Dyrendal et al., 2021; Enders et al., 2021). Therefore, in the studies presented in the final empirical chapter, we examined both general and specific conspiracy beliefs, in order to examine the contributions that attachment anxiety, catastrophizing, and general conspiracy beliefs has on specific conspiracy beliefs. In all, the initial aim of the current thesis was to discover whether catastrophizing is associated increased general conspiracy theorising for people high in attachment anxiety, and, in the latter part of the thesis, to examine whether these findings also extend to belief in specific conspiracy theories.

Taken together, these studies will provide an extensive investigation into the link between attachment insecurity (namely attachment anxiety), catastrophizing, and belief in conspiracy theories. In doing so, they will also draw a bridge between attachment theory and the existential threat motive framework of belief in conspiracy theories. All studies in this thesis were pre-registered, which—alongside the materials and data for each study—can be found here: https://osf.io/rsf2h/. Each study in this thesis largely followed the pre-registered hypotheses, designs, and analyses. Deviations from the pre-registrations are discussed as they arose.

Chapter 2: Catastrophizing

Abstract

Belief in conspiracy theories has been linked to attachment anxiety. In this research, we examined the extent to which this relationship can be explained by the tendency to catastrophize, or to view situations as being considerably worse than they are. We hypothesised that catastrophizing would positively predict belief in conspiracy theories and mediate the relationship between attachment anxiety and conspiracy beliefs. We tested and conceptually replicated this hypothesis across six cross-sectional studies (N = 2395). In all studies we examined attachment anxiety and avoidance and belief in conspiracy theories. We varied the operationalization of catastrophizing across studies, which included intensity of daily hassles, pain and stress catastrophizing, and a looming cognitive style (i.e., the tendency to perceive social and physical threats as magnifying and approaching quickly). In all studies, attachment anxiety (vs. avoidance) was positively associated with indicators of catastrophizing and belief in conspiracy theories. Importantly, attachment anxiety (vs. avoidance) indirectly predicted conspiracy beliefs through all indicators of catastrophizing. The mediation by looming cognitive style was only evident at high (vs. low) levels of stress catastrophizing. Our findings suggest that belief in conspiracy theories is associated with the attachment-anxious hyperactivating regulatory strategy of catastrophizing. We argue that endorsing conspiracy theories may therefore be a specific means to exaggerate and catastrophize life's problems. Theoretical implications are discussed.

As outlined in Chapter 1, previous research has shown that attachment anxiety is associated with belief in conspiracy theories (Freeman & Bentall, 2017; Green & Douglas, 2018; Leone et al., 2018). To date, however, no research has investigated why this relationship exists. The main aim of the current chapter, therefore, is to address this gap in the literature.

Green and Douglas (2018) offered a theoretical account of why attachment anxiety is associated with conspiracy beliefs, by arguing that this relationship may be driven by the tendency to catastrophize, that is to view or present situations as considerably worse than they actually are. This conclusion was guided by Mikulincer and Shaver's (2017) model of attachment-system functioning, which argues that attachment-anxious individuals employ hyperactivating regulatory strategies (i.e., catastrophizing) as means to alleviate their attachment concerns. Indeed, attachment anxiety is characterised by worrying about being underappreciated or abandoned by one's significant others (Brennan et al., 1998), and so catastrophizing is one strategy employed by attachment-anxious persons as to express vulnerability and helplessness, in order to elicit attention and support. Empirical research backs up this account. For example, attachment-anxious persons were shown to catastrophize expressions of hurt when their relationship was threatened, as an apparent attempt to induce guilt in their partner to get a reassuring reaction (Overall et al., 2014).

Catastrophizing is not limited to threats to relationships, however. For example, attachment anxiety predicts a higher looming cognitive style (Altan-Atalay & Ayvaşık, 2018; Williams & Riskind, 2004), which is the tendency to perceive social and physical threats as magnifying and approaching quickly. Further, attachment anxiety (but not avoidance) predicts greater pain catastrophizing (McWilliams & Asmundson, 2007; McWilliams & Holmberg, 2010; Tremblay & Sullivan, 2010). In the current chapter, we contend that the relationship between attachment anxiety and belief in conspiracy theories may also be

another indication of catastrophizing. In the current studies, therefore, we examined the link between conspiracy beliefs and catastrophizing. We predicted that such a link would exist and that catastrophizing would—in part—explain the relationship between attachment anxiety and belief in conspiracy theories. Further, it might be the case that higher endorsement of conspiracy theories goes hand in hand with higher catastrophizing, and so it is possible that indirect effects could be found when the mediator and outcome variables are switched. Therefore, we also explored whether conspiracy beliefs can explain the relationship between attachment anxiety and catastrophizing.

Overview of Studies

In six studies, we measured attachment anxiety and avoidance, belief in general notions of conspiracy, and a range of variables operationalised as indicators of catastrophizing. In Study 1, we examined whether experience of *daily hassles* would mediate the relationship between attachment anxiety and belief in conspiracy theories. In Studies 2 and 3, we included cognitive appraisals of *pain* and *stress catastrophizing* (respectively)—which captured three subfactors; (1) *helplessness*, (2) *magnification*, and (3) *rumination* —as potential mediators. In Study 4, we examined whether *looming cognitive style* would mediate the relationship between attachment anxiety and belief in conspiracy theories. In Studies 5 and 6, we again examined whether the same subfactors of *stress catastrophizing* would mediate the relationship in question. Additionally, we examined whether the mediating role of *looming cognitive style* is moderated by high (versus low) *stress helplessness*, *magnification*, and *rumination*. In all studies we also examined possible pathways for attachment avoidance to conspiracy beliefs through these mediators, though we only expected attachment anxiety to be positively associated with these variables.

Study 1

In Study 1, we examined appraisals of daily hassles as a potential mediator of the relationship between attachment anxiety and belief in conspiracy theories. Daily hassles can be characterised as the irritating, frustrating, distressing demands of daily life (e.g., disliking daily activities and failing to get money that one expected; Kanner et al., 1981; Kohn & McDonald, 1992). Previous research has shown appraisals of daily hassles to be positively correlated with attachment anxiety and avoidance (Jinyao et al., 2012). It is not yet known, however, if daily hassles are associated with higher conspiracy beliefs, though some indirect evidence would point to such a relationship existing. For example, daily hassles have been associated with delusional (Goldstone et al., 2011) and paranoid thinking (Anderson & Freeman, 2013), each of which have also been associated with conspiracy beliefs (Dagnall et al., 2015; Darwin et al., 2011; see also, Imhoff & Lamberty. 2018). Further, belief in conspiracy theories has previously been predicted by higher perceived stress and stressful life events (Swami et al., 2016), and appraisal of daily hassles is considered to be an indicator of perceived stress (see Kanner et al., 1981). We therefore aimed to show that conspiracy beliefs are also predicted by a more intense experience of daily hassles. Further, research also shows that attachment anxiety, more than avoidance, is associated with higher perceived stress (Maunder et la., 2006). Taken together, we predicted that a higher intensity of daily hassles would be associated with increased belief in conspiracy theories, and such experiences would positively mediate the relationship between attachment anxiety and such beliefs. Socio-demographic variables were included as covariates. In previous research, some socio-demographics variables (e.g., lower age and educational attainment, and higher religiosity) have been shown to be associated with increased belief in conspiracy theories (e.g., Douglas et al., 2016; Green & Douglas, 2018; van Prooijen, 2017). Therefore, we aimed to show that the predicted relationships would hold over and above known socio-demographic covariates

of conspiracy beliefs. Finally, we also explored an alternative model where conspiracy belief is the mediator of the relationship between attachment anxiety and pain catastrophizing.[1]

Method

Participants

We aimed to recruit $N = 400$ participants, which would provide 80% power to detect an indirect effect with a probability of .05, when *a* path shows a moderate, and *b* path shows a small, effect in the mediational analyses (Fritz & MacKinnon, 2010).[2] We recruited 445 US American participants from Amazon's Mechanical Turk (MTurk) to complete an online questionnaire (they were each paid US $1 for their time). Participants who did not complete the main variables of interest ($n = 30$) or were not from the US ($n = 26$) were excluded from the study. The remaining participants ($N = 389$; 228 men, 159 women, 2 rather not say; $M_{age} = 35.39$ years, $SD_{age} = 10.43$, range = 18–74) were included in the final analyses.

Measures

Belief in General Notions of Conspiracy. We used the Generic Conspiracist Beliefs scale (GCB; Brotherton, French, & Pickering, 2013). There were 15 statements that described general notions of conspiracy (e.g., "certain significant events have been the result of the activity of a small group who secretly manipulate world events", "the spread of certain viruses and/or disease is the result of deliberate, concealed efforts of some organisation"; 1 = *definitely not true*, 5 = *definitely true*, $\alpha = .95$).

Attachment Anxiety and Avoidance. We used the revised Experiences in Close Relationships scale (ECR-R; Fraley et al., 2000). There were 36 statements comprised of 18 attachment anxiety items (e.g., "I often worry that my partner doesn't love me", "I'm afraid

[1] General anxiety was also measured in this study but was not used in subsequent analyses.
[2] All studies in this thesis examined mediation models and, where possible, followed this same rationale for determining sample sizes.

that I will lose my partner's love"; α = .96) and 18 avoidance items (e.g., "I don't feel comfortable opening up to romantic partners", "I get uncomfortable when a romantic partner wants to be very close"; α = .95; 1 = *strongly disagree*, 7 = *strongly agree*).

Daily Hassles. We used the Survey of Recent Life Experiences scale (SRLE; Kohn & McDonald, 1992). This scale lists 51 daily hassles that people can experience and asks participants to rate how intensely they have experienced them over the past month (e.g., "having trust betrayed by a friend", "getting "ripped off*"* or cheated in the purchase of goods", "lower evaluation of your work than you think you deserve"; 1 = *not at all a part of my life*, 4 = *very much a part of my life*; α = .98). A total daily hassles score is calculated by aggregating the responses to the 51 items, ranging from 51 to 204.

Covariates. In addition to age and gender, participants were also asked to rate their educational attainment (1 = *no formal education*, 2 = *primary level education*, 3 = *secondary level education*, 4 = *college or university level education [bachelor's degree]*, 5 = *college or university level education [graduate degree]*) and religiosity (1 = *not religious at all*, 7 = *very religious*).

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (conspiracy beliefs, attachment anxiety and avoidance, and daily hassles). Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through daily hassles. We also included attachment avoidance in this model as a predictor alongside anxiety, where we also tested for direct and indirect effects on conspiracy beliefs. Indirect effects were checked using 10,000 bootstrapped

samples and 95% confidence intervals.[3] Then—for robustness—we reran this model with covariates included (age, gender [male = 0, female = 1], educational attainment, and religiosity) to see if the results remain unchanged. Finally, we used Model 4 to explore whether there was an indirect effect of attachment anxiety (but not avoidance) on experience of daily hassles through conspiracy beliefs, with covariates included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 1. Attachment anxiety and avoidance strongly positively correlated together. Attachment anxiety showed a strong positive correlation with daily hassles, and a moderate positive correlation with conspiracy beliefs. Attachment avoidance showed a small positive correlation with conspiracy beliefs, and a moderate positive correlation with daily hassles.

Table 1

Means, standard deviations, and zero-order correlations (Study 1).

Measure	*M*	*SD*	1	2	3	4
1. Conspiracy beliefs	2.70	1.00	-	.40**	.13*	.49**
2. Attachment anxiety	3.22	1.47		-	.56**	.74**
3. Attachment avoidance	3.01	1.23			-	.43**
4. Daily hassles	99.44	33.52				-

$* p < .01$, $** p < .001$.

[3] All studies in the current thesis used this criterion when checking indirect effects.

Mediation Analyses

Attachment anxiety and avoidance explained 55% of the variance in daily hassles (R^2 = .545, $F(2, 386) = 231.436$, $p < .001$). The analysis showed that attachment anxiety was significantly associated with daily hassles ($b = 16.56$, $SE = 0.95$, $p < .001$), whereas avoidance was not ($b = 0.67$, $SE = 1.13$, $p = .552$).

The total effects ($R^2 = .169$, $F(2, 386) = 39.103$, $p < .001$) of attachment anxiety and avoidance on conspiracy beliefs were significant ($b = 0.32$, $SE = 0.04$, $p < .001$; $b = -0.11$, $SE = 0.05$, $p = .020$, respectively). Attachment anxiety and avoidance, and daily hassles explained 25% of variance in conspiracy belief ($R^2 = .255$, $F(3, 385) = 43.865$, $p < .001$). Daily hassles were significantly associated with conspiracy beliefs ($b = 0.01$, $SE = 0.01$, $p < .001$). The direct effects of attachment anxiety and avoidance on conspiracy beliefs were significant ($b = 0.11$, $SE = 0.05$, $p = .031$; $b = -0.12$, $SE = 0.04$, $p = .008$, respectively).

We found a significant indirect effect of attachment anxiety on conspiracy belief through experience of daily hassles ($b = 0.22$, $SE = 0.04$, CI = [.15, .29]), but not from attachment avoidance ($b = 0.01$, $SE = 0.01$, CI = [-.02, .04]).

Inclusion of Covariates. One relationship changed when covariates were included in the model (See Figure 1 for an illustration of this model with standardised values). The relationships between attachment anxiety and avoidance with daily hassles remained the same ($b = 15.35$, $SE = 0.96$, $p < .001$; $b = 1.50$, $SE = 1.13$, $p = .184$, respectively). The total effect of attachment anxiety on conspiracy beliefs remained the same ($b = 0.27$, $SE = 0.05$, $p < .001$); however, the total effect of attachment avoidance on conspiracy beliefs was no longer significant ($b = -0.08$, $SE = 0.05$, $p = .089$). The relationship between daily hassles and conspiracy beliefs remained the same ($b = 0.01$, $SE = 0.01$, $p < .001$). The direct effects of attachment anxiety and avoidance on conspiracy beliefs remained the same ($b = 0.10$, $SE =$

0.05, p = .045; b = -0.09, SE = 0.04, p = .033, respectively), and so did their indirect effects through daily hassles (b = 0.17, SE = 0.03, CI = [.10, .24]; b = 0.02, SE = 0.01, CI = [-.01, .04], respectively).

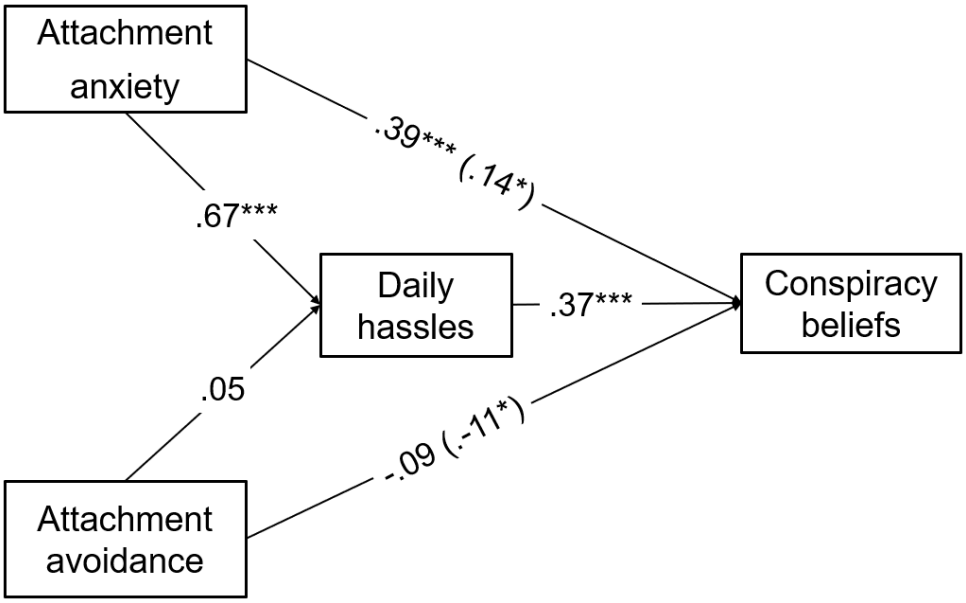

Figure 1. Standardized regression coefficients for mediation analysis (Study 1). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for daily hassles, can be found in the parentheses. Age, gender, educational attainment, and religiosity are also included as covariates.

Exploratory Mediation Analysis: Conspiracy Belief as Mediator

We found a significant indirect effect of attachment anxiety on daily hassles through conspiracy beliefs (b = 1.79, SE = 0.44, CI = [1.03, 2.72]), but not from attachment avoidance (b = -0.53, SE = 0.35, CI = [-1.14, 0.11]).

Discussion

In line with our hypotheses, attachment anxiety predicted more intense experiences of daily hassles, which in turn predicted higher conspiracy beliefs. Importantly, attachment

anxiety predicted conspiracy beliefs through daily hassles. Further, such relationships did not exist for attachment avoidance. Similar findings were found when conspiracy belief and catastrophizing was switched. These findings support previous research, which showed feelings of stress to be associated with attachment anxiety (Jinyao et al., 2012; Maunder et la., 2006) and conspiracy beliefs (Swami et al., 2016). Extending these findings, the current study provides initial support for the notion that conspiracy beliefs are associated catastrophizing—the hyperactivating mechanism of attachment anxiety. However, this study is limited to the context of daily hassles, and it could also be argued that this measure does not tap into a dispositional tendency of catastrophizing. Indeed, the daily hassles measure used in this study asks participants to indicate how many of the daily stressors that they have actually experienced, and so it is difficult to ascertain whether these experiences are exaggerated or not. Therefore, in Study 2 we aimed to conceptually replicate these findings by changing the context (to pain) and examining thoughts and feelings that are explicitly associated with catastrophizing, as a potential mediator.

Study 2

In Study 2, we sought to investigate the thoughts and feelings that are explicitly associated with catastrophizing. As outlined in Chapter 1, attachment anxiety has been associated with catastrophizing across a number of issues and life's problems (see Mikulincer & Shaver, 2017, for a review). If catastrophizing is an underlying factor that explains conspiracy beliefs for attachment-anxious persons—which is what we argue—then different forms of catastrophizing should also be associated with conspiracy beliefs through this shared factor. Therefore, instead of examining appraisals of daily hassles (Study 1), we examined the thoughts and feelings that people may have had when they have experienced *pain*, as a potential mediator of the relationship between attachment anxiety and conspiracy beliefs.

The literature on pain catastrophizing is extensive (for a review, see Leung, 2012), and borne from this literature is the Pain Catastrophizing Scale (Sullivan, et al., 1995). This measure captures three subfactors of catastrophizing: *rumination* (e.g., "I worry all the time about whether the pain will end"; *magnification* (e.g., I become afraid that the pain will get worse"; and *helplessness* (e.g., "There's nothing I can do to reduce the intensity of the pain"). These subfactors of pain catastrophizing represent cognitive and emotional responses to actual or anticipated pain. Appraisal theories for pain catastrophizing suggest that rumination and magnification reflect an evaluation of pain as threatening (primary appraisal), whereas helplessness reflects appraisals of inability to cope with pain (secondary appraisal; Severeijns et al., 2004; see also, Lazarus & Folkman, 1984). Previous research has shown that attachment anxiety is associated with greater pain catastrophizing, including each of the subfactors (McWilliams & Asmundson, 2007; McWilliams & Holmberg, 2010; Tremblay & Sullivan, 2010). According to Mikulincer and Shaver (2017), attachment-anxious persons catastrophize the severity of threats before them, as well as their inability to cope with such threats. In this light, primary (rumination, magnification) and secondary (helplessness) appraisals of pain might both be explanatory mediators of the relationship between attachment anxiety and conspiracy beliefs. Therefore, we examined whether these subfactors of pain catastrophizing would predict increased belief in conspiracy theories, and whether they would positively mediate the relationship between attachment anxiety and conspiracy beliefs. We included socio-demographics as covariates to test the robustness of the predicted relationships. Finally, we explored an alternative model where conspiracy belief is the mediator of the relationship between attachment anxiety and pain helplessness, magnification, and rumination catastrophizing.[4]

[4] Emotion dysregulation was also measured in this study but was not used in subsequent analyses.

Method

Participants

We recruited 423 US American participants from MTurk to complete an online questionnaire (they were each paid US $1 for their time). Participants who did not complete the main variables of interest (n = 18) or were not from the US (n = 14) were excluded from the study. The remaining participants (N = 391; 232 men, 157 women, 2 rather not say; M_{age} = 35.11 years, SD_{age} = 10.47, range = 19–68) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .96), attachment anxiety (α = .96) and avoidance (α = .94), and covariates (age, gender, educational attainment, and religiosity) were used as in the previous study.

Pain Catastrophizing. We used the Pain Catastrophizing Scale (PSC; Sullivan et al., 1995). This scale lists 13 different thoughts and feelings that may occur when someone is in pain (e.g., headaches, tooth pain, joint or muscle pain), which consists of three subfactors: *helplessness* (6 items; e.g., “I worry all the time about whether the pain will end”, “I feel I can’t stand it anymore”; α = .93), *magnification* (3 items; e.g., “I wonder whether something serious may happen”, “I become afraid that the pain will get worse”; α = .82), and *rumination* (4 items; e.g., “I anxiously want the pain to go away”, “I can’t seem to get it out of my mind”; α = .91). Items are scored on a five-point scale, where higher scores indicate higher catastrophizing (1 = not at all, 5 = all the time; 13-item total α = .96).

Results

Analytic Strategy

First, we examined zero-order correlations between conspiracy beliefs, attachment anxiety and avoidance, and pain helplessness, magnification, and rumination. Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through pain helplessness, magnification, and rumination. We also included attachment avoidance as a predictor alongside anxiety, where we also tested for direct and indirect effects on conspiracy belief. Then—for robustness—we reran this mediation analysis with covariates included (age, gender [male = 0, female = 1], educational attainment, religiosity) to see if the results remain unchanged. Finally, we used Model 4 to explore whether there was an indirect effect of attachment anxiety (but not avoidance) on pain helplessness, magnification, and rumination through conspiracy beliefs, with covariates included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 2. Attachment anxiety and avoidance strongly positively correlated together. Attachment anxiety showed a strong positive correlation with pain helplessness and magnification, and a moderate positive correlation with rumination and conspiracy beliefs. Attachment avoidance showed a moderate positive correlation with conspiracy beliefs, pain helplessness, magnification, and rumination.

Table 2

Means, standard deviations, and zero-order correlations (Study 2).

Measure	*M*	*SD*	1	2	3	4	5	6
1. Conspiracy beliefs	2.81	1.06	-	.44*	.21*	.40*	.36*	.29*
2. Attachment anxiety	3.13	1.49		-	.68*	.57*	.55*	.42*
3. Attachment avoidance	2.85	1.18			-	.32*	.31*	.22*
4. $Pain_{helplessness}$	2.49	1.09				-	.85*	.84*
5. $Pain_{magnification}$	2.58	1.07					-	.78*
6. $Pain_{rumination}$	2.94	1.12						-

Note: Pain = pain catastrophizing.

$*$ $p < .001$.

Mediation Analyses

Attachment anxiety and avoidance explained 33%, 31%, and 18% of variance in helplessness ($R^2 = .333$, $F(2, 388) = 96.873$, $p < .001$), magnification ($R^2 = .309$, $F(2, 388) = 86.871$, $p < .001$), and rumination ($R^2 = .180$, $F(2, 388) = 42.622$, $p < .001$), respectively. Attachment anxiety was significantly associated with helplessness ($b = 0.48$, $SE = 0.04$, $p < .001$), magnification ($b = 0.45$, $SE = 0.04$, $p < .001$), and rumination ($b = 0.37$, $SE = 0.05$, $p < .001$), whereas avoidance was only significantly associated with the former two ($b = -0.12$, $SE = 0.05$, $p = .026$; $b = -0.11$, $SE = 0.05$, $p = .039$; $b = -0.11$, $SE = 0.06$, $p = .057$, respectively).

The total effects ($R^2 = .213$, $F(2, 388) = 52.465$, $p < .001$) of attachment anxiety and avoidance on conspiracy beliefs were significant ($b = 0.40$, $SE = 0.04$, $p < .001$; $b = -0.16$, $SE = 0.06$, $p = .005$, respectively). Attachment anxiety and avoidance, and pain helplessness, magnification, and rumination explained 24% of variance conspiracy beliefs ($R^2 = .243$, $F(2,$

385) = 24.735, $p < .001$). Helplessness was significantly associated with conspiracy beliefs ($b = 0.28$, $SE = 0.10$, $p < .001$), whereas magnification ($b = 0.01$, $SE = 0.09$, $p = .868$) and rumination ($b = -0.10$, $SE = 0.08$, $p = .234$) were not. The direct effects of attachment anxiety and avoidance on conspiracy belief were significant ($b = 0.30$, $SE = 0.05$, $p < .001$; $b = -0.13$, $SE = 0.06$, $p = .015$, respectively).

Significant indirect effects of attachment anxiety and avoidance on conspiracy beliefs were found through helplessness ($b = 0.13$, $SE = 0.05$, CI = [.04, .23]; $b = -0.03$, $SE = 0.02$, CI = [-.08, -.01], respectively), but not through magnification ($b = 0.01$, $SE = 0.04$, CI = [-.06, .08]; $b = -0.01$, $SE = 0.01$, CI = [-.03, .02], respectively) or rumination ($b = -0.04$, $SE = 0.03$, CI = [-.10, .02]; $b = 0.01$, $SE = 0.01$, CI = [-.01, .04], respectively).

Inclusion of Covariates. Some relationships changed when covariates were included in the model. The relationships between attachment anxiety and helplessness ($b = 0.45$, $SE = 0.05$, $p < .001$), magnification ($b = 0.41$, $SE = 0.04$, $p < .001$), and rumination ($b = 0.38$, $SE = 0.05$, $p < .001$) remained the same. The relationship between attachment avoidance and rumination remained the same ($b = -0.11$, $SE = 0.06$, $p = .069$); however, attachment avoidance lost significance with helplessness ($b = -0.09$, $SE = 0.05$, $p = .076$) and magnification ($b = -0.08$, $SE = 0.05$, $p = .144$).

The total effect of attachment anxiety on conspiracy beliefs remained the same ($b = 0.34$, $SE = 0.05$, $p < .001$); however, the total effect of attachment avoidance was no longer significant ($b = -0.11$, $SE = 0.06$, $p = .057$). The relationships between pain helplessness, magnification, and rumination on conspiracy beliefs remained the same ($b = 0.26$, $SE = 0.10$, $p = .012$; $b = -0.02$, $SE = 0.09$, $p = .852$; $b = -0.08$, $SE = 0.08$, $p = .335$, respectively). The direct effect of attachment anxiety on conspiracy beliefs remained the same ($b = 0.26$, $SE =$

0.05, $p < .001$); however, the direct effect of attachment avoidance lost significance (b = -0.09, SE = 0.06, p = .097).

The indirect effects of attachment anxiety and avoidance on conspiracy beliefs through magnification (b = -0.01, SE = 0.03, CI = [-.07, .06]; b = 0.01, SE = 0.01, CI = [-.02, .02], respectively) and rumination (b = -0.03, SE = 0.03, CI = [-.09, .03]; b = 0.01, SE = 0.01, CI = [-.01, .04], respectively) remained the same; however, where the indirect effect through helplessness remained significant for attachment anxiety (b = 0.12, SE = 0.05, CI = [.03, .21]), it did not for avoidance (b = -0.02, SE = 0.02, CI = [-.07, .01]; see Figure 2 for an illustration of this model with standardised values).

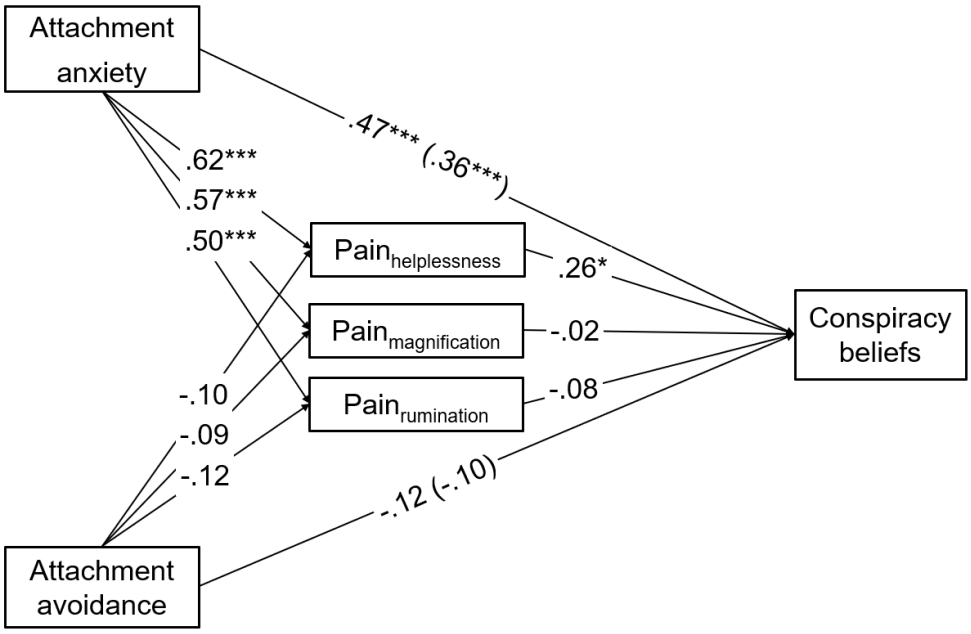

Figure 2. Standardized regression coefficients for mediation analysis (Study 2). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for pain helplessness, magnification, and rumination, can be found in the parentheses. Age, gender, educational attainment, and religiosity are also included as covariates.

Exploratory Mediation Analysis: Conspiracy Belief as Mediator

Helplessness as Outcome. We found a significant indirect effect of attachment anxiety on pain helplessness through conspiracy beliefs (b = 0.05, SE = 0.02, CI = [0.02, 0.09]), but not from attachment avoidance (b = -0.02, SE = 0.01, CI = [-0.04, 0.01]).

Magnification as Outcome. We found a significant indirect effect of attachment anxiety on pain magnification through conspiracy beliefs (b = 0.04, SE = 0.02, CI = [0.01, 0.08]), but not from attachment avoidance (b = -0.01, SE = 0.01, CI = [-0.04, 0.01]).

Rumination as Outcome. We did not find an indirect of attachment anxiety on pain rumination through conspiracy beliefs (b = 0.04, SE = 0.02, CI = [-0.01, 0.08]), and nor from attachment avoidance (b = -0.01, SE = 0.01, CI = [-0.04, 0.01]).

Discussion

In line with our hypothesis, we found pain catastrophizing to explain the relationship between attachment anxiety and belief in conspiracy theories. In support of previous research, we found attachment anxiety to be positively associated with pain catastrophizing (McWilliams & Asmundson, 2007; McWilliams & Holmberg, 2010; Tremblay & Sullivan, 2010). Importantly, we found all subfactors of pain catastrophizing to be positively associated with conspiracy beliefs. However, in subsequent mediation analyses only the subfactor of pain *helplessness* was found to mediate the relationship between attachment anxiety and conspiracy beliefs. According to appraisal theories of pain catastrophizing, this would suggest that exaggerating one's inability to cope (secondary appraisal) with pain is what explains the relationship between attachment anxiety and conspiracy beliefs (Severeijns et al., 2004; see also, Lazrus & Folhman, 1984). This finding is consistent with hyperactivating strategies, where attachment-anxious persons tend to express their vulnerabilities in order to elicit attention and support (Mikulincer & Shaver, 2017). When covariates were not included

in the mediation analyses, attachment avoidance was found to predict conspiracy beliefs (but not through catastrophizing). When covariates were included, however, this relationship failed to materialise (unlike for attachment anxiety), which suggests that the relationship between conspiracy beliefs and attachment is more robust for anxiety. Indeed, the findings from this study suggest that conspiracy beliefs may form part of an attachment-anxious person's strategy to appear helpless in a world supposedly rife with conspiracies. Interestingly, in the alternative model we explored, conspiracy belief meditated the relationship between attachment anxiety and pain helplessness and magnification. A limitation of this study, however, is that it is the first to examine these subfactors against attachment anxiety and conspiracy beliefs, and it is not known if feeling helpless in other domains (e.g., stress) would produce the same pattern of results. Indeed, as we have argued, catastrophizing should underlie the relationship between attachment anxiety and conspiracy beliefs, and so finding the same pattern of relationships under a different context will help to paint this picture better. In the next study, therefore, we aimed to build on the findings of the previous two studies, by examining stress helplessness, magnification, and rumination as potential mediators of the relationship between attachment anxiety and conspiracy beliefs.

Study 3

In Study 1, we found that a higher intensity of daily hassles mediated the relationship between attachment anxiety and conspiracy beliefs. In Study 2, we found similar results when we examined pain as a target of catastrophizing, but only for the subfactor of helplessness. Therefore, in the current study we aimed to conceptually replicate the findings of the previous two studies by examining the thoughts and feelings (helplessness, magnification, and rumination) that people may have when they have experienced *stress*. In doing so, we simply adapted the Pain Catastrophizing Scale to instead focus on stress. Again, this measure captured three subfactors of catastrophizing; *rumination*, *helplessness*, and *magnification*. We

examined whether these subfactors of stress catastrophizing would predict increased belief in conspiracy theories, and whether they would positively mediate the relationship between attachment anxiety and conspiracy beliefs. Based on the findings of Study 2, we expected stress helplessness to play a more important role in this mediation than magnification and rumination. For robustness, we also included socio-demographics as covariates. Finally, we continued to explore whether conspiracy belief mediates the relationships between attachment anxiety and pain helplessness, magnification, and rumination catastrophizing.[5]

Method

Participants

We recruited 535 US American participants from MTurk to complete an online questionnaire (they were each paid US $1 for their time). Participants who did not complete the main variables of interest (n = 5) or were not from the US (n = 30) were excluded from the study. The remaining participants (N = 510; 313 men, 196 women, 1 rather not say; M_{age} = 37.34 years, SD_{age} = 10.46, range = 19–69) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .96), attachment anxiety (α = .96) and avoidance (α = .90), and covariates (age, gender, educational attainment, and religiosity) were used as in the previous study.

