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# Perceived Lack of Control and Conspiracy Theory Beliefs in the Wake of Political Strife and Natural Disaster*

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While lack of control is one plausible explanation for conspiracy beliefs, the experimental evidence is mixed. We present two naturalistic studies that offer some limited support for the control hypothesis. In the first, Macedonians living in (North) Macedonia ($N = 116$) completed a conspiracy ideation scale immediately after a national referendum on the country's name change from "Macedonia" to "North Macedonia," and one year after. The opposition, whose control was lowered after the name change, increased their conspiracy beliefs, but supporters did not. Study 2, conducted with Americans ($N = 266$) in the wake of a series of devastating tornadoes, replicated and expanded the first study: the effects were evident only for the threatening event-related conspiracy beliefs. These studies suggest a possible link between lack of control and conspiracy beliefs in the real world.

*Keywords*: conspiracy beliefs, perceived control, compensatory control, natural disasters, political upheaval

## Highlights:

- Losers of a political referendum increased their belief in conspiracies.
- Victims of tornados increased their belief in weather-related conspiracies.
- Change in perceived control predicted change in weather-related conspiracy beliefs.

Although there is currently no agreed-upon definition used by the research community, conspiracy theories are generally thought of as implausible, unwarranted claims that significant events are being caused

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by malevolent, clandestine groups. Such "theories" typically contradict explanations provided by the relevant epistemic authorities, and tend to be embedded in a broader (often socio-political) explanatory framework (Stojanov & Halberstadt, 2019).

The psychological underpinnings of conspiracy beliefs have become the subject of increased research interest (e.g., Brotherton & French, 2015; Cichocka et al., 2016; van Prooijen et al, 2018), as researchers have posited various motivating forces behind people's endorsement of such beliefs. These include the need for uniqueness (Imhoff & Lamberty, 2017; Lantian et al., 2017), the need to see the world as ordered and structured (Whitson & Galinsky, 2008), and, in particular, the need for personal control (van Prooijen & Acker, 2015). Several studies have demonstrated that when participants' sense of control is threatened, such as by asking them to recall and describe an event when they lacked control (van Prooijen & Acker, 2015), or by reminding them about everyday uncontrollable hazards (Sullivan et al., 2010), they report stronger conspiracy beliefs relative to control groups.

According to Kay and colleagues' compensatory control theory (Kay et al., 2008), conspiracy theory beliefs help those who have lost a sense of personal control to restore their worldview that existence is non-random, ordered and structured (see; Kay et al, 2009; Kay et al., 2015). The theory proposes that individuals have higher order need for structure and control. When perceptions of the world as structured and ordered are not feasible, individuals resort to compensatory means of restoring such perceptions. Belief in nefarious, conspiring agents is not the only way that individuals can regain such a worldview; other restorative "agents" include God (Laurin et al., 2008), the government (Shepherd et al., 2011), and even abstract constructs such as meritocracy (Goode et al., 2014). However, under the right conditions, explaining unsettling events as the product of coordinated, secretive actors can be psychologically appealing, and presumably a conspiracy theory is preferable to no explanation at all (Marchlewska et al., 2018).

A closer look at the evidence, however, reveals that the link between personal control and conspiracy beliefs has not been definitively established. For practical as well as ethical reasons, virtually all research on control and conspiracy beliefs is conducted in the laboratory, using various priming techniques to challenge participants' sense of control, or more often to remind them of times when their sense of control has been challenged. In a typical experiment, one group of participants, usually undergraduate students, is asked to recall and describe an incident in which they felt they did not have any control over the situation, while another group is asked to do the same for an event in which they were in complete control (or for a neutral event with no control implications). They then answer a questionnaire assessing their belief in conspiracy theories, operationalized as either belief in specific conspiracy claims or as generic conspiracy beliefs (Brotherton et al., 2013; Bruder et al., 2013; Stojanov & Halberstadt, 2019).

Although many such studies report that people compensate for diminished personal control by endorsing conspiratorial beliefs (e.g., van Prooijen & Acker, 2015; Whitson & Galinsky, 2008), other studies (e.g., van Elk & Lodder, 2018) find the opposite, such that participants whose control is threatened report *weaker* conspiracy beliefs than those whose control is not threatened. Still other studies find no difference in conspiracy beliefs at all (e.g., Hart & Graether, 2018; Nyhan & Zeitzoff, 2018; Stojanov et al., 2020).

