




SAPIENZA  
UNIVERSITÀ EDITRICE

Work published in open access form  
and licensed under Creative Commons  
Attribution – NonCommercial  
ShareAlike 4.0 International (CC BY-NC-SA 4.0)

 © Author(s)  
E-ISSN 2724-2943  
ISSN 2723-973X

Psychology Hub (2024)  
XLI, Special Issue, 9-18

## Article info

Submitted: 04 January 2024  
Accepted: 21 March 2024  
DOI: 10.13133/2724-2943/18367

# Unraveling Uncertainty: Exploring Cognitive Closure, Information Processing, and the Multifaceted Nature of Certainty Motivation in the Tapestry of Beliefs and Ideologies

Małgorzata Kossowska<sup>1\*</sup>, Ewa Szumowska<sup>1</sup>, Paulina Szwed<sup>1</sup>, Aneta Czernatowicz-Kukuczka<sup>2</sup>

<sup>1</sup> Jagiellonian University, Institute of Psychology, Behaviour in Crisis Lab

<sup>2</sup> Jagiellonian University, Institute of Religious Studies

## Abstract

*In this paper dedicated to our esteemed colleagues Lucia Mannetti, we will delve into the connection between uncertainty, particularly as it manifests in the need for cognitive closure, and its influence on cognitive functioning, social perspectives, and ideologies. The paper will commence by providing a definition of uncertainty and then delve into the cognitive coping strategies employed to alleviate its impact. Additionally, we will incorporate empirical findings demonstrating that the experience of uncertainty does not always lead to simplistic and biased information processing. Departing from conventional research paradigms, we will underscore instances where individuals, driven by a desire for certainty, engage in nuanced, contemplative, and receptive information processing. The paper will also examine the strategies employed to navigate uncertainty through the beliefs, worldviews, and ideologies adopted by individuals. We believe this paper contributes to the ongoing discourse on how human psychology interacts with socio-cultural dynamics, a dialogue in which Lucia Mannetti has long been actively engaged.*

**Keywords:** uncertainty, need for cognitive closure, strategies to reduce uncertainty

\*Corresponding author.

Małgorzata Kossowska  
Behaviour in Crisis Lab, Institute  
of Psychology, Jagiellonian University  
Kraków, Poland  
E-mail: malgorzata.kossowska@uj.edu.pl  
(M. Kossowska)

## Introduction

Despite the fact that, in psychology, no term has gained as much attention and prominence in recent decades as ‘uncertainty’, the experience of uncertainty and its consequences remain incompletely described. Here we will focus on how uncertainty, and the impetus to mitigate it—as specifically manifested in the need for cognitive closure (Kruglanski, 1989)—is linked to cognitive functioning, social views, and ideologies. This paper will unfold by first presenting a definition of the term uncertainty, then elucidating the cognitive coping strategies deployed to diminish its impact. In addition, we will integrate empirical findings which show that the experience of uncertainty does not invariably precipitate simplistic and biased information processing. Counter to prevailing research paradigms, we will highlight instances wherein individuals, driven by an inclination towards certainty, actually engage in a multifaceted, contemplative, and receptive manner of information processing. The paper will also explore the strategies adopted for navigating uncertainty through the beliefs, worldviews, and ideologies embraced by individuals. We believe this paper contributes to the ongoing discussion about how human psychology interacts with socio-cultural dynamics, emphasizing the significance of the means by which we handle uncertainty and bring order to our surroundings. This paper is dedicated to Lucia Mannetti, our esteemed colleague renowned for her contributions to the exploration of the social psychological processes by which individuals attribute the causes of behaviors and events. We have been inspired by her scholarly work on the motivational and cognitive mechanisms underlying the genesis and transformation of beliefs, attitudes, behavioral choices.

### *What Is Uncertainty?*

Uncertainty is commonly defined as an unpleasant affective state, experienced as feelings of anxiety, discomfort, distress, or torment (Harmon-Jones, 2000). However, various forms of uncertainty are often distinguished in the literature, each with its own specificity and distinctiveness. Among them are informational uncertainty, stemming from a deficit of necessary information for purposeful action (Greco & Roger, 2001), self-related uncertainty, arising from subjective feelings of self-instability or self-doubt (Van den Bos et al., 2009), and uncertainty linked to subjectively experienced inconsistency (Festinger, 1957). Various terms are also used to describe this phenomenon, such as cognitive dissonance (Festinger, 1957), disequilibrium (Piaget, 1937), potential for anxiety (Greenberg et al., 2003), and anxious uncertainty (McGregor et al., 2010). In recent scholarship, a conceptualization of uncertainty has been proposed: to define uncertainty as a state occurring when an individual confronts a scenario where optimal courses of action are indeterminate (Proulx et al., 2012). Such a state emerges in any conflicting situation, characterized by the existence of multiple potential responses, decisions, or actions. It is essential to note, particularly in the field of social cognition, that knowledge is considered pragmatic, aligning with the principle that ‘thinking is for doing’ (Fiske, 1992).

This conceptualization posits that action is defined as tangible outcomes of cognitive processes, encompassing choices (e.g., a consumer decision like purchasing a car), decisions (e.g. ‘I’ll start exercising tomorrow’), or the formation of opinions (e.g. ‘Marta doesn’t do her job’). Hence, conflicts come about as a result of inconsistencies within the knowledge system, inconsistencies that can arise from any information that contradicts what we feel, know, or believe. Still, not every inconsistency is of equal importance – it is recognized that it is only when incongruence pertains to deeply significant beliefs about oneself, others, and the world at large that it induces a highly undesirable state of uncertainty necessitating means of mitigation (Kruglanski et al., 2018). These deeply significant beliefs are those that afford us the capacity to conceive of the world as an ordered, meaningful, and controllable place, and ourselves as integral components, belonging to a given community (see Kossowska, Szumowska, & Szwed, 2018).