Stress Catastrophizing. We formed a new Stress Catastrophizing Scale, adapted from the Pain Catastrophizing Scale to focus instead on stressful situations (e.g., losing a job,

[5] This study was originally designed to examine the potential causal link between catastrophizing and conspiracy belief. The experiment showed no experimental effects. We therefore decided to treat the study as a correlational study and again test the associations between attachment, catastrophizing, and conspiracy belief. We included experimental condition as a covariate (0 = control, 1 = experimental condition) in the current study, which had no effect on the main pattern of results. See Appendix for full details and analyses of the original study.

having emotional problems, moving home), which consisted of the same subfactors: *helplessness* (e.g., "I worry all the time about whether the stress will end"; α = .92), *magnification* (e.g., "I become afraid that the stress will get worse"; α = .83), and *rumination* (e.g., "I anxiously want the stress to go away"; α = .85; 13-item total α = .95).

Results

Analytic Strategy

First, we examined zero-order correlations between conspiracy beliefs, attachment anxiety and avoidance, and stress helplessness, magnification, and rumination. Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy belief through either of the stress helplessness, magnification, and rumination. We also included attachment avoidance as a predictor alongside anxiety, where we also tested for direct and indirect effects on conspiracy belief. Then—for robustness—we reran this mediation analysis with covariates included (age, gender [male = 0, female = 1], educational attainment, religiosity, experimental conditions) to see if the results remain unchanged. Finally, we used Model 4 to explore whether there was an indirect effect of attachment anxiety (but not avoidance) on stress helplessness, magnification, and rumination through conspiracy beliefs, with covariates included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 3. Attachment anxiety and avoidance strongly positively correlated with each other. Attachment anxiety showed a strong positive correlation with stress helplessness, magnification, rumination, and conspiracy beliefs. Attachment avoidance showed a moderate positive correlation with stress magnification and rumination, and a small positive correlation with stress helplessness and conspiracy beliefs.

Table 3

Means, standard deviations, and zero-order correlations (Study 3).

Measure	*M*	*SD*	1	2	3	4	5	6
1. Conspiracy beliefs	3.09	1.05	-	.62*	.20*	.58*	.53*	.40*
2. Attachment anxiety	3.94	1.44		-	.58*	.72*	.67*	.55*
3. Attachment avoidance	3.17	1.00			-	.36*	.33*	.26*
4. $Stress_{helplessness}$	1.99	1.07				-	.82*	.81*
5. $Stress_{magnification}$	2.10	1.03					-	.78*
6. $Stress_{rumination}$	2.23	0.96						-

Note: Stress = stress catastrophizing.

$*$ $p < .001$.

Mediation Analyses

Attachment anxiety and avoidance explained 53%, 45%, and 30% of variance in helplessness ($R^2 = .526$, $F(2, 507) = 281.754$, $p < .001$), magnification ($R^2 = .447$, $F(2, 507) = 205.262$, $p < .001$), and rumination ($R^2 = .302$, $F(2, 507) = 109.621$, $p < .001$), respectively. Attachment anxiety was significantly associated with helplessness ($b = 0.58$, $SE = 0.03$, $p < .001$), magnification ($b = 0.51$, $SE = 0.03$, $p < .001$), and rumination ($b = 0.40$, $SE = 0.03$, $p < .001$), whereas avoidance was only significantly associated with the former two subfactors ($b = -0.10$, $SE = 0.04$, $p = .014$; $b = -0.09$, $SE = 0.04$, $p = .031$; $b = -0.09$, $SE = 0.04$, $p = .052$, respectively).

The total effects ($R^2 = .416$, $F(2, 507) = 180.905$, $p < .001$) of attachment anxiety and avoidance on conspiracy beliefs were significant ($b = 0.55$, $SE = 0.03$, $p < .001$; $b = -0.25$, $SE = 0.04$, $p < .001$, respectively). Attachment anxiety and avoidance, and stress helplessness, magnification, and rumination explained 47% of variance conspiracy beliefs ($R^2 = .470$, $F(5,$

504) = 89.228, $p < .001$). Helplessness, magnification, and rumination were significantly associated with conspiracy belief ($b = 0.39$, $SE = 0.07$, $p < .001$; $b = 0.16$, $SE = 0.06$, $p = .011$; $b = -0.27$, $SE = 0.06$, $p < .001$, respectively). The direct effects of attachment anxiety and avoidance on conspiracy belief were significant ($b = 0.36$, $SE = 0.04$, $p < .001$; $b = -0.23$, $SE = 0.04$, $p < .001$, respectively).

A significant indirect effect of attachment anxiety on conspiracy beliefs was found through helplessness ($b = 0.21$, $SE = 0.04$, CI = [.13, .29]), magnification ($b = 0.08$, $SE = 0.03$, CI = [.02, .14]), and rumination ($b = -0.11$, $SE = 0.03$, CI = [-.16, -.05]). For attachment avoidance, we found a significant indirect effect on conspiracy beliefs through helplessness ($b = -0.04$, $SE = 0.02$, CI = [-.08, -.01]), but not through magnification or rumination ($b = -0.01$, $SE = 0.01$, CI = [-.04, .01]; $b = 0.02$, $SE = 0.02$, CI = [-.01, .06], respectively).

Inclusion of Covariates. Some relationships changed when covariates were included in the model. The relationships between attachment anxiety and helplessness ($b = 0.55$, $SE = 0.03$, $p < .001$), magnification ($b = 0.50$, $SE = 0.03$, $p < .001$), and rumination ($b = 0.42$, $SE = 0.03$, $p < .001$) remained the same. The relationship between attachment avoidance and helplessness remained significant ($b = -0.09$, $SE = 0.04$, $p = .033$), but lost significance with magnification ($b = -0.08$, $SE = 0.04$, $p = .071$), and was now significantly associated with rumination ($b = -0.09$, $SE = 0.04$, $p = .035$).

The total effects of attachment anxiety and avoidance on conspiracy beliefs remained significant ($b = 0.44$, $SE = 0.03$, $p < .001$; $b = -0.18$, $SE = 0.04$, $p < .001$, respectively). The relationships between helplessness, magnification, and rumination and conspiracy beliefs remained significant ($b = 0.31$, $SE = 0.07$, $p < .001$; $b = 0.13$, $SE = 0.06$, $p = .038$; $b = -0.20$, $SE = 0.06$, $p = .002$, respectively). The direct effects of attachment anxiety and avoidance on

conspiracy belief remained significant (b = 0.29, SE = 0.04, p < .001; b = -0.17, SE = 0.04, p < .001, respectively).

We again found indirect effects of attachment anxiety on conspiracy beliefs through helplessness (b = 0.17, SE = 0.04, CI = [.10, .25]), magnification (b = 0.06, SE = 0.03, CI = [.01, .12]), and rumination; (b = -0.08, SE = 0.03, CI = [-.14, -.03]). The indirect effect of attachment avoidance on conspiracy beliefs through helplessness was no longer significant (b = -0.03, SE = 0.02, CI = [-.07, .01]), and its non-significant indirect effects through magnification (b = -0.01, SE = 0.01, CI = [-.03, .01]) and rumination (b = 0.02, SE = 0.01, CI = [-.01, .05]) remained the same (See Figure 3 for an illustration of this model with standardised values).

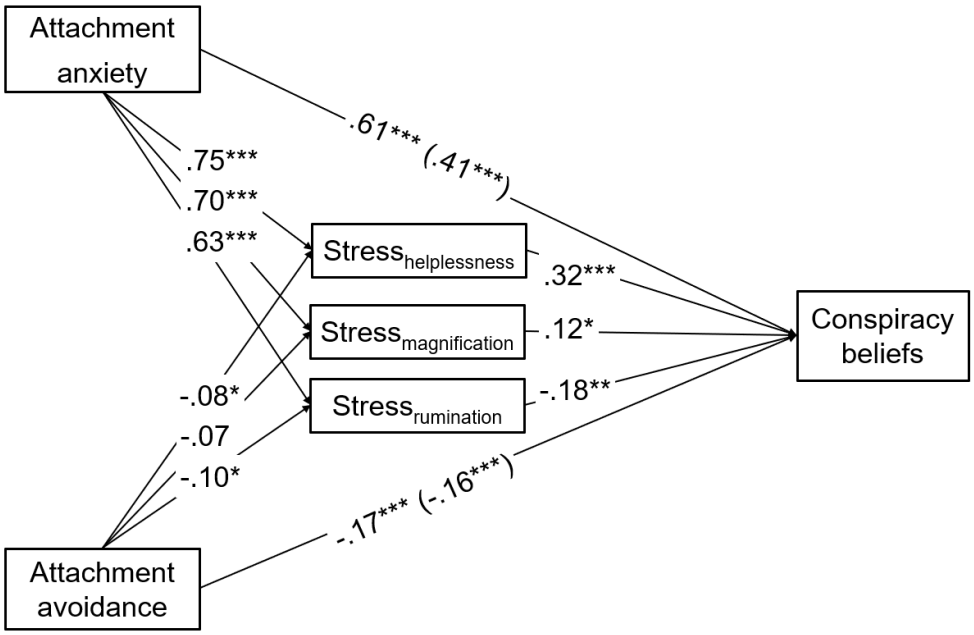

Figure 3. Standardized regression coefficients for mediation analysis (Study 3). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for stress helplessness, magnification, and rumination, can be found in the parentheses. Age, gender, educational attainment, and religiosity are also included as covariates.

Exploratory Mediation Analysis: Conspiracy Belief as Mediator

Helplessness as Outcome. We found a significant indirect effect of attachment anxiety on stress helplessness through conspiracy beliefs (b = 0.10, SE = 0.02, CI = [0.05, 0.15]), as well as from attachment avoidance (b = -0.04, SE = 0.01, CI = [-0.07, 0.02]).

Magnification as Outcome. We found a significant indirect effect of attachment anxiety on stress magnification through conspiracy beliefs (b = 0.08, SE = 0.02, CI = [0.04, 0.13]), as well as from attachment avoidance (b = -0.03, SE = 0.01, CI = [-0.06, -0.01]).

Rumination as Outcome. We did not find an indirect of attachment anxiety on pain rumination through conspiracy beliefs (b = 0.04, SE = 0.02, CI = [-0.01, 0.09]), and nor from attachment avoidance (b = -0.02, SE = 0.01, CI = [-0.04, 0.01]).

Discussion

In line with our hypothesis, and replicating the Study 2, we found stress catastrophizing to explain the relationship between attachment anxiety and conspiracy beliefs. As in Study 2, all three subfactors of catastrophizing were found to correlate with attachment anxiety and belief in conspiracy theories. In subsequent mediation analyses stress *helplessness* and *magnification* were found to positively explain the relationship between attachment anxiety and conspiracy beliefs. Interestingly, however, rumination was found to negatively predict conspiracy beliefs, and negatively mediate the relationship between attachment anxiety and conspiracy beliefs. The most consistent finding thus far, however, is that catastrophizing feelings of helplessness explains the relationship between attachment anxiety and conspiracy beliefs (as in Study 2). Further, in the exploratory model, we again found conspiracy beliefs to mediate the relationships between attachment anxiety and stress helplessness and magnification. Finally, unlike the previous studies, attachment avoidance was found to negatively predict stress helplessness and rumination catastrophizing and

conspiracy beliefs. Nevertheless, the attachment pattern found to predict catastrophizing and conspiracy beliefs is that of attachment anxiety (Brennan et al., 1998), and the mediation results suggest that conspiracy beliefs are driven by the hyperactivating strategy of appearing helpless. In the next study, we aimed to conceptually replicate these results by examining a different construct which encapsulates catastrophizing: looming cognitive style.

Study 4

In Study 4, we again aimed to conceptually replicate the findings of our previous studies. In doing so, we changed the operationalization of catastrophizing to looming cognitive style. Looming cognitive style can be described as a tendency to construct mental scenarios and appraisal of unfolding threat and increasing danger (Risking & Williams, 2005). In previous research, attachment-anxious (versus avoidant) persons have been shown to exhibit a looming cognitive style (Altan-Atalay & Ayvaşık, 2018; Williams & Riskind, 2004). Unlike our previous operationalizations of catastrophizing, this measure describes several scenarios in which potentially threatening social and physical situations are unfolding (e.g., presenting in front of an unknown group and having car difficulties on the motorway, respectively). Therefore, in this study—compared to the previous three studies—we examined potential (versus actual) threats that people can be faced with and how they appraise these hypothetical situations. In line with our main hypothesis, we expected higher looming cognitive style would predict increased belief in conspiracy theories, and that attachment anxiety would have a positive indirect effect on these beliefs through looming cognitive style. For robustness, we also included socio-demographic variables as covariates. Finally, we also explored whether conspiracy belief mediates the relationship between attachment anxiety and looming cognitive style.[6]

[6] General anxiety was also measured in this study but was not used in subsequent analyses.

Methods

Participants

We recruited 255 UK participants from Prolific Academic to complete an online questionnaire (they were each paid UK £1 for their time). Participants who did not complete the main variables of interest (n = 1) or were not from the UK (n = 14) were excluded from the study. The remaining participants (N = 240; 164 women, 76 men; M_{age} = 34.29 years, SD_{age} = 12.14, range = 18–74) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .93), attachment anxiety (α = .95) and avoidance (α = .95), and covariates (age, gender, education, and religiosity) were used as in the previous studies.

Looming Cognitive Style. We used the revised Looming Maladaptive Style Questionnaire (LMSQ-R; Riskind et al., 2000). The questionnaire consists of six scenarios describing potentially threatening situations and measures perceived increased risk of the threat. Three scenarios assess physical looming (e.g., engine problems whilst driving on a motorway during rush hour traffic) and another three assess social looming (e.g., public-speaking in front of a large audience on a topic you do not know a lot about). Participants were asked to imagine each scenario in detail and answer three questions. There were nine physical and nine social items (e.g., "Is the level of threat from the car's engine [audience] staying fairly constant, or is it growing rapidly larger with each passing moment?"; 1 = *threat is staying fairly constant*, 5 = *threat is growing rapidly larger*). A total looming cognitive style score is calculated by aggregating responses to the three items across the six vignettes, ranging from 18 to 90 (α = .89)

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (attachment anxiety and avoidance, looming cognitive style, and conspiracy beliefs). Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through looming cognitive style. We also included attachment avoidance in this model as a predictor alongside anxiety, where we tested for direct and indirect effects on conspiracy beliefs. Then—for robustness—we reran this mediation analysis with covariates included (age, gender [male = 0, female = 1], educational attainment, and religiosity) to see if the results remain unchanged. Finally, we used Model 4 to explore whether there was an indirect effect of attachment anxiety (but not avoidance) on looming cognitive style through conspiracy beliefs, with covariates included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 4. Attachment anxiety and avoidance moderately positively correlated with each other. Attachment anxiety showed a medium positive correlation with looming cognitive style and conspiracy beliefs. Attachment avoidance did not correlate with conspiracy beliefs or looming cognitive style.

Table 4

Means, standard deviations, and zero-order correlations (Study 4).

Measure	*M*	*SD*	1	2	3	4
1. Conspiracy beliefs	2.82	0.82	-	.17**	.03	.15*
2. Attachment anxiety	3.54	1.28		-	.46***	.27***
3. Attachment avoidance	2.93	1.20			-	.04
4. Looming cognitive style	64.45	12.08				-

$* p < .05$. $** p < .01$. $*** p < .001$.

Mediation Analyses

Attachment anxiety and avoidance explained 8% of the variance in looming cognitive style ($R^2 = .080$, $F(2, 237) = 10.249$, $p < .001$). The analysis showed that attachment anxiety was significantly associated with looming cognitive style ($b = 2.97$, $SE = 0.67$, $p < .001$), whereas avoidance was not ($b = -1.02$, $SE = 0.71$, $p = .151$).

The total effect ($R^2 = .033$, $F(2, 237) = 4.046$, $p = .019$) of attachment anxiety of conspiracy beliefs was significant ($b = 0.13$, $SE = 0.05$, $p = .006$), but not for avoidance ($b = -0.04$, $SE = 0.05$, $p = .396$). Attachment anxiety and avoidance, and looming cognitive style explained 4% of variance in conspiracy belief ($R^2 = .044$, $F(3, 236) = 3.625$, $p = .014$). Looming cognitive style was not associated with conspiracy beliefs ($b = 0.01$, $SE = 0.01$, $p = .100$). The direct effect of attachment anxiety on conspiracy beliefs was significant ($b = 0.11$, $SE = 0.05$, $p = .026$), but not for avoidance ($b = -0.03$, $SE = 0.05$, $p = .487$).

No indirect effects were found from attachment anxiety or avoidance on conspiracy belief through looming cognitive style ($b = 0.02$, $SE = 0.01$, CI = [-.01, .05]; $b = -0.01$, $SE = 0.01$, CI = [-.02, .01], respectively).

Inclusion of Covariates. No significant changes were found when covariates were included in the model (See Figure 4 for an illustration of this model with standardised values). The relationships between attachment anxiety and avoidance on looming cognitive style remained the same (b = 3.18, SE = 0.68, p < .001; b = -0.93, SE = 0.70, p = .182, respectively). The total effects of attachment anxiety and avoidance on conspiracy beliefs remained the same (b = 0.15, SE = 0.05, p = .002; b = -0.05, SE = 0.05, p = .332). The relationship between looming cognitive style and conspiracy beliefs remained the same (b = 0.01, SE = 0.01, p = .157). The direct effects of attachment anxiety and avoidance on conspiracy beliefs remained the same (b = 0.13, SE = 0.05, p = .010; b = -0.04, SE = 0.05, p = .398, respectively), and so did their indirect effects through looming cognitive style (b = 0.02, SE = 0.01, CI = [-.01, .05]; b = -0.01, SE = 0.01, CI = [-.02, .01], respectively).

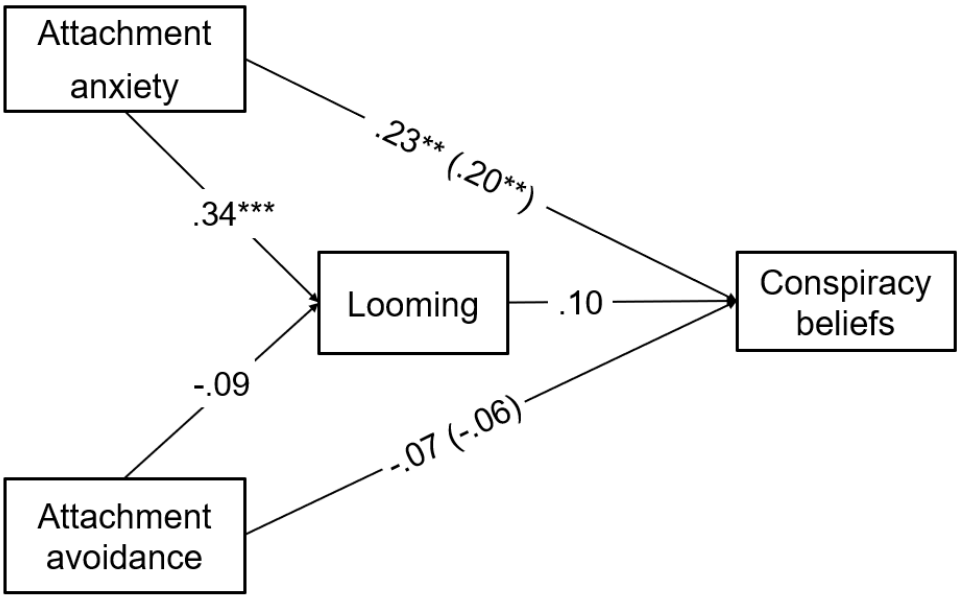

Figure 4. Standardized regression coefficients for mediation analysis (Study 4). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for looming cognitive style can be found in the parentheses. Age, gender, educational attainment, and religiosity are also included as covariates.

Exploratory Mediation Analysis: Conspiracy Belief as Mediator

We did not find an indirect of attachment anxiety on looming cognitive style through conspiracy beliefs (b = 0.20, SE = 0.15, CI = [-0.05, 0.55]), and nor from attachment avoidance (b = -0.01, SE = 0.01, CI = [-0.03, 0.01]).

Discussion

Looming cognitive style was found to be positively associated with attachment anxiety, supporting previous research (Altan-Atalay & Ayvaşık, 2018; Williams & Riskind, 2004). Attachment avoidance was not shown to predict looming cognitive style or conspiracy beliefs. However, although we found a positive correlation between looming cognitive style and conspiracy beliefs, subsequent regression analyses did not find looming cognitive style to be a predictor or mediator of conspiracy beliefs. Further, in the exploratory model, conspiracy belief did not mediate the relationship between attachment anxiety and looming cognitive style. There are a several reasons why this might be. First, it might be the case that catastrophic appraisals of threats only explain the relationship between attachment anxiety and conspiracy beliefs if the appraised threat is something that a person has experienced themselves (arguably, everyone has experienced pain and stress at some point in their lives). That is, catastrophic appraisals of hypothetical threats might produce different results for the relationship in question compared to threats that people are more versed with. Second, it could also be argued that looming cognitive style does not distinguish between primary and secondary threat appraisals associated with catastrophizing (Severeijns et al., 2004; see also, Lazarus & Folkman, 1984). Indeed, looming cognitive style appears to only measure primary threat appraisals, which asks participants to rate whether the threats from the scenarios are growing larger and rapidly, but does not appear to measure secondary appraisals which would ask participants to rate their (in)ability to cope with said threats. Finally, in the current study we recruited participants from the U.K., whereas in the previous studies we recruited from

the U.S., which might have contributed to the difference in results. However, there is no reason to suspect there would be differences between these two cultures in attachment (Mikulincer & Shaver, 2017) or conspiracy beliefs (Brotherton et al., 2013).

Taken together, the present and previous studies suggest that only certain types of catastrophizing might explain the relationship in question, namely helplessness. In the next study, however, we aim to show that looming cognitive style (a primary appraisal) may still have an important role to play in explaining the relationship between attachment anxiety and conspiracy beliefs, but only in conjunction with feelings of helplessness (a secondary appraisal).

Study 5

In Study 5, we aimed to re-examine looming cognitive style's relationship with belief in conspiracy theories and attachment anxiety. This time however, we reintroduced the helplessness, rumination, and magnification subfactors of stress catastrophizing. The logic behind this was to test whether looming cognitive style would mediate the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress catastrophizing. We previously reasoned that the threatening scenarios provided by the looming cognitive style measure were hypothetical and participants may not have had similar past experiences to inform their appraisals, unlike with threats from pain and stress. It might be the case then, that the relationship between looming cognitive style and conspiracy beliefs is moderated by catastrophizing. That is, only participants who have a high tendency to catastrophize stress, for example, will also likely exhibit a looming cognitive style and be drawn to conspiracy theories. By examining these variables through moderated mediation analyses, we will be able to draw out the attachment-anxious persons with the highest stress catastrophizing tendencies and looming cognitive style, who should then show the highest level of conspiracy beliefs. Therefore, we explored whether high (versus low) stress

catastrophizing would moderate the relationship between looming cognitive style and belief in conspiracy theories, and subsequently moderate the indirect effects of attachment anxiety on conspiracy beliefs through looming cognitive style. Based on the results of Studies 2 and 3, we might expect stress helplessness and magnification to be the key moderating subfactors. Furthermore, by reintroducing stress catastrophizing, this allowed us to replicate the results of Studies 2 and 3 by examining stress helplessness, magnification, and rumination as mediators of attachment anxiety and conspiracy beliefs—whilst controlling for looming cognitive style—to see whether stress helplessness remains the key subfactor that explains the relationship in question. As in the previous studies, we included age, educational attainment, and religiosity as covariates for robustness. Additionally, we included social and economic political orientation as covariates. Previous research has shown political orientation to be an important antecedent of conspiracy beliefs (e.g., Krouwel et al., 2017; van Prooijen et al., 2015), and could affect the main pattern of results. We therefore examined whether the associations between attachment, catastrophizing, and conspiracy belief holds over and above other important socio-demographic variables. Finally, we also explored conspiracy belief as a mediator of the relationships between attachment anxiety and stress helplessness, magnification, and rumination.

Method

Participants

We recruited 454 US American participants from MTurk to complete an online questionnaire (they were each paid US $1 for their time). Participants who did not complete the main variables of interest (n = 6) or were not from the US (n = 37) were excluded from the study. The remaining participants (N = 411; 257 men, 153 women, 1 other; M_{age} = 37.73 years, SD_{age} = 10.83, range = 18–76) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .95), attachment anxiety (α = .95) and avoidance (α = .84), stress helplessness (α = .90), magnification (α = .78), and rumination (α = .82), looming cognitive style (α = .87), and covariates (age, gender, educational attainment, and religiosity) were used as in previous studies. We also included two new single-item covariates: social and political orientation (1 = *very liberal*, 7 = *very conservative*)

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (conspiracy beliefs, attachment anxiety and avoidance, stress helplessness, magnification, and rumination, and looming cognitive style). Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through stress helplessness, magnification, and rumination. We also included attachment avoidance in this model as a predictor alongside anxiety, where we also tested for direct and indirect effects on conspiracy beliefs. Third—for robustness—we reran this model including sociodemographic variables (age, gender [male = 0, female = 1], educational attainment, religiosity, social and economic political orientation) and looming cognitive style included as covariates, to see if the results remain unchanged. Next, we used Model 4 to explore an alternative model where we test whether there was an indirect effect of attachment anxiety (but not avoidance) on stress helplessness, magnification, and rumination through conspiracy beliefs, with covariates included. Finally, we used PROCESS Model 14 to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs thorough looming cognitive style, and whether these indirect effects are moderated by stress helplessness,

magnification, or rumination. In these models, we included attachment avoidance and sociodemographic variables as covariates.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 5. Attachment anxiety and avoidance strongly positively correlated with each other. Attachment anxiety showed a strong positive correlation with conspiracy beliefs, stress helplessness, magnification, and rumination, and a moderate positive correlation with looming cognitive style. Attachment avoidance showed a moderate positive correlation with conspiracy beliefs, stress helplessness, magnification, and rumination, but did not correlate with looming cognitive style. Looming cognitive style moderately positively correlated with stress helplessness, magnification, and rumination.

Table 5

Means, standard deviations, and zero-order correlations (Studies 5 and 6).

Measure		1	2	3	4	5	6	7
1. Conspiracy beliefs		-	.70***	.33***	.64***	.58***	.53***	.40***
2. Attachment anxiety		.23***	-	.55***	.74***	.70***	.66***	.39***
3. Attachment avoidance		.05	.48***	-	.39***	.32***	.30***	-.05
4. $Stress_{helplessness}$		.08	.43***	.26***	-	.80***	.80***	.43***
5. $Stress_{magnification}$		.10*	.36***	.17***	.75***	-	.80***	.46***
6. $Stress_{rumination}$		.07	.37***	.15***	.81***	.78***	-	.43***
7. Looming cognitive style		.13**	.37***	.12**	.44***	.49***	.47***	-
Study 5	*M*	3.49	4.38	3.23	2.26	2.35	2.44	68.42
	SD	0.88	1.34	0.79	1.00	0.96	0.92	9.60
Study 6	*M*	2.44	3.27	2.93	1.35	1.89	1.99	53.79
	SD	0.80	1.28	1.20	1.02	1.05	1.03	13.44

Note: Study 5 zero-order correlations are displayed on the upper diagonal, while those for Study 6 are displayed on the lower diagonal.

$* p < .05$. $** p < .01$. $*** p < .001$.

Mediation Analyses

Attachment anxiety and avoidance explained 55%, 50%, and 44% of variance in stress helplessness (R^2 = .570, F(2, 408) = 246.284, p < .001), magnification (R^2 = .496, F(2, 408) = 200.468, p < .001), and rumination (R^2 = .442, F(2, 408) = 161.265, p < .001), respectively. Attachment anxiety was significantly associated with helplessness (b = 0.57, SE = 0.03, p < .001), magnification (b = 0.54, SE = 0.03, p < .001), and rumination (b = 0.49, SE = 0.03, p < .001). Attachment avoidance was significantly associated with magnification (b = -0.13, SE = 0.05, p = .013) and rumination (b = -0.11, SE = 0.05, p = .030), but not with helplessness (b = -0.04, SE = 0.05, p = .460).

The total effects (R^2 = .056, F(2, 488) = 14.482, p < .001) of attachment anxiety and avoidance on conspiracy beliefs were significant (b = 0.50, SE = 0.03, p < .001; b = -0.10, SE = 0.05, p = .040, respectively). Attachment anxiety and avoidance, and stress helplessness, magnification, and rumination explained 53% of variance conspiracy beliefs (R^2 = .532, F(5, 405) = 91.890, p < .001). Stress helplessness was significantly associated with conspiracy beliefs (b = 0.23, SE = 0.06, p < .001), whereas magnification and rumination were not (b = 0.08, SE = 0.06, p = .120; b = -0.08, SE = 0.06, p = .164, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.36, SE = 0.04, p < .001), but the direct effect of avoidance was not (b = -0.09, SE = 0.05, p = .057).

A significant indirect effect of attachment anxiety on conspiracy beliefs was found through helplessness (b = 0.13, SE = 0.05, CI = [.05, .22]), but not through magnification (b = 0.04, SE = 0.03, CI = [-.02, .10]), or rumination (b = -0.04, SE = 0.03, CI = [-.10, .02]). No significant indirect effects were found for attachment avoidance (b = -0.01, SE = 0.01, CI = [-.04, .02]; b = -0.01, SE = 0.01, CI = [-.03, .01]; b = 0.01, SE = 0.01, CI = [-.01, .03], respectively).

Inclusion of Covariates. The results changed slightly when covariates were included. Attachment anxiety remained significantly associated with helplessness (b = 0.47, SE = 0.04, p < .001), magnification (b = 0.44, SE = 0.04, p < .001), and rumination (b = 0.42, SE = 0.04, p < .001). Attachment avoidance was still not significantly associated with helplessness (b = 0.06, SE = 0.05, p = .253), and lost significance with magnification and rumination (b = -0.02, SE = 0.05, p = .680; b = -0.03, SE = 0.06, p = .619, respectively).

The total effect of attachment anxiety on conspiracy beliefs remained the same (b = 0.35, SE = 0.03, p < .001); however, the total effect of attachment avoidance on conspiracy beliefs was no longer significant (b = 0.02, SE = 0.05, p = .358). The relationships between stress helplessness, magnification or rumination on conspiracy beliefs remained the same (b = 0.18, SE = 0.06, p = .002; b = 0.05, SE = 0.06, p = .350; b = -0.05, SE = 0.06, p = .357, respectively). The direct effect of attachment anxiety on conspiracy beliefs remained significant (b = 0.36, SE = 0.04, p < .001); however, the direct effect of attachment avoidance on conspiracy beliefs was no longer significant (b = -0.09, SE = 0.05, p = .357).

The indirect effects of attachment anxiety and avoidance on conspiracy beliefs through helplessness (b = 0.08, SE = 0.03, CI = [.02, .15]; b = 0.01, SE = 0.01, CI = [-.01, .04], respectively), magnification (b = -0.01, SE = 0.01, CI = [-.01, .01]; b = -0.01, SE = 0.01, CI = [-.01, .01], respectively), and rumination (b = -0.02, SE = 0.02, CI = [-.07, .03]; b = 0.01, SE = 0.01, CI = [-.01, .01], respectively) remained the same (see Figure 5 for an illustration of this model with standardised values).

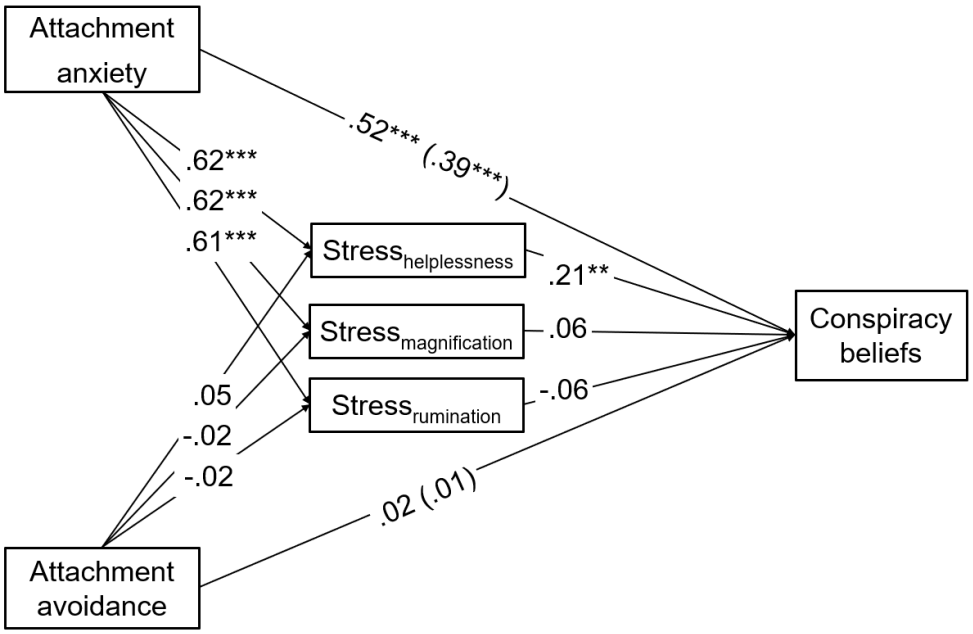

Figure 5. Standardized regression coefficients for mediation analysis (Study 5). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for stress helplessness, magnification, and rumination, can be found in the parentheses. Age, gender, educational attainment, religiosity, social and economic political orientation, and looming cognitive style are also included as covariates.

Exploratory Mediation Analysis: Conspiracy Belief as Mediator

Helplessness as Outcome. We found a significant indirect effect of attachment anxiety on stress helplessness through conspiracy beliefs (b = 0.10, SE = 0.03, CI = [0.05, 0.17]), but not from attachment avoidance (b = -0.01, SE = 0.02, CI = [-0.05, 0.03]).

Magnification as Outcome. We found a significant indirect effect of attachment anxiety on stress magnification through conspiracy beliefs (b = 0.08, SE = 0.03, CI = [0.03, 0.14]), but not from attachment avoidance (b = -0.01, SE = 0.01, CI = [-0.03, 0.02]).