It is unclear why the evidence for the compensatory control hypothesis is so variable, but a likely component is the relatively weak effects of experimental manipulations of control. The standard experimental technique of asking participants to recall an uncontrollable situation is dubious for several reasons. Such manipulations are transparent to participants and subject to experimenter demand (Orne, 2009). Participants can easily infer that the intent of the experimenter is to lower perceived control and respond in line with those expectations. But even assuming that participants truthfully and accurately report their lowered sense of personal control, manipulations based on brief, abstract threats to control are in principle unstable: if a participant's sense of control can be altered by imagining an uncontrollable situation, it should be able to be rectified just as easily. In fact, participants may exhibit psychological reactance (Brehm, 1989) and restore their sense of control without waiting for the opportunity to endorse conspiracy theories, potentially overcompensating for the experimental threat in the process. For example, after reminding themselves and describing a control threatening event, participants could spontaneously engage in self-soothing activities such as recalling an event in which they did have control, nullifying the effect of the manipulation. Even without such spontaneous activities, the experimental design itself could offer opportunities for restoring control. Indeed, Hauser et al. (2018) have argued that merely answering a manipulation check, such as having participants report on their sense of control after it has been experientially threatened, is sufficient to undo the effects of the manipulation. Moreover, there are some indications that the recall task may not always be effective in manipulating participants' feelings of control in the first place (e.g., van Elk & Lodder, 2018).

Even at their best, laboratory manipulations in which participants imagine or recall threats to control pale in comparison to the types of real-world scenarios that actually induce such threats. To our knowledge, however, there is no study of conspiracy beliefs and perceived control in their "natural" environment. Such an approach would be an important complement to the experimental literature. From a methodological perspective, examining people's conspiracy beliefs following a "real" threat to their perceived sense of control provides a more powerful and ecologically valid way to address the central claims of the compensatory control model. From a theoretical perspective, this approach would speak directly to the sort of social and political events that appear to motivate conspiracy beliefs in the first place (van Prooijen & Douglas, 2017).

In the present article, therefore, we sought to examine how lack of control affected conspiracy beliefs in two distinctive real-world contexts: a political

crisis in North Macedonia (Study 1); and a natural disaster in North America (Study 2). Although these two events could hardly be less similar on the surface, they both represent acute and significant challenges to feelings of control among the individuals who experienced them directly.

## Study 1: North Macedonian Political Crisis, 2018–2019

### Background

The state of Yugoslavia disintegrated between 1989–1992, and its constituent parts, the Socialist Republic of Bosnia and Herzegovina, the Socialist Republic of Croatia, the Socialist Republic of Slovenia, and the Socialist Republic of Macedonia, became independent countries[1]. Of these, we were especially interested in the Socialist Republic of Macedonia, which declared its independence from Yugoslavia in 1991 to create the *Republic of Macedonia.* This name was, however, disputed by Greece on the grounds that *Macedonia* already describes a region in Greece, and that "the Republic of Macedonia" implies territorial claims by this state against the Greek province with the same name. Thus, Greece objected to the country being recognized by its constitutional name (Republic of Macedonia), which in turn resulted in the UN admitting membership to the country under the reference, the *Former Yugoslav Republic of Macedonia* (FYROM).

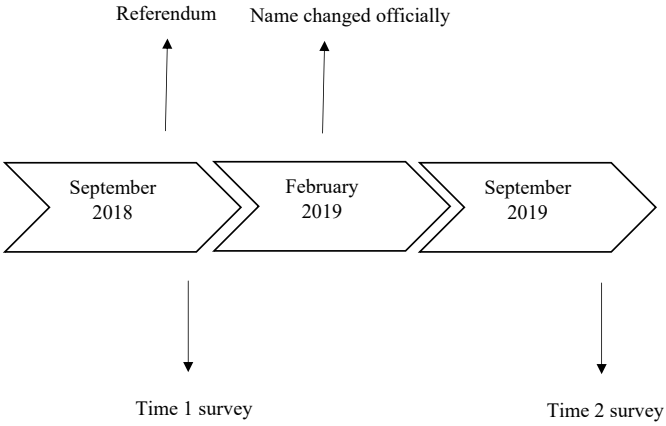
Moreover, in the early 1990s Greece imposed a trade embargo and, until recently, blocked the country's ascension into EU and NATO. After nearly three decades of conflict, the two countries found a mutually acceptable solution with the signing of the Prespa agreement in June 2018. Among other things, this agreement meant that the Republic of Macedonia would change its name to the *Republic of North Macedonia*. However, the opposition parties in both countries found the Prespa agreement unacceptable and nationwide protests were initiated. The Greek opposition argued that too many concessions were made in the agreement, such as recognition of Macedonian nationality and language (Smith, 2019); and the Macedonian opposition argued that the name change threatened national identity.