### *The Motivation to Reduce Uncertainty*

Uncertainty is a disconcerting state, being particularly pronounced among individuals characterized by a heightened need for cognitive closure (Kruglanski, 1989). Therefore, individuals are inclined to actively mitigate this discomfiting state, an effort termed the motivation for closure (Kruglanski, 1989), i.e. the reduction of uncertainty through the establishment of unequivocal knowledge (opinions, judgments, and beliefs). Notably, it is only this form of assured knowledge—information immune to questioning—that serves as a shield against the vagaries of uncertainty. The pursuit of uncertainty reduction, or closure, has ramifications across diverse domains of an individual’s functioning, and manifests itself at cognitive, and social levels.

### *Uncertainty Reduction at the Cognitive Level*

The tones of studies linking uncertainty and cognitive functioning show that uncertainty can be reduced through selective, superficial, simplified, and biased information processing (for overview: Webster & Kruglanski, 1997). While such approaches represent one cognitive strategy for attaining certainty, in some circumstances, alternative strategies based on more effortful and in-depth processing of available information might prove more effective in satisfying the motivation for closure than cognitively expedient ‘shortcuts’. Indeed, a wealth of research indicates that when the drive for certain knowledge is particularly strong (as observed in individuals with a high need for closure), the chosen strategies are whichever are deemed most effective for fulfilling this intense motivation, irrespective of the level of cognitive effort required (for overview: Kossowska, Szumowska, Dragon, et al., 2018).

For instance, Roets and Van Hiel (2008) demonstrated that individuals with a high need for closure, tasked with guessing a figure categorization rule or recognizing obscurely presented digits, not only refrained from minimizing their engagement with the task but, on the contrary, exhibited even greater involvement in comparison to those with a low need for closure, as measured

by the frequency of repetitions attempted when exposed to these stimuli. In fact, it was precisely in these individuals that increased skin conductance activity was observed, indicative of heightened arousal, associated with the drive for closure.

In another study, by Viola et al. (2015), participants were asked to make decisions in a perceptual task involving the observation of clouds of dots on a monitor screen (some of which moved in the same direction while others moved randomly in different directions) in which the task was to accurately identify the direction in which the majority of dots were moving. The time taken by participants to make a decision was measured, with the assumption that the more time a person spent observing a particular cloud and analyzing the dots' movements, the more effort they invested in the task, and the more they were keen to provide the right answer. The results revealed that individuals with a high need for closure dedicated more time to decision-making than their counterparts with a low need for closure, particularly when the task held greater importance (i.e. when it included the offer of a monetary reward for correct responses).

Our own investigations into the relationship between the need for closure and the level of effort invested in cognitive tasks have yielded even more nuanced findings (Sankaran et al., 2017; see also Sankaran et al., 2023). In this series of studies, participants were presented with a suite of 25 reasoning and logical thinking tasks, in which they gained points for each completed task, with the goal of accumulating as many points as possible. Additionally, participants were informed that, after completing a minimum of 6 tasks, they could activate the button 'I have achieved my goal. End the task,' located at the bottom of the page. Therefore, participants had the option to conclude the task once they deemed their goal accomplished. Our primary interest lay in the final outcome, namely, how many points participants scored and how much time they spent solving individual tasks.

Counterintuitively, it turned out that a greater need for closure (motivation to reduce uncertainty) was actually associated with reduced effort invested in task-solving, resulting in poorer final outcomes. However, when the task held greater perceived importance, as reflected in the participants' desire to maximize their point score, this negative impact did not materialize. Furthermore, in a subsequent study, when we removed the 'goal achieved' button from the task—thereby eliminating the simpler route to task completion—the need for closure was correlated with increased effort invested in the task and brought about a much-improved final outcome.

This demonstrates that the need for closure does not uniformly lead to a tendency to exploit "shortcuts" aimed at conserving cognitive effort. Rather, the extent of effort exerted hinges on contextual factors. In instances where cognitive closure is paramount, often synonymous with effortful task completion, individuals with a high need for closure are willing to invest even greater effort than those with a low need for closure. These results suggest that the essence of the need for closure is the drive to achieve or maintain certainty. However, the chosen means to this end—whether employing simpler strategies demanding less effort or more effortful, engaging strategies—are contingent on situational demands (see Roets et al., 2015).

According to the bulk of research on the need for closure, when an individual possesses a verified and reliable basis for forming an opinion, a heightened need for closure tends to amplify reliance on prior knowledge (Kunda & Oleson, 1995). However, in instances where there is no basis for knowledge formation or the application of prior knowledge becomes infeasible, a pronounced need for closure—as seen in our study—prompts individuals to invest Trojan efforts in acquiring new information for knowledge formation. This variability manifests in distinct patterns observed when individuals with a high need for closure encounter situations that call for increased information processing. These situations can be classified, each shedding light on the nuanced interplay between cognitive closure and adaptive strategies.

Circumstances in which individuals with a heightened need for closure engage in more, rather than less, information processing can be divided into three groups: (1) when there are credible grounds to believe that open strategies are optimal for uncertainty reduction (accessible cues strategy), (2) when simplified reasoning is either entirely impossible or fails to yield the desired certainty (the more, the better strategy), and (3) when confidence in previous approaches to managing uncertainty is somehow curtailed (distrust in simple strategies). Let's discuss each of these situations.