Rumination as Outcome. We found a significant indirect effect of attachment anxiety on stress rumination through conspiracy beliefs (b = 0.06, SE = 0.03, CI = [0.01, 0.12]), but not from attachment avoidance (b = -0.01, SE = 0.01, CI = [-.02, 0.01]).

Exploratory Moderated Mediation Analysis

Stress Helplessness as Moderator. Attachment anxiety (including attachment avoidance, stress magnification and rumination, and covariates) explained 32% of variance in the looming cognitive style (R^2 = .325, F(10, 399) = 19.166, p < .001). The analysis showed that attachment anxiety was significantly associated with a looming cognitive style (b = 1.87, SE = 0.53, p < .001). All variables explained 59% of variance in conspiracy belief (R^2 = .590, F(13, 396) = 44.631, p < .001). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.24, SE = 0.04, p < .001). Looming cognitive style and helplessness were significantly associated with conspiracy beliefs (b = 0.01, SE = 0.01, p = .012; b = 0.18, SE = 0.06, p < .001, respectively).

The interaction term between looming cognitive style and stress helplessness on conspiracy beliefs was significant (b = 0.01, SE = 0.01, p = .011; see Table 6 for conditional effects and Figure 5 for illustration of simple slopes). The simple slopes showed that at medium and high levels of stress helplessness, looming cognitive style positively predicted conspiracy beliefs (b =.01, p = .012; b = .02, p < .001, respectively), but not at low levels of stress helplessness (b =.01, p = .583). Importantly, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through looming cognitive style at medium and high, but not low, levels of stress helplessness. Specifically, looming cognitive style mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress helplessness. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 6).

Table 6

Conditional effects, conditional indirect effects, and index of moderated mediation (Study 5).

	Helplessness		Magnification		Rumination	
Conditional effects (M on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]
0	0.01 (0.01)	[0.01, 0.02]	0.01 (0.01)	[0.01, 0.02]	0.01 (0.01)	[0.01, 0.02]
+1.00	0.02 (0.01)	[0.01, 0.03]	0.02 (0.01)	[0.01, 0.03]	0.01 (0.01)	[0.01, 0.02]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	0.01 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.03]
0	0.02 (0.01)	[0.01, 0.04]	0.02 (0.01)	[0.01, 0.04]	0.02 (0.01)	[0.01, 0.04]
+1.00	0.03 (0.01)	[0.01, 0.06]	0.03 (0.01)	[0.01, 0.06]	0.03 (0.01)	[0.01, 0.05]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	0.01 (0.01)	[0.01, 0.03]	0.02 (0.01)	[0.01, 0.04]	0.01 (0.01)	[-0.01, 0.03]

Note: X = Attachment anxiety; M = Looming cognitive style; Y = Conspiracy beliefs; W = Stress helplessness, magnification, or rumination.

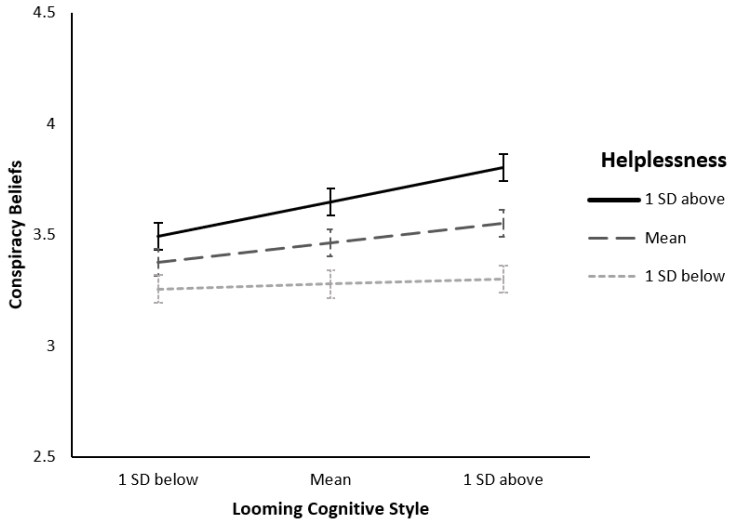

Figure 6. Interaction between looming cognitive style and stress helplessness in predicting conspiracy beliefs. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Magnification as Moderator. Attachment anxiety (including attachment avoidance, stress helplessness and rumination, and covariates) explained 32% of variance in the looming cognitive style (R^2 = .315, F(10, 399) = 18.348, p < .001). The analysis showed that attachment anxiety was significantly associated with looming cognitive style (b = 2.01, SE = 0.54, p < .001). All variables explained 60% of variance in conspiracy beliefs (R^2 = .596, F(13, 396) = 44.886, p < .001). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.25, SE = 0.04, p < .001). Looming cognitive style, but not stress magnification, was significantly associated with conspiracy beliefs (b = 0.01, SE = 0.01, p = .012; b = 0.07, SE = 0.06, p = .244, respectively).

The interaction term between looming cognitive style and stress magnification on conspiracy beliefs was significant (b = 0.01, SE = 0.01, p = .005; see Table 6, p. 56, for conditional effects and Figure 7 for illustration of simple slopes). The simple slopes show that at medium and high levels of stress magnification, looming cognitive style positively

predicted conspiracy beliefs (b =.01, p = .013; b = .02, p < .001, respectively), but not at low levels of stress magnification (b =.01, p = .735). Importantly, we found conditional indirect effects of attachment anxiety on conspiracy belief through looming cognitive style at medium and high, but not low, levels of stress magnification. That is, looming cognitive style mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress magnification. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 6, p. 56).

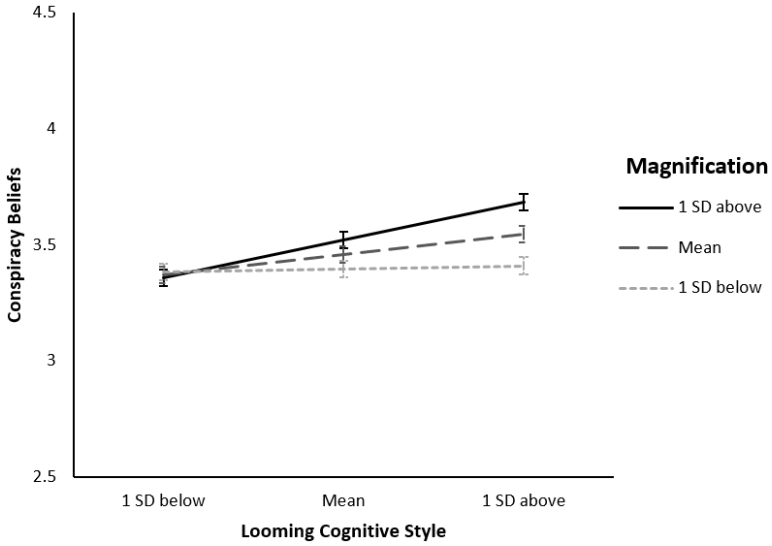

Figure 7. Interaction between looming cognitive style and stress magnification in predicting conspiracy beliefs. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Rumination as Moderator. Attachment anxiety (including attachment avoidance, stress helplessness and magnification, and covariates) explained 32% of variance in the looming cognitive style (R^2 = .325, F(10, 399) = 19.182, p < .001). The analysis showed that attachment anxiety was significantly associated with a looming cognitive style (*b*

= 1.78, *SE* = 0.54, $p < .001$). All variables explained 59% of variance in conspiracy beliefs ($R^2 = .592$, $F(13, 396) = 44.253$, $p < .001$). The direct effect of attachment anxiety on conspiracy beliefs was significant ($b = 0.25$, $SE = 0.04$, $p < .001$). Looming cognitive style, but not stress rumination, was significantly associated with conspiracy beliefs ($b = 0.01$, $SE = 0.01$, $p = .015$; $b = -0.05$, $SE = 0.06$, $p = .384$, respectively).

The interaction term between looming cognitive style and stress rumination on conspiracy beliefs was significant ($b = 0.01$, $SE = 0.01$, $p = .036$; see Table 6, p. 56, for conditional effects and Figure 8 for illustration of simple slopes). The simple slopes show that at medium and high levels of stress rumination, looming cognitive style positively predicted conspiracy beliefs ($b = .01$, $p = .015$; $b = .01$, $p = .003$, respectively), but not at low levels of stress rumination ($b = .01$, $p = .783$). Importantly, we found indirect effects of attachment anxiety on conspiracy belief through looming cognitive style at medium and high, but not low, levels of stress rumination; however, a non-significant index of moderated mediation suggests that the indirect effects are not conditional on stress rumination. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 6, p. 56).

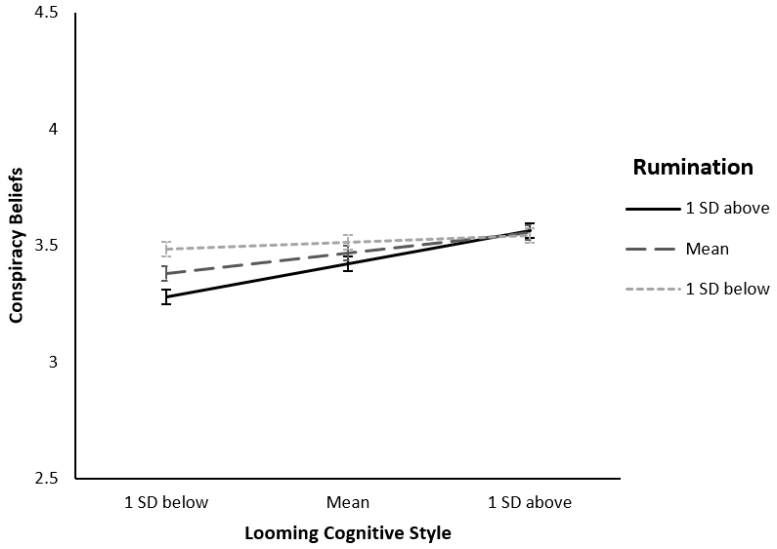

Figure 8. Interaction between looming cognitive style and stress rumination in predicting conspiracy beliefs. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Discussion

The current study largely confirmed our predictions. Firstly, we again found all subfactors of stress catastrophizing to correlate with attachment anxiety and conspiracy beliefs. When we examined these subfactors as mediators of attachment anxiety and conspiracy beliefs, only stress helplessness was found to significantly mediate this relationship, providing further support for Studies 2 and 3. In the exploratory model, we found conspiracy belief to mediate the relationships between attachment anxiety and stress helplessness, magnification, and rumination.

Looming cognitive style correlated positively with conspiracy beliefs as well, replicating Study 4. Further, confirming our predictions, we found looming cognitive style to mediate the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress helplessness and magnification. This suggests looming cognitive style

does have a part to play in explaining the relationship in question, but only for individuals who are high stress catastrophizers, which might explain why we did not find this anticipated mediation in Study 4. Indeed, by examining catastrophizing in such a way—by examining appraisals of hypothetical and actual threats—we were able to hone in on the attachment-anxious persons who were more likely to endorse conspiracy theories. In the next study we aimed to replicate these findings.

Study 6

In Study 6, we aimed to replicate the previous study whilst also whilst also increasing the validity of the findings. Specifically, in all previous studies thus far, participants were recruited from crowdsourcing platforms (i.e., Prolific Academic and MTurk). Therefore, in the current study we instead recruited participants by means of convenience sampling. In doing so, we advertised the survey on Reddit (a social media platform), where no incentives were offered. Other researchers have benefited from this inexpensive approach to sampling and have been able to replicate previous findings in the psychological literature (e.g., Biddlestone et al., 2020; Green et al., 2021; Jamnik & Lane, 2017). This was the only change to our methodology. We expected to replicate the results of Study 5, where (1) helplessness is the sole subfactor that mediates the relationship between attachment anxiety and conspiracy beliefs and (2) that looming cognitive style also mediates the relationship in question, but only at higher levels of stress helplessness and magnification. For robustness, we also include socio-demographic covariates as used in Study 5. Finally, we explored whether conspiracy belief mediates the relationships between attachment anxiety and stress helplessness, magnification, and rumination.

Method

Participants

We recruited 708 US American participants through adverts we posted on Reddit (they were not compensated for their time). Participants who did not complete the main variables of interest (n = 141) or were not from the US (n = 76) were excluded from the study. The remaining participants (N = 491; 254 women, 216 men, 12 other, 2 rather not say; M_{age} = 35.46 years, SD_{age} = 10.64, range = 18–72) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .92), attachment anxiety (α = .94) and avoidance (α = .95), stress helplessness (α = .91), magnification (α = .79), and rumination (α = .87), looming cognitive style (α = .87), and covariates (age, gender, educational attainment, religiosity, and social and economic political orientation) were used as in the previous studies.

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (conspiracy beliefs, attachment anxiety and avoidance, stress helplessness, magnification, and rumination, and looming cognitive style). Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through stress helplessness, magnification, and rumination. We also included attachment avoidance in this model as a predictor alongside anxiety, where we also tested for direct and indirect effects on conspiracy beliefs. Third—for robustness—we reran this model including demographics (age, gender [male = 0, female = 1], educational attainment, religiosity, social and economic political orientation, and looming cognitive style as covariates, to see if the

results remain unchanged. Next, we used Model 4 to explore whether there was an indirect effect of attachment anxiety on stress helplessness, magnification, and rumination through conspiracy beliefs, with covariates included. Finally, we used PROCESS Model 14 to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs thorough looming cognitive style, and whether these indirect effects are moderated by stress helplessness, magnification, or rumination.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 5 (p. 51). Attachment anxiety and avoidance moderately positively correlated with each other. Attachment anxiety showed small positive correlations with conspiracy beliefs, and showed moderate positive correlations with stress helplessness, magnification, and rumination, and looming cognitive style. Attachment avoidance did not correlate with conspiracy beliefs or looming cognitive style, but showed small positive correlations with stress helplessness, magnification, and rumination. Looming cognitive style moderately positively correlated with stress helplessness, magnification, and rumination.

Mediation Analyses

Attachment anxiety and avoidance explained 19%, 13%, and 14% of variance in stress helplessness (R^2 = .188, F(2, 488) = 56.360, p < .001), magnification (R^2 = .127, F(2, 488) = 35.420, p < .001), and rumination (R^2 = .139, F(2, 488) = 39.278, p < .001), respectively. The analysis showed that attachment anxiety was significantly associated with stress helplessness (b = 0.31, SE = 0.04, p < .001), magnification (b = 0.29, SE = 0.04, p < .001), and rumination (b = 0.31, SE = 0.04, p < .001), whereas attachment avoidance was not found to be associated with these mediators (b = 0.06, SE = 0.04, p = .136; b = -0.01, SE = 0.04, p = .954; b = -0.03, SE = 0.04, p = .451, respectively).

The total effect (R^2 = .066, F(2, 488) = 14.482, p < .001) of attachment anxiety on conspiracy beliefs was significant (b = 0.16, SE = 0.03, p < .001), whereas the total effect of attachment avoidance on conspiracy beliefs was not (b = -0.05, SE = 0.03, p = .114). Attachment anxiety and avoidance, and stress helplessness, magnification, and rumination explained 6% of variance conspiracy beliefs (R^2 = .061, F(5, 485) = 6.253, p < .001). Helplessness, magnification, and rumination were not significantly associated with conspiracy beliefs (b = -0.03, SE = 0.07, p = .630; b = 0.08, SE = 0.06, p = .151; b = -0.06, SE = 0.07, p = .377, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.17, SE = 0.03, p < .001), whereas the direct effect of attachment avoidance was not (b = -0.05, SE = 0.03, p = .120). No significant indirect effects of attachment anxiety and avoidance on conspiracy beliefs were found through stress helplessness (b = -0.01, SE = 0.02, CI = [-.05, .03]; b = -0.01, SE = 0.01, CI = [-.01, .01], respectively), magnification (b = 0.02, SE = 0.02, CI = [-.01, .06]; b = -0.01, SE = 0.01, CI = [-.01, .01], respectively), or rumination (b = -0.02, SE = 0.02, CI = [-.06, .02]; b = -0.01, SE = 0.01, CI = [-.01, .01], respectively).

Inclusion of Covariates. The pattern of results remained largely the same when covariates were included in the model. Attachment anxiety was remained significantly associated with stress helplessness (b = 0.20, SE = 0.04, p < .001), magnification (b = 0.14, SE = 0.04, p < .001), and rumination (b = 0.18, SE = 0.04, p < .001). The relationships between attachment avoidance on magnification and rumination remained insignificant (b = 0.02, SE = 0.04, p = .619; b = -0.02, SE = 0.04, p = .675, respectively); however, attachment avoidance was now found to be significantly associated with stress helplessness (b = 0.08, SE = 0.04, p = .041). The total effects of attachment anxiety and avoidance on conspiracy beliefs remained the same (b = 0.11, SE = 0.03, p = .002; b = -0.03, SE = 0.03, p = .374, respectively). The relationships between stress helplessness, magnification or rumination on

conspiracy beliefs remained the same (*b* = -0.04, *SE* = 0.07, *p* = .536; *b* = 0.06, *SE* = 0.06, *p* = .280; *b* = -0.04, *SE* = 0.07, *p* = .470, respectively). The indirect effects of attachment anxiety and avoidance on conspiracy beliefs through stress helplessness (*b* = -0.01, *SE* = 0.01, CI = [-.04, .02]; *b* = -0.01, *SE* = 0.01, CI = [-.01, .01], respectively), magnification (*b* = 0.01, *SE* = 0.01, CI = [-.01, .03]; *b* = 0.01, *SE* = 0.01, CI = [-.01, .01], respectively), and rumination (*b* = -0.01, *SE* = 0.01, CI = [-.03, .02]; *b* = 0.01, *SE* = 0.01, CI = [-.01, .01], respectively) remained non-significant (see Figure 9 for an illustration of this model with standardised values).

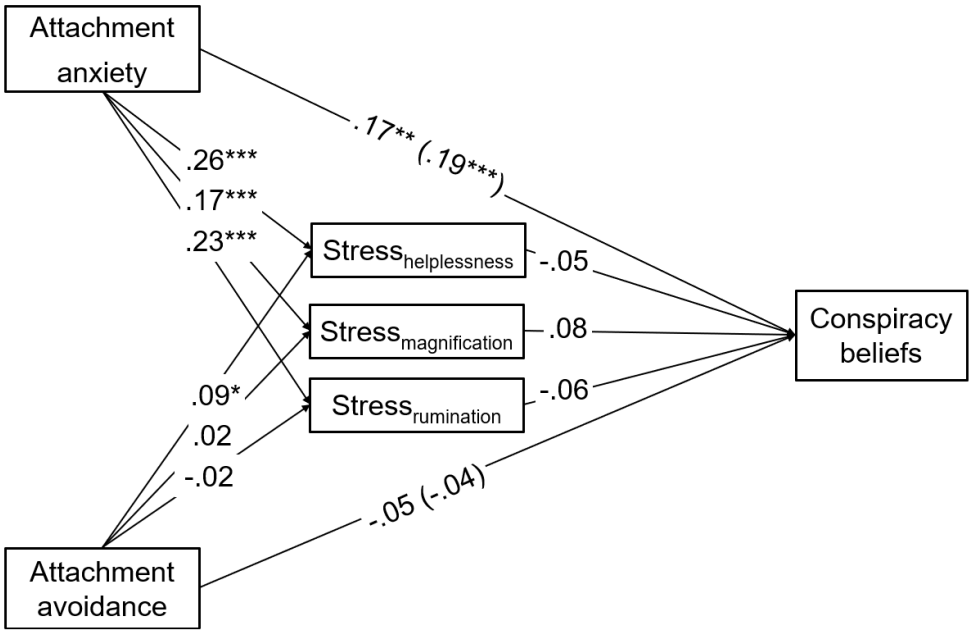

Figure 9. Standardized regression coefficients for mediation analysis (Study 6). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for stress helplessness, magnification, and rumination, can be found in the parentheses. Age, gender, educational attainment, religiosity, social and economic political orientation, and looming cognitive style are also included as covariates.

Exploratory Mediation Analysis: Conspiracy Belief as Mediator

Helplessness as Outcome. We did not find an indirect of attachment anxiety on stress helplessness through conspiracy beliefs (b = -0.01, SE = 0.01, CI = [-0.02, 0.01]), and nor from attachment avoidance (b = 0.01, SE = 0.01, CI = [-0.01, 0.01]).

Magnification as Outcome. We did not find an indirect of attachment anxiety on stress helplessness through conspiracy beliefs (b = 0.01, SE = 0.01, CI = [0.01, 0.02]), and nor from attachment avoidance (b = -0.01, SE = 0.01, CI = [-0.01, 0.01]).

Rumination as Outcome. We did not find an indirect of attachment anxiety on stress helplessness through conspiracy beliefs (b = -0.01, SE = 0.01, CI = [-0.02, 0.01]), and nor from attachment avoidance (b = -0.53, SE = 0.35, CI = [-1.14, 0.11]).

Moderated Mediation Analysis

Stress Helplessness as Moderator. Attachment anxiety (including attachment avoidance, stress magnification and rumination, and covariates) explained 31% of variance in the looming cognitive style (R^2 = .311, F(10, 458) = 20.714, p < .001). The analysis showed that attachment anxiety was significantly associated with looming cognitive style (b = 2.65, SE = 0.51, p < .001). All variables explained 15% of variance in conspiracy beliefs (R^2 = .153, F(13, 455) = 6.334, p < .001). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.11, SE = 0.03, p < .001). Looming cognitive style and stress helplessness were not significantly associated with conspiracy beliefs (b = 0.01, SE = 0.01, p = .117; b = -0.06, SE = 0.07, p = .386, respectively).

The interaction term between looming cognitive style and stress helplessness on conspiracy beliefs was significant (b = 0.01, SE = 0.01, p = .028; see Table 7 for conditional effects and Figure 10 for illustration of simple slopes). The simple slopes show that at high levels of stress helplessness, looming cognitive style positively predicted conspiracy beliefs

(*b* = .01, *p* = .007), but not at low and medium levels of stress helplessness (*b* = -.01, *p* = .980; *b* = .01, *p* = .105, respectively). Importantly, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through looming cognitive style at high, but not at medium or low, levels of stress helplessness. That is, looming cognitive style mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress helplessness. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 7).

Table 7

Conditional effects, conditional indirect effects, and index of moderated mediation (Study 6).

	Helplessness		Magnification		Rumination	
Conditional effects (M on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]
0	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.02]
+1.00	0.01 (0.01)	[0.01, 0.02]	0.01 (0.01)	[0.01, 0.02]	0.01 (0.01)	[0.01, 0.02]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.01 (0.01)	[-0.02, 0.02]	-0.01 (0.01)	[-0.03, 0.02]	-0.01 (0.01)	[-0.03, 0.02]
0	0.02 (0.01)	[-0.01, 0.03]	0.01 (0.01)	[-0.01, 0.03]	0.01 (0.01)	[-0.01, 0.03]
+1.00	0.03 (0.01)	[0.01, 0.05]	0.03 (0.01)	[0.01, 0.06]	0.03 (0.01)	[0.01, 0.06]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	0.01 (0.01)	[0.01, 0.03]	0.01 (0.01)	[0.01, 0.03]	0.02 (0.01)	[0.01, 0.03]

Note: X = Attachment anxiety; M = Looming cognitive style; Y = Conspiracy beliefs; W = Stress helplessness, magnification, or rumination.

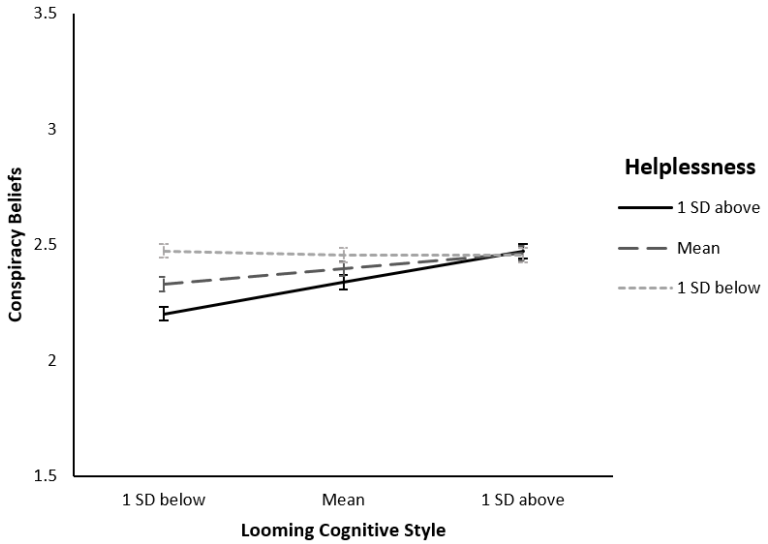

Figure 10. Interaction between looming cognitive style and stress helplessness in predicting conspiracy beliefs. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Magnification as Moderator. Attachment anxiety (including attachment avoidance, stress helplessness and rumination, and covariates) explained 28% of variance in the looming cognitive style (R^2 = .279, F(10, 458) = 17.702, p < .001). The analysis showed that attachment anxiety was significantly associated with a looming cognitive style (b = 2.745, SE = 0.52, p < .001). All variables explained 15% of variance in conspiracy belief (R^2 = .154, F(13, 455) = 6.362, p < .001). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.11, SE = 0.03, p < .001). Looming cognitive style and stress magnification were not significantly associated with conspiracy beliefs (b = 0.01, SE = 0.01, p = .125; b = 0.06, SE = 0.06, p = .269, respectively).

The interaction term between looming cognitive style and stress magnification on conspiracy belief was significant (b = 0.01, SE = 0.01, p = .024; see Table 7, p. 68, for conditional effects and Figure 11 for illustration of simple slopes). The simple slopes show

that at high levels of stress magnification, looming cognitive style positively predicted conspiracy beliefs (b = .01, p = .006), but not at low and medium levels of stress helplessness (b = -.01, p = .860; b = .01, p = .125, respectively). Importantly, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through looming cognitive style at high, but not at medium or low, levels of stress magnification. That is, looming cognitive style mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress magnification. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 7, p. 68).

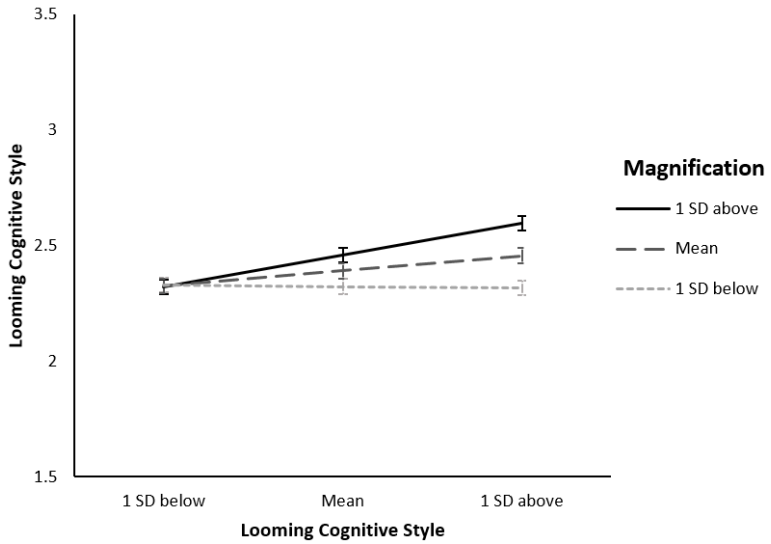

Figure 11. Interaction between looming cognitive style and stress magnification in predicting conspiracy beliefs. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Rumination as Moderator. Attachment anxiety (including attachment avoidance, stress helplessness and rumination, and covariates) explained 31% of variance in the looming cognitive style (R^2 = .309, F(10, 458) = 20.435, p < .001). The analysis showed

that attachment anxiety was significantly associated with looming cognitive style (b = 2.731, SE = 0.51, p < .001). All variables explained 16% of variance in conspiracy belief (R^2 = .156, F(13, 455) = 6.447, p < .001). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.12, SE = 0.03, p < .001). Looming cognitive style and stress rumination were not significantly associated with conspiracy beliefs (b = 0.01, SE = 0.01, p = .123; b = -0.04, SE = 0.07, p = .547, respectively).

The interaction term between looming cognitive style and stress rumination on conspiracy belief was significant (b = 0.01, SE = 0.01, p = .014; see Table 7, p. 68, for conditional effects and Figure 12 for illustration of simple slopes). The simple slopes show that at high levels of stress rumination, looming cognitive style positively predicted conspiracy beliefs (b = .01, p = .004), but not at low and medium levels of stress helplessness (b = -.01, p = .731; b = .01, p = .123, respectively). Importantly, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through looming cognitive style at high, but not at medium or low, levels of stress magnification. That is, looming cognitive style mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of stress rumination. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 7, p. 68).

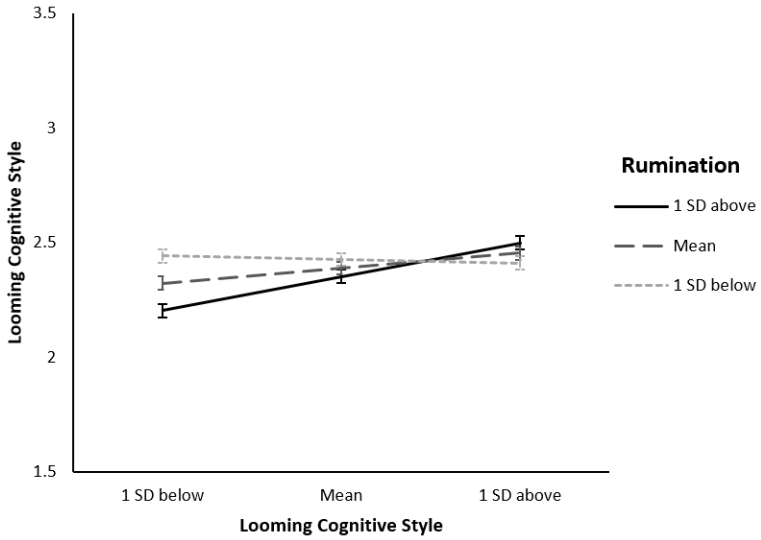

Figure 12. Interaction between looming cognitive style and stress rumination in predicting conspiracy beliefs. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Discussion

The results from the current study largely replicated those found in Study 5. First, we found looming cognitive style to correlate with conspiracy beliefs. We also found looming cognitive style to mediate the relationship with between attachment anxiety and conspiracy beliefs, but that this mediation was moderated by higher levels of stress catastrophizing (all three subfactors). However, the stress catastrophizing results—whilst controlling for looming cognitive style—did not replicate the previous findings. Only rumination correlated with conspiracy beliefs, and when we examined these subfactors in subsequent mediation analyses, neither of them mediated the relationship between attachment anxiety and conspiracy beliefs. Similarly, in the exploratory model, conspiracy belief was not found to mediate the relationships between stress helplessness, magnification, and rumination. This could be explained by the current study's change of sampling method, from crowdsourcing to convenience. Judging by the mean scores found in this study, we appear to have recruited

participants with lower conspiracy beliefs, attachment anxiety and stress catastrophizing, compared to Study 5. Nevertheless, the overall findings outlined in this chapter suggest that catastrophizing, namely helplessness, does have an important role to play in explaining the relationship between attachment anxiety and conspiracy beliefs.

General Discussion

Across six studies, we found support for the hypothesis that the tendency to catastrophize explains the relationship between attachment anxiety and belief in conspiracy theories. Specifically, higher intensity of daily hassles (Study 1); higher pain (Study 2) and stress (Studies 3 and 5) catastrophizing (namely helplessness); and a higher looming cognitive style (Studies 4, 5 and 6), were all found to positively mediate the relationship between attachment anxiety and belief in conspiracy theories. However, the mediating role of looming cognitive style was only evident at higher (versus lower) levels of stress catastrophizing (Studies 5 and 6). By examining the interaction between looming cognitive style and stress catastrophizing, we were able to draw out the attachment-anxious individuals who were more likely to be drawn to conspiracy theories. Interestingly, in Study 6, we did not find the same results for stress catastrophizing as a mediator of attachment anxiety and conspiracy beliefs as we did in the Studies 2, 3, and 5. This could be explained by our change of sampling, where we recruited participants from Reddit instead of Prolific Academic and MTurk.

Theoretical Implications

The current research corroborates and extends previous research. Specifically, in all studies we found that attachment anxiety positively predicted belief in conspiracy theories (Green & Douglas, 2018). Interestingly, in some studies we found attachment avoidance to negatively predict these beliefs (Studies 1, 2, and 3) which is contrary to Leone and colleague's (2018) study with Italian participants which found attachment avoidance (but not

anxiety) to positively predict belief in conspiracy theories. Perhaps there are cultural differences (between Italians and U.K./U.S.) in attachment styles or conspiracy beliefs, and indeed in the relationships between these variables.

In line with previous findings in the attachment literature (e.g., Tremblay & Sullivan, 2010), in all studies we found that attachment anxiety positively predicted indicators of catastrophizing, whereas attachment avoidance was generally not associated with them (mostly no association; sometimes negatively, Studies 3, 5, and 6; once positively, Study 6). The attachment pattern of consistently high anxiety and mixed avoidance on catastrophizing and conspiracy belief indeed suggest that hyperactivating (versus deactivating) regulatory strategies (Cassidy & Kobak, 1988; Shaver & Mikulincer, 2002) can best explain these relationships. Specifically, our findings suggest that belief in conspiracy theories is associated with the attachment-anxious hyperactivating regulatory strategy of catastrophizing. These findings suggest that endorsing conspiracy theories may—in part—be another means to exaggerate and catastrophize life's problems. More specifically, catastrophizing one's helplessness in these situations was found to be the key explanatory variable in most of the studies. Moreover, in the exploratory analyses, we also found conspiracy belief to be a mediator of the relationships between attachment anxiety and different facets of catastrophizing. This further suggests that endorsement of conspiracy theories is one and the same as catastrophizing, in that thinking of the world in conspiratorial terms is in itself, catastrophic thinking.