The Prespa agreement needed Macedonian approval via a national referendum. However, sensing that public opinion was not supportive of the name change, the Macedonian government determined that the referendum would be consultative rather than obligatory, and framed the question in a way many considered manipulative: "Are you in favour of European Union and NATO membership by accepting the agreement between the Republic of Macedonia and the Republic of Greece?". In response, a movement emerged on social media calling on people to boycott the referendum entirely (#bojkotiram), based on the belief that if the required 50% voter turnout was not met, the name change

1 The Socialist Republic of Serbia and the Socialist Republic of Montenegro were initially united as the State Union of Serbia and Montenegro, but Montenegro declared independence in 2006.

would not take place. Indeed, voter turnout for the referendum, which took place September 30th of 2018, only reached 37% of the population, and although those who voted were overwhelmingly in favor (94%), it was the opposition who celebrated victory. However, as it turns out, the opposition was wrong: despite the failure to obtain the minimum voter turnout, Macedonia officially changed to North Macedonia in February 2019 (see Figure 1 for timeline of events).

**Figure 1**
*Timeline of events between September 2018 and September 2019*




Thus, the political situation in Macedonia created a natural experiment, in which presumably some citizens' sense of control, but not others', were threatened by a salient and emotional political event. To test the idea that this event might have created a natural manipulation of perceived control, which in turn affected conspiracy beliefs, we used a dataset collected for different purposes, which included measures of conspiracy beliefs at two points in time: immediately after the opposition's apparently successful boycott (when their sense of control was presumably high); and one year later, after the name change had been in effect for six months (when their sense of control was presumably low). If lack of control leads to conspiracy beliefs, then the opposition should endorse conspiracy beliefs to a greater extent at the second point than the first, but the opposite should be true for name-change supporters.

## Method

### *Participants*

A quota sample of 307 ethnic Macedonians (the ethnic majority, for whom the name change is most relevant) were sent the survey both immediately (Time 1) and one year after (Time 2) the referendum. A Macedonian market research company, GfK Skopje, was tasked with data collection, using a screening questionnaire to identify potential participants in order to fill gender, age, and regional quotas. For the purposes of the current research, we present data only from participants who reported that they either voted in favor of the name change,

or boycotted the referendum/voted no (i.e., excluding those who did not vote for other reasons or did not disclose their behavior), and who provided data at both time points (overall dropout rate was 48%, while the dropout rate only for the participants who voted yes or boycotted/voted no was 37%). As there were only $N = 3$ "no" voters we merged these participants with the boycotters, however the results hold even if the "no" voters are excluded from the analysis. This left 116 participants in total: 61 opposers (boycotters or "no" voters", 30 females, 31 males, mean age was 42.96 years, $SD = 15.31$) and 55 supporters (26 females, 29 males, mean age $M = 43.78$ years, $SD = 14.34$). The participants who completed the survey at both time points did not differ from the participants who completed the survey only at time 1 in terms of conspiracy beliefs at time 1, $F(1, 306) = 2.39$, $p = .12$. In terms of education, 1.7% had finished only primary school, about a third (33.6%) had high school degree, about half (50.9%) Bachelor's degree, 6% reported having Associate degree ("више образование"), 6% Master's degree, while 1.7% had a doctoral degree. Supporters and opposers did not differ in terms of their education level, $\chi^2(5) = 4.91$, $p = .427$. The sample size was determined based on the requirement for the larger study. However, a sensitivity power analysis in GPower ($\alpha = .05$, $1-\beta = .95$, $N = 116$, 2 groups, 2 measurement, and correlations among measurement of .6 indicated that we could detect an effect of $f = 0.15$ (equivalent to $\eta_p^2 = .02$).

### *Procedure*

Participants were directed to the Qualtrics online platform to complete the survey, which was part of a larger study on an unrelated topic (The larger survey was looking at identification, identity fusion and the country name as a sacred value. The following measures were taken: arousal regarding the name change, positivity regarding the name change, reflection on the name change, fusion with Macedonians, fusion with the name "Macedonia", identification with the country, centrality of experience, attitudes towards the name change, extreme behavior (i.e., fight or die), pragmatic thinking, essentialism). All materials were written first in English and then translated independently by two people fluent in English and Macedonian (one of whom was the first author); minor disagreements in wording were resolved via discussion. The order of administration of the measures (including those of the larger, unrelated study) was the same at both time points.