#### *Accessible Cues Strategy*

Individuals striving for certainty resort to simplified reasoning, decision-making, and judgment-forming strategies when they perceive them to be sufficiently effective. Therefore, a fair assumption would be that if open strategies are deemed more efficacious ways of attaining certainty in a given situation—be it making a decision, forming a judgment, or solving a task—individuals with a high need for closure would be inclined to engage in seeking out and processing new information, even if that demands they expend more time and effort on the task. Research has consistently demonstrated that individuals with a heightened need for certainty do not necessarily shy away from exerting effort and involvement in cognitive activities to achieve closure. On the contrary, they willingly strive more when clear guidelines, rules, or norms are present, and the task holds significance to them (i.e., seems worth the effort invested) (Jaško et al., 2015). This willingness is further evident in multitasking scenarios (Szumowska & Kossowska, 2016; Szumowska & Kossowska, 2017a, 2017b; Szumowska et al., 2018).

#### *"The More, The Better" Heuristic*

There are instances where we cannot rely on prior knowledge, opinions, perspectives, or stereotypes simply due to the unavailability of the desired knowledge for that particular situation. When we find ourselves without the essential 'tools' to alleviate the ambiguity inherent in the (social) world, leaving us devoid of any basis for helpful simplification, an approach that can be taken is 'the more, the better'—an approach that assumes the acquisition of more information will lead to greater levels of certainty. Consequently, individuals with a need for

closure may exhibit open behaviors, such as actively seeking and processing a greater volume of information and investing more effort into the reasoning process (e.g., Kruglanski et al., 1991; Houghton & Grewal, 2000; Vermeir et al., 2002; studies utilizing physiological indicators, e.g., Szumowska et al., 2017).

### *Distrust in Simple Strategies*

When individuals characterized by a heightened need for closure harbor doubts with respect to their efficacy in achieving it, they exhibit behaviors indicative of cognitive openness, such as a diminished inclination toward bias in forming impressions of others, a tendency to take complex decisions over simpler ones, and a trend towards the minimization of stereotyping (Kossowska & Bar-Tal, 2013). Importantly, the confidence (or lack thereof) in one's established coping strategies is not solely contingent on the individual's stable self-beliefs; it is also situation-dependent. Various experiences can instigate self-doubt, uncertainties about their degree of knowledge and erode confidence, including events that undermine a person's self-esteem (e.g., encountering failure; Fein & Spencer, 1997), threats to their sense of control (Kossowska et al., 2015; Whitson et al., 2015), challenges to their self-image (e.g., recalling a situation where someone acted contrary to their moral principles, Kossowska, Bukowski, et al., 2016), induction of a feeling of powerlessness (Kossowska, Guinote, & Strojny, 2016), activation of self-image threats (Kossowska, Bukowski, et al., 2016), or exposure to information in conflict with their expectations, worldviews, or general understanding of the world (Dragon & Kossowska, 2019). In such instances, individuals experience a loss of confidence in themselves and their knowledge, rendering their established knowledge (i.e., opinions, beliefs, stereotypes) incapable of serving as a reliable basis for judgments and assessments, thus diminishing its potential to guarantee certainty. As a result, individuals are compelled to turn to unconventional strategies for dealing with uncertainty, and thus resort to engaging in more effortful and open-ended information processing.

### *Reducing Uncertainty at the Social Level*

The drive to reduce uncertainty transcends individual cognition and extends to the social domain, playing a particularly pivotal role in navigating and functioning in social environments as well as shaping attitudes toward individuals and groups. This socio-cognitive endeavour involves ideological engagement (see Czernatowicz-Kukuczka et al., 2020). Below, we discuss three key ideologies that function as mechanisms for uncertainty reduction: religion/atheism, political beliefs, and (un)scientific worldviews.

#### *Religion/Atheism*

The examination of ideologies, particularly religious and atheistic perspectives, within the context of uncertainty, has recently been a focal point of scholarly inquiry (see summaries

in Kossowska et al., 2017; Kossowska, Szumowska, & Szwed, 2018; Szumowska et al., 2020). Numerous studies indicate that the level of an individual's need for cognitive closure, understood as a measure of individual sensitivity to uncertainty, is associated with expressions of religious fundamentalism (Brandt & Reyna, 2010; Saroglou, 2002) or religious orthodoxy (Kossowska et al., 2017). These forms of religiosity are typified by a steadfast adherence to religious doctrines and dogmas, perceived as unquestionable, incontrovertible, ultimate truths about the world (Altemeyer & Hunsberger, 1992; Wulff, 1991). This structural belief system ostensibly provides those individuals high in need of cognitive closure with a sense of certainty and stability.

Moreover, there is a substantial body of evidence to suggest that religiosity tends to intensify in times of uncertainty. An illustrative example comes from our research, a study conducted in the weeks preceding the terrorist attacks in Paris in 2015 (Czernatowicz-Kukuczka et al., 2019). In this study, we measured religious orthodoxy and open religiosity using the Post-Critical Belief Scale (Hutsebaut, 2000); the participants' level of experienced anxiety was also assessed. Subsequently, we repeated the study (with the same participants) within a week after the attacks, treating the attacks as a 'natural' manipulation of uncertainty (Merolla et al., 2011). During the second assessment, participants reported significantly higher levels of anxiety. Intriguingly, the level of religious orthodoxy significantly increased, while the level of open religiosity remained unchanged. This may suggest that a robust attachment to religious values serves as a response to uncertainty. These findings were echoed in the works of Kay et al. (2010) whose research showed an association between an unstable political situation, such as approaching elections, and heightened religiosity, particularly faith in a controlling deity (one who brings order to the universe). Analogous results were obtained in a laboratory setting, where presenting participants with a text about political instability (versus a text on political stability) led to an increased belief in a controlling God.

Uncertainty experienced as part of daily life can further amplify religious beliefs. In a notable experiment, it was demonstrated that the act of reading an incomprehensible text intensified religious idealism in individuals with high aversion to uncertainty (McGregor et al., 2010). Similarly, our own studies revealed that participants exposed to sentences related to uncertainty (e.g., 'Sometimes I cannot fall asleep at night when I do not know what might happen the next day') expressed a stronger inclination to engage in religious behaviors, such as fasting or attending religious services (Sekerdej et al., 2018).