Limitations and Future Research

The current findings are important, but they are not without their limitations. First, all six studies used a cross-sectional design, and so it is not possible to conclude that attachment anxiety or catastrophizing causes conspiracy beliefs. Previous research demonstrated the effectiveness of priming different attachment patterns on negative and positive affect (see

Rowe et al., 2020, for a review). Therefore, future research could aim to investigate causal pathways be experimentally priming attachment and testing changes in catastrophizing and conspiracy beliefs. Further, all studies only focused on participants from the U.K. and U.S., and previous research in Italy has shown attachment avoidance to be the predominant attachment pattern associated with conspiracy beliefs (Leone et al., 2018). Therefore, it is still not known if the pattern of relationships found in the current studies would hold with Italian participants, for example. Exploring these cultural differences would be a fruitful avenue for future research. Finally, these studies primarily examined one mechanism of the relationship between attachment anxiety and conspiracy beliefs: the hyperactivating strategy catastrophizing. Mikulincer and Shaver (2017) argue, however, that attachment-anxious persons catastrophize as a means to elicit attention and support from others. Therefore, more research is needed to determine whether the motivation to garner attention and support helps to explain the relationships between attachment anxiety, catastrophizing, and conspiracy beliefs.

Conclusion

The current research suggests that people with higher levels of attachment anxiety are drawn to conspiracy theories because they have a tendency to catastrophize life's difficulties. Attachment theory suggests that this is a strategy where the goal is to elicit attention, care and support from others. This potential mechanism was not examined in the current studies. Therefore, in the next chapter we extend the current findings by investigating whether the relationship between attachment anxiety and belief in conspiracy theories—underpinned by catastrophizing—can be explained by different types of communal orientation. Specifically, in the next chapter we examine whether the desire to have one's needs met (self-orientated), versus meeting the needs of others (selfless), can further explain the relationships between attachment anxiety, catastrophizing, and conspiracy beliefs.

Chapter 3: Communal Orientation

Abstract

In the previous chapter we found the tendency to catastrophize to be a mediator of the relationship between attachment anxiety and belief in conspiracy theories. In this chapter, we extend these findings by examining the extent to which these relationships can also be explained by different forms of communal orientation: self-orientated (the desire that one's needs should be met by others) and selfless (the desire to meet the needs of others). We hypothesised that higher self-oriented, and lower selfless, communal orientations would predict belief in conspiracy theories and mediate the relationship between attachment anxiety and conspiracy beliefs, but only at high levels of catastrophizing. We tested and conceptually replicated this hypothesis across two cross-sectional studies (N = 869). In each study we examined attachment anxiety and avoidance, self-orientated and selfless communal orientations, and belief in conspiracy theories. We also examined pain (Study 7) and stress (Study 8) catastrophizing. Attachment anxiety was positively associated with indicators of catastrophizing and belief in conspiracy theories. Importantly, attachment anxiety indirectly predicted conspiracy beliefs through lower selfless communal orientation, but not higher self-orientated communal orientation. Further, this mediation was only evident at higher levels of catastrophizing. Our findings suggest that, for people with attachment anxiety, endorsement for conspiracy theories may not be a means to elicit attention, care and support. Instead, attachment-anxious persons may be so immersed into their own worries about the supposed ills of the world that they are not able to attend to the needs of others.

Chapter 2 provided support for the prediction that catastrophizing explains the relationship between attachment anxiety and belief in conspiracy theories. The current chapter aims to extend these findings by examining another possible mechanism of the relationships between attachment anxiety, catastrophizing, and conspiracy beliefs: the motivations surrounding having one's needs met versus meeting the needs of others.

Mikulincer and Shaver's (2017) model of adult attachment proposes that attachment-anxious persons catastrophize as a strategy to elicit attention, support, and care from significant others. In Chapter 2, we confirmed the first part of this process by showing that participants with attachment anxiety (versus avoidance) indeed catastrophize, and that this explains their appeal towards conspiracy theories. However, it is still not known if these processes are linked to the motivation to garner attention, support, and protection from others. Therefore, in the present studies we examined a new variable that captures this notion: communal orientation (see Clark, 2012; Clark et al., 1987). This measure has been shown to have two subfactors (Bonnie et al., 2012): (1) *self-orientated*—the desire that one's needs should be met by others; and (2) *selfless*—the desire to meet the needs of others. If conspiracy beliefs are associated with attachment anxiety and catastrophizing as a way to garner attention and support from others, then we should expect self-orientated communal orientation to play in an important role in the relationships between attachment anxiety, catastrophizing, and conspiracy beliefs. Specifically, we might expect that a higher self-orientated communal orientation would mediate the relationship between attachment anxiety and belief in conspiracy theories, but only at high levels of catastrophizing. That is, for attachment-anxious persons, a motivation to have their needs met should only (or more likely) be associated with conspiracy beliefs when the tendency to catastrophize is high. As we noted in Chapter 1, however, the relationship between attachment anxiety and support-seeking is mixed (for a review, see Mikulincer & Shaver, 2017), which throws some doubt on

this prediction. Regarding selfless communal orientation, however, as individuals with high attachment anxiety hold the belief that they are unable to cope with life's demands (Mikulincer & Shaver, 2017), we therefore might also expect a lower selfless communal orientation to mediate the relationship in question, but only at higher levels of catastrophizing. That is, as attachment-anxious persons are immersed in their own worries, including from supposed threats from conspiracy theories, they may not feel they are able to attend to the needs of others.

Taken together, the main aim of this chapter is to examine whether different forms of communal orientation can further explain the relationships between attachment anxiety, catastrophizing, and belief in conspiracy theories.

Overview of Studies

In two studies, we measured attachment anxiety and avoidance, belief in general notions of conspiracy, helplessness, magnification, and rumination catastrophizing, and self-orientated and selfless communal orientation. In Study 7, we examined our primary hypothesis again and tested whether the subfactors of pain catastrophizing (helplessness, magnification, and rumination) would mediate the relationship between attachment anxiety and belief in conspiracy theories. Then, we tested our new hypothesis and examined whether self-orientation and selfless communal orientations would mediate the relationship between attachment anxiety and belief in conspiracy theories, and whether this mediation is only evident in higher levels of pain catastrophizing. In Study 8, we conceptually replicated Study 7 by instead using the subfactors of stress catastrophizing as our moderating variables. In all studies, demographic variables (age, gender, and educational attainment) were also included as covariates.

Study 7

In Study 7, we examined self-orientated and selfless communal orientations as potential mediators of the relationship between attachment anxiety and belief in conspiracy theories. In the previous studies we found pain catastrophizing, namely helplessness, to explain the relationship between attachment anxiety and conspiracy beliefs. We employed this same measure to test whether communal orientation mediated the relationship in question, but only at high levels of pain catastrophizing. In doing so, this study would more robustly test the hyperactivating mechanisms of attachment anxiety, which stipulates that the goal of catastrophizing is to elicit attention, care or support from others (Mikulincer & Shaver, 2017). Similar to attachment theory, theoretical models in the pain catastrophizing literature also suggests that people who catastrophize pain do so as a tactic to elicit attention and care from others, termed the communal coping model (Sullivan, 2012). Taken together, we predicted that high (versus low) pain catastrophizing would moderate the relationships between attachment anxiety and self-orientated and selfless communal orientations, and subsequently moderate the indirect effects of attachment anxiety on conspiracy beliefs through higher self-orientated, and lower selfless, communal orientations.

We also explored alternative relationship pathways between these variables. We have previously argued (Chapter 2) that conspiracy beliefs, like pain and stress, may be another form of catastrophizing for people with attachment anxiety. Specifically, endorsement of conspiracy theories may be a way to catastrophize about the world in a more general sense. With this in mind, and the argument that catastrophizing is done so in order to elicit attention and support (Mikulincer & Shaver, 2017), it could also be the case that conspiracy beliefs lead to higher self-orientated, and lower selfless, communal orientation. Further, conspiracy beliefs might mediate the relationships between attachment anxiety and self-orientated and selfless communal orientation, and this might only be the case (or at least be more

pronounced) at higher levels of catastrophizing. Therefore, we also explored whether high (versus low) pain catastrophizing would moderate the relationships between conspiracy beliefs and self-orientated and selfless communal orientations, and subsequently moderate the indirect effects of attachment anxiety on self-orientated, and selfless, communal orientations, through higher conspiracy beliefs.

Finally, by reintroducing pain catastrophizing, we aimed to replicate the results of our previous studies by examining pain helplessness, magnification, rumination as mediators of the relationship between attachment anxiety and conspiracy beliefs—in isolation of communal orientation—to test whether helplessness remains the key subfactor that explains the pertinent relationship in question. For robustness, we again included the same socio-demographic variables as used in Studies 5 and 6.

Method

Participants

We recruited 483 US American participants from MTurk to complete an online questionnaire (they were each paid US $1 for their time). Participants who did not complete the main variables of interest (n = 31) or were not from the US (n = 26) were excluded from the study. The remaining participants (N = 426; 241 men, 184 women, 1 rather not say; M_{age} = 37.14 years, SD_{age} = 11.46, range = 20–74) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .96), attachment anxiety (α = .96) and avoidance (α = .95), pain helplessness (α = .93), magnification (α = .80), and rumination (α = .90), and covariates (age, gender, educational attainment, religiosity, and social and economic political orientation) were used as in the previous studies.

Self-orientated and Selfless Communal Orientation. We used the Communal Orientation Scale (Clark et al., 1987). There were 14 statements comprised of four self-orientated items (e.g., “I expect people I know to be responsive to my needs and feelings”, “When I have a need that others ignore, I'm hurt”; α = .77) and 10 selfless items (e.g., “I often go out of my way to help another person”, “I believe people should go out of their way to be helpful”; α = .90; 1 = *extremely uncharacteristic of me*, 7 = *extremely characteristic of me*).

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (conspiracy beliefs, attachment anxiety and avoidance, self-orientated and selfless communal orientation, and pain helplessness, magnification, and rumination). Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was indirect effects of attachment anxiety and avoidance on conspiracy beliefs through pain helplessness, magnification, and rumination. Third—for robustness—we reran this model with covariates included, to see if the results remain unchanged. Then, we used PROCESS Model 7 to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through self-orientated and selfless communal orientations, and whether these indirect effects are moderated by stress helplessness, magnification, and rumination, with covariates included. Finally, we used Model 14 to explore an alternative model where we test whether there was an indirect effect of attachment anxiety on self-orientated and selfless communal orientations through conspiracy beliefs, and whether these indirect effects are moderated by pain helplessness, magnification, and rumination, with covariates included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 8. Attachment anxiety and avoidance strongly positively correlated with each other. Attachment anxiety moderately positively correlated with conspiracy beliefs and pain rumination; strongly positively correlated with pain helplessness and magnification; and showed a strong negative correlation with selfless, and a small positive correlation self-orientated, communal orientation. Attachment avoidance showed small positive correlations with conspiracy beliefs and pain rumination; moderated positive correlations with pain helplessness and magnification; and showed a moderate negative correlation with selfless, and a small negative correlation self-orientated, communal orientation. Pain helplessness, magnification, and rumination showed moderate positive correlations with self-orientated communal orientation. Finally, pain helplessness and magnification showed moderate negative correlations, and pain rumination showed a small negative correlation, with selfless communal orientation.

Table 8

Means, standard deviations, and zero-order correlations (Studies 7 and 8).

Measure		1	2	3	4	5	6	7	8
1. Conspiracy beliefs		-	.47***	.25***	.19***	-.38***	.39***	.36***	.27***
2. Attachment anxiety		.67***	-	.57***	.26***	-.52***	.58***	.58***	.47***
3. Attachment avoidance		.25***	.52***	-	-.13**	-.48***	.38***	.34***	.27***
4. Self-orientated CO		.39***	.43***	-.13***	-	.01	.32***	.36***	.31***
5. Selfless CO		-.71***	-.76***	-.34***	-.40***	-	-.43***	-.38***	-.28***
6. Helplessness		.64***	.79***	.34***	.47***	-.71***	-	.82***	.83***
7. Magnification		.60***	.74***	.28***	.49***	-.67***	.86***	-	.79***
8. Rumination		.53***	.67***	.24***	.48***	-.60***	.83***	.82***	-
Study 7	*M*	2.77	3.22	2.86	4.57	4.99	14.32	7.54	11.14
	SD	1.07	1.44	1.20	1.31	1.28	6.45	3.09	4.39
Study 8	*M*	3.37	4.22	3.24	4.92	4.04	12.64	6.64	9.64
	SD	0.93	1.42	0.86	1.25	1.12	6.51	3.27	4.07

Note: Study 7 zero-order correlations are displayed on the upper diagonal, while those for Study 8 are displayed on the lower diagonal. The helplessness, magnification, and rumination subfactors of catastrophizing for Studies 7 and 8 refer to pain and stress, respectively. CO = Communal orientation.

$* p < .05$. $** p < .01$. $*** p < .001$.

Mediation Analyses

Attachment anxiety and avoidance explained 34%, 34%, and 22% of variance in helplessness (R^2 = .342, F(2, 423) = 109.830, p < .001), magnification (R^2 = .341, F(2, 423) = 109.473, p < .001), and rumination (R^2 = .469, F(2, 423) = 59.774, p < .001), respectively. The analysis showed that attachment anxiety was significantly associated with pain helplessness (b = 2.41, SE = 0.21, p < .001), magnification (b = 1.23, SE = 0.10, p < .001), and rumination (b = 1.43, SE = 0.16, p < .001), whereas attachment avoidance was not (b = 0.41, SE = 0.26, p = .112; b = 0.05, SE = 0.12, p = .688; b = 0.01, SE = 0.19, p = .979, respectively).

The total effects (R^2 = .224, F(2, 423) = 61.052, p < .001) of attachment anxiety and conspiracy beliefs was significant (b = 0.36, SE = 0.04, p < .001), and the total effect of attachment avoidance on conspiracy beliefs was not (b = -0.02, SE = 0.05, p = .660). Attachment anxiety and avoidance, and pain helplessness, magnification, and rumination explained 26% of variance conspiracy belief (R^2 = .262, F(5, 420) = 29.765, p < .001). Pain helplessness and rumination were significantly associated with conspiracy beliefs (b = 0.04, SE = 0.01, p = .004; b = -0.06, SE = 0.02, p = .005, respectively), whereas pain magnification was not (b = 0.05, SE = 0.03, p = .060). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.27, SE = 0.04, p < .001), whereas attachment avoidance was not (b = -0.04, SE = 0.05, p = .375).

A significant indirect effect of attachment anxiety on conspiracy beliefs was found through pain helplessness, magnification, and rumination (b = 0.11, SE = 0.03, CI = [.04, .18]; b = 0.07, SE = 0.03, CI = [.01, .13]; b = -0.08, SE = 0.03, CI = [-.14, -.03], respectively). No significant indirect effects were found for attachment avoidance on conspiracy beliefs

through these mediators (*b* = 0.02, *SE* = 0.01, CI = [-.01, .05]; *b* = 0.01, *SE* = 0.01, CI = [-.01, .02]; *b* = -0.01, *SE* = 0.01, CI = [-.03, .02], respectively).

Inclusion of Covariates. The pattern of results changed slightly when covariates were included. The relationships remained the same for attachment anxiety and avoidance on pain helplessness (*b* = 2.26, *SE* = 0.23, *p* < .001; *b* = 0.49, *SE* = 0.26, *p* = .062, respectively), magnification (*b* = 1.15, *SE* = 0.11, *p* < .001; *b* = 0.10, *SE* = 0.13, *p* = .428, respectively), and rumination (*b* = 1.46, *SE* = 0.17, *p* < .001; *b* = 0.01, *SE* = 0.19, *p* = .990, respectively).

The total effects of attachment anxiety and avoidance on conspiracy beliefs remained the same conspiracy beliefs (*b* = 0.28, *SE* = 0.04, *p* < .001; *b* = 0.02, *SE* = 0.04, *p* = .604, respectively). The relationships between pain helplessness and rumination on conspiracy beliefs remained the same (*b* = 0.03, *SE* = 0.01, *p* = .050; *b* = -0.03, *SE* = 0.02, *p* = .101, respectively); however, pain magnification was no longer significantly associated with conspiracy beliefs (*b* = 0.04, *SE* = 0.03, *p* = .167). The direct effects of attachment anxiety and avoidance on conspiracy beliefs remained the same (*b* = 0.21, *SE* = 0.04, *p* < .001; *b* = 0.01, *SE* = 0.05, *p* = .901, respectively).

The indirect effects of attachment anxiety on conspiracy beliefs through helplessness remained significant (*b* = 0.06, *SE* = 0.03, CI = [.01, .13]); however, the indirect effects of attachment anxiety on conspiracy beliefs through magnification and rumination were no longer significant (*b* = 0.04, *SE* = 0.03, CI = [-.01, .11]; *b* = -0.05, *SE* = 0.03, CI = [-.11, .01], respectively). In indirect effects of attachment avoidance on conspiracy beliefs remained insignificant (*b* = 0.01, *SE* = 0.01, CI = [-.01, .04]; *b* = 0.01, *SE* = 0.01, CI = [-.01, .02]; *b* = -0.01, *SE* = 0.01, CI = [-.02, .02], respectively; see Figure 13 for an illustration of this model with standardised values).

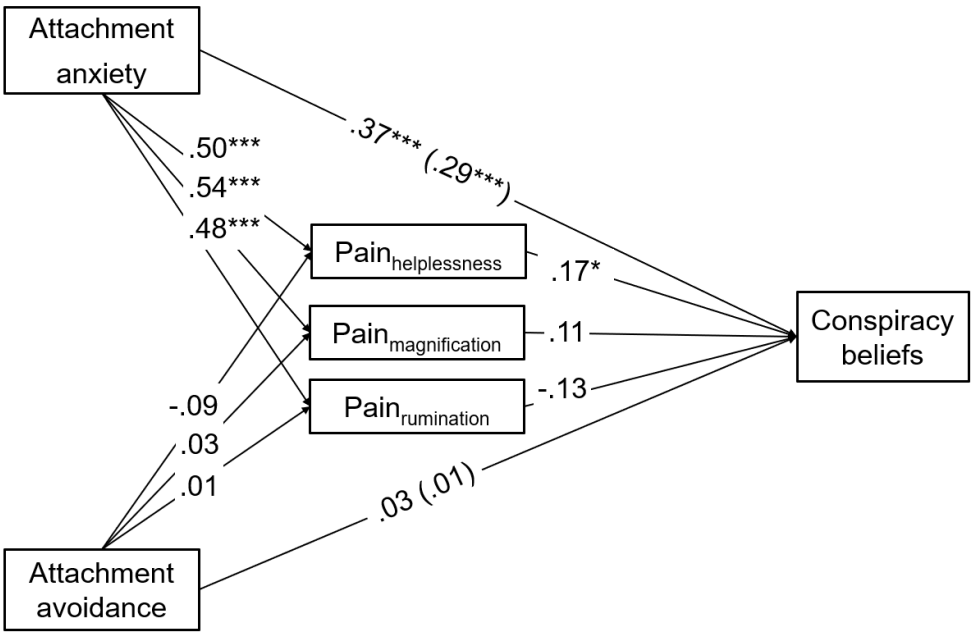

Figure 13. Standardized regression coefficients for mediation analysis (Study 7). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for pain helplessness, magnification, and rumination, can be found in the parentheses. Age, gender, educational attainment, religiosity, social and economic political orientation, and looming cognitive style are also included as covariates.

Moderated Mediation Analyses: Conspiracy Beliefs as the Dependent Variable

Pain Helplessness as Moderator. Attachment anxiety and pain helplessness explained 29% and 43% of variance a self-orientated (R^2 = .292, F(12, 411) = 14.123, p < .001) and selfless (R^2 = .425, F(12, 411) = 25.355, p < .001) communal orientation, respectively. The analysis showed that attachment anxiety was significantly associated with self-orientated (b = 0.24, SE = 0.06, p < .001) and selfless (b = -0.19, SE = 0.05, p < .001) communal orientation. Pain helplessness was significantly associated with selfless (b = -0.05, SE = 0.02, p = .002), but not self-orientated (b = 0.01, SE = 0.02, p = .464), communal orientation.

The interaction term between attachment anxiety and pain helplessness was significant for selfless (b = -0.02, SE = 0.01, p = .006) communal orientation, but not for self-orientated (b = -0.01, SE = 0.01, p = .933; see Table 9 for conditional effects and Figure 14 for illustration of simple slopes). The simple slopes show that at all levels (low, medium, and high) of stress helplessness, attachment anxiety positively predicted self-orientated communal orientation (b = .23, p = .002; b = .24, p < .001; b = .24, p < .001, respectively). They also show that at medium and high levels of pain helplessness, attachment anxiety negatively predicted conspiracy beliefs (b = .-19, p = <.001; b = -.29, p < .001, respectively), but not at lower levels of stress helplessness (b = -.09, p = .188). All variables explained 34% of variance in conspiracy belief (R^2 = .343, F(12, 411) = 17.878, p < .001). The direct effect of selfless, but not self-orientated, communal orientation on conspiracy beliefs was significant (b = -0.13, SE = 0.04, p = .002; b = 0.02, SE = 0.04, p = .594, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.19, SE = 0.05, p < .001). Finally, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through selfless communal orientation at medium and high, but not low, levels of pain helplessness. That is, lower selfless communal orientation mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of pain helplessness. No such indirect effects were found through self-orientated communal orientation. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 9).

Table 9
Conditional effects, conditional indirect effects, and index of moderated mediation.

	Self-orientated communal orientation						Selfless communal orientation					
	Helplessness		Magnification		Rumination		Helplessness		Magnification		Rumination	
Conditional effects (X on M) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	0.23 (0.08)	[0.08, 0.38]	0.28 (0.07)	[0.13, 0.42]	0.28 (0.08)	[0.13, 0.43]	-0.09 (0.07)	[-0.22, 0.04]	-0.11 (0.06)	[-0.24, 0.02]	-0.16 (0.07)	[-0.29, -0.02]
0	0.24 (0.06)	[0.13, 0.35]	0.24 (0.06)	[0.13, 0.35]	0.25 (0.06)	[0.14, 0.36]	-0.19 (0.05)	[-0.29, -0.09]	-0.20 (0.05)	[-0.29, -0.10]	-0.20 (0.05)	[-0.30, -0.10]
+1.00	0.24 (0.06)	[0.11, 0.37]	0.21 (0.06)	[0.08, 0.34]	0.21 (0.06)	[0.09, 0.34]	-0.29 (0.06)	[-0.40, -0.18]	-0.28 (0.06)	[-0.40, -0.18]	-0.24 (0.06)	[-0.35, -0.13]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	0.01 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.04]	0.01 (0.01)	[-0.03, 0.03]	0.01 (0.01)	[0.05, 0.17]	0.01 (0.01)	[-0.01, 0.04]	0.02 (0.01)	[0.01, 0.05]
0	0.02 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.03]	0.03 (0.01)	[0.10, 0.23]	0.02 (0.01)	[0.01, 0.06]	0.03 (0.01)	[0.01, 0.06]
+1.00	0.02 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.03]	0.04 (0.02)	[0.13, 0.31]	0.04 (0.02)	[0.01, 0.08]	0.03 (0.01)	[0.01, 0.07]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[0.01, 0.01]	0.01 (0.01)	[0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]

Note: X = Attachment anxiety; M = Self-orientated or selfless communal orientation; Y = Conspiracy beliefs; W = Pain helplessness, magnification, or rumination.

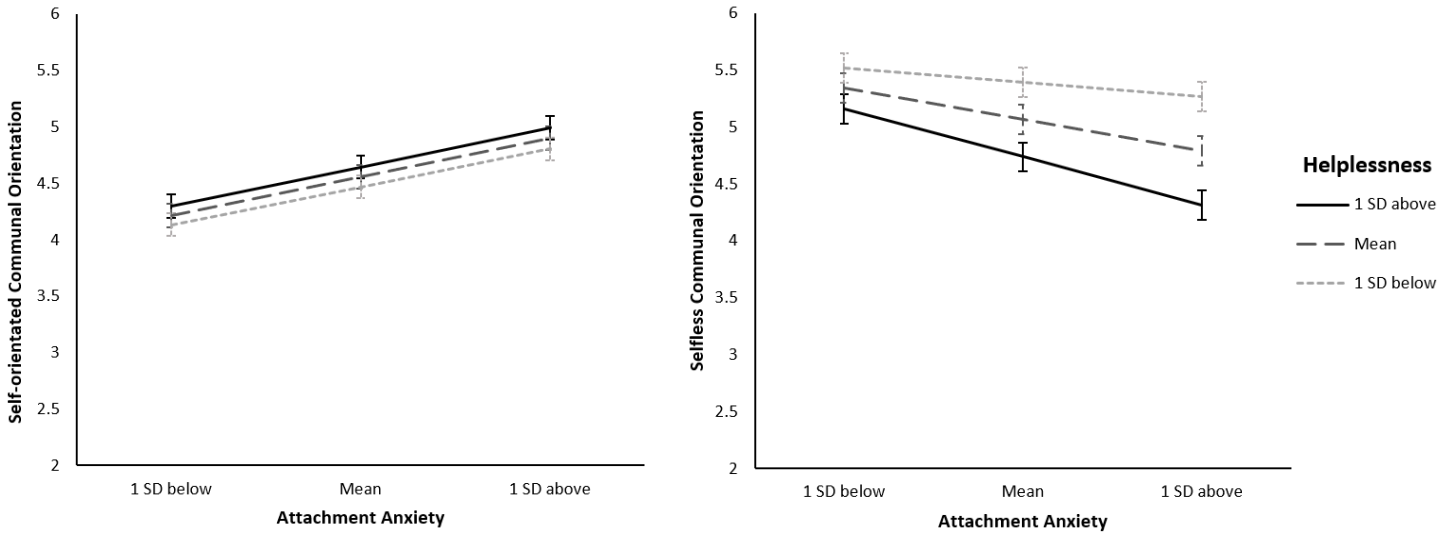

Figure 14. Interaction between attachment anxiety and pain helplessness in predicting self-orientated (left) and selfless (right) communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Pain Magnification as Moderator. Attachment anxiety and pain magnification explained 29% and 42% of variance a self-orientated (R^2 = .293, F(12, 411) = 14.205, p < .001) and selfless (R^2 = .423, F(12, 411) = 25.119, p < .001) communal orientation, respectively. The analysis showed that attachment anxiety was significantly associated with a self-orientated (b = 0.24, SE = 0.06, p < .001) and selfless (b = -0.20, SE = 0.05, p < .001) communal orientation. Pain magnification was significantly associated with self-orientated (b = 0.10, SE = 0.03, p = .006), but not selfless (b = -0.02, SE = 0.03, p = .594), communal orientation.

The interaction term between attachment anxiety and pain magnification was significant for selfless (b = -0.03, SE = 0.01, p = .016) communal orientation, but not for self-orientated (b = -0.01, SE = 0.01, p = .401; see Table 9, p. 88, for conditional effects and Figure 15 for illustration of simple slopes). The simple slopes show that at all levels (low, medium, and high) of pain magnification, attachment anxiety positively predicted self-

orientated communal orientation (b = .28, p = .002; b = .24, p < .001; b = .21, p < .001, respectively). They also show that at medium and high levels of pain magnification, attachment anxiety negatively predicted selfless communal orientation (b = -.20, p = < .001; b = -.28, p < .001, respectively), but not at lower levels of pain magnification (b = -.11, p = .088). All variables explained 34% of variance in conspiracy belief (R^2 = .344, F(12, 411) = 17.953, p < .001). Self-orientated, but not selfless, communal orientation was significantly associated with conspiracy beliefs (b = -0.13, SE = 0.04, p = .005; b = 0.02, SE = 0.04, p = .532, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.19, SE = 0.04, p < .001). Finally, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through selfless communal orientation at medium and high, but not low, levels of pain magnification. That is, lower selfless communal orientation mediated the relationship between attachment anxiety and conspiracy beliefs, but only at higher levels of pain magnification. No such indirect effects were found through self-orientated communal orientation. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 9, p. 88).

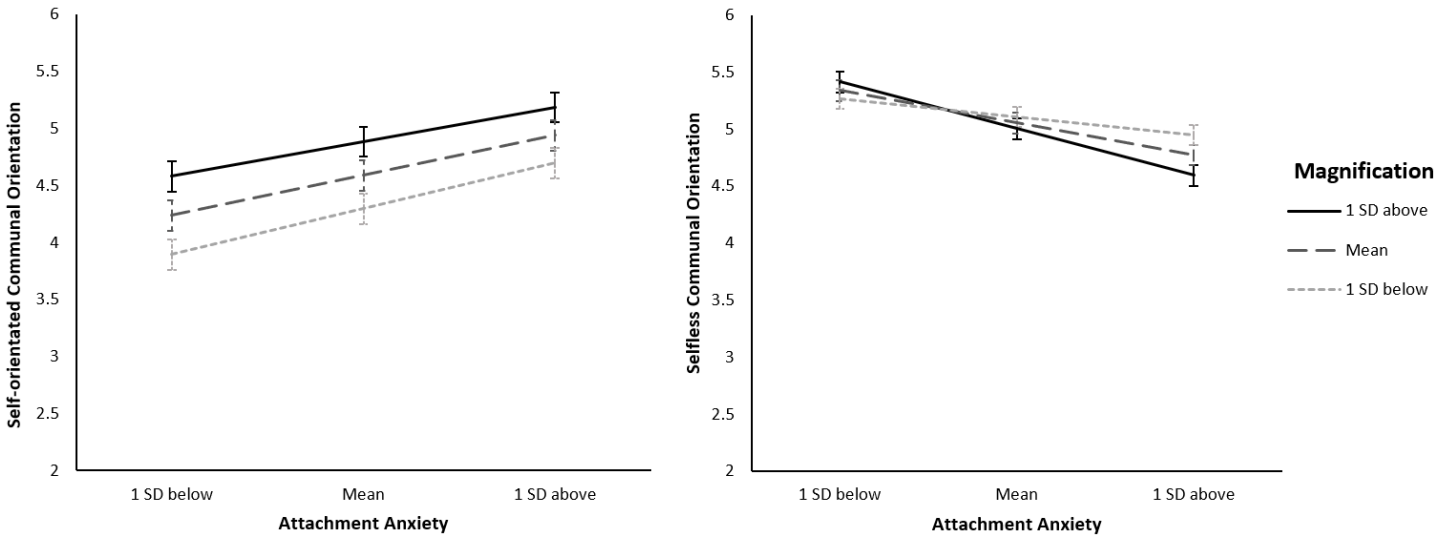

Figure 15. Interaction between attachment anxiety and pain magnification in predicting self-orientated (left) and selfless (right) communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Pain Rumination as Moderator. Attachment anxiety and pain rumination explained 29% and 42% of variance a self-orientated (R^2 = .292, F(12, 411) = 14.123, p < .001) and selfless (R^2 = .417, F(12, 411) = 24.468, p < .001) communal orientation, respectively. The analysis showed that attachment anxiety was significantly associated with self-orientated (b = 0.25, SE = 0.06, p < .001) and selfless (b = -0.20, SE = 0.05, p < .001) communal orientation. Pain rumination was significantly associated with selfless (b = 0.05, SE = 0.02, p = .026), but not self-orientated (b = 0.01, SE = 0.02, p = .752), communal orientation.

The interaction term between attachment anxiety and pain rumination was insignificant for self-orientated (b = -0.01, SE = 0.01, p = .440) and selfless communal orientation (b = -0.01, SE = 0.01, p = .249; see Table 9, p. 88, for conditional effects and Figure 16 for illustration of simple slopes). The simple slopes show that at all levels (low, medium, and high) of pain rumination, attachment anxiety positively predicted self-orientated communal orientation (b = .28, p < .001; b = .25, p < .001; b = .21, p < .001, respectively), and negatively predicted selfless communal orientation (b = -.16, p = .020; b = -.20, p < .001;

b = -.24, *p* < .001, respectively). All variables explained 34% of variance in conspiracy belief (R^2 = .344, *F*(12, 411) = 17.926, *p* < .001). Self-orientated, but not selfless, communal orientation was significantly associated with conspiracy beliefs (*b* = -0.13, *SE* = 0.04, *p* = .003; *b* = 0.02, *SE* = 0.04, *p* = .660, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (*b* = 0.18, *SE* = 0.05, *p* < .001). Finally, we found indirect effects of attachment anxiety on conspiracy beliefs through self-orientated communal orientation at low, medium, and high levels of pain rumination; however, a non-significant index of moderated mediation suggests that the indirect effects are not conditional on pain rumination. No such indirect effects were found through self-orientated communal orientation. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 9, p. 88).