Participants were told that the survey concerned attitudes towards the country's proposed name change. Participants first answered questions about their emotional state (how aroused and positive they felt about the name change), interest in the issue of the name change, and their sociocultural identification with Macedonia. Next, they were asked to select which one of five options best reflected their situation: "I voted yes"; "I voted against"; "I boycotted"; "I didn't vote"; "I'd rather not say"). The option "I didn't vote" (selected by 51 participants) was offered to distinguish those that did not vote as a political expression from those who did not vote for other reasons. After participants answered the voting question, they were asked to elaborate on their answer in a text box (Qualitative analysis of the answer is part of the larger study on the name change.) No word or time limitations were imposed.

Participants' conspiracy theory beliefs were operationalized as a score on the Conspiracy Theory Ideation subscale of the Conspiracy Mentality Scale (Stojanov & Halberstadt, 2019), which measures generic conspiracy beliefs. The subscale has good predictive validity of specific conspiracy beliefs, as well as good convergent and divergent validity (Stojanov & Halberstadt, 2019). Even though it may look as if the subscale taps into the construct of trust, the validation study has suggested that the scores on the subscale are unrelated to trust. This subscale consists of seven items (e.g., "Events on the news may not have actually happened "; "The alternative explanations for important societal events are closer to the truth than the official story"; "Many so called 'coincidences' are in fact clues as to how things really happened"; etc.). Participants rated their agreement with each statement on a 7-point scale anchored at "strongly disagree" and "strongly agree". Cronbach alpha was .87 and .89, for time 1 and 2, respectively.

Finally, participants completed a demographic questionnaire, including age, religious affiliation (Christian, Muslim, Atheist, Agnostic, None, Other), gender (male or female), and level of education.

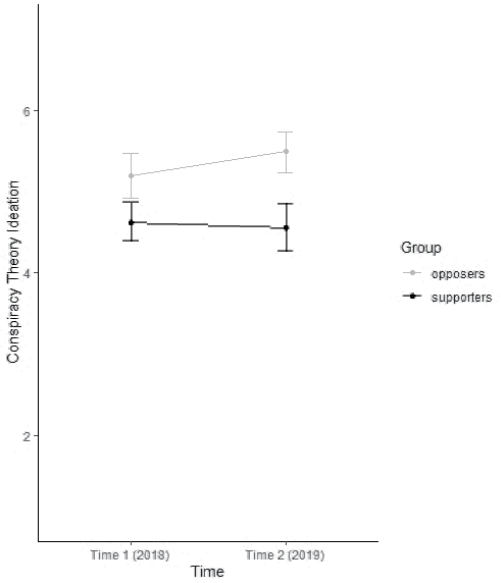
## Results and Discussion

The descriptive statistics for the dependent variable, by voting behavior (opposers vs. supporters) are given in Table 1.

**Table 1**
*Means [and 95% CI] for conspiracy theory ideation (CTI) at time 1 (2018) and time 2 (2019)*

| | Time 1 | Time 2 | |
|---|---|---|---|
| | CTI | CTI | *Mean* |
| Supporters | 4.62 | 4.56 | 4.59 |
| | [4.35, 4.89] | [4.26, 4.85] | [4.34, 4.82] |
| Opposers | 5.19 | 5.48 | 5.34 |
| | [4.93, 5.44] | [5.20, 5.77] | [5.10, 5.57] |
| Mean | 4.91 | 5.02 | 4.96 |
| | [4.72, 5.09] | [4.82, 5.23] | [4.79, 5.14] |

**Figure 2**
*Change in conspiracy theory ideation for the supporters and opposers (error bars represent 95% CI)*




To test the hypothesis that conspiracy theory beliefs increase after a loss of political power, we conducted a mixed measures ANOVA (voting behavior: support versus oppose) x survey wave: (Time 1 vs Time 2), with wave treated

as a within-subjects factor. There was a main effect of voting behavior, with opposers expressing significantly stronger conspiracy beliefs than supporters, $F(1, 114) = 18.412$, $p < .001$, $\eta_p^2 = .14$. There was no significant main effect of wave, $F(1, 114) = 1.698$, $p = .195$, $\eta_p^2 = .015$, however, there was a marginally significant interaction with voting behavior, $F(1, 114) = 3.949$, $p = .05$, $\eta_p^2 = .03$ (see Figure 2)[2]. This remained true even after controlling for change in self-reported positivity and arousal and education, $F(1, 111) = 3.429$, $p = .07$, $\eta_p^2 = .03$. Within-subjects contrasts partially supported our hypothesis: comparing Time 1 and Time 2 scores revealed a significant increase in conspiracy theories for the opposers after the name change took effect, $F(1, 58) = 6.613$, $p = .01$, $\eta_p^2 = .10$, but no difference for supporters, $F(1, 52) = .076$, $p = .78$, $\eta_p^2 = .001$.