The results mentioned above suggest that, amidst uncertain circumstances, people tend to become more disposed towards dogmatic religious views and more willing to engage in religious rituals. By way of contrast, atheistic worldviews are frequently believed to be associated with a greater tolerance of uncertainty, fostering increased openness and flexibility (see Zuckerman, 2013). However, at the theoretical level, Wulff (1991) noted that, in a manner analogous to the dual dimensions of faith—orthodox and symbolic—non-belief can also manifest both open and dogmatic attributes. So, can atheism too be motivated by uncertainty?

In one of our studies, we successfully demonstrated a positive correlation between the need for cognitive closure and dogmatic atheism, as gauged by the Post-Critical Beliefs Scale (Kossowska et al., 2017). Additionally, Silver and colleagues (2014) indicated that atheism is not a homogeneous construct and that, among the six types of atheism identified was a dogmatic form: ‘anti-theism’, characterized by the belief that faith is socially detrimental, arising from ignorance and darkness. Although no direct measure associations with uncertainty were made, the researchers found a robust connection between this form of atheism and dogmatism, as assessed by Rokeach’s scale (1960). Further evidence indicates that beliefs motivated by uncertainty tend to exhibit a dogmatic character (see Kossowska, Szumowska, Dragon, et al., 2018). The connection between (a)theism and uncertainty is also reinforced by other experimental research which shows that activating thoughts about one’s mortality (which evokes strong distress and uncertainty; see Jonas et al., 2014) prompts an increased belief in God among believers, while among non-believers, it leads to an intensification of atheistic beliefs (Vail et al., 2012). These findings suggest that dogmatic atheism can fulfil functions akin to religion in navigating the challenges posed by uncertainty.

### *Political Beliefs*

Psychologists have long believed that motivation underlies the core of political beliefs (e.g., Altemeyer, 1981; Frenkel-Brunswick, 1949; Hibbing et al., 2014; Jost et al., 2003; Rokeach, 1956). For the most part, research in this domain has predominantly centred on the relationship between the need for certainty and conservative/right-wing ideologies<sup>1</sup> (e.g., Jost et al., 2009). A comprehensive meta-analysis by Jost and colleagues conducted in 2003, encompassing 88 studies on the nexus between uncertainty-related traits (e.g., dogmatism, intolerance of ambiguity, need for order and structure, need for cognitive closure) and political ideology, provided foundational insights. Subsequent supplementary studies in 2017 bolstered these findings (Jost, 2017), consistently revealing positive associations between uncertainty-related traits and right-wing beliefs, juxtaposed with negative correlations with left-wing perspectives. Going beyond purely correlational evidence, which does not allow for the delineation of causal relationships, Nail and McGregor (2009) demonstrated an upsurge in support for conservative ideologies post the September 11, 2001 terrorist attacks in the USA—an event emblematic of heightened threat and uncertainty (Czernatowicz-Kukuczka et al., 2019; Merolla et al., 2011). Similar associations were found in laboratory settings deploying uncertainty manipulations, whether through mortality salience manipulation or system injustice manipulation (Nail et al., 2009). As a result, individuals holding liberal views showed an increase in preferences for conservative behaviors or attitudes, such as favoring their in-group, or showing aversion toward same-sex relationships. Remarkably, in situations fraught with uncertainty, participants universally demonstrated a tendency to gravitate towards a conservative or right-wing perspective, irrespective of their initial beliefs.

In a parallel with the investigations into the association between religious views and atheism, historically, there has been a prevailing unidimensional perspective positing a simple correlative link between the motivation to reduce uncertainty and conservative ideology. However, more contemporary studies indicate a more nuanced pattern of relationships. A pivotal study by Roets et al. (2014), based on an analysis of data from the European Social Survey, demonstrated that a positive relationship between openness (a proxy for tolerance for uncertainty) and self-identification on the left-right political spectrum was evident, but only in Western European countries, whereas for Eastern European countries the results were considerably weaker, and often reversed. Subsequent analyses revealed that disparities in the relationship between tolerance for uncertainty and political beliefs across Eastern and Western Europe pertained to the economic sphere. Specifically, the link between openness and (right-wing) economic beliefs<sup>2</sup> was strongly positive for Eastern European countries but much weaker for Western European countries. Conversely, right-wing cultural beliefs turned out to be consistently correlated with greater closed-mindedness, regardless of the region under analysis (Czarnek & Kossowska, 2018). Even more nuance was conveyed by Proulx and Major’s study (2013) demonstrating that the manipulation of perceptual uncertainty (via changing card colors) engendered a reinforcement of liberal viewpoints among individuals with pre-existing leanings towards liberalism. However, this conflicts somewhat earlier studies by Nail et al. (2009), suggesting a universal tendency for uncertainty to induce conservative attitudes, irrespective of the foundational ideology. Unfortunately, the extant body of research examining the associations between uncertainty and liberal perspectives is relatively sparse. Nevertheless, the available evidence tentatively posits that both conservative and liberal ideologies may be underpinned by a shared impetus to alleviate uncertainty.

### *(Un)scientific Worldviews*

In addition to religious or political ideologies, alternative mechanisms for navigating and coping with involve subscribing to various belief systems, spanning from unsubstantiated conspiracy theories to more substantial scientific paradigms. While these systems diverge in their empirical verifiability—conspiracy theories, in contrast to scientific paradigms, being virtually unfalsifiable—both categories ostensibly possess the capacity to impose order upon any perceived prevailing chaos, rendering belief in them efficacious for dealing with uncertainty (Rutjens et al., 2010).