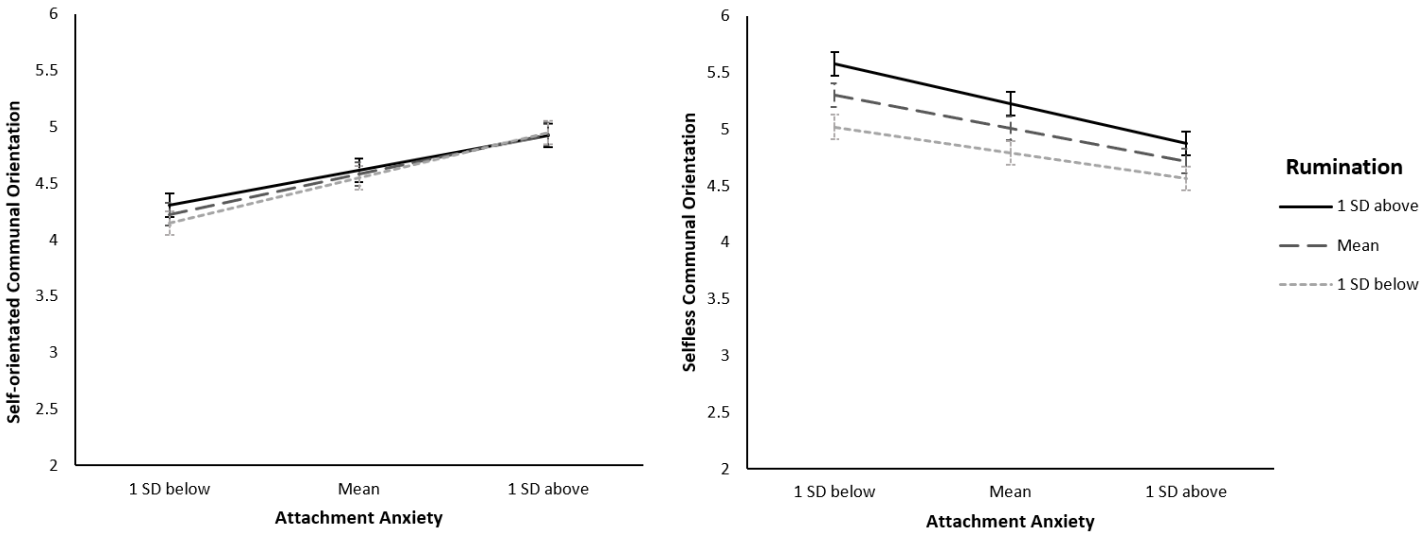

Figure 16. Interaction between attachment anxiety and pain rumination in predicting self-orientated (left) and selfless (right) communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Exploratory Moderated Mediation Analysis: Self-Orientated Communal Orientation as the Dependent Variable

Pain Helplessness as Moderator. Attachment anxiety explained 33% of variance in the conspiracy beliefs (R^2 = .328, F(10, 413) = 20.119, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.23, SE = 0.04, p < .001). All variables explained 29% of variance in self-orientated communal orientation (R^2 = .292, F(13, 410) = 13.030, p < .001). The direct effect of attachment anxiety on self-orientated communal orientation was significant (b = 0.23, SE = 0.06, p < .001). Conspiracy beliefs and pain helplessness were not significantly associated with self-orientated communal orientation (b = 0.02, SE = 0.06, p = .795; b = 0.01, SE = 0.02, p = .492, respectively), and nor was the interaction term between these two variables on self-orientated communal orientation (b = 0.01, SE = 0.01, p = .641; see Table 10 for conditional effects and Figure 17 for illustration of simple slopes). The analysis did not find conditional indirect effects of attachment anxiety on self-orientated communal orientation through conspiracy beliefs, at any level of pain helplessness. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 10).

Table 10

Conditional effects, conditional indirect effects, and index of moderated mediation (Study 7).

	Helplessness		Magnification		Rumination	
Conditional effects (M on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.01 (0.07)	[-0.15, 0.13]	0.01 (0.07)	[-0.13, 0.15]	0.01 (0.07)	[-0.13, 0.15]
0	-0.02 (0.06)	[-0.11, 0.14]	0.01 (0.06)	[-0.12, 0.13]	0.01 (0.06)	[-0.12, 0.13]
+1.00	-0.04 (0.10)	[-0.15, 0.23]	0.01 (0.09)	[-0.18, 0.19]	0.01 (0.09)	[-0.18, 0.19]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.01 (0.02)	[-0.04, 0.04]	0.01 (0.02)	[-0.04, 0.05]	0.01 (0.02)	[-0.04, 0.05]
0	0.01 (0.02)	[-0.03, 0.04]	0.01 (0.02)	[-0.04, 0.04]	0.01 (0.02)	[-0.03, 0.04]
+1.00	0.01 (0.03)	[-0.04, 0.06]	0.01 (0.03)	[-0.05, 0.05]	0.01 (0.02)	[-0.05, 0.05]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]

Note: X = Attachment anxiety; M = Conspiracy beliefs; Y = Self-orientated communal orientation; W = Pain helplessness, magnification, or rumination.

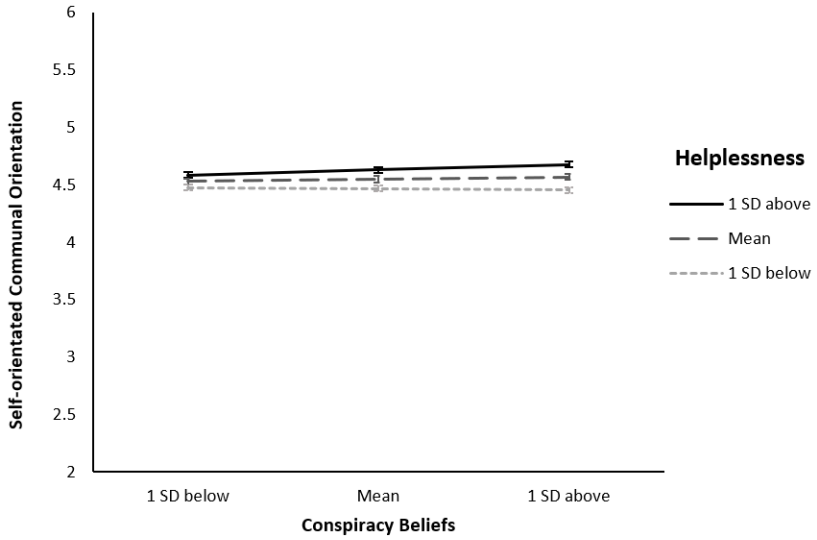

Figure 17. Interaction between conspiracy beliefs and pain helplessness in predicting self-orientated communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Pain Magnification as Moderator. Attachment anxiety explained 33% of variance in the conspiracy beliefs (R^2 = .331, F(10, 413) = 20.411, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.23, SE = 0.04, p < .001). All variables explained 29% of variance in self-orientated communal orientation (R^2 = .292, F(13, 410) = 13.006, p < .001). The direct effect of attachment anxiety on self-orientated communal orientation was significant (b = 0.24, SE = 0.06, p < .001). Conspiracy beliefs was not significantly associated with self-orientated communal orientation (b = 0.01, SE = 0.06, p = .901), but pain magnification was (b = 0.09, SE = 0.03, p = .008). The interaction term between conspiracy beliefs and pain magnification on self-orientated communal orientation was non-significant (b = -0.01, SE = 0.02, p = .970; see Table 10, p. 94, for conditional effects and Figure 18 for illustration of simple slopes). The analysis did not find conditional indirect effects of attachment anxiety on self-orientated communal orientation through conspiracy belief, at any level of pain magnification. Bootstrap

confidence intervals and index of moderated mediation corroborated these results (see Table 10, p. 94).

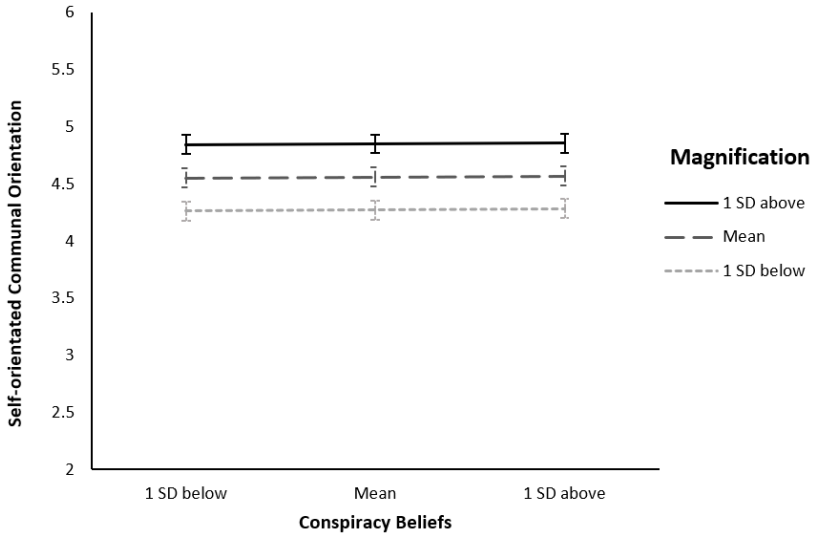

Figure 18. Interaction between conspiracy beliefs and pain magnification in predicting self-orientated communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Pain Rumination as Moderator. Attachment anxiety explained 33% of variance in the conspiracy beliefs (R^2 = .330, F(10, 413) = 20.294, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.22, SE = 0.04, p < .001). All variables explained 29% of variance in self-orientated communal orientation (R^2 = .292, F(13, 410) = 13.000, p < .001). The direct effect of attachment anxiety on self-orientated communal orientation was significant (b = 0.24, SE = 0.06, p < .001). Conspiracy beliefs and pain rumination were not significantly associated with self-orientated communal orientation (b = 0.01, SE = 0.06, p = .896; b = 0.01, SE = 0.02, p = .650, respectively), and nor was the interaction term between these two variables on self-orientated communal

orientation (b = -0.01, SE = 0.01, p = .992; see Table 10, p. 94, for conditional effects and Figure 19 for illustration of simple slopes). The analysis also did not find conditional indirect effects of attachment anxiety on self-orientated communal orientation through conspiracy beliefs, at any level of pain rumination. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 10, p. 94).

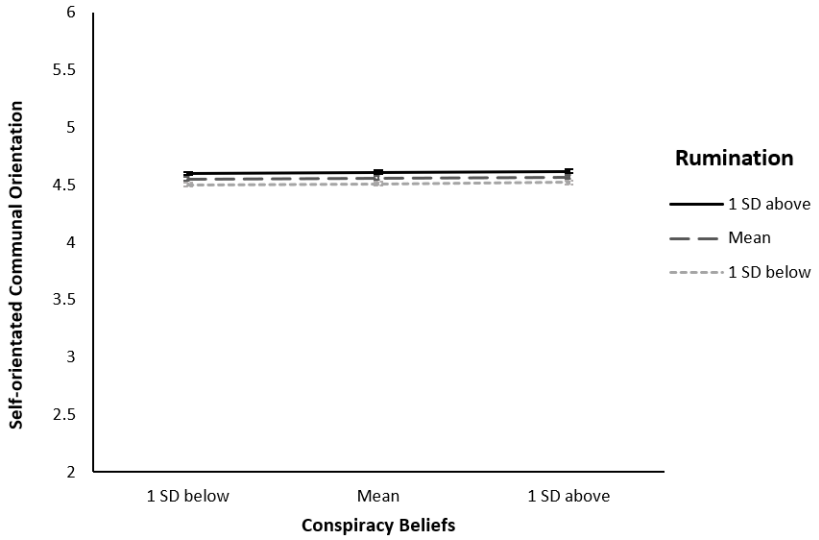

Figure 19. Interaction between conspiracy beliefs and pain rumination in predicting self-orientated communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Exploratory Moderated Mediation Analysis: Selfless Communal Orientation as the Dependent Variable

Pain Helplessness as Moderator. Attachment anxiety explained 33% of variance in conspiracy beliefs (R^2 = .328, F(10, 413) = 20.119, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.23, SE = 0.04, p < .001). All variables explained 44% of variance in selfless communal orientation (R^2 =

.438, $F(13, 410) = 24.623$, $p < .001$). The direct effect of attachment anxiety on selfless communal orientation was significant ($b = -0.14$, $SE = 0.05$, $p = .009$). Conspiracy beliefs and pain helplessness were significantly associated with conspiracy beliefs ($b = -0.20$, $SE = 0.06$, $p < .001$; $b = -0.05$, $SE = 0.02$, $p = .003$, respectively). The interaction term between conspiracy beliefs and pain helplessness on selfless communal orientation was significant ($b = -0.02$, $SE = 0.01$, $p = .002$; see Table 11 for conditional effects and Figure 20 for illustration of simple slopes). The simple slopes show that at medium and high levels of pain helplessness, conspiracy beliefs negatively predicted selfless communal orientation ($b = -0.20$, $p < .001$; $b = -0.35$, $p < .001$, respectively), but not at low levels of pain helplessness ($b = -0.05$, $p = .455$). Importantly, we found conditional indirect effects of attachment anxiety on selfless communal orientation through conspiracy beliefs at medium and high, but not low, levels of pain helplessness. That is, conspiracy beliefs mediated the relationship between attachment anxiety and selfless communal orientation, but only at higher levels of pain helplessness. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 11).

Table 11

Conditional effects, conditional indirect effects, and index of moderated mediation (Study 7).

	Helplessness		Magnification		Rumination	
Conditional effects (M on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.05 (0.06)	[-0.17, 0.08]	-0.09 (0.06)	[-0.21, 0.04]	-0.11 (0.06)	[-0.24, 0.01]
0	-0.20 (0.06)	[-0.31, -0.09]	-0.18 (0.06)	[-0.29, -0.07]	-0.17 (0.06)	[-0.28, -0.06]
+1.00	-0.35 (0.08)	[-0.51, -0.18]	-0.26 (0.08)	[-0.42, -0.11]	-0.22 (0.08)	[-0.38, -0.06]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.01 (0.02)	[-0.04, 0.02]	-0.02 (0.02)	[-0.05, 0.03]	-0.02 (0.02)	[-0.06, 0.01]
0	-0.04 (0.02)	[-0.08, -0.01]	-0.04 (0.02)	[-0.08, -0.01]	-0.04 (0.02)	[-0.07, -0.01]
+1.00	-0.08 (0.03)	[-0.14, -0.03]	-0.06 (0.02)	[-0.11, -0.02]	-0.05 (0.02)	[-0.10, -0.01]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	-0.01 (0.01)	[-0.01, -0.01]	-0.01 (0.01)	[-0.01, -0.01]	-0.01 (0.01)	[-0.01, 0.01]

Note: X = Attachment anxiety; M = Conspiracy beliefs; Y = Selfless Communal Orientation; W = Pain helplessness, magnification, or rumination.

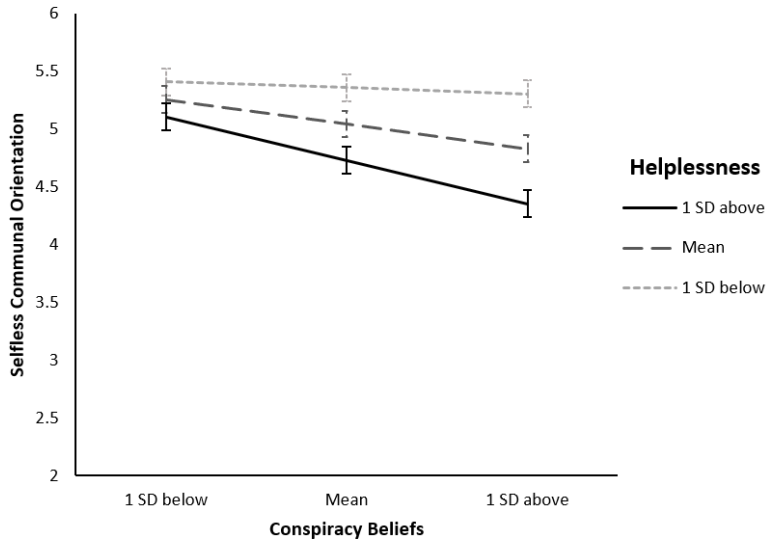

Figure 20. Interaction between conspiracy beliefs and pain helplessness in predicting selfless communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Pain Magnification as Moderator. Attachment anxiety explained 33% of variance in conspiracy beliefs (R^2 = .331, F(10, 413) = 20.411, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.23, SE = 0.04, p < .001). All variables explained 43% of variance in selfless communal orientation (R^2 = .431, F(13, 410) = 23.851, p < .001). The direct effect of attachment anxiety on selfless communal orientation was significant (b = -0.16, SE = 0.05, p = .003). Conspiracy belief was significantly associated with selfless communal orientation (b = -0.18, SE = 0.06, p = .002), but pain magnification was not (b = -0.01, SE = 0.03, p = .687). The interaction term between conspiracy beliefs and pain magnification on selfless communal orientation was not significant (b = -0.03, SE = 0.02, p = .056; see Table 11, p. 99, for conditional effects and Figure 21 for illustration of simple slopes). The simple slopes show that at medium and high levels of stress magnification, conspiracy beliefs negatively predicted selfless communal

orientation (b = -0.18, p = .002; b = -0.26, p < .001, respectively), but not at low levels of stress magnification (b = -0.09, p = .173). Importantly, we found conditional indirect effects of attachment anxiety on selfless communal orientation through conspiracy beliefs at mediums and high, but not low, levels of pain magnification. That is, conspiracy beliefs mediated the relationship between attachment anxiety and selfless communal orientation, but only at higher levels of pain magnification. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 11, p. 99).

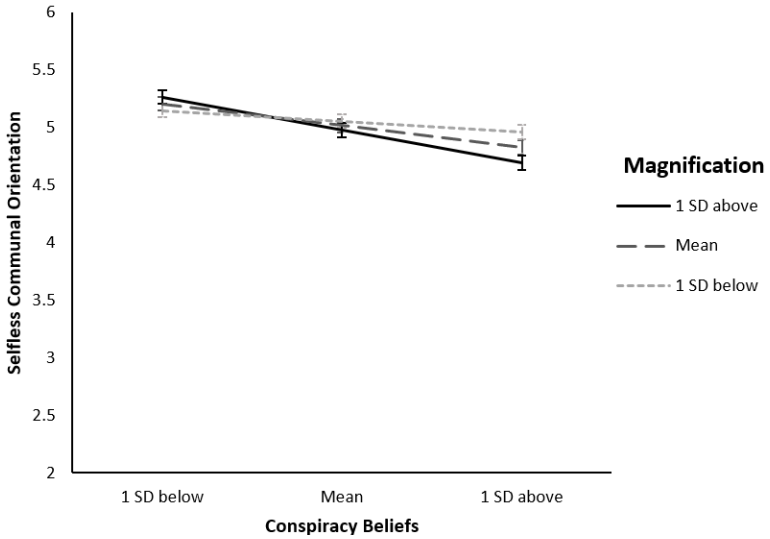

Figure 21. Interaction between conspiracy beliefs and pain magnification in predicting selfless communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Pain Rumination as Moderator. Attachment anxiety (including covariates and attachment avoidance) explained 33% of variance in conspiracy beliefs (R^2 = .330, F(10, 413) = 20.294, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.22, SE = 0.04, p < .001). All variables explained 43% of

variance in selfless communal orientation (R^2 = .428, F(13, 410) = 23.550, p < .001). The direct effect of attachment anxiety on selfless communal orientation was significant (b = -0.16, SE = 0.05, p = .002). Conspiracy belief and pain rumination were significantly associated with selfless communal orientation (b = -0.17, SE = 0.06, p = .003; b = -0.05, SE = 0.02, p = .037, respectively). The interaction term between conspiracy beliefs and pain rumination on selfless communal orientation was not significant (b = -0.01, SE = 0.01, p = .237; see Table 11, p. 99, for conditional effects and Figure 22 for illustration of simple slopes). The simple slopes show that at medium and high levels of pain rumination, conspiracy beliefs negatively predicted selfless communal orientation (b = -0.07, p = .003; b = -0.22, p = .007, respectively), but not at low levels of pain rumination (b = -0.11, p = .081). We found indirect effects of attachment anxiety on selfless communal orientation through conspiracy beliefs at medium and high, but not low, levels of pain rumination; however, the index of moderated mediation was not significant and thus a moderated mediation was not found. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 11, p. 99).

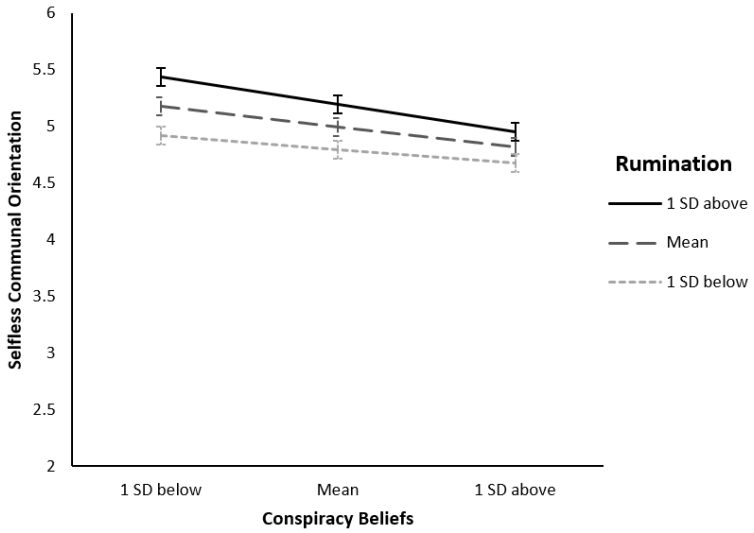

Figure 22. Interaction between conspiracy beliefs and pain rumination in predicting selfless communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Discussion

Firstly, we again found support for the prediction that catastrophizing would mediate the relationship between attachment anxiety and belief in conspiracy theories. Specifically, we found pain helplessness to mediate the relationship in question (supporting Studies 2, 3, 5, and 6). However, our predictions regarding self-orientated and selfless communal orientations were not fully met. Firstly, we did find conspiracy beliefs to be positively correlated with self-orientated, and negatively with selfless, communal orientations. Further, we found all stress helplessness, magnification, and rumination to moderate the relationships between attachment anxiety and self-orientated and selfless communal orientations. However, we only found (low) selfless communal orientation to mediate the relationship between attachment anxiety and belief in conspiracy theories, which was moderated by (high) pain helplessness and magnification. Therefore, contrary to our initial expectations, self-

orientated communal orientation was not able to explain the relationship in question, even at higher levels of catastrophizing. This might mean that endorsement of conspiracy theories is not a means to garner attention, care or support, for attachment-anxious persons. This could be due to the ambivalent nature towards support-seeking that people with attachment anxiety have been shown to exhibit (Mikulincer & Shaver, 2017). Indeed, even when we explored an alternative model, in which communal orientations were the dependent variables, we still found no support for conspiracy beliefs explaining communal orientations within the relationships of attachment anxiety and catastrophizing.

Nevertheless, the finding that a lower selfless communal orientation explains conspiracy beliefs, via high catastrophizing, was found—including in the alternative model which was explored. As individuals with attachment anxiety are preoccupied with their own attachment needs, this might decrease the resources they have available to address other people's needs. That is, these individuals may be too preoccupied with catastrophizing, including the existence of conspiracy theories, to be able to support the needs of others. In the next study we aimed to conceptually replicate these findings by examining stress catastrophizing instead.

Study 8

In Study 8, we aimed to conceptually replicate the findings of the previous study. Specifically, we instead focused on stress catastrophizing as a potential moderator of the mediation of communal orientations on attachment anxiety and conspiracy beliefs. This was the only change to our methodology. We expected to replicate the results of Study 7, where (1) helplessness is the sole subfactor that mediates the relationship between attachment anxiety and conspiracy beliefs and (2) that (lower) selfless communal orientation also mediates the relationship in question, but only at higher levels of stress helplessness and magnification catastrophizing. Further, due to the ambivalent nature of support-seeking

associated with attachment anxiety (Mikulincer & Shaver 2017), we also expected that we might find a change of results (compared to Study 7) regarding self-orientated communal orientation's role within the relationships between attachment anxiety, catastrophizing and conspiracy beliefs. Specifically, we were still open to the prediction that self-orientated communal orientation would also mediate the relationship in question, but only at higher levels of stress catastrophizing. Further, we continued to explore the alternative model in which conspiracy beliefs are the mediator and communal orientations are the dependent variable.

Method

Participants

We recruited 473 US American participants from MTurk to complete an online questionnaire (they were each paid US $1 for their time). Participants who did not complete the main variables of interest (n = 14) or were not from the US (n = 20) were excluded from the study. The remaining participants (N = 439; 277 men, 161 women, 1 other; M_{age} = 37.01 years, SD_{age} = 10.83, range = 19–71) were included in the final analyses.

Measures

The same measures for conspiracy beliefs (α = .94), attachment anxiety (α = .96) and avoidance (α = .86), stress helplessness (α = .92), magnification (α = .82), and rumination (α = .87), self-orientated (α = .76) and selfless (α = .83) communal orientation, and covariates (age, gender, educational attainment, religiosity, and social and economic political orientation) were used as in the previous studies.

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (conspiracy beliefs, attachment anxiety and avoidance, stress helplessness, magnification, and rumination, and self-orientated and selfless communal orientation). Second, we used PROCESS Model 4 (Hayes, 2017) to test whether there was an indirect effect of attachment anxiety on conspiracy belief through stress helplessness, magnification, and rumination. We also included attachment avoidance in this model as a predictor alongside anxiety, where we also tested for direct and indirect effects on conspiracy belief. Third—for robustness—we reran this model including covariates (age, gender [male = 0, female = 1], education level, religiosity, social and economic political orientation) to see if the results remain unchanged. Then, we used PROCESS Model 7 to test whether there was an indirect effect of attachment anxiety on conspiracy beliefs through self-orientated and selfless communal orientations, and whether these indirect effects are moderated by stress helplessness, magnification, and rumination, covariates were also included in this model. Finally, we used Model 14 to explore an alternative model where we tested whether there was an indirect effect of attachment anxiety on self-orientated and selfless communal orientations through conspiracy beliefs, and whether these indirect effects are moderated by stress helplessness, magnification, and rumination, covariates were also included in this model.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 8 (p. 83). Attachment anxiety and avoidance strongly positively correlated with each other. Attachment anxiety strongly positively correlated with conspiracy beliefs and stress helplessness, magnification and rumination, and self-orientated communal

orientation, and showed a strong negative correlation with selfless communal orientation. Attachment avoidance showed small positive correlations with conspiracy beliefs and stress magnification and rumination, a moderate positive correlation with stress helplessness; and showed a moderate negative correlation with selfless, and no correlation with self-orientated, communal orientation. Stress helplessness, magnification, and rumination showed strong positive correlations with self-orientated communal orientation, and strong negative correlations with selfless communal orientation.

Mediation Analyses

Attachment anxiety and avoidance explained 63%, 57%, and 46% of variance in stress helplessness (R^2 = .627, F(2, 436) = 366.558, p < .001), magnification (R^2 = .566, F(2, 436) = 284.754, p < .001), and rumination (R^2 = .457, F(2, 436) = 183.655, p < .001), respectively. The analysis showed that attachment anxiety and avoidance were significantly associated with helplessness (b = 3.82, SE = 0.16, p < .001; b = -0.68, SE = 0.26, p = .009, respectively), magnification (b = 1.87, SE = 0.08, p < .001; b = -0.52, SE = 0.14, p < .001, respectively), and rumination (b = 2.11, SE = 0.12, p < .001; b = -0.67, SE = 0.19, p < .001, respectively).

The total effects (R^2 = .467, F(2, 436) = 190.771, p < .001) of attachment anxiety and avoidance on conspiracy beliefs were significant (b = 0.48, SE = 0.03, p < .001; b = -0.14, SE = 0.04, p < .001, respectively). Attachment anxiety and avoidance, and stress helplessness, magnification, and rumination explained 49% of variance conspiracy belief (R^2 = .495, F(5, 433) = 84.724, p < .001). Helplessness, but not magnification or rumination, was significantly associated with conspiracy beliefs (b = 0.04, SE = 0.01, p < .001; b = 0.02, SE = 0.02 p = .437; b = -0.01, SE = 0.02, p = .495, respectively). The direct effects of attachment anxiety

and avoidance on conspiracy beliefs were significant (b = 0.33, SE = 0.04, p < .001; b = -0.12, SE = 0.04, p = .008, respectively).

A significant indirect effect of attachment anxiety on conspiracy beliefs was found through helplessness (b = 0.14, SE = 0.05, CI = [.06, .24]), but not through magnification (b = 0.03, SE = 0.04, CI = [-.05, .12]), or rumination (b = -0.02, SE = 0.03, CI = [-.09, .04]). A significant indirect effect was found from attachment avoidance on conspiracy beliefs through helplessness (b = -0.03, SE = 0.02, CI = [-.06, -.01]), but not magnification (b = -0.01, SE = 0.01, CI = [-.04, .02]) or rumination (b = 0.01, SE = 0.01, CI = [-.01, .03]).

Inclusion of Covariates. The pattern of results changed slightly when covariates were included. The relationships remained the same for attachment anxiety and avoidance on pain helplessness (b = 3.44, SE = 0.19, p < .001; b = -0.63, SE = 0.26, p = .170, respectively), magnification (b = 1.66, SE = 0.10, p < .001; b = -0.46, SE = 0.14, p < .001, respectively), and rumination (b = 1.92, SE = 0.14, p < .001; b = -0.65, SE = 0.19, p < .001, respectively).

The total effects of attachment anxiety and avoidance on conspiracy beliefs remained the same (b = 0.36, SE = 0.03, p < .001; b = -0.09, SE = 0.04, p = .039, respectively). The relationships between stress helplessness, magnification, and rumination on conspiracy beliefs remained the same (b = 0.03, SE = 0.01, p = .004; b = 0.01, SE = 0.02, p = .689; b = -0.01, SE = 0.01, p = .562, respectively). The direct effect of attachment anxiety on conspiracy beliefs remained significant (b = 0.25, SE = 0.04, p < .001; b = 0.01, SE = 0.05, p = .901, respectively); however, the direct effect of attachment avoidance lost significance (b = -0.07, SE = 0.04, p = .103)

The indirect effect of attachment anxiety on conspiracy beliefs through helplessness, magnification, and rumination remained the same (b = 0.11, SE = 0.04, CI = [.04, .19]; b = 0.01, SE = 0.04, CI = [-.05, .09]; b = -0.02, SE = 0.03, CI = [-.08, .04], respectively). The

indirect effect of attachment avoidance on conspiracy beliefs through helplessness lost significance (b = -0.02, SE = 0.01, CI = [-.05, .01]), and remained insignificant through magnification (b = -0.01, SE = 0.01, CI = [-.03, .01]) and rumination (b = 0.01, SE = 0.01, CI = [-.01, .03]; see Figure 23 for an illustration of this model with standardised values).

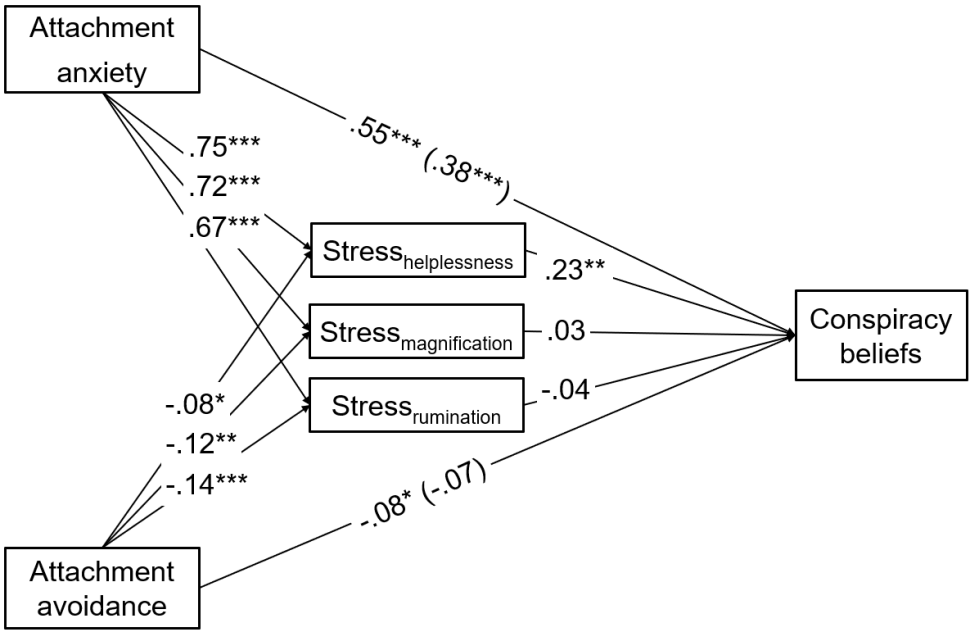

Figure 23. Standardized regression coefficients for mediation analysis (Study 8). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for stress helplessness, magnification, and rumination can be found in the parentheses. Age, gender, educational attainment, religiosity, and social and economic political orientation are also included as covariates.

Moderated Mediation Analysis

Stress Helplessness as Moderator. Attachment anxiety and stress helplessness explained 47% and 57% of variance a self-orientated (R^2 = .470, F(12, 424) = 31.345, p < .001) and selfless (R^2 = .574, F(12, 424) = 47.683, p < .001) communal orientation, respectively. The analysis showed that attachment anxiety was significantly associated with a

self-orientated (b = 0.37, SE = 0.06, p < .001) and selfless (b = -0.33, SE = 0.05, p < .001) communal orientation. Stress helplessness was significantly associated with selfless (b = -0.04, SE = 0.01, p = .006), but not self-orientated (b = 0.02, SE = 0.02, p = .185), communal orientation.

The interaction term between attachment anxiety and stress helplessness was insignificant for self-orientated (b = 0.01, SE = 0.01, p = .064) and selfless communal orientation (b = -0.01, SE = 0.01, p = .110; see Table 12 for conditional effects and Figure 24 for illustration of simple slopes). The simple slopes show that at all levels (low, medium, and high) of stress helplessness, attachment anxiety positively predicted self-orientated communal orientation (b = .30, p < .001; b = .37, p < .001; b = .44, p < .001, respectively), and negatively predicted selfless communal orientation (b = -.28, p < .001; b = -.33, p < .001; b = -.38, p < .001, respectively). All variables explained 57% of variance in conspiracy belief (R^2 = .471, F(12, 424) = 47.006, p < .001). Selfless, but not self-oriented, communal orientation was significantly associated with conspiracy beliefs (b = -0.25, SE = 0.04, p < .001; b = 0.03, SE = 0.03, p = .424, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.19, SE = 0.04, p < .001). Finally, we found indirect effects of attachment anxiety on conspiracy beliefs through self-orientated communal orientation at low, medium, and high levels of stress helplessness; however, a non-significant index of moderated mediation suggests that the indirect effects are not conditional on stress helplessness. No such indirect effects were found through self-orientated communal orientation. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 12).

Table 12
Conditional effects, conditional indirect effects, and index of moderated mediation (Study 8).