This study represents the first test of the control account of conspiracy beliefs in a natural setting, and offers some weak support for the idea that such beliefs increase when control is threatened. Participants opposing the name change, whose efforts to prevent it were subsequently frustrated, arguably felt that their personal, political and ingroup power had been compromised. At Time 2, these participants, but not the supporters of the name change, reported stronger conspiratorial thinking, even though they were surveyed six months after the control-threatening event. This is in line with the reasoning of other researchers (e.g., Imhoff, 2015) who suggest that it is *chronic* lack of control that elicits conspiracy beliefs, thus potentially explaining why one-off experimental manipulations may produce weak or inconsistent effects. Indeed, the effect among the control-threatened group ($\eta_p^2 = .10$, equivalent to $d = 0.66$) far exceeded the mean effect size obtained in a recent meta-analysis of experimental manipulations of control on conspiracy beliefs we conducted (Stojanov & Halberstadt, 2020) on 45 effect sizes across 23 studies ($d = 0.07$), hinting at a power-based explanation for previous, uneven experimental findings. This same meta-analysis also revealed a moderating effect of conspiracy belief operationalization, such that control manipulations affected endorsement of specific conspiracy theories more strongly than more abstract conspiracy beliefs (as used in the current studies). Moreover, conspiracy beliefs that are related to the control threat may be especially likely to be endorsed (Stojanov et al., 2020). Thus, the effect observed in the current study may have been stronger if measured as endorsement of a specific theory directly related to the political crisis.

Contrary to our expectation, supporters of the name change did not show the opposite pattern to the opposers; their conspiracy beliefs remained stable. Although we can only speculate about this null result, it is possible that

2 The pattern of results is the same if participants who voted "no" are excluded: There is no main effect of time, $F(1, 111) = 1.625$, $p = .21$; the main effect of group is significant, $F(1, 111) = 16.746$, $p < .001$, and the time x group effect marginally significant $F(1, 111) = 3.772$, $p = .05$.

The results also held when one outlier is excluded. The main effect of group remained, $F(1, 113) = 16.99$, $p < .001$. There was no main effect of time $F(1, 113) = 2.53$, $p = 1.11$. The interaction between time and group was marginal $F(1, 113) = 3.128$, $p = .08$.

supporters' control was not in fact threatened by the ultimate outcome of the referendum. Indeed, both the opposers and the supporters celebrated victory at the time of the referendum – the opposers because the referendum did not reach the minimum turnout, and the supporters because the overwhelming majority of those who voted found the name change acceptable. Thus, supporters may have felt empowered at both time points.

Unfortunately, our dataset, which was part of a larger, unrelated study, did not include a direct measure of perceived control, so our mechanistic interpretation of the effects cannot be confirmed empirically. Although we controlled for some possible confounds, such as different educational backgrounds of opposers versus supporters, as well as emotional reactions to the name change, it is possible that the opposers' beliefs changed for other reasons. For example, six months after the name change could have been enough time for conspiracy theories regarding the name change to spread among the opposers who arguably felt disenfranchised, but not among the supporters. If this is so it would also mean that opposers' sense of control was not threatened to begin with.

To address the last concern, we conducted a post hoc survey to see whether people do indeed perceive political upheaval as a threat to personal control. We asked 97 Amazon MTurk (an online crowdsourcing platform) workers (52 males, 45 females, mean age $M = 35.77$, $SD = 9.47$) what kinds of events tend to influence people's sense of control. Participants were asked to "think about some of the situations in your life that you have [do not have] control over" (between subjects), and to briefly describe ten such situations (see the Appendix for complete list of controllable and uncontrollable event categories). The first author classified the situations into categories, and a research assistant independently classified 20% of the statements. The agreement rate between the coders was 82%.

The category *Politics*, arguably the best-fitting category for the Macedonian referendum, ranked 7$^{th}$ ($f = 18$), suggests that while the event we considered is a plausible context in which control might be challenged, there are others that produce more psychologically significant threats. For example, the third most frequently mentioned factor was the weather ($f = 47$), and victims of extreme weather events commonly report an acute loss of control (Afifi et al., 2014).