Evidence supporting the connections between the experience of uncertainty and a reliance on scientific theories can be found in the research of Farias et al. (2013): employing a laboratory setting, the researchers invited two groups of rowers - one anticipating an imminent competition (a condition of heightened uncertainty), while the other faced no upcoming contests. It turned out that rowers in the high uncertainty condition were more convinced that science is the only effective way to understand the surrounding world, thereby displaying a dogmatic attachment to scientific theories.

Analogously, Tracy et al. (2011), utilizing mortality salience manipulation (an uncertainty condition) found that natural science students, in such a state of mind, exhibited increased faith in the theory of evolution. Interestingly, a different set of students in these circumstances exhibited intensified belief in creationism. Additionally, Rutjens and colleagues (2010) demonstrated that evoking existential fear leads to stronger belief in human species progress, a belief that assuages fear by strengthening a sense of control (cf. Rutjens et al., 2013). These findings suggest that faith in science can serve as a viable means of coping with uncertainty.

As mentioned before, unlike scientific theories, baseless conspiracy theories are characterized by their unfalsifiability, often founded on the fundamental assumption of the existence of hidden agents whose actions explain seemingly inexplicable phenomena (Kofta & Sędek, 2005). Indeed, research underscores a positive correlation between belief in these supposedly explanatory constructs and the need for cognitive closure (Kossowska & Bukowski, 2015; Marchlewska et al., 2018). Furthermore, under experimentally induced uncertainty (e.g., by recalling emotions associated with uncertainty or describing one's feelings while experiencing uncertainty), people evince a stronger belief in unfounded conspiracy theories (Van Prooijen & Jostmann, 2013; Whitson et al., 2015). It is reasonably plausible that, given the prevailing global uncertainty (see Kossowska, Szumowska, Dragon, et al., 2018), a climate is being created where successive speculative, implausible and unverified conspiracy theories garner escalating societal support and adherence.

## Conclusion

In conclusion, our comprehensive analysis, supported by a diverse array of research studies, underscores the considerable impact of the imperative to reduce uncertainty (and achieve closure) on cognitive functioning, various social perspectives, and diverse ideologies. Our insights on uncertainty reduction align with the scholarship of Lucia Mannetti, whose investigations (Brizi et al., 2016) emphasize the importance of considering both individual traits and situational factors in understanding how uncertainty influences responses at the intergroup level. From a practical standpoint, her results shed light on the notion that uncertainty poses a challenge to the typical manifestations and expressions of societal tolerance. Additionally, Mannetti has demonstrated the complex connections between the need for cognitive closure and key aspects of group behavior (Kruglanski et al., 2006), positing that a heightened need for closure, whether rooted in individual dispositions or situational factors, contributes to a behavioral syndrome described as 'group-centrism'. This syndrome encompasses pressures for opinion uniformity, advocacy of autocratic leadership, in-group favoritism, rejection of 'deviants', resistance to change, conservatism, and the perpetuation of group norms. In our view, Mannetti's work has significantly enriched the ongoing dialogue, delving into the complex interplay between human psychology and socio-cultural dynamics.

## Footnotes

<sup>1</sup> In this paper, the terms 'conservative/right-wing' and 'liberal/left-wing' are utilized interchangeably, reflecting nuanced political distinctions inherent in these dimensions. While recognizing the prevalent use of the conservatism-liberalism dimension by researchers in the United States, our contextual specificity—particularly within the European, and specifically Polish, milieu—benefits from a more precise reference to 'right-wing' and 'left-wing beliefs'. It is worth noting that, throughout the text, these dimensions are employed in a psychological context, directing attention to the psychological attributes characterizing individuals aligned with these political orientations.

<sup>2</sup> Right-wing economic beliefs include the endorsement of a free-market economy, the elimination of price controls, and opposition to extensive social protection policies. In contrast, left-wing economic principles are centered on a commitment to egalitarianism and the advocacy for a robust welfare state.

## Ethical approval

Not applicable

## Data availability statement

Not applicable

## Funding/Financial Support

This publication has been supported by a grant from the Priority Research Area (Future Society: Behavior in Crisis Lab - Flagship Project) under the Strategic Programme Excellence Initiative at Jagiellonian University.

## Authors' contribution

Małgorzata Kossowska, Ewa Szumowska and Paulina Szwed played a lead role in conceptualization, write-up of the first draft and discussions on the original draft. Aneta Czernatowicz-Kukuczka played a supporting role in conceptualization and in write-up reviews and edit of the manuscript.

## Declaration of Conflicting Interests

The authors have no conflicts of interest to declare that are relevant to the content of this article.

## References

- Altemeyer, B. (1981). *Right-Wing Authoritarianism*. Manitoba: University of Manitoba Press.
- Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion*, 2(2), 113–133. DOI: 10.1207/s15327582ijpr0202\_5
- Brandt, M. J., & Reyna, C. (2010). The role of prejudice and the need for closure in religious fundamentalism. *Personality and Social Psychology Bulletin*, 36(5), 715–725. DOI: 10.1177/0146167210366306
- Brizi, A., Mannetti, L., & Kruglanski, A. W. (2016). The closing of open minds: Need for closure moderates the impact