	Self-orientated communal orientation						Selfless communal orientation					
	Helplessness		Magnification		Rumination		Helplessness		Magnification		Rumination	
Conditional effects (X on M) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	0.30 (0.07)	[0.16, 0.44]	0.34 (0.07)	[0.20, 0.49]	0.35 (0.07)	[0.21, 0.50]	-0.28 (0.06)	[-0.39, -0.17]	-0.26 (0.06)	[-0.38, -0.15]	-0.24 (0.06)	[-0.36, -0.12]
0	0.37 (0.06)	[0.25, 0.49]	0.37 (0.06)	[0.25, 0.49]	0.37 (0.06)	[0.25, 0.49]	-0.33 (0.05)	[-0.43, -0.23]	-0.32 (0.05)	[-0.42, -0.23]	-0.31 (0.05)	[-0.41, -0.21]
+1.00	0.44 (0.07)	[0.30, 0.59]	0.40 (0.07)	[0.26, 0.53]	0.38 (0.07)	[0.25, 0.51]	-0.38 (0.06)	[-0.49, -0.27]	-0.39 (0.06)	[-0.50, -0.28]	-0.38 (0.05)	[-0.48, -0.28]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	0.01 (0.01)	[-0.02, 0.03]	0.01 (0.01)	[-0.02, 0.04]	0.01 (0.01)	[-0.02, 0.04]	0.07 (0.02)	[0.03, 0.12]	0.06 (0.02)	[0.02, 0.11]	0.06 (0.02)	[0.02, 0.10]
0	0.01 (0.02)	[-0.02, 0.04]	0.01 (0.02)	[-0.02, 0.04]	0.01 (0.02)	[-0.02, 0.04]	0.08 (0.02)	[0.04, 0.13]	0.08 (0.02)	[0.03, 0.13]	0.08 (0.02)	[0.03, 0.12]
+1.00	0.01 (0.02)	[-0.02, 0.05]	0.01 (0.02)	[-0.02, 0.04]	0.01 (0.02)	[-0.02, 0.04]	0.10 (0.03)	[0.04, 0.16]	0.09 (0.03)	[0.04, 0.16]	0.09 (0.03)	[0.04, 0.15]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[0.01, 0.01]

Note: X = Attachment anxiety; M = Self-orientated or selfless communal orientation; Y = Conspiracy beliefs; W = Stress helplessness, magnification, or rumination.

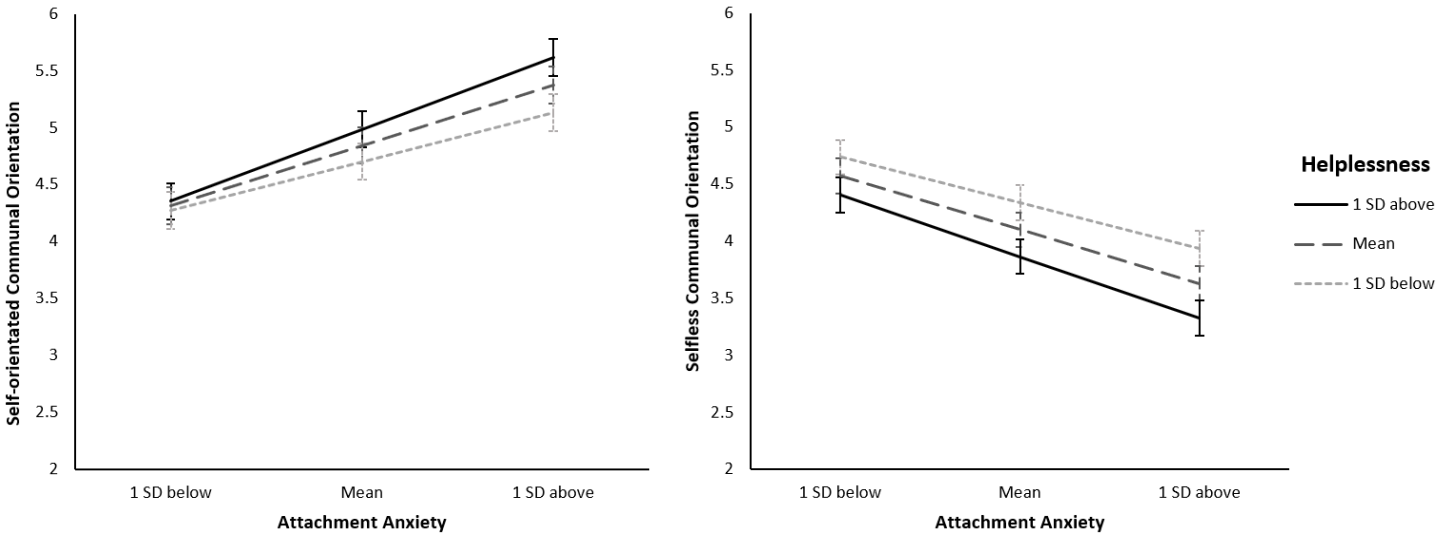

Figure 24. Interaction between attachment anxiety and stress helplessness in predicting self-orientated (left) and selfless (right) communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Magnification as Moderator. Attachment anxiety and stress magnification explained 47% and 58% of variance a self-orientated (R^2 = .466, F(12, 424) = 30.885, p < .001) and selfless (R^2 = .576, F(12, 424) = 48.062, p < .001) communal orientation, respectively. The analysis showed that attachment anxiety was significantly associated with a self-orientated (b = 0.37, SE = 0.06, p < .001) and selfless (b = -0.33, SE = 0.05, p < .001) communal orientation. Stress magnification was not significantly associated with self-orientated (b = 0.03, SE = 0.03, p = .381) or selfless (b = -0.02, SE = 0.02, p = .407), communal orientation.

The interaction term between attachment anxiety and stress magnification was significant for selfless (b = -0.02, SE = 0.01, p = .034), and insignificant for self-orientated (b = 0.01, SE = 0.01, p = .489), communal orientation; see Table 12, p. 111, for conditional effects and Figure 25 for illustration of simple slopes). The simple slopes show that at all levels (low, medium, and high) of stress helplessness, attachment anxiety positively predicted

self-orientated communal orientation (b = .34, p < .001; b = .37, p < .001; b = .40, p < .001, respectively), and negatively predicted selfless communal orientation (b = -.26, p < .001; b = -.32, p < .001; b = -.39, p < .001, respectively). All variables explained 57% of variance in conspiracy belief (R^2 = .576, F(12, 424) = 47.936, p < .001). Selfless, but not self-orientated, communal orientation was significantly associated with conspiracy beliefs (b = -0.24, SE = 0.04, p < .001; b = 0.02, SE = 0.03, p = .507, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.17, SE = 0.04, p < .001). Finally, we found indirect effects of attachment anxiety on conspiracy beliefs through self-orientated communal orientation at low, medium, and high levels of stress magnification; however, a non-significant index of moderated mediation suggests that the indirect effects are not conditional on stress magnification. No such indirect effects were found through self-orientated communal orientation. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 12, p. 111).

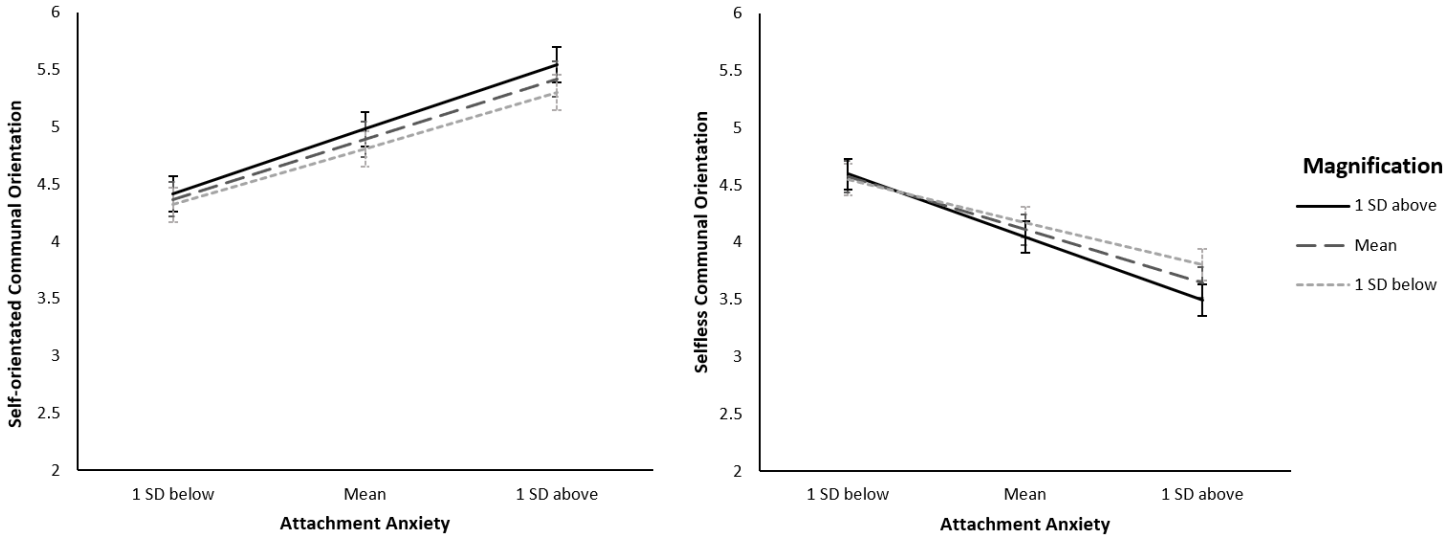

Figure 25. Interaction between attachment anxiety and stress magnification in predicting self-orientated (left) and selfless (right) communal orientation. Plotted values are b values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Rumination as Moderator. Attachment anxiety and stress rumination explained 47% and 58% of variance a self-orientated (R^2 = .466, F(12, 424) = 30.842, p < .001) and selfless (R^2 = .578, F(12, 424) = 48.467, p < .001) communal orientation, respectively. The analysis showed that attachment anxiety was significantly associated with a self-orientated (b = 0.37, SE = 0.06, p < .001) and selfless (b = -0.31, SE = 0.05, p < .001) communal orientation. Stress rumination was significantly associated with self-orientated (b = 0.05, SE = 0.02, p = .025), but not selfless (b = -0.02, SE = 0.02, p = .300), communal orientation.

The interaction term between attachment anxiety and stress rumination was significant for self-orientated (b = -0.02, SE = 0.01, p = .011), and insignificant for selfless (b = 0.01, SE = 0.01, p = .652), communal orientation; see Table 12, p. 111, for conditional effects and Figure 26 for illustration of simple slopes). The simple slopes show that at all levels (low, medium, and high) of stress rumination, attachment anxiety positively predicted self-orientated communal orientation (b = .35, p < .001; b = .37, p < .001; b = .38, p < .001, respectively), and negatively predicted selfless communal orientation (b = -.24, p < .001; b = -.31, p < .001; b = -.38, p < .001, respectively). All variables explained 58% of variance in conspiracy belief (R^2 = .576, F(12, 424) = 47.908, p < .001). Selfless, but not self-orientated, communal orientation was significantly associated with conspiracy beliefs (b = -0.24, SE = 0.04, p < .001; b = 0.02, SE = 0.03, p = .537, respectively). The direct effect of attachment anxiety on conspiracy beliefs was significant (b = 0.17, SE = 0.04, p < .001). Finally, we found conditional indirect effects of attachment anxiety on conspiracy beliefs through self-orientated communal orientation at low, medium, and high levels of stress rumination. That is, lower selfless communal orientation was found to mediate the relationship between attachment anxiety and conspiracy beliefs, which was found to be more pronounced at high

levels of stress rumination. No such indirect effects were found through self-orientated communal orientation. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 12, p. 111).

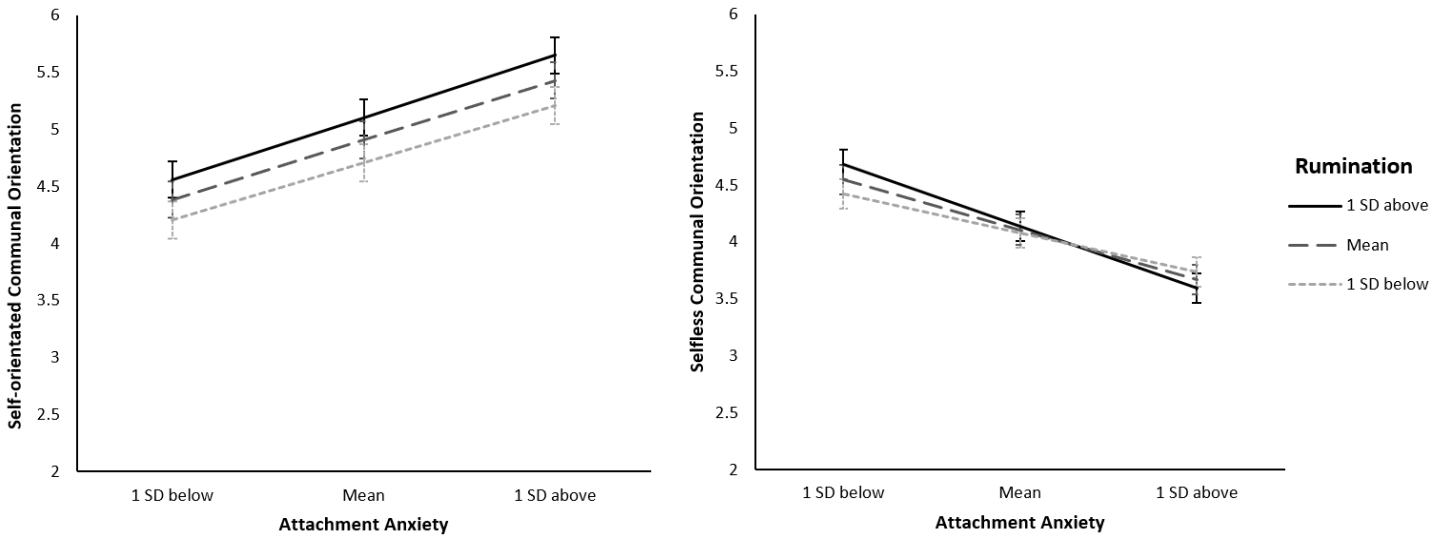

Figure 26. Interaction between attachment anxiety and stress rumination in predicting self-orientated (left) and selfless (right) communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Exploratory Moderated Mediation Analysis: Self-Orientated Communal Orientation as the Dependent Variable

Stress Helplessness as Moderator. Attachment anxiety (including covariates and attachment avoidance) explained 53% of variance in conspiracy beliefs (R^2 = .530, F(10, 426) = 48.098, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.29, SE = 0.04, p < .001). All variables explained 50% of variance in self-orientated communal orientation (R^2 = .500, F(13, 423) = 32.522, p < .001). The direct effect of attachment anxiety on self-orientated communal orientation was significant (b = 0.26, SE = 0.06, p < .001). Conspiracy belief was significantly associated

with self-orientated communal orientation (b = 0.22, SE = 0.08, p = .005), but stress helplessness was not (b = 0.02, SE = 0.02, p = .246).

The interaction term between conspiracy belief and stress helplessness on self-orientated communal orientation was significant (b = 0.04, SE = 0.01, p < .001; see Table 13 for conditional effects and Figure 27 for illustration of simple slopes). The simple slopes show that at medium and high levels of stress helplessness, conspiracy belief positively predicted self-orientated communal orientation (b = .22, p = .005; b = .50, p < .001, respectively), but not at low levels of stress helplessness (b = -.05, p = .478). We found conditional indirect effects of attachment anxiety on self-orientated communal orientation through conspiracy beliefs at medium and high, but not at low, levels of stress helplessness. That is, conspiracy beliefs mediated the relationship between attachment anxiety and self-orientated communal orientation, but only at higher levels of stress helplessness. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 13).

Table 13

Conditional effects, conditional indirect effects, and index of moderated mediation (Study 8).

	Helplessness		Magnification		Rumination	
Conditional effects (M on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.05 (0.07)	[-0.19, 0.09]	-0.05 (0.07)	[-0.19, 0.09]	-0.06 (0.07)	[-0.20, 0.08]
0	0.22 (0.08)	[0.07, 0.38]	0.13 (0.08)	[-0.02, 0.28]	0.12 (0.08)	[-0.03, 0.27]
+1.00	0.50 (0.11)	[0.27, 0.72]	0.31 (0.11)	[0.10, 0.51]	0.30 (0.10)	[0.10, 0.50]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.01 (0.03)	[-0.07, 0.04]	-0.01 (0.03)	[-0.07, 0.04]	-0.01 (0.03)	[-0.07, 0.04]
0	0.07 (0.03)	[0.01, 0.13]	0.03 (0.03)	[-0.01, 0.09]	0.03 (0.03)	[-0.01, 0.09]
+1.00	0.14 (0.05)	[0.07, 0.25]	0.08 (0.04)	[0.02, 0.17]	0.07 (0.03)	[0.02, 0.15]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	0.01 (0.01)	[0.01, 0.02]	0.01 (0.01)	[0.01, 0.03]	0.01 (0.01)	[0.01, 0.02]

Note: X = Attachment anxiety; M = Self-orientated communal orientation; Y = Conspiracy beliefs; W = Stress helplessness, magnification, or rumination.

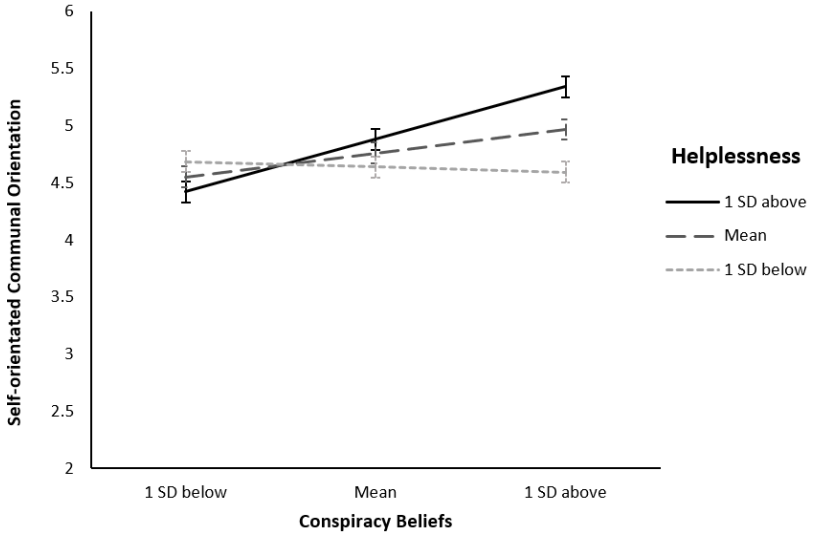

Figure 27. Interaction between conspiracy beliefs and stress helplessness in predicting self-orientated communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Magnification as Moderator. Attachment anxiety (including covariates and attachment avoidance) explained 54% of variance in conspiracy beliefs (R^2 = .539, F(10, 426) = 49.859, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.25, SE = 0.04, p < .001). All variables explained 48% of variance in self-orientated communal orientation (R^2 = .483, F(13, 423) = 30.421, p < .001). The direct effect of attachment anxiety on self-orientated communal orientation was significant (b = 0.29, SE = 0.07, p < .001). Conspiracy belief and stress helplessness were not significantly associated with self-orientated communal orientation (b = 0.13, SE = 0.08, p = .092; b = 0.03, SE = 0.03, p = .286, respectively).

The interaction term between conspiracy belief and stress magnification on self-orientated communal orientation was significant (b = 0.05, SE = 0.01, p < .001; see Table 13, p. 117, for conditional effects and Figure 28 for illustration of simple slopes). The simple

slopes show that at high levels of stress magnification, conspiracy belief positively predicted self-orientated communal orientation (b = .31, p = .004), but not at low and medium levels of stress helplessness (b = -.05, p = .480; b = .13, p = .092, respectively). We found conditional indirect effects of attachment anxiety on self-orientated communal orientation through conspiracy belief at high, but not low of medium, levels of stress magnification. That is, conspiracy belief mediated the relationship between attachment anxiety and self-orientated communal orientation, but only at higher levels of stress magnification. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 13, p. 117).

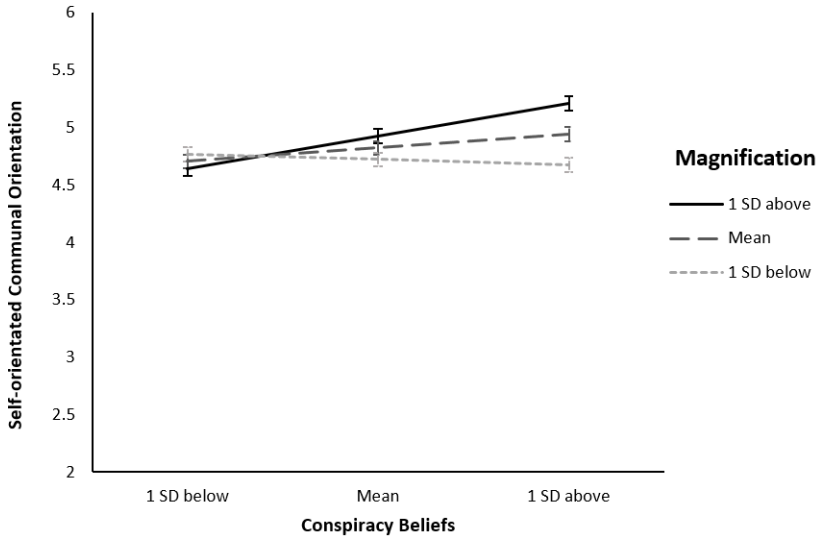

Figure 28. Interaction between conspiracy beliefs and stress magnification in predicting self-orientated communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Rumination as Moderator. Attachment anxiety (including covariates and attachment avoidance) explained 54% of variance in conspiracy beliefs (R^2 = .539, F(10, 426) = 49.822, p < .001). The analysis showed that attachment anxiety was significantly associated

with conspiracy beliefs (b = 0.25, SE = 0.04, p < .001). All variables explained 48% of variance in self-orientated communal orientation (R^2 = .484, F(13, 423) = 30.460, p < .001). The direct effect of attachment anxiety on self-orientated communal orientation was significant (b = 0.29, SE = 0.07, p < .001). Conspiracy belief was not significantly associated with self-orientated communal orientation (b = 0.12, SE = 0.08, p = .113), but stress rumination was (b = 0.05, SE = 0.02, p = .010).

The interaction term between conspiracy belief and stress rumination on self-orientated communal orientation was significant (b = 0.04, SE = 0.01, p < .001; see Table 13, p. 117, for conditional effects and Figure 29 for illustration of simple slopes). The simple slopes show that at high levels of stress rumination, conspiracy belief positively predicted self-orientated communal orientation (b = .30, p = .004), but not at low and medium levels of stress rumination (b = -.06, p = .420; b = .12, p = .113, respectively).

We found conditional indirect effects of attachment anxiety on self-orientated communal orientation through conspiracy beliefs at high, but not low of medium, levels of stress rumination. That is, conspiracy belief mediated the relationship between attachment anxiety and self-orientated communal orientation, but only at higher levels of stress rumination. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 13, p. 117).

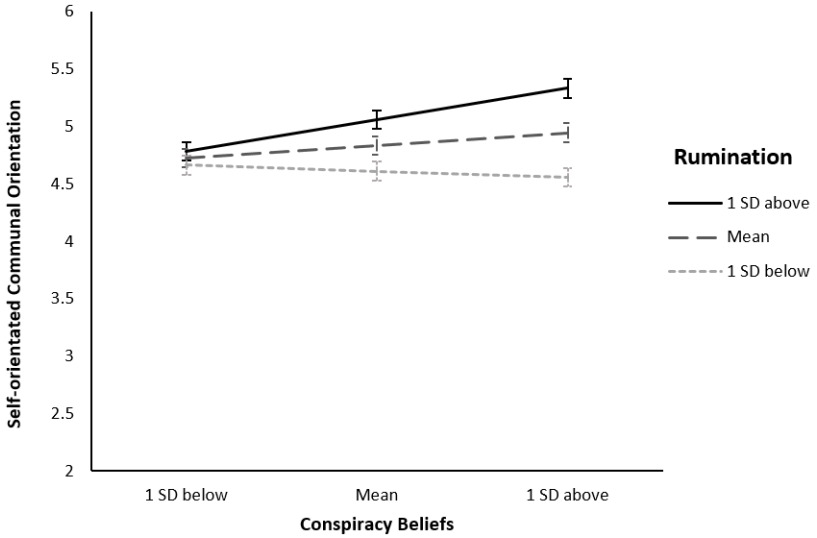

Figure 29. Interaction between conspiracy beliefs and stress rumination in predicting self-orientated communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Exploratory Moderated Mediation Analysis: Selfless Communal Orientation as the Dependent Variable

Stress Helplessness as Moderator. Attachment anxiety (including covariates and attachment avoidance) explained 53% of variance in conspiracy beliefs (R^2 = .530, F(10, 426) = 49.098, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.29, SE = 0.04, p < .001). All variables explained 61% of variance in selfless communal orientation (R^2 = .605, F(13, 423) = 49.890, p < .001). The direct effect of attachment anxiety on selfless communal orientation was significant (b = -0.24, SE = 0.05, p < .001). Conspiracy belief was significantly associated with selfless communal orientation (b = -0.34, SE = 0.06, p < .001), but stress helplessness was not (b = -0.02, SE = 0.01, p = .065).

The interaction term between these conspiracy beliefs and stress helplessness on selfless communal orientation was not significant (b = -0.02, SE = 0.01, p = .709; see Table 14, for conditional effects and Figure 30 for illustration of simple slopes). We found indirect effects of attachment anxiety on selfless communal orientation through conspiracy belief at all levels of stress helplessness, but they were not conditional on stress helplessness. That is, conspiracy belief mediated the relationship between attachment anxiety and selfless communal orientation, regardless of the level of stress helplessness. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 14).

Table 14

Conditional effects, conditional indirect effects, and index of moderated mediation (Study 8).

	Helplessness		Magnification		Rumination	
Conditional effects (M on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.32 (0.05)	[-0.43, -0.21]	-0.33 (0.06)	[-0.44, -0.22]	-0.32 (0.06)	[-0.43, -0.21]
0	-0.34 (0.06)	[-0.46, -0.21]	-0.31 (0.06)	[-0.43, -0.20]	-0.33 (0.06)	[-0.45, -0.22]
+1.00	-0.35 (0.09)	[-0.53, -0.17]	-0.30 (0.08)	[-0.46, -0.13]	-0.35 (0.08)	[-0.51, -0.19]
Conditional indirect effects (X on Y) at ± 1 SD of W	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
-1.00	-0.09 (0.03)	[-0.17, -0.03]	-0.08 (0.01)	[-0.15, -0.03]	-0.08 (0.03)	[-0.15, -0.03]
0	-0.10 (0.0)	[-0.17, -0.04]	-0.08 (0.01)	[-0.14, -0.03]	-0.08 (0.03)	[-0.15, -0.03]
+1.00	-0.10 (0.04)	[-0.19, -0.04]	-0.08 (0.01)	[-0.15, -0.02]	-0.09 (0.03)	[-0.16, -0.03]
Index of moderated mediation	Index (*SE*)	95% CI	Index (*SE*)	95% CI	Index (*SE*)	95% CI
	-0.01 (0.01)	[-0.01, 0.01]	0.01 (0.01)	[-0.01, 0.01]	-0.01 (0.01)	[-0.01, 0.01]

Note: X = Attachment anxiety; M = Conspiracy beliefs; Y = Selfless communal orientation; W = Stress helplessness, magnification, or rumination.

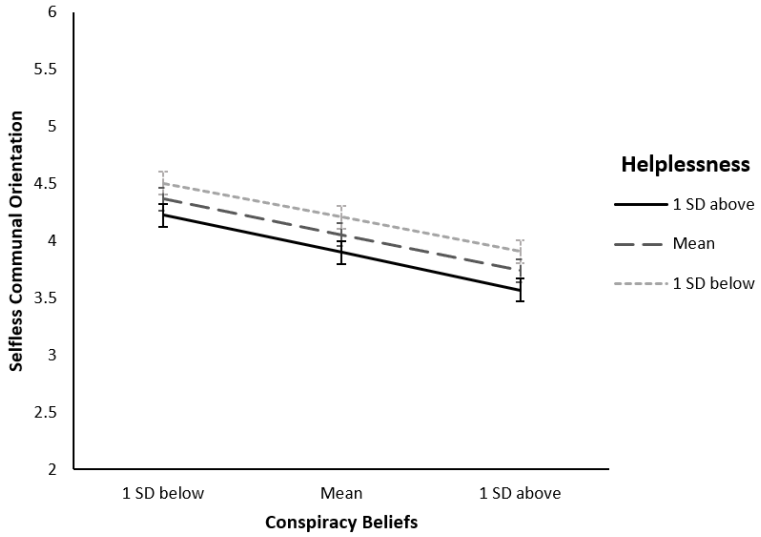

Figure 30. Interaction between conspiracy beliefs and stress helplessness in predicting selfless communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Magnification as Moderator. Attachment anxiety (including covariates and attachment avoidance) explained 54% of variance in conspiracy beliefs (R^2 = .540, F(10, 426) = 49.859, p < .001). The analysis showed that attachment anxiety was significantly associated with conspiracy beliefs (b = 0.25, SE = 0.04, p < .001). All variables explained 61% of variance in selfless communal orientation (R^2 = .605, F(13, 423) = 49.908, p < .001). The direct effect of attachment anxiety on selfless communal orientation was significant (b = -0.25, SE = 0.05, p < .001). Conspiracy belief was significantly associated with selfless communal orientation (b = -0.31, SE = 0.06, p < .001), but stress magnification was not (b = -0.02, SE = 0.02, p = .492).

The interaction term between conspiracy belief and stress magnification on selfless communal orientation was not significant (b = 0.01, SE = 0.01, p = .632; see Table 14, p. 123, for conditional effects and Figure 31 for illustration of simple slopes). We found indirect effects of attachment anxiety on selfless communal orientation through conspiracy belief at all levels of stress magnification, but they were not conditional on stress magnification. That is, conspiracy belief mediated the relationship between attachment anxiety and self-orientated communal orientation, regardless of level of stress magnification. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 14, p. 123).

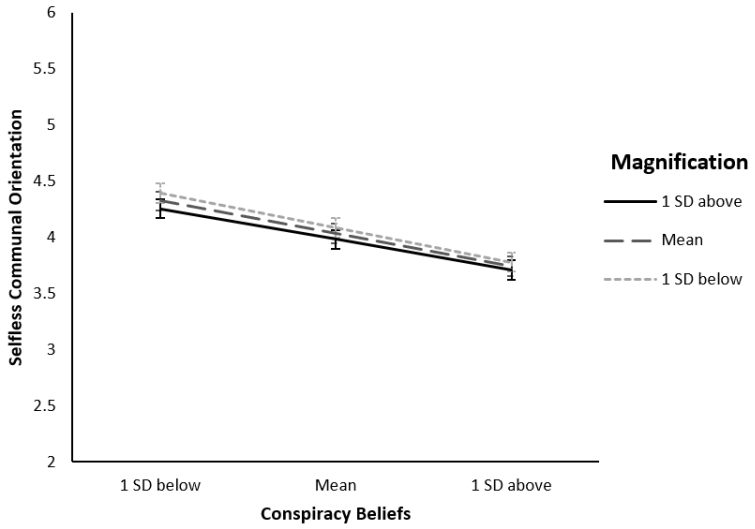

Figure 31. Interaction between conspiracy beliefs and stress magnification in predicting selfless communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Stress Rumination as Moderator. Attachment anxiety explained 54% of variance in conspiracy belief (R^2 = .539, F(10, 426) = 49.822, p < .001). The analysis showed that

attachment anxiety was significantly associated with conspiracy belief (b = 0.25, SE = 0.04, p < .001). All variables explained 61% of variance in conspiracy belief (R^2 = .605, F(13, 423) = 49.889, p < .001). The direct effect of attachment anxiety on selfless communal orientation was significant (b = 0.24, SE = 0.05, p < .001). Conspiracy belief was significantly associated with selfless communal orientation (b = -0.33, SE = 0.06, p < .001), but stress rumination was not (b = 0.01, SE = 0.02, p = .485).

The interaction term between conspiracy beliefs and stress rumination on selfless communal orientation was not significant (b = -0.01, SE = 0.01, p = .717; see Table 14, p. 123, for conditional effects and Figure 32 for illustration of simple slopes). We found indirect effects of attachment anxiety on selfless communal orientation through conspiracy belief at one standard deviation below the mean, the mean, and one standard deviation above the mean, of stress rumination, but they were not conditional on stress rumination. That is, conspiracy belief mediated the relationship between attachment anxiety and self-orientated communal orientation, regardless of level of stress rumination. Bootstrap confidence intervals and index of moderated mediation corroborated these results (see Table 14, p. 123).

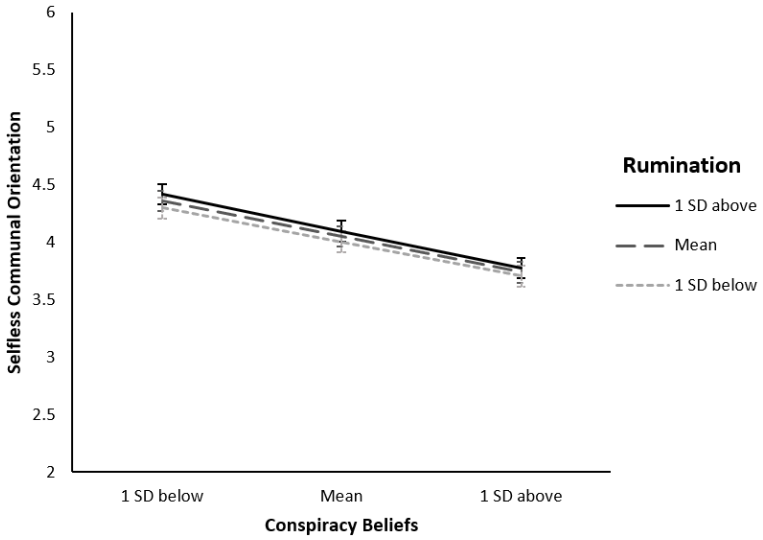

Figure 32. Interaction between conspiracy beliefs and stress rumination in predicting selfless communal orientation. Plotted values are *b* values of the slopes at 1 SD above the mean (high), the mean (medium) and 1 SD below the mean (low). Error bars represent one standard error.