- of uncertainty salience on outgroup discrimination. *British Journal of Social Psychology*, 55(2), 244–262. DOI: 10.1111/bjso.12130
- Czarnek, G., & Kossowska, M. (2018). *Openness to experience and ideology in European Western and Eastern countries: Analysis of 7th waves of European Social Survey* [Unpublished Manuscript]. Jagiellonian University.
- Czernatowicz-Kukuczka, A., Kossowska, M., Szwed, P., & Sekerdej, M. (2019). *Radicalization under terrorist threat: Effects of intolerance of uncertainty on attitudes toward immigrants* [Unpublished Manuscript]. Jagiellonian University.
- Czernatowicz-Kukuczka, A., Kossowska, M., Czarnek, G., Szumowska, E., & Szwed, P. (2020). Radzenie sobie z niepewnością na poziomie przekonań i sądów społecznych [Coping with uncertainty at the level of beliefs and social judgments.]. In M. Kofta & A. M. Rędzio (Eds.), *Poczucie Kontroli i Niepewność: Konsekwencje dla Rozumienia Świata Społecznego* [Sense of control and uncertainty: Consequences for understanding the social world](pp. 111–138). Warszawa, PL: Liberi Libri.
- Dragon, P., & Kossowska, M. (2019). Need for closure and compensatory rule-based perception: The role of information consistency. *European Journal of Social Psychology*, 49(1), 127–140. DOI: 10.1002/ejsp.2387
- Farias, M., Newheiser, A. K., Kahane, G., & de Toledo, Z. (2013). Scientific faith: Belief in science increases in the face of stress and existential anxiety. *Journal of Experimental Social Psychology*, 49(6), 1210–1213. DOI: 10.1016/j.jesp.2013.05.008
- Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of Personality and Social Psychology*, 73(1), 31–44. DOI: 10.1037/0022-3514.73.1.31
- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.
- Fiske, S. T. (1992). Thinking is for doing: Portraits of social cognition from daguerreotype to laserphoto. *Journal of Personality and Social Psychology*, 63(6), 877–889. DOI: 10.1037/0022-3514.63.6.877
- Frenkel-Brunswick, E. (1949). Intolerance of ambiguity as emotional and perceptual variable. *Journal of Personality*, 18, 108–143. DOI: 10.1111/j.1467-6494.1949.tb01236.x
- Greco, V., & Roger, D. (2001). Coping with uncertainty: The construction and validation of a new measure. *Personality and Individual Differences*, 31(4), 519–534. DOI: 10.1016/S0191-8869(00)00156-2
- Greenberg, J., Martens, A., Jonas, E., Eisenstadt, D., Pyszczynski, T., & Solomon, S. (2003). Psychological defense in anticipation of anxiety: Eliminating the potential for anxiety eliminates the effect of mortality salience on worldview defense. *Psychological Science*, 14(5), 516–519. DOI: 10.1111/1467-9280.03455
- Harmon-Jones, E. (2000). Cognitive dissonance and experienced negative affect: Evidence that dissonance increases experienced negative affect even in the absence of aversive consequences. *Personality and Social Psychology Bulletin*, 26(12), 1490–1501. DOI: 10.1177/01461672002612004
- Hibbing, J. R., Smith, K. B., & Alford, J. R. (2014). Differences in negativity bias underlie variations in political ideology. *Behavioral and Brain Sciences*, 37(3), 297–307. DOI: 10.1017/S0140525X13001192
- Houghton, D. C., & Grewal, R. (2000). Please, let's get an answer—any answer: Need for consumer cognitive closure. *Psychology & Marketing*, 17(11), 911–934. DOI: 10.1002/(SICI)1520-6793(200011)17
- Hutsebaut, D. (2000). Post-Critical belief scales. *Journal of Empirical Theology*, 13(2), 19–28. DOI: 10.1163/157092500X00028
- Jaśko, K., Czernatowicz-Kukuczka, A., Kossowska, M., & Czarna, A. (2015). Individual differences in response to uncertainty and decision making: The role of behavioral inhibition system and need for closure. *Motivation & Emotion*, 39(4), 541–552. DOI: 10.1007/s11031-015-9471-4
- Jonas, E., McGregor, I., Klackl, J., Agroskin, D., Fritsche, I., & Holbrook, C. (2014). Threat and defense: From anxiety to approach. In J. M. Olson & M. P. Zanna (Eds.), *Advances in Experimental Social Psychology* (Vol. 49, pp. 219–286). Burlington, VT: Academic Press.
- Jost, J. T. (2017). Ideological asymmetries and the essence of political psychology. *Political Psychology*, 38(2), 167–208. DOI: 10.1111/pops.12407
- Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, 60, 307–337. DOI: 10.1146/annurev.psych.60.110707.163600
- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129(3), 339–375. DOI: 10.1037/0033-2909.129.3.339
- Kay, A. C., Gaucher, D., McGregor, I., & Nash, K. (2010). Religious belief as compensatory control. *Personality and Social Psychology Review*, 14(1), 37–48. DOI: 10.1177/1088868309353750
- Kofta, M., & Sędek, G. (2005). Conspiracy stereotypes of Jews during systemic transformation in Poland. *International Journal of Sociology*, 35(1), 40–64. DOI: 10.1080/00207659.2005.11043141
- Kossowska, M., & Bar-Tal, Y. (2013). Need for closure and heuristic information processing: The moderating role of the ability to achieve the need for closure. *British Journal of Psychology*, 104(4), 457–480. DOI: 10.1111/bjop.12001
- Kossowska, M., & Bukowski, M. (2015). Motivated roots of conspiracies: The role of certainty and control motives in conspiracy thinking. In M. Bilewicz, A. Cichońka & W. Soral (Eds.), *The Psychology of Conspiracy* (pp. 145–161). London, UK: Routledge.
- Kossowska, M., Bukowski, M., Guinote, A., Dragon, P., & Kruglanski, A. (2016). Self-image threat decreases stereotyping: The role of motivation toward closure. *Motivation & Emotion*, 40(6), 830–841. DOI: 10.1007/s11031-016-9575-x
- Kossowska, M., Czernatowicz-Kukuczka, A., & Sekerdej, M. (2017). Many faces of dogmatism: Prejudice as a way of protecting certainty against value violators among dogmatic believers and atheists. *British Journal of Psychology*, 108(1), 127–147. DOI: 10.1111/bjop.12183
- Kossowska, M., Dragon, P., & Bukowski, M. (2015). When need for closure leads to positive attitudes towards a negatively stere-

- otyped outgroup. *Motivation & Emotion*, 39(1), 88–98. DOI: 10.1007/s11031-014-9440-9
- Kossowska, M., Guinote, A., & Strojny, P. (2016). Power boosts reliance on preferred processing styles. *Motivation and Emotion*, 40(4), 556–565. DOI: 10.1007/s11031-016-9552-4
- Kossowska, M., Szumowska, E., Dragon, P., Jaśko, K., & Kruglanski, A. W. (2018). Disparate roads to certainty processing strategy choices under need for closure. *European Review of Social Psychology*, 29(1), 161–211. DOI: 10.1080/10463283.2018.1471956
- Kossowska, M., Szumowska, E., & Szwed, P. (2018). *Tolerancja w czasach niepewności* [Tolerance in uncertain times]. Sopot, PL: Smak Słowa.
- Kruglanski, A. W. (1989). The psychology of being “right”: The problem of accuracy in social perception and cognition. *Psychological Bulletin*, 106(3), 395–409. DOI: 10.1037/0033-2909.106.3.395
- Kruglanski, A. W., Pierro, A., Mannetti, L., & De Grada, E. (2006). Groups as epistemic providers: Need for closure and the unfolding of group-centrism. *Psychological Review*, 113(1), 84–100. DOI: 10.1037/0033-295X.113.1.84
- Kruglanski, A. W., Jasko, K., Milyavsky, M., Chernikova, M., Webber, D., Pierro, A., & Di Santo, D. (2018). Cognitive consistency theory in social psychology: A paradigm reconsidered. *Psychological Inquiry*, 29(2), 45–59. DOI: 10.1080/1047840X.2018.1480619
- Kruglanski, A. W., Peri, N., & Zakai, D. (1991). Interactive effects of need for closure and initial confidence on social information seeking. *Social Cognition*, 9(2), 127–148. DOI: 10.1521/soco.1991.9.2.127
- Kunda, Z., & Oleson, K. C. (1995). Maintaining stereotypes in the face of disconfirmation: Constructing grounds for subtyping deviants. *Journal of Personality and Social Psychology*, 68(4), 565–579. DOI: 10.1037/0022-3514.68.4.565
- Marchlewska, M., Cichońska, A., & Kossowska, M. (2018). Addicted to answers: Need for cognitive closure and the endorsement of conspiracy beliefs. *European Journal of Social Psychology*, 48(2), 109–117. DOI: 10.1002/ejsp.2308
- McGregor, I., Nash, K., & Prentice, M. (2010). Reactive approach motivation (RAM) for religion. *Journal of Personality and Social Psychology*, 99(1), 148–161. DOI: 10.1037/a0019702
- Merolla, J. L., Ramos, J. M., & Zechmeister, E. J. (2011). Authoritarianism, need for closure, and conditions of threat. In M. A. Hogg & D. L. Blaylock (Eds.), *Extremism and the Psychology of Uncertainty* (pp. 212–227). Hoboken, NJ: Wiley-Blackwell.
- Nail, P. R., & McGregor, I. (2009). Conservative shift among liberals and conservatives following 9/11/01. *Social Justice Research*, 22(2-3), 231–240. DOI: 10.1007/s11211-009-0098-z
- Nail, P. R., McGregor, I., Drinkwater, A. E., Steele, G. M., & Thompson, A. W. (2009). Threat causes liberals to think like conservatives. *Journal of Experimental Social Psychology*, 45(4), 901–907. DOI: 10.1016/j.jesp.2009.04.013
- Piaget, J. (1937). *The Construction of Reality in the Child*. New York, NY: Basic Books.
- Proulx, T., Inzlicht, M., & Harmon-Jones, E. (2012). Understanding all inconsistency compensation as a palliative response to violated expectations. *Trends in Cognitive Sciences*, 16(5), 285–291. DOI: 10.1016/j.tics.2012.04.002
- Proulx, T., & Major, B. (2013). A raw deal: Heightened liberalism following exposure to anomalous playing cards. *Journal of Social Issues*, 69(3), 455–472. DOI: 10.1111/josi.12024
- Roets, A., Cornelis, I., & Van Hiel, A. (2014). Openness as a predictor of political orientation and conventional and unconventional political activism in Western and Eastern Europe. *Journal of Personality Assessment*, 96(1), 53–63. DOI: 10.1080/00223891.2013.809354
- Roets, A., Kruglanski, A. W., Kossowska, M., Pierro, A., & Hong, Y. (2015). The motivated gatekeeper of our minds: New directions in need for closure theory and research. In J. M. Olson & M. Zanna (Eds.), *Advances in Experimental Social Psychology*, (Vol. 52, pp. 221–283). London, UK: Academic Press.
- Roets, A., & van Hiel, A. V. (2008). Why some hate to dilly-dally and others do not: The arousal-invoking capacity of decision-making for low-and high-scoring need for closure individuals. *Social Cognition*, 26(3), 333–346. DOI: 10.1521/soco.2008.26.3.333
- Rokeach, M. (1956). Political and religious dogmatism: An alternative to the authoritarian personality. *Psychological Monographs: General and Applied*, 70(18), 1–43. DOI: 10.1037/h0093730
- Rokeach, M. (1960). *The Open and Closed Mind: Investigations Into the Nature of Belief Systems and Personality Systems*. Oxford, UK: Basic Books.
- Rutjens, B. T., Van Harreveld, F., & Van Der Pligt, J. (2010). Yes we can: Belief in progress as compensatory control. *Social Psychological and Personality Science*, 1(3), 246–252. DOI: 10.1177/1948550610361782
- Rutjens, B. T., van Harreveld, F., & van Der Pligt, J. (2013). Step by step: Finding compensatory order in science. *Current Directions in Psychological Science*, 22(3), 250–255. DOI: 10.1177/0963721412472810
- Sankaran, S., Kossowska, M., & Von Hecker, U. (2023). When do they push the right buttons? Need for closure and the role of perceived control in situations of uncertainty. *Personality and Individual Differences*, 213, Article 112316. DOI: 10.1016/j.paid.2022.112316
- Sankaran, S., Szumowska, E., & Kossowska, M. (2017). “When the going gets tough, the tough get going”: Motivation towards closure and effort investment in the performance of cognitive tasks. *Motivation & Emotion*, 41(3), 308–321. DOI: 10.1007/s11031-017-9615-0
- Saroglou, V. (2002). Beyond dogmatism: The need for closure as related to religion. *Mental Health, Religion & Culture*, 5(2), 183–194. DOI: 10.1080/13674670210144130
- Sekerdej, M., Kossowska, M., & Czernatowicz-Kukuczka, A. (2018). Uncertainty and prejudice: The role of religiosity in shaping group attitudes. *European Journal of Social Psychology*, 48(2), 091–0102. DOI: 10.1002/ejsp.2309
- Silver, C. F., Coleman III, T. J., Hood Jr, R. W., & Holcombe, J. M. (2014). The six types of nonbelief: a qualitative and quantitative study of type and narrative. *Mental Health, Religion & Culture*, 17(10), 990–1001. DOI: 10.1080/13674676.2014.987743