Discussion

Firstly, we again found support for our primary hypothesis that catastrophizing would mediate the relationship between attachment anxiety and belief in conspiracy theories. Specifically, we found stress helplessness to mediate the relationship in question. Additionally, we also found (lower) stress rumination catastrophizing to meditate this relationship, which we had not found before in the previous studies. We found similar results regarding self-orientated and selfless communal orientations as we did in the previous study. Firstly, we again found conspiracy beliefs to be positively correlated with self-orientated, and negatively with selfless, communal orientations. However, unlike the previous study, we found only stress rumination to moderate the relationships between attachment anxiety and selfless communal orientation, but not self-orientated communal orientation. Importantly, we replicated the main findings of the previous study: we only found (low) selfless communal

orientation to mediate the relationship between attachment anxiety and belief in conspiracy theories, which was moderated by (high) stress catastrophizing (helplessness and magnification subfactors only). Therefore, contrary to our expectations, self-orientated communal orientation did not explain the relationship in question, even at higher levels of catastrophizing. However, when we explored the alternative model, we found some difference in results. First, we did not find conspiracy beliefs to mediate the relationship between attachment anxiety and selfless communal orientation, even when moderating for stress catastrophizing. Finally, we found conspiracy beliefs to mediate the relationship between attachment anxiety and self-orientated communal orientation. Further, this mediation was moderated by higher levels of stress helplessness, magnification, and rumination. In this light, it might be the case that—for people high in attachment anxiety—conspiracy endorsement is a means to catastrophize which leads to the motivation to elicit attention and support from others (amplify threat, then get attention).

General Discussion

Across two studies, we found support for the hypothesis that the tendency to catastrophize will explain the relationship between attachment anxiety and belief in conspiracy theories. Specifically, higher pain (Study 7) and stress (Studies 8) catastrophizing (namely helplessness) were found to positively mediate the relationship between attachment anxiety and belief in conspiracy theories. Further, the mediating role of (low) selfless communal orientation was only evident at high (versus low) levels of catastrophizing (Studies 7 and 8). However, in both studies, our prediction that self-orientated communal orientation would mediate the relationship between attachment anxiety and conspiracy beliefs, at higher levels of catastrophizing, was not found. However, in exploratory analyses, in Study 8 only, we found conspiracy beliefs to positively explain the relationship between attachment anxiety and self-orientated communal orientation, at higher levels of stress catastrophizing only.

Theoretical Implications

The current research corroborates and extends previous research. Specifically, in all studies we found that attachment anxiety positively predicted belief in conspiracy theories (Green & Douglas, 2018). Further, we again found that attachment anxiety was associated with catastrophizing (e.g., Tremblay & Sullivan, 2010), which in turn predicts belief in conspiracy theories, namely helplessness (Chapter 2). We therefore provided further evidence which suggests that individuals with attachment anxiety catastrophize, and that another possible way to do this is through exaggerating the existence of conspiracy theories.

Our findings regarding the relationships between attachment anxiety relationship, self-orientated communal orientation and catastrophizing were mixed. Specifically, in Study 7, attachment anxiety was shown to be predict with self-orientated communal orientation at higher levels of catastrophizing, but this was not replicated in Study 8. Although inconsistent, these results still somewhat align with the literature. Indeed, attachment-anxious individuals are ambivalent towards support-seeking, due to their desire for such support and lack of trust in others providing it (Mikulincer & Shaver, 2017). Importantly, across both studies, we did not find evidence for the notion that individuals with attachment anxiety catastrophize the existence of conspiracy theories in order to elicit attention and support. There are a couple of reasons why this may be. First, at the time of completing the surveys, participants may not have been particularly distressed and therefore did not have an increased need to elicit attention and support from others. Future studies could therefore test whether making the supposed threats from conspiracy theories salient increases the desire to elicit attention, care, and support from others, particularly for people with attachment anxiety whom tend to catastrophize. Second, it might be the case these individuals have failed previously in trying to elicit attention and support from others by catastrophizing in this way. For example, the internet is awash with articles reporting on relationships breaking up because a family

members or partners has going down the conspiracy theory rabbit hole (e.g., BBC, 2020; The Washington Post, 2020). Therefore, it might be the case that exaggerating the existence of conspiracy theories has been tried and tested, in order elicit to attention and support, but may not have been a fruitful approach to take for people with attachment anxiety. However, when we explored an alternative model, we found conspiracy beliefs to explain the relationship between attachment anxiety and self-orientated communal orientation, at higher levels of stress catastrophizing only (Study 8). Future studies could explore these relationships further to determine which model is best suited.

Across both studies, however, we found lower selfless communal orientation to explain the relationship between attachment anxiety and conspiracy beliefs, predominately at higher levels of helplessness and magnification catastrophizing. This suggests attachment-anxious persons may be too preoccupied with their owns worries, including pain, stress, and the supposed threats from conspiracy theories, to be able to think about attending to other people's needs. Indeed, as well as the tendency to catastrophize threats, individuals with higher attachment anxiety have also been shown to exaggerate their inability to cope with life's demands (e.g., Buelow et al., 2002; Zeyrek et al., 2009). With this is mind, our findings suggest that individuals with higher attachment anxiety do not have the psychological resources available to be able to attend to others' needs, due to their preoccupation with catastrophizing threats, including the supposed threats from conspiracy theories.

Conclusion

The current studies provide further support for the prediction that catastrophizing explains the link between attachment anxiety and conspiracy beliefs, suggesting that conspiracy theory endorsement may be another means to catastrophize life's problems. However, although conspiracy beliefs were found to be associated with self-orientated communal orientation, it did not explain the link between attachment anxiety and conspiracy

beliefs, even at high levels of catastrophizing. This suggests that, although conspiracy theory endorsement may be a means to catastrophize, it might not necessarily be a means to elicit attention, care or support from others. Instead, a lower selfless communal orientation, at higher levels of catastrophizing, was able to explain the link in question. This suggests that attachment-anxious persons may be too preoccupied with potential threats (including from conspiracy theories) that they do not have the psychological resources to be able to tend to other people's needs.

Thus far, the current and previous studies (Chapter 2) have found catastrophizing to play an important role in explaining the relationships between attachment anxiety and conspiracy beliefs. However, in all these studies we have focused on belief in general notions of conspiracy (versus specific conspiracy theories). In the next chapter, therefore, examined the relationship between attachment anxiety and belief in COVID-19 conspiracy theories.

Chapter 4: COVID-19 Powerlessness

Abstract

In the previous chapters we demonstrated that hyperactivating strategies (i.e., catastrophizing helplessness) associated with attachment anxiety were able to—in part—explain belief in general notions of conspiracy. In the current chapter we aimed to extend these findings by examining belief in COVID-19 conspiracy theories. Specifically, we examined the extent to which insecure attachment (anxiety and avoidance) can predict belief in COVID-19 conspiracy theories. We also examined whether general conspiracy beliefs and COVID-19 powerlessness can help to explain these relationships further. In Study 9 (n = 1518) both attachment anxiety and avoidance predicted belief in COVID-19 conspiracy theories, which was mediated by COVID-19 powerlessness. Further, only attachment anxiety was associated with general conspiracy beliefs, which in turn predicted COVID-19 powerlessness and conspiracy beliefs. We aimed to replicate these findings in Study 10 (n = 1651). In this study, only attachment avoidance was found to predict COVID-19 conspiracy beliefs, through COVID-19 powerlessness. The current fundings suggest that individuals with different attachment patterns (anxiety versus avoidant) might find one conspiracy theory more appealing than the other (i.e., one that amplifies versus downplays a particular threat, respectively). Theoretical implications and limitations are discussed.

The previous studies in this thesis thus far have found support for the notion that catastrophizing, namely feelings of helplessness, can explain the link between attachment anxiety and belief in conspiracy theories. However, all the previous studies in this thesis have measured belief in *general notions of conspiracy* (Brotherton et al., 2013), and so it is still not known if these results would be the same for belief in *specific conspiracy theories*. It has been argued that there are conceptual differences between a conspiracy mindset (or mentality) and belief in specific conspiracy theories (Frenken & Imhoff, 2021). Indeed, Frenken and Imhoff found a conspiracy mindset to be more associated with the endorsement of contradictory conspiracy theories (see also Wood et al., 2012). Further, other research suggests that conspiracy mentality and belief in specific conspiracy theories are underpinned by different motives. For example, Stojanov & Halberstadt (2020) conducted a meta-analysis examining the effect of lack of control on conspiracy beliefs, and, importantly, they moderated the results by different types of conspiracy belief: conspiracy mindset versus specific conspiracy beliefs. Overall, they did not find lack of control to increase conspiracy beliefs. However, when they moderated by type of conspiracy belief, specific conspiracy belief (but not conspiracy mindset) was found to increase conspiracy beliefs. This suggests that the findings from the current thesis thus far are limited as they only measure one type of conspiracy belief and it is important to broaden these findings to a more specific context. Therefore, in the current studies we aimed to address this limitation by focusing on the context of COVID-19 conspiracy theories.

Since the first news broke out regarding COVID-19, conspiracy theories began to immediately circulate (van Bavel et al., 2020). For example, some believed that COVID-19 was manufactured by the Chinese to wage war on the United States, or that it was it was hoax aimed at thwarting Donald Trump's re-election hopes (Douglas, 2021). Conspiracy theories surrounding COVID-19 have been shown to have negative consequences, such as reducing

intentions to limit the spread of COVID-19 (Biddlestone et al., 2020) and intentions to take the COVID-19 vaccine (Bertin et al., 2020), as well as justifying and promoting general violence (Jolley & Patterson, 2020). It is therefore important to understand the psychological underpinnings of COVID-19 conspiracy beliefs.

Jutzi and colleagues (2020) described COVID-19 as a "super threat" because of the severity of its consequences on a personal (e.g., health risks) and societal (e.g., government restrictions) level. They found evidence for individuals employing "distal defence" strategies for this anxiety-provoking threat, which includes directing attention away from the threat (Gray & McNaughton, 2000; Jonas et al., 2014). On the other hand, Jutzi and colleagues did not examine possible "proximal defences", which includes higher vigilance and anxious arousal, as they argued that avoiding the negative affect is the main motivation of belief in COVID-19 conspiracy theories. Interestingly, these two different types of defence against the threat of COVID-19 are similar to the deactivating and hyperactivating strategies associated with attachment anxiety and avoidance, respectively (Mikulincer & Shaver, 2017).

Regarding attachment avoidance, individuals with this attachment pattern tend to employ deactivating strategies to alleviate distress (Mikulincer & Shaver, 2017). These strategies involve downplaying threats and avoiding or denying negative affect. Conspiracy theories are described as being nefarious plots by secret groups (Douglas et al., 2019) and, arguably, have the potential to arouse negative affect for individuals who believe in, or are exposed to, these theories. This suggests that conspiracy theories would be incongruent with the goals of deactivating strategies. However, in Leone and colleagues' (2018) study among Italian samples, attachment avoidance was found to be associated with belief conspiracy theories. In their studies, they measured belief in general and specific conspiracy theories (e.g., "The so-called Islamic State does not really exist; it is a smoke-screen concocted by Western Governmental Agencies"). Leone and colleagues argued that—for attachment-

avoidant persons—conspiracy theory endorsement may be motivated as a way to avoid psychological distress. Further, research has also shown that conspiracy beliefs are associated with the use of stress-avoiding coping strategies (Marchlewska et al., 2021). Therefore, in some contexts, conspiracy theories might provide attachment-avoidant persons with a means to satisfy their insecurity, by avoiding negative affect related to a particular threat. For example, by being able to live life as if COVID-19 does not exist (e.g., that COVID-19 is a hoax).

Regarding attachment anxiety, individuals with this attachment pattern tend to employ hyperactivating strategies to alleviate distress (Mikulincer & Shaver, 2017). These strategies involve the exaggeration of threats and inability to cope with them. We previously found attachment anxiety to be associated with belief in specific conspiracy theories (Green & Douglas, 2018). As described above, COVID-19 is considered a super threat (Jutzi et al., 2020), and COVID-19 conspiracy theories might decrease the feeling of threat from the pandemic. This would suggest that this specific conspiracy theory might be incongruent with the goals of hyperactivating strategies. However, it could be argued that there are elements to COVID-19 conspiracy theories that do add an extra layer of threat. For example, although COVID-19 conspiracy theories may decrease the threat from the actual virus, they also allude to another threat—which is common to conspiracy theories in general—where COVID-19 is manipulated by global powers as means to exert further control over humanity (Shahsavarai et al., 2020). In this light, attachment-anxious persons might be motivated to believe in COVID-19 conspiracy theories due to supposed nefarious threats to their control over life (via government restrictions) and their helplessness in being able to stop this agenda. Therefore, it might also be the case that attachment anxiety is associated with belief in COVID-19 conspiracy theories.

Taken together, on the one hand COVID-19 conspiracy theories might appeal to attachment-avoidant persons as they provide a way to deny the threat from the COVID-19 virus, which would align with deactivating strategies. On the other hand, COVID-19 conspiracy theories might also appeal to attachment anxious-persons as they provide a means to amplify the threat to their control over life, which would align with hyperactivating strategies. Therefore, it might be the case that both attachment avoidance and anxiety would be associated with belief in COVID-19 conspiracy theories.

COVID-19 Powerlessness

In Chapters 2 and 3, we found the tendency to exaggerate feelings of helplessness (e.g., pain and stress) to be associated with beliefs in conspiracy theories. Helplessness is conceptually similar to feelings of powerlessness—feelings that one has about being unable to make a meaningful impact on important issues (Xiang et al., 2019). Early research found powerlessness to be associated with belief in specific conspiracy theories (Abalakina-Paap et al., 1999). On more recent issues, feelings of powerlessness regarding climate change (Jolley & Douglas, 2014b) and COVID-19 (Biddlestone et al., 2020) have also been associated with conspiracy beliefs. Therefore, we aimed to examine COVID-19 powerlessness as a potential mediator of the relationships between attachment insecurity (anxiety and avoidance) and COVID-19 conspiracy beliefs.

Attachment-anxious persons might exhibit feelings of COVID-19 powerlessness due to their belief about being unable to cope with life's problems generally (Mikulincer & Shaver, 2017). Indeed, it could be argued that by examining COVID-19 powerlessness, we are honing in on a specific exaggeration of threat related to COVID-19. Further, considering we previously found exaggeration of helplessness to explain the relationship between attachment anxiety and conspiracy beliefs (Chapter 2 and 3), we might also expect COVID-19 powerlessness to also explain this relationship. That is, COVID-19 powerlessness may

show the same relationships with attachment anxiety and conspiracy beliefs as helplessness has, due to their similarities in describing an inability to cope with life's problems. Conversely, attachment-avoidant persons might also exhibit feelings of COVID-19 powerlessness, due to their negative views of others (Brennan et al., 1998). That is, people high in attachment avoidance may not have faith in others to mitigate the spread of the virus, thereby rendering their own actions as meaningless in the grand scheme of things. Therefore, attachment avoidance might also be associated feelings of COVID-19 powerlessness.

Finally, belief general notions of conspiracy could help to further explain the relationships between COVID-19 powerlessness, attachment anxiety and avoidance, and COVID-19 conspiracy beliefs. Previous studies have examined belief in conspiracy theories as a predictor of feelings of powerlessness (e.g., Jolley & Douglas, 2014b; Biddlestone et al., 2020), suggesting that conspiracy theories may exacerbate people's existential concerns (Douglas et al., 2017). It has been previously argued that there may be a cyclical relationship between conspiracy beliefs and existential threat (Douglas et al., 2017; van Prooijen, 2020). Indeed, it has been shown that belief in one conspiracy theory predicts belief in other conspiracy theories (Abalakina-Paap et al., 1999; Goertzel, 1994), even when they contradict each other (Wood et al., 2012)—termed a conspiracy mentality (Imhoff & Bruder, 2014). Further, it is argued that people are drawn to conspiracy theories as an attempt to satisfy existential concerns, including feelings of powerlessness (Douglas et al., 2017). Therefore, we might expect belief in general notions of conspiracy to lead to feelings of COVID-19 powerlessness, which then in turn could lead to higher COVID-19 conspiracy beliefs. In this way, we could test the cyclical relationship theory of conspiracy belief and existential threat (Douglas et al., 2017; van Prooijen, 2020) and whether attachment anxiety and avoidance can also explain these relationships.

Overview of Studies

In two studies, we examined the relationships between attachment anxiety and avoidance, belief in general notions of conspiracy and COVID-19 conspiracy theories, and feelings of COVID-19 powerlessness. Demographic variables (age, gender, and educational attainment), and underlying health condition (*yes* or *no*) were also included as covariates in both studies. We examined whether COVID-19 powerlessness mediates the relationship between attachment insecurity (anxiety and avoidance) and COVID-19 conspiracy beliefs. Further, we examined a sequential mediation where general conspiracy belief is included is the first mediator, and COVID-19 powerlessness is entered as the second mediator. In such a way, we examined whether existential concerns (attachment insecurity and COVID-19 powerlessness) exacerbate conspiracy beliefs (general and COVID-19) and vice versa. Study 10 was a straight replication of Study 9. Finally, in both studies, we recruited participants by means of convenience sampling. Study 1 was advertised on three social media platforms: Facebook, Twitter, and Reddit (the majority of participants were recruited from the latter), and Study 2 was solely advertised on Reddit. In all cases, the same advertisement was posted on each platform, referring to a survey on COVID-19 that was being conducted by psychology researchers at the University of Kent.

Study 9

In Study 9, we explored the relationships between attachment anxiety and avoidance, COVID-19 powerlessness, and belief in general notions of conspiracy and COVID-19 conspiracy theories. We examined whether attachment anxiety and avoidance would predict belief in COVID-19 conspiracy theories, and whether these relationships would be mediated by COVID-19 powerlessness. Further, we also examined whether general conspiracy beliefs and COVID-19 powerlessness sequentially mediates the relationships between attachment anxiety and avoidance and COVID-19 conspiracy beliefs. For robustness, we included age,

gender (male versus female), and educational attainment as covariates. Further, it is plausible that people with underlying health conditions are less inclined to believe in COVID-19 conspiracy theories, as they may take the precautions around COVID-19 more seriously than people without underlying health conditions. This dichotomy regarding people's health status could affect the results. Therefore, we additionally included whether or not participants had an underlying health condition as a covariate, to test whether the main psychological associations we examined hold over and above this important COVID-19-related health status.[7]

Method

Participants

We recruited 1547 British and US American participants through adverts we posted on Reddit (they were not compensated for their time). Participants who failed at least one two attention checks (n = 28) were excluded from the study. The remaining participants (N = 1519; 864 women, 606 men, 27 rather not say, 21 trans; M_{age} = 34.34 years, SD_{age} = 10.37, range = 18–78) were included in the final analyses. Of these participants, 75% were US American and 25% were British.

Measures

Belief in Covid-19 Conspiracy Theories. We used the 10-item COVID-19 Conspiracy Beliefs Scale (CCB; Biddlestone et al., 2020). The scale consists of various specific conspiracy theories regarding COVID-19 (e.g., "Coronavirus was purposefully created in, and released from, a biochemistry lab in Wuhan, China," and "The

[7] The variables from this study were originally part of a wider project, but were ultimately not used (see Green et al., 2020). Therefore, as the current predictions were not hypothesised prior to data collection, the current study is treated purely as exploratory.

implementation of 5G technology is a means of deliberately spreading Coronavirus"; 1 = *strongly disagree*, 6 = *strongly agree*, α = .86).

Belief in General Notions of Conspiracy. We used the single-item conspiracy beliefs scale (Lantian et al., 2016; i.e., "I think that the official version of the events given by authorities very often hides the truth"; 1 = *completely false*, 9 = *completely true*).

Attachment Anxiety and Avoidance. We used the shortened Experiences in Close Relationships scale (ECR; Wei et al., 2007). There were 12 statements comprised of six attachment anxiety items (e.g., "I get frustrated if romantic partners are not available when I need them" and "I need a lot of reassurance that I am love by my partner"; α = .77) and six avoidance items (e.g., "it helps to turn to my romantic partner in times of need" and "I get uncomfortable when a romantic partner wants to be very close"; α = .83; 1 = *strongly disagree*, 7 = *strongly agree*).

COVID-19 Powerlessness. We used the three-item measure of powerlessness concerning the spread of COVID-19 (Biddlestone et al., 2020; e.g., "I feel that the Coronavirus is too big for my actions to have an impact" and "I feel that my actions will not affect the outcome of Coronavirus"; 1 = *strongly disagree*, 6 = *strongly agree*, α = .88).

Covariates. In addition to age and gender, participants were asked to rate their educational attainment (1 = *no formal education*, 2 = *primary level education*, 3 = *secondary level education*, 4 = *college or university level education [bachelor's degree]*, 5 = *college or university level education [graduate degree]*) and report whether they had an underlying health condition (*yes*, *no*, or *not sure*).

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (COVID-19 and general conspiracy beliefs, attachment anxiety and avoidance, and COVID-19 powerlessness). Second, we used PROCESS Model 6 (Hayes, 2017) to explore whether COVID-19 powerlessness mediates the relationship between attachment anxiety and avoidance and COVID-19 conspiracy beliefs, and whether general conspiracy beliefs and COVID-19 powerlessness shows a sequential for this relationship. Covariates (age, gender [male = 0, female = 1], educational attainment, and underlying health condition (no = 0, yes = 1) were also included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 15. Attachment anxiety and avoidance weakly positively correlated with each other. Attachment anxiety showed very small positive correlations with powerlessness, general and COVID-19 conspiracy beliefs. Attachment avoidance showed a very small positive correlations with general and COVID-19 conspiracy beliefs, and a small positive correlation with powerlessness. Powerlessness showed small positive correlations with general and COVID-19 conspiracy beliefs. General and COVID-19 conspiracy beliefs moderately positively correlated with each other.

Table 15

Means, standard deviations, and zero-order correlations (Studies 9 and 10).

Measure		1	2	3	4	5
1. Covid-19 CB		-	.48***	.07**	.08***	.21***
2. General CB		.49***	-	.09***	.07**	.15***
3. Attachment anxiety		.02	.03	-	.23***	.11***
4. Attachment avoidance		.06*	.05*	.22***	-	.14***
5. COVID-19 Powerlessness		.20***	.13***	.07**	.14***	-
Study 9	*M*	1.42	4.52	3.46	2.45	2.67
	SD	0.47	2.19	1.20	1.08	1.21
Study 10	*M*	1.42	4.62	3.47	2.45	2.62
	SD	0.51	2.27	1.19	1.06	1.18

Note: Study 9 zero-order correlations are displayed on the upper diagonal, while those for Study 10 are displayed on the lower diagonal.

Exploratory Sequential Mediation Analyses

Attachment anxiety and avoidance explained 3% of the variance in general conspiracy beliefs (R^2 = .030, F(6, 1268) = 6.523, p < .001). The analysis showed that attachment anxiety was significantly associated with general conspiracy beliefs (b = 0.18, SE = 0.05, p < .001), whereas attachment avoidance was not (b = 0.09, SE = 0.06, p = .118). Attachment anxiety and avoidance, and general conspiracy beliefs explained 9% of variance in powerlessness (R^2 = .088, F(7, 1267) = 17.347, p < .001). Attachment anxiety (b = 0.07, SE = 0.03, p = .013) and avoidance (b = 0.11, SE = 0.03, p < .001), and general conspiracy beliefs (b = 0.08, SE = 0.02, p < .001) were all significantly associated with COVID-19 powerlessness.

The total effects (R^2 = .025, F(6, 1268) = 5.513, p < .001) of attachment anxiety and avoidance on COVID-19 conspiracy beliefs were significant (b = 0.02, SE = 0.01, p = .031; b = 0.03, SE = 0.01, p = .034, respectively). Attachment anxiety and avoidance, general

conspiracy beliefs, and powerlessness explained 26% of variance in COVID-19 conspiracy beliefs (R^2 = .262, F(8, 1266) = 56.303, p < .001). General conspiracy beliefs and COVID-19 powerlessness were associated with COVID-19 conspiracy beliefs (b = 0.09, SE = 0.01, p < .001; b = 0.05, SE = 0.01, p < .001, respectively). The direct effects of attachment anxiety and avoidance on conspiracy beliefs were not significant (b = 0.01, SE = 0.01, p = .797; b = 0.01, SE = 0.01, p = .305, respectively).

Significant indirect effects were found from attachment anxiety on conspiracy belief through general conspiracy beliefs and powerlessness (b = 0.02, SE = 0.01, CI = [.01, .03]; b = 0.01, SE = 0.01, CI = [.01, .01], respectively), and a significant sequential mediation was found through these two mediators respectively (b = 0.01, SE = 0.01, CI = [.01, .01]). A significant indirect effect was found from attachment avoidance on COVID-19 conspiracy beliefs through COVID-19 powerlessness (b = 0.01, SE = 0.01, CI = [.01, .02]), but not general conspiracy beliefs (b = 0.02, SE = 0.01, CI = [-.01, .05]), or through general conspiracy beliefs and COVID-19 powerlessness (b = 0.01, SE = 0.01, CI = [-.01, .01]; see Figure 33 for an illustration of this model with standardised values).

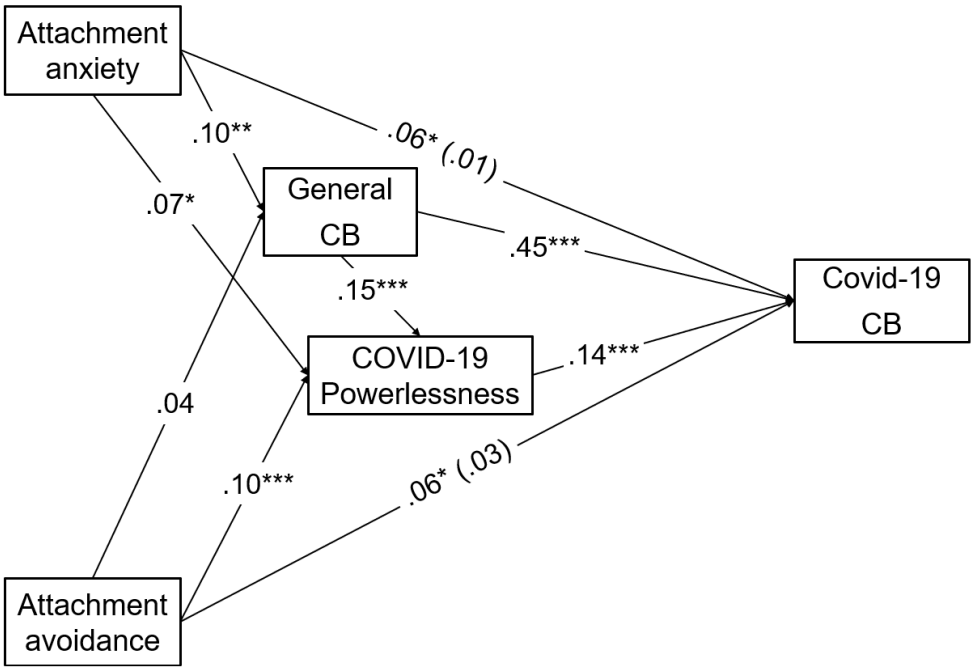

Figure 33. Standardized regression coefficients for sequential mediation analysis (Study 9). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling belief in general conspiracy beliefs and COVID-19 powerlessness, can be found in the parentheses. Age, gender, educational attainment, and underlying health condition (yes versus no) were also included as covariates.

Discussion

In this study, we extended the findings of the previous studies in this thesis (Chapter 2 & 3) by showing that attachment anxiety is also associated with belief in COVID-19 conspiracy theories. Also, similar to previous research, we found COVID-19 powerlessness to be associated with COVID-19 conspiracy beliefs (Abalakina-Paap et al., 1999; Biddlestone et al., 2020; Jolley & Douglas, 2014b). In line with the overall findings of the current thesis (Chapters 2 & 3) we found COVID-19 powerlessness to mediate the relationship between attachment anxiety and COVID-19 conspiracy beliefs. We previously drew parallels between helplessness and powerlessness, arguing that—for attachment-anxious persons—expressing

feelings of powerlessness might also form part of a hyperactivating strategy (i.e., by exaggerating one's inability to cope with life's stressors; Mikulincer & Shaver, 2017). The results suggest, therefore, that the tendency to catastrophize—in part—explains the relationship between attachment anxiety and COVID-19 conspiracy beliefs

We also found attachment avoidance to be associated COVID-19 conspiracy beliefs, supporting previous research (Freeman & Bentall, 2017; Leone et al., 2018). Jutzi and colleagues (2020) described COVID-19 as a "super threat" and found COVID-19 conspiracy beliefs to be associated with "distal defence" strategies. Therefore, it could be argued that—for attachment-avoidant persons—COVID-19 conspiracy theories could a vessel for avoiding the "super threat" of COVID-19, by denying its severity or existence, which would be in line with attachment deactivating strategies (Mikulincer & Shaver, 2017). We also found COVID-19 powerlessness to mediate the relationship between attachment avoidance and COVID-19 conspiracy beliefs. This could be driven by the tendency for attachment-avoidant persons tend to hold negative views of others (Brennan et al., 1998), and they therefore might not expect others to try to mitigate the spread of the virus, making their own actions less impactful. Alternatively, it might be the case that attachment-avoidant persons believe COVID-19 is a hoax perpetuated by global powers, and that no action taken by anyone will be able to stop this agenda (i.e., you cannot limit the spread of the virus if it does not exist in the first place).

We also included belief in general notions of conspiracy, with the aim of examining the sequential effects of general conspiracy beliefs and COVID-19 powerlessness, on the relationships between attachment anxiety and avoidance and COVID-19 conspiracy beliefs. In line previous findings, we found attachment anxiety to be associated with general conspiracy beliefs (Chapters 2 & 3; Freeman & Bentall, 2017; Green & Douglas, 2018; Leone et al., 2018). We did not find attachment avoidance to be associated with general

conspiracy beliefs, however. This suggests that attachment avoidance might only be associated with some types of conspiracy theories (e.g., Stojanov et al., 2020), particularly ones that deny actual threats (i.e., from COVID-19). We also found general conspiracy beliefs to predict COVID-19 powerlessness (Biddlestone et al., 2020; Jolley & Douglas, 2014b). Importantly, we found sequential indirect effects for attachment anxiety (but not avoidance) on COVID-19 conspiracy beliefs. Specifically, general conspiracy beliefs and COVID-19 powerlessness predicted each other in turn, and explained the relationship between attachment anxiety and COVID-19 conspiracy beliefs. These results support the idea that there may be a repeated loop between existential concerns and conspiracy beliefs (Douglas et al., 2017; van Prooijen, 2020), at least for attachment-anxious persons. Indeed, it could also be a result of hyperactivating strategies, which include amplifying threats and vulnerability (Mikulincer & Shaver, 2017), which might also explain why a sequential mediation was not found for attachment-avoidant persons on COVID-19 conspiracy beliefs, whose deactivating strategies include the denial or downplaying of threats.

Study 10

In the previous study we found both attachment anxiety and avoidance to be associated with COVID-19 conspiracy beliefs, and that COVID-19 powerlessness explained these relationships. We also found that attachment anxiety (but not avoidance) was associated general conspiracy beliefs. Further, we found general conspiracy beliefs and COVID-19 powerlessness to sequentially mediate the relationship between attachment anxiety and COVID-19 conspiracy beliefs. As the previous study was exploratory, we aimed to replicate the previous findings in another pre-registered study using the same method.

Method

Participants

We recruited 1733 British and US American participants through adverts we posted on Reddit (they were not compensated for their time). Participants who failed at least one two attention checks (n = 28) were excluded from the study. The remaining participants (N = 1705; 830 men, 828 women, 37 rather not say, 19 trans; M_{age} = 33.94 years, SD_{age} = 10.72, range = 18–78) were included in the final analyses. Of these participants, 69% were US American and 31% were British.

Measures

The same measures for general and COVID-19 conspiracy beliefs (α = .96), attachment anxiety (α = .96) and avoidance (α = .90), powerlessness (α = .96) and covariates (age, gender, educational attainment, and underlying health condition) were used as in the previous study.

Results

Analytic Strategy

First, we examined zero-order correlations between the main variables of interest (attachment anxiety and avoidance, COVID-19 powerlessness, and general and COVID-19 conspiracy beliefs). Second, we used PROCESS Model 6 (Hayes, 2017) to test whether COVID-19 powerlessness mediates the relationship between attachment anxiety and COVID-19 conspiracy beliefs, and whether general conspiracy beliefs and COVID-19 powerlessness shows a sequential for this relationship. Covariates (age, gender [male = 0, female = 1], educational attainment, and underlying health condition (no = 0, yes = 1) were also included.

Zero-order Correlations

Means, standard deviations, and zero-order correlations for the main variables can be found in Table 15 (p. 142). Attachment anxiety and avoidance weakly positively correlated with each other. Attachment anxiety showed a very small positive correlation with powerlessness, but did not correlate with general and COVID-19 conspiracy beliefs. Attachment avoidance showed a very small positive correlation with COVID-19 conspiracy beliefs, a small positive correlation with powerlessness, and no correlation with general conspiracy beliefs. Powerlessness showed small positive correlations with general and COVID-19 conspiracy beliefs. General and COVID-19 conspiracy beliefs moderately positively correlated with each other.

Sequential Mediation Analyses

Attachment anxiety and avoidance (including covariates) explained 2% of the variance in general conspiracy beliefs (R^2 = .024, F(6, 1438) = 5.098, p < .001). The analysis showed that attachment anxiety and avoidance were not associated with general conspiracy beliefs (b = -0.01, SE = 0.05, p = .868; b = 0.10, SE = 0.06, p = .081). Attachment anxiety and avoidance, and general conspiracy beliefs (including covariates) explained 8% of variance in powerlessness (R^2 = .077, F(7, 1437) = 17.134, p < .001). Attachment avoidance (b = 0.13, SE = 0.03, p < .001), and general conspiracy beliefs (b = 0.06, SE = 0.01, p < .001) were significantly associated with COVID-19 powerlessness, whereas attachment anxiety was not (b = 0.04, SE = 0.03, p = .144).

The total effect (R^2 = .035, F(6, 1438) = 8.567, p < .001) of attachment avoidance on COVID-19 conspiracy beliefs was significant (b = 0.03, SE = 0.01, p = .035), whereas the total effect of attachment anxiety was not (b = -0.02, SE = 0.01, p = .176). Attachment anxiety and avoidance, general conspiracy beliefs, and powerlessness (including covariates)

explained 28% of variance in COVID-19 conspiracy beliefs (R^2 = .278, F(8, 1436) = 69.185, p < .001). General conspiracy beliefs and COVID-19 powerlessness were associated with COVID-19 conspiracy beliefs (b = 0.10, SE = 0.01, p < .001; b = 0.06, SE = 0.01, p < .001, respectively). The direct effects of attachment anxiety and avoidance on conspiracy beliefs were not significant (b = -0.02, SE = 0.01, p = .087; b = 0.01, SE = 0.01, p = .768, respectively).

We did not find significant indirect effects from attachment anxiety on conspiracy belief through general conspiracy beliefs and powerlessness (b = -0.01, SE = 0.01, CI = [-.01, .01]; b = 0.01, SE = 0.01, CI = [-.01, .01], respectively), or through a sequential mediation of these two mediators respectively (b = 0.01, SE = 0.01, CI = [-.01, .01]). A significant indirect effect was found from attachment avoidance on COVID-19 conspiracy beliefs through COVID-19 powerlessness (b = 0.01, SE = 0.01, CI = [.01, .01]), but not through general conspiracy beliefs (b = 0.01, SE = 0.01, CI = [-.01, .02]), or through general conspiracy beliefs and COVID-19 powerlessness (b = 0.01, SE = 0.01, CI = [-.01, .01]; see Figure 34 for an illustration of this model with standardised values).

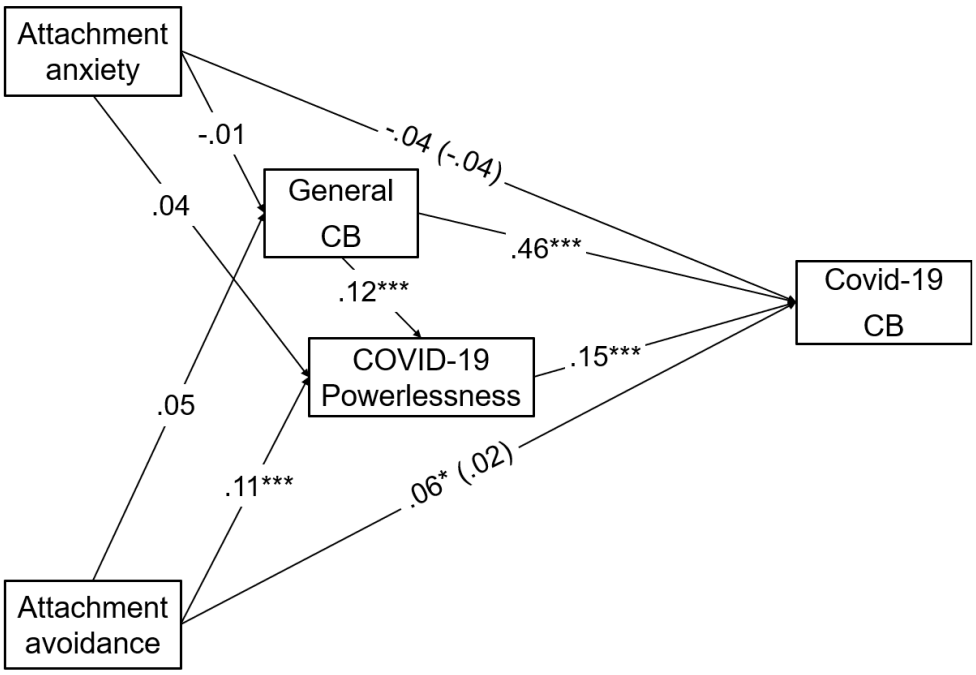

Figure 34. Standardized regression coefficients for sequential mediation analysis (Study 10). The standardized regression coefficients of attachment anxiety and avoidance on conspiracy beliefs, controlling for general conspiracy beliefs and COVID-19 powerlessness, can be found in the parentheses. Age, gender, educational attainment, and underlying health condition (yes versus no) were also included as covariates.

Discussion

We again found COVID-19 powerlessness to predict COVID-19 conspiracy beliefs. However, unlike the previous study, attachment anxiety was not found to predict COVID-19 conspiracy beliefs, or COVID-19 powerlessness. Further, we did not replicate the previous indirect effect of attachment anxiety on COVID-19 conspiracy beliefs through COVID-19 powerlessness, which is in contrast to majority of the findings in the current thesis. Furthermore, we did not find attachment anxiety to predict general conspiracy beliefs. However, we again found general conspiracy beliefs to predict COVID-19 powerlessness, but

we did not find a sequential mediation between these two variables on the relationship between attachment anxiety and COVID-19 conspiracy beliefs. Replicating previous study, however, attachment avoidance was found to predict COVID-19 powerlessness and COVID-19 conspiracy beliefs. Further, only COVID-19 powerlessness was found to explain the relationship between attachment avoidance and COVID-19 conspiracy beliefs. Taken together, we partially replicated the previous study, which suggests that, compared to attachment anxiety, the relationship between attachment avoidance and COVID-19 conspiracy beliefs, explained by COVID-19 powerlessness, is more robust.

General Discussion

Across two studies, we examined the relationships between attachment anxiety and avoidance, general and COVID-19 conspiracy beliefs, and COVID-19 powerlessness. Study 9 was exploratory, where we found attachment anxiety to predict belief in general and COVID-19 conspiracy theories. We also found COVID-19 powerlessness to explain the relationship between attachment anxiety and COVID-19 conspiracy beliefs. Further, we found general conspiracy beliefs and COVID-19 powerlessness to sequentially mediate the relationship between attachment anxiety and COVID-19 conspiracy beliefs. We also found attachment avoidance to predict COVID-19 conspiracy beliefs, which was mediated by COVID-19 powerlessness. However, attachment avoidance did not predict general conspiracy beliefs or show any sequential effects on COVID-19 conspiracy beliefs through general conspiracy beliefs and COVID-19 powerlessness. In Study 10—using the same method—we partially replicated the findings from Study 9. Specifically, we again found attachment avoidance to predict COVID-19 conspiracy beliefs (but not general conspiracy beliefs), which was also mediated by COVID-19 powerlessness. However, attachment anxiety was not found to be associated with general or COVID-19 conspiracy beliefs, and was also not indirectly associated with them through any of the meditators. Therefore, the

consistent findings were that attachment avoidance is associated with COVID-19 conspiracy beliefs, which—in part—can be explained by COVID-19 powerlessness.

Theoretical Implications

The current research partially supports previous findings on the relationship between attachment anxiety and conspiracy beliefs. In Study 9, attachment anxiety predicted belief in general notions of conspiracy, replicating previous research (Chapters 2 & 3; Freeman & Bentall, 2017; Green & Douglas, 2018; Leone, 2018), which was also extended to the context of COVID-19 conspiracy theories. Further, we found COVID-19 powerlessness to explain the relationship between attachment anxiety and COVID-19 conspiracy beliefs, which would suggest that hyperactivating strategies might be at play (e.g., exaggerating an inability to cope with life's stressors; Chapters 2 & 3). In the Study 10, however, we did not replicate any of these effects: attachment anxiety was not associated with COVID-19 powerlessness or conspiracy beliefs. Therefore, the relationship between attachment anxiety and COVID-19 conspiracy beliefs does not appear to be robust.

The same cannot be said for relationship between attachment avoidance and COVID-19 conspiracy beliefs, however. Indeed, in both studies, attachment avoidance predicted belief in COVID-19 conspiracy theories, supporting previous research (Freeman & Bentall, 2017; Leone et al., 2018), and this relationship was mediated by COVID-19 powerlessness. Previous research has argued that COVID-19 is a "super threat" and that people endorse COVID-19 conspiracy theories as a strategy to deny or downplay the COVID-19 threat (Jutzi et al., 2020). This might explain why attachment avoidance—compared to anxiety—showed a more robust relationship with COVID-19 conspiracy beliefs. For example, attachment avoidance is associated with deactivating strategies as a means to alleviate distress (Mikulincer & Shaver, 2017), which includes denial of negative affect. Therefore, attachment-avoidant persons might find COVID-19 conspiracy theories appealing as they

provide a way to deny the harsh realities of the COVID-19 pandemic (i.e., by claiming it's a hoax). In the same vein, denying the pandemic by viewing it as a hoax could explain why COVID-19 powerlessness mediated the relationship between attachment avoidance and COVID-19 conspiracy beliefs (Studies 9 & 10). For instance, their actions to limit COVID-19 might feel particularly powerless if they believe the pandemic to be manipulated in the first place. Alternatively, attachment-avoidant persons tend to hold negative views of others (Brennan et al., 1998), and therefore might believe that others would not do their part to limit the spread of the virus, which could lead them to deny the threat of COVID-19 through conspiracy theories.

Finally, we examined potential sequential effects of general conspiracy beliefs and COVID-19 powerlessness, on the relationships between attachment anxiety and avoidance and COVID-19 conspiracy beliefs. In both studies, we found general conspiracy beliefs to predict COVID-19 powerlessness, conceptually replicating previous research in the literature (Biddlestone et al., 2020; Jolley & Douglas, 2014b). In Study 9 we found a sequential indirect effect for attachment anxiety on COVID-19 conspiracy beliefs, through general conspiracy beliefs and COVID-19 powerlessness, but we did not replicate this in Study 10. Therefore, we found partial support for a cyclical relationship between existential concerns and conspiracy beliefs (Douglas et al., 2017; van Prooijen, 2020). To illustrate, an attachment-anxious person might be drawn to conspiracy theories as a way to satisfy their attachment insecurity (Green & Douglas, 2018); then, endorsement of these conspiracy theories may lead to feelings of powerlessness regarding social issues (Biddlestone et al., 2020; Jolley & Douglas, 2014b); and finally, such existential concerns may then lead to the endorsement of other conspiracy theories. The findings from Study 9 support the idea of a cyclical relationship between existential concerns and conspiracy beliefs (Douglas et al., 2017; van Prooijen, 2020); however, we did not replicate these results in Study 10. Further,

no such relationships were found for attachment avoidance on COVID-19 conspiracy beliefs. Therefore, more research is needed to test the robustness of these relationships.

Limitations and Future Research

The current studies provide further understanding to the relationships between attachment anxiety and avoidance and conspiracy beliefs, but they are also not without their limitations. To begin, the current studies extended the findings the current thesis (Chapters 2 & 3), by examining the effects of attachment anxiety and avoidance on belief in specific (versus general) conspiracy theories. However, COVID-19 conspiracy theories were the only specific ones examined in the current studies. Further, this particular conspiracy theory is associated with the "super threat" of COVID-19, and therefore could be labelled as a conspiracy theory that downplays the threat from COVID-19. Similarly, conspiracy theories regarding climate change (Jolley & Douglas, 2014b; van der Linden, 2015) could also be grouped into this category of threat denying conspiracy theories. On the other hand, some conspiracy theories appear to amplify potential or imagined threats. For example, QAnon conspiracy theories purport that the left-wing elite are Satan-worshipping paedophiles (Wired, 2020). Therefore, future research would do well to examine the relationships between attachment insecurity and belief in different specific conspiracy theories (i.e., threat denying versus amplifying).

Further, in the current studies, we were not able to replicate the results for the relationship between attachment anxiety and general and COVID-19 conspiracy beliefs. Similarly, when we used Reddit for participant recruitment in Chapter 2 (Study 6), we found different results for the relationships attachment anxiety, catastrophizing, and conspiracy beliefs, relative to the results in the rest of the chapter. That is, we tend to find weaker relationships between attachment and conspiracy beliefs from Reddit samples, compared to samples from crowdsourcing (i.e., MTurk). Future research could examine these differences

systemically, or ideally endeavour to employ nationally representative samples to paint a clearer picture of these relationships. Finally, we attempted to test a cyclical relationship between existential concerns and conspiracy beliefs (Douglas et al., 2017; van Prooijen, 2020). Although a sequential mediation analysis may have been a good start, future research would be better to test these relationships in longitudinal designs, where the reciprocal effects of existential concerns (i.e., attachment anxiety and powerlessness) on conspiracy beliefs, and vice versa, could be examined.

Conclusion

The current research demonstrates the importance of examining the relationships between attachment anxiety and avoidance and different types of conspiracy beliefs. Indeed, majority of the findings the current thesis found attachment anxiety, but not avoidance, to be positively associated with general conspiracy beliefs. When examining COVID-19 conspiracy beliefs, however, attachment avoidance was found to be the robust predictor. Further, COVID-19 powerlessness was shown to explain the relationship between attachment avoidance and COVID-19 conspiracy beliefs. COVID-19 conspiracy theories may offer individuals with a means to deny or downplay the threat from COVID-19, which might explain why attachment-avoidant persons find COVID-19 conspiracy theories appealing—there is nothing to fear if COVID-19 is not real!

The next and final chapter discusses the theoretical and practical implications of findings from the empirical chapters (Chapters 2, 3 and 4). Before discussing limitations and future research, and concluding remarks.

Chapter 5: Implications and Future Research

Abstract

In this final chapter, a summary of the findings from the empirical chapters, theoretical and practical implications for future research, and potential limitations are discussed. The results of the present research provide strong evidence that the relationship between attachment anxiety and belief in conspiracy theories can be explained by the tendency to catastrophize, particularly feelings of helplessness about being able to cope with life's problems. The research reported suggests several potentials avenues for future investigation, including longitudinal designs that test these associations over time, experiments that manipulate situational attachment, and potential interventions that aim to reduce catastrophic thinking in the hope of reducing the appeal of conspiracy theories.

The main aim of the current thesis was to answer the following research question: does catastrophizing explain the link between attachment anxiety and belief in conspiracy theories? In Chapter 2, we conducted six cross-sectional studies, providing strong evidence for the above research question, showing that the relationship between attachment anxiety and conspiracy belief is—in part—explained by the tendency to catastrophize (regarding pain, stress, and social situations), namely feelings of helplessness. In Chapter 3, in another two cross-sectional studies, we found further support for the main hypothesis, again showing that catastrophizing (namely helplessness) explains the relationship in question. Additionally, we found these processes to also be linked to a lower selfless communal orientation, suggesting that attachment-anxious persons are preoccupied with their own worries—about personal issues and the supposed threats from conspiracy theories—to be able to attend to the needs of others. Unexpectedly, self-orientated communal orientation did not explain the relationships between attachment anxiety, catastrophizing, and belief in conspiracy theories. Finally, in another two cross-sectional studies making up Chapter 4, we conceptually replicated these findings in the context of COVID-19, although the results for attachment anxiety were only partially replicated. Specifically, in the first study attachment anxiety and avoidance were found to be associated with COVID-19 powerlessness, which in turn predicted belief in COVID-19 conspiracy theories. However, attachment anxiety did not play a role in any of these relationships in the second study of this chapter. Instead, we found attachment avoidance to be a consistent predictor of COVID-19 powerlessness and conspiracy beliefs across both studies.

Theoretical Implications

These current findings corroborate and extends previous research in number of ways. Firstly, in Chapter 2 we consistently found attachment anxiety (but not avoidance) to be associated with belief in conspiracy theories across all studies, replicating previous findings

in the literature (Freeman & Bentall, 2017; Green & Douglas, 2018; Leone et al., 2018). Further, in line with previous findings in the attachment literature (e.g., Tremblay & Sullivan, 2010), we also found attachment anxiety to be associated with catastrophizing across a number of domains, including pain, stress, and social situations. Importantly, we integrated the frameworks of attachment regulation (Mikulincer & Shaver, 2017) and motivated conspiracy beliefs (Douglas et al., 2017) by demonstrating that the relationship between attachment anxiety and conspiracy beliefs can be explained by the tendency to catastrophize, namely feelings of helplessness. Specifically, Mikulincer and Shaver argue that people with higher attachment anxiety employ hyperactivating strategies to alleviate their attachment insecurity, such as catastrophizing life's problems in order to appear helpless and vulnerable, as an apparent attempt to elicit attention, care or support from others. Similarly, Douglas and colleagues argue that people may be motivated to believe on conspiracy in an attempt to alleviate their existential concerns. Drawing these two theoretical frameworks together, the findings from Chapter 2 suggest that, for people with higher attachment anxiety, endorsement of conspiracy theories may be another means to catastrophize life's problems, as an attempt to alleviate their attachment insecurities. Indeed, as the exploratory models showed, conspiracy beliefs mediated the relationships between attachment anxiety and different facets of catastrophizing, further suggesting that conspiracy belief and catastrophizing is one and the same.

Secondly, Chapter 3 provided further evidence for the notion that catastrophizing explains the link between attachment anxiety and conspiracy beliefs. More importantly, in this chapter, we also attempted to demonstrate that these processes were associated with the need to elicit attention, care, and support from others. Indeed, Mikulincer and Shaver (2017) argue that the hyperactivating mechanism of

catastrophizing is a strategy to garner the attention of significant others. This notion was partially found when we examined attachment anxiety, catastrophizing, self-orientated communal orientation. In Study 7, attachment anxiety was associated with higher levels self-orientated communal orientation, at high levels of catastrophizing, but we did not replicate this finding in Study 8. Further, in both studies, self-orientated communal orientation was not found to explain the relationship between attachment anxiety and conspiracy beliefs, even at higher levels of catastrophizing. This suggests that catastrophizing the existence of conspiracy theories may not be a means to garner attention and support from others. This might be due to the ambivalence towards support-seeking that has been found in attachment-anxious persons where sometimes a positive relationship is found (e.g., Jerome & Liss, 2005; Vogel & Wei, 2005), and others times have shown negative (e.g., Halpern et al., 2012; Nam & Lee, 2015) or no relationship at all (e.g., Karantzas & Cole, 2011; Pierce & Lydon, 1998). Therefore, it might be worthwhile examining these processes again before ruling out the idea that individuals high in attachment anxiety exaggerate the existence of conspiracy theories in order to garner attention from others.

Indeed, when we explored alternative mediation pathways, we found conspiracy beliefs to positively mediate the relationship between attachment anxiety and self-orientated communal orientation (Study 7), but we did not replicate this in the subsequent study. Alternately, as we discussed previously in Chapter 4, it might be the case that this means of catastrophizing is not a fruitful one. Indeed, there are many reports that show conspiracy theories are tearing some families apart (e.g., BBC, 2020), and so catastrophizing in this way may actually have the opposite desired effect. On the other hand, we consistently found lower selfless communal orientation to explain the relationship between attachment anxiety and conspiracy beliefs, at higher levels of catastrophizing. This could be explained the preoccupation that attachment-anxious persons have with life's difficulties and potential

threats (e.g., from conspiracy theories) and their inability to deal with them (Buelow et al., 2002; Zeyrek et al., 2009), leaving these individuals with less resources to be able to tend to the needs of others.

Chapter 4 provided partial evidence of the role that catastrophizing might play in explaining the relationship between attachment insecurity and belief in *specific* conspiracy theories: in all the previous studies we measured belief in general notions of conspiracy. In this chapter, we focused on the specific context of COVID-19. Here, we found attachment anxiety and avoidance to be associated with COVID-19 conspiracy beliefs. However, for attachment anxiety we only found this relationship in Study 9, and for attachment avoidance it was found in Studies 9 and 10. Further, COVID-19 powerlessness mediated the relationship between attachment anxiety (Study 9) and avoidant (Studies 9 & 10) and COVID-19 conspiracy beliefs. Therefore, we found partial support for hyperactivating strategies (i.e., exaggerate one's inability to cope with life's problems) explaining the relationship between attachment anxiety and COVID-19 conspiracy beliefs. Drawing on previous research on COVID-19 conspiracy beliefs, it might be the case that COVID-19 conspiracy theories appear more to individuals who are motived to downplay or deny the threat from COVID-19 (Jutzi et al., 2020). In this light, COVID-19 conspiracy theories may be more appealing to attachment-avoidant persons. Indeed, in both studies we found attachment avoidance to predict COVID-19 conspiracy beliefs, but not general conspiracy beliefs. Future research could therefore systematically examine the relationships between attachment anxiety and avoidance and different types conspiracy beliefs (e.g., generic versus specific).

Finally, we will now summarise the magnitude of the observed effects. The relationships between conspiracy beliefs and attachment anxiety tended to be of a moderate effect size, and whereas the relationships between conspiracy beliefs and attachment

avoidance tended to be of a small effect size. In subsequent regression analyses however, where attachment anxiety tended to remain a significant predictor, attachment avoidance tended to lose its significant association with conspiracy beliefs. The relationships between attachment anxiety and the different measures of catastrophizing tended to be of a moderate-to-large effect size, whereas relationships between attachment avoidance and catastrophizing tended to be of a small-to-moderate effect size. Again however, in subsequent regression analyses, where attachment anxiety remained a significant predictor, attachment avoidance tended to lose its significant association with the different measures of catastrophizing. Importantly, the relationships between conspiracy belief and catastrophizing tended to be of a moderate-to-large effect size. Another important observation is that the effects sizes in studies where participants were recruited from Reddit were generally weaker than the effect sizes in studies where participants were recruited from MTurk or Prolific. Overall, the studies in this thesis provide strong evidence that conspiracy belief is associated attachment anxiety and catastrophizing.

Practical Implications

Belief in conspiracy theories has been associated with a number of adverse consequences (see Douglas. 2021 for a review, see also Douglas et al., 2015), which means that research investigating ways to reduce conspiracy beliefs is important. Although there does not appear to be a silver bullet for this problem, previous research has shown some promise in reducing the appeal of conspiracy theories. For example, research has demonstrated the benefits of promoting analytical thinking in reducing the appeal of conspiracy theories (Swami et al., 2014). Other research found providing rational arguments to be an effective strategy in reducing conspiracy beliefs in others (Orodz et al., 2016). In a more proactive approach, van der Linden and colleagues (2017) investigated the potential of "inoculation theory" in reducing the appeal of misinformation. They demonstrated that "pre-

bunking" (or "inoculating") individuals with weakened misinformation reduced (or "protected") their susceptibility to misinformation later on. All of these approaches have merit; however, it could be argued that they might not necessarily address people's existential concerns (i.e., attachment insecurity)—which is at the heart of the current thesis—and therefore might not be as effective in reducing the appeal of conspiracy theories for attachment-anxious persons.

Scholars have suggested that it might be ideal to address people's existential concerns such as deficits in wellbeing (Douglas, 2021; Douglas et al., 2015). Theoretically, addressing a root cause of conspiracy theorizing should reduce the appeal of conspiracy theories. Therefore, in light of the findings in this thesis, and considering that ongoing mental distress appears to be a robust concomitant of conspiracy belief (Douglas et al., 2017), we argue that interventions should ideally aim to improve wellbeing, with a focus on attenuating feelings of helplessness in coping with life's difficulties (Chapters 2 & 3). As noted in Chapter 2 (p. 36, Footnote 5), the initial purpose of Study 3 was to attempt to do this, but was not successful. Evidently, a more rigorous concerted effort is needed. Indeed, alleviating people's anxieties is no mean feat, especially for the long term. Therefore, it might prove fruitful to test whether interventions from clinical psychology that are designed to improve wellbeing could be suited for this task. For example, cognitive restructuring training or anxiety-reducing thinking techniques, such as self-distancing (e.g., mentally stepping back from the self, disidentifying from internal experiences) and perspective broadening (e.g., seeing the bigger picture; see Travers-Hill et al., 2017), could play an important role in reducing catastrophic thinking and subsequent conspiracy belief. Taken together, providing individuals with cognitive reconstructing techniques that aim to reduce catastrophic thinking might help to squash the appeal of harmful conspiracy beliefs.

Limitations and Future Research

Despite the theoretical advancements made in this thesis, there are general limitations that are worth addressing. First, majority of findings in these studies cannot be used to infer causation. That is, all the studies were cross-sectional in nature and do test whether attachment insecurity, or catastrophizing, causes conspiracy beliefs. Testing the cognitive restructuring techniques described above (Travers-Hill et al., 2017) would go a long way to answer whether catastrophizing is causally associated with conspiracy belief. Further, other experimental efforts could focus on the effects of manipulating attachment security on conspiracy beliefs. Indeed, research has consistently demonstrated the positive effects of priming attachment security (Mikulincer & Shaver, 2001; see also Gillath & Karantzas, 2019 for a review). Future research could therefore attempt to demonstrate a causal link between reduced attachment anxiety and conspiracy beliefs by employing attachment security priming techniques. For example, one priming technique includes subliminal presentation of pictures suggesting attachment-figure availability (e.g., a Picasso drawing of a mother cradling an infant in her arms), which was shown to reduce outgroup derogation. Previous research shows conspiracy beliefs to be associated with ingroup bias and intergroup threat (e.g., Jutzi et al., 2020; Jolley et al., 2019), which suggests that attachment security priming techniques might be able to reduce endorsement of conspiracy theories, particularly if the focus is on the outgroup associated with the conspiracy. Employing these methods would help to establish whether attachment insecurity is causally related to conspiracy beliefs.

Alternatively, longitudinal designs—to a degree—could also help to establish if attachment insecurity causes conspiracy beliefs. Indeed, it has been noted that longitudinal studies examining conspiracy beliefs are scarce (Douglas et al., 2019; for longitudinal studies see Golec de Zavala & Federico, 2018; Vitriol & Marsh, 2018). Future research could assess attachment anxiety and avoidance, pain and/or stress catastrophizing, and conspiracy beliefs

at multiple time points over a year, and examine the temporal dynamics between these variables. We might expect increases in attachment anxiety to cause increases in conspiracy beliefs over time, and—based on the findings in this thesis—increases in catastrophizing might also contribute to this. Further, future research could more systematically test the idea of a cyclical relationship between existential concerns and conspiracy beliefs (Douglas et al., 2017; van Prooijen, 2020), which we attempted to examine in Chapter 4. Indeed, the longitudinal study proposed above could investigate these reciprocal relationships, for example, by examining whether catastrophizing at Time 1 predicts conspiracy belief at Time 2, and whether Time 2 conspiracy belief subsequently predicts catastrophizing at Time 3, and similar pathways could also be observed for attachment anxiety. Taken together, experimental and longitudinal designs would address a limitation of the current thesis, by extending the cross-sectional findings and establishing causality between the relationships in question.

In the current studies, participants were mainly recruited via online crowdsourcing (i.e., MTurk), and some from social media platforms (i.e., Reddit), which limits the generalizability of our findings. Further, we tended not to fully replicate our findings in studies that recruited participants via Reddit (compared to MTurk). Specifically, we observed weaker relationships between attachment anxiety, catastrophizing, and conspiracy beliefs in Reddit samples, compared to samples from crowdsourcing platforms (i.e., MTurk). This suggests the relationships found in the current studies might not be generalizable to the wider population. Future research could therefore examine these potential differences systemically, or ideally endeavour to employ nationally representative samples, which would help to paint a clearer picture of these relationships. Furthermore, the current studies have all comprised of WEIRD (white, educated, industrialised, rich and democratic) samples, and so future could examine whether the same relationships can be found in non-WEIRD samples.

Finally, the current studies were limited by the focus on attachment anxiety and catastrophizing in explaining conspiracy beliefs (which, to be fair, was the main objective of the current thesis). However, as the literature shows (Freeman & Bentall, 2017; Leone et al., 2018), attachment avoidance is associated with higher conspiracy beliefs as well, but we did not attempt to show possible mechanistic pathways for attachment avoidance to conspiracy beliefs, other than showing that catastrophizing would not be a mechanism of this relationship. In Chapter 4, in fact, we found attachment avoidance to be a robust predictor of conspiracy beliefs, unlike attachment anxiety. Specifically, attachment-avoidant persons were more likely to believe in a specific (COVID-19) conspiracy theory than believe in them generally. Therefore, it seems that under some contexts, attachment avoidance is associated with belief in specific conspiracy theories. In this light, the current studies are limited by the fact that majority of them examined general conspiracy beliefs only. Indeed, previous research has shown that that different motivations underlie different types of conspiracy belief (e.g., general versus specific; see Stojanov & Halberstadt, 2020). The COVID-19 conspiracy theory we measured in Chapter 4 was argued to be way of denying or downplaying the threat from COVID-19 (Jutzi, 2020), which suggested that attachment-avoidant persons might be motivated to believe in this conspiracy theory as a way of avoiding the threat from COVID-19. Future research could examine, therefore, whether attachment-avoidant persons are more likely to believe in conspiracy theories that downplays (versus amplifies) threats, and whether attachment deactivating strategies, such as avoidance coping (e.g., Marchlewska et al., 2020) can help to explain this relationship.

Concluding Remarks

The research outlined in thesis extends previous findings on the relationship between attachment insecurity, namely anxiety, and belief in conspiracy theories. In doing so, the current thesis provides strong evidence that the tendency to catastrophize life's problems,

specifically one's helplessness in coping with life's difficulties, is a mechanism of the relationship between attachment anxiety and conspiracy beliefs. This suggests that conspiracy theory endorsement may be another means to catastrophize life's problems, in and of itself. Although this mechanism was not shown to be associated with the motive to elicit attention, care, and support, it was found to be associated with a decreased motive to tend to the needs of others, suggesting that catastrophizing, including exaggerating the existence of conspiracy theories, may make attachment-anxious persons too preoccupied with their own worries to be able to tend to the needs of others. In the context of COVID-19, we also found attachment avoidance—and anxiety to a lesser extent—to be associated with feelings of COVID-19 powerlessness, which in turn was associated with COVID-19 conspiracy beliefs. This suggest that for attachment-avoidant persons, some types of conspiracy theories may appeal to them, if they are able to deny or downplay an actual threat (i.e., from COVID-19). Taken together, the findings from this thesis could be used to inform future interventions that might aim to reduce the appeal of harmful conspiracy theories. One way to do this could be to provide individuals with attachment insecurity the psychological tools needed to reduce their insecurities and catastrophic thinking tendencies.

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Appendix

Original Experimental Design of Study 3

As noted in Footnote 5 (p. 36), the original design of Study 3 was a pre-registered experiment where we attempted to reduce conspiracy belief by reducing the tendency to catastrophize, and that the predicted experimental effects did not occur. Here, we will provide a very brief report of this study.

Chronologically, Study 3 was actually the ninth study out of the 10 that was conducted in this thesis. By this point in the project, we had discovered that catastrophizing does indeed explain the relationship between attachment anxiety and belief in conspiracy theories. However, all of these findings were correlational in nature, and so we had yet to establish whether or not catastrophizing is casually linked to conspiracy belief. We therefore attempted to establish this link, by testing whether a reduction in catastrophizing leads to a reduction in conspiracy belief. Borrowing techniques from clinical psychology (e.g., Burns et al., 2020; Georgescu et al., 2018; Jensen et al., 2011), we aimed to do this by making people aware of catastrophizing thoughts and the pitfalls that come with them, and that questioning these thoughts is a good first step in reducing them. We also expected that this effect might be stronger for people high in attachment anxiety, as these people tend to be higher catastrophizers who are drawn to conspiracy theories, and so the intervention might be most effective for them.

Method

Participants

The same participants took part as in Study 3.

Measures and procedure

Firstly, participants completed the ECR-R attachment anxiety (α = .94) and avoidance (α = .94) measure as in Studies 1 to 8.

Then, participants were randomly assigned to one of two conditions: (1) 'catastrophizing reduction' and (2) control. In the 'catastrophizing reduction' condition, participants read the following:

"Catastrophizing is a way of thinking called a 'cognitive distortion.' When people catastrophize, they think that particular events will end in disaster.

Here are some examples of catastrophizing:

"If I fail this test, I will never pass school and I will be a total failure in life."

"If I don't recover quickly from this procedure, I will never get better and I will be disabled my entire life."

"If my partner leaves me, I will never find anyone else and I will never be happy again."

According to professionals, catastrophizing is also "magnifying," because a person makes a situation seem much worse, dire, or severe than it is.

Many people are not aware that they catastrophize, and the first step towards reducing catastrophizing thoughts is to be aware of them in the first place. Then, by questioning your thoughts (i.e., "what am I worried about?", "how likely is that it will actually come true?"), you can begin to stop yourself from catastrophizing."

In the control condition, participants were not shown any information on catastrophizing and how to reduce it.

Then, as a manipulation check, participants completed the stress catastrophizing scale ($\alpha = .94$), with a slight adaption. Followed by the Generic Conspiracist Belief scale as used in Studies 1 to 8. Finally, participants reported their demographic details, as in Study 3.

Results

Firstly, we tested whether a reduction in stress catastrophizing was found after the manipulation. An independent samples t-test found no differences in stress catastrophizing between the *catastrophizing reduction* ($N = 254$, $M = 2.10$, $SD = 1.00$) and control ($N = 256$, $M = 2.08$, $SD = 0.93$) conditions, $t(508) = -0.19$, $p = 0.850$. Then, we tested whether a reduction in conspiracy belief was found after the manipulation. An independent samples t-test found no differences in conspiracy belief between the *catastrophizing reduction* ($M = 3.13$, $SD = 1.00$) and control ($M = 3.01$, $SD = 1.08$) conditions, $t(508) = 0.13$, $p = 0.434$. Finally, we tested whether participants' level of attachment anxiety moderates these effects. The interaction between the experimental conditions and attachment anxiety on stress catastrophizing ($b = 0.05$, $SE = 0.04$, $p = .267$) and conspiracy belief ($b = 0.04$, $SE = 0.05$, $p = .471$) was not significant, and thus no moderations were found.

Discussion

The results of this study did not provide evidence of a causal relationship between catastrophizing and conspiracy belief. However, there are a number of reasons why this might be. The manipulation we used was very brief and we did not provide participants with ample time to practice this technique either. Indeed, as discussed in Chapter 5, research could attempt to use more comprehensive interventions to reduce catastrophizing thoughts, and potentially conspiracy belief. For example, Traver-Hill et al., (2017) found that low-intensity cognitive training, on self-distancing and perspective broadening techniques, over a two-week period provided cognitive and affective benefits. Future research could attempt to use these techniques to reduce catastrophizing and conspiracy beliefs. Alternatively, another way

to establish causality would be to temporarily prime/increase catastrophizing thoughts to see if this increases agreement with conspiracy theories. See Chapter 5 for further suggestions.