- Szumowska, E., Czernatowicz-Kukuczka, A., Kossowska, M., Król, S., & Kruglanski, A. W. (2020). Truth and significance: A 3N model (needs, narratives, networks) perspective on religion. In K. E. Vail III & C. Routledge (Eds.), *The Science of Religion, Spirituality, and Existentialism* (pp. 225–242). London, UK: Elsevier Academic Press.
- Szumowska, E., & Kossowska, M. (2016). Need for closure and multitasking performance: The role of shifting ability. *Personality and Individual Differences*, *96*, 12–17. DOI: 10.1016/j.paid.2016.02.055
- Szumowska, E., & Kossowska, M. (2017a). Motivational rigidity enhances multitasking performance: The role of handling interruptions. *Personality and Individual Differences*, *106*, 81–89. DOI: 10.1016/j.paid.2016.10.048
- Szumowska, E., & Kossowska, M. (2017b). Need for cognitive closure and attention allocation during multitasking: Evidence from eye-tracking studies. *Personality and Individual Differences*, *106*, 81–89. DOI: 10.1016/j.paid.2016.06.048
- Szumowska, M., Kossowska, M., & Roets, A. (2018). Motivation to comply with task rules and multitasking performance: The role of need for cognitive closure and goal importance. *Motivation & Emotion*, *42*(3), 360–376. DOI: 10.1007/s11031-017-9615-0
- Szumowska, E., Szwed, P., Kossowska, M., & Wright, R. (2017). Multifaceted effects of need for cognitive closure on effort: A cardiovascular response study. *Motivation Science*, *3*(4), 369–382. DOI: 10.1037/mot0000053
- Tracy, J. L., Hart, J., & Martens, J. P. (2011). Death and science: The existential underpinnings of belief in intelligent design and discomfort with evolution. *PLoS ONE*, *6*(3), Article e17349. DOI: 10.1371/journal.pone.0017349
- Vail III, K. E., Arndt, J., & Abdollahi, A. (2012). Exploring the existential function of religion and supernatural agent beliefs among Christians, Muslims, Atheists, and Agnostics. *Personality and Social Psychology Bulletin*, *38*(10), 1288–1300. DOI: 10.1177/0146167212449361
- van den Bos, R., Harteveld, M., & Stoop, H. (2009). Stress and decision-making in humans: performance is related to cortisol reactivity, albeit differently in men and women. *Psychoneuroendocrinology*, *34*(10), 1449–1458. DOI: 10.1016/j.psyneuen.2009.04.016
- Van Prooijen, J. W. & Jostmann, N. B. (2013). Belief in conspiracy theories: The influence of uncertainty and perceived morality. *European Journal of Social Psychology*, *43*(1), 109–115. DOI: 10.1002/ejsp.1922
- Vermeir, I., Van Kenhove, P., & Hendrickx, H. (2002). The influence of need for closure on consumer's choice behaviour. *Journal of Economic Psychology*, *23*(6), 703–727. DOI: 10.1016/S0167-4870(02)00154-0
- Viola, V., Tosoni, A., Brizi, A., Salvato, I., Kruglanski, A. W., Galati, G., & Mannetti, L. (2015). Need for cognitive closure modulates how perceptual decisions are affected by task difficulty and outcome relevance. *PLoS ONE*, *10*(12), Article e0146002. DOI: 10.1371/journal.pone.0146002
- Webster, D. M., & Kruglanski, A. W. (1997). Cognitive and social consequences of the need for cognitive closure. *European Review of Social Psychology*, *8*(1), 133–173. DOI: 10.1080/14792779643000100
- Whitson, J. A., Galinsky, A. D., Kay, A. (2015). The emotional roots of conspiratorial perceptions, system justification, and belief in the paranormal. *Journal of Experimental Social Psychology*, *56*, 89–95. DOI: 10.1016/j.jesp.2014.09.002
- Wulff, D. M. (1991). *Psychology of Religion: Classic and Contemporary Views*. Oxford, UK: John Wiley & Sons.
- Zuckerman, P. (2013). Atheism and societal health. In W. S. Bulivant & M. Ruse (Eds.), *The Oxford Handbook of Atheism*. Oxford, UK: Oxford University Press.