In Study 2, we therefore examined the real-time relationship between perceptions of control and conspiracy beliefs immediately following a series of more than 500 tornadoes that struck the American Midwest in May, 2019. In addition to a new participant sample and a different challenge to control, Study 2 added an explicit measure of perceived control, and additional measures of conspiracy theory beliefs. The latter included weather-related conspiracies, allowing us to test the hypothesis that threats to control encourage the endorsement of threat-related conspiracy theories to a greater extent than unrelated or abstract beliefs. Finally, to implicate the tornadoes as the cause of control threat we also measured the impact they had on participants. We predicted that impact would predict conspiracy theory beliefs (general and/or specific) via their effect on individuals' sense of control.

## Study 2: Midwestern American Tornadoes, 2019

## Method

### *Participants*

Two hundred and sixty-six (114 males, 150 females, 2 "other") MTurk workers from Colorado, Indiana, Iowa, Kansas, Missouri, New Jersey, Ohio, Pennsylvania and Texas took part in the study[3]. Their average age was 37.74 years (*SD* = 13.22, range 18–81 years). In terms of education, 0.8% had no degree, 35.3% had high school degree, 41.7% had a Bachelor's degree, 14.7% Master's degree, 2.3% doctoral degree, and 5.3% had an "other" degree. Fifteen participants failed an attention check question and were removed from the final analysis.

### *Materials*

#### *Impact of Tornadoes*

To assess the extent to which participants were affected by the tornado, we adapted six questions used previously by Segal and colleagues (Segal, Jong, & Halberstadt, 2018): "To what extent did you suffer physical harm as a result of the tornado?"; "To what extent did you suffer psychological harm as a result of the tornado?"; "To what extent was your home damaged by the tornado?"; "To what extent was the area where you live damaged by the tornado?"; "To what extent did you feel your life was in danger during the tornado?"; "Overall to what extent has your life been affected by the tornado?"

Participants answered on a 9-point scale anchored at 0 = *not at all* and 8 = *very much so*. Answers were combined into one measure by averaging across all the answers. Cronbach alpha was .94.

#### *Conspiracy Beliefs*

Conspiracy beliefs were assessed in three ways.

**Generic conspiracy beliefs.** As in Study 1, we used the Conspiracy Theory Ideation Subscale of the Conspiracy Mentality Scale (Stojanov & Halberstadt, 2019). Among the items of this scale was an attention check question (i.e., "To make sure you read attentively please select strongly agree."). Cronbach alpha was .93.

**Specific conspiracy beliefs.** To measure specific conspiracy beliefs (as opposed to a general tendency to believe conspiracy theories, as indicated by responses to the foregoing subscale) we used the Conspiracy Theory Beliefs Inventory (Swami et al., 2011), a 15-item scale that measures belief in specific conspiracy theories (e.g., "The Apollo moon landings never happened and were staged in a Hollywood film studio." Participants answer on a 9-point scale (1 = *completely false* to 9 = *completely true*). Cronbach alpha was .94.

**Weather-related conspiracy theories.** Finally, we measured belief in weather-related conspiracy theories with the following three items: "The adverse weather conditions we are experiencing right now are a result of a weather manipulation experiment"; "The trails left in the sky by planes are evidence of a technology used to change the weather"; "The weather is controlled by multiple governments to help various industries and hurt others." Participants indicated their agreement with these statements on a 7-point scale (1 = *strongly disagree* to

3 Programming of the survey did not allow participants from other states to participate. These were the states that were experiencing tornado threats in the week when time 1 was conducted.

7 = *strongly agree*). Cronbach alpha was .94 and removing any of the items lowered the coefficient.

**Perceived control.** Perceived control was measured with Pearlin and Schooler's (1978) Mastery Scale. The scale consists of seven items (e.g., "What happens to me in the future mostly depends on me"), five of which are reverse coded. Participants respond on a four-point scale (1= *strongly disagree* to 4 = *strongly agree*), and responses are averaged such that higher scores indicate a higher perception of the self being in control. Cronbach alpha was .82.

### *Procedure*

Participants were surveyed on June 1, 2019. After giving informed consent, they were directed to the Qualtrics platform where they read about the purpose of the study ("investigating people's perceptions about natural disasters and world affairs"). Those who agreed to participate then completed the measure of the tornadoes' impact on them personally, the three conspiracy belief scales in random order, the Mastery Scale, and, finally, a series of demographic questions, before being debriefed.

## Results and Discussion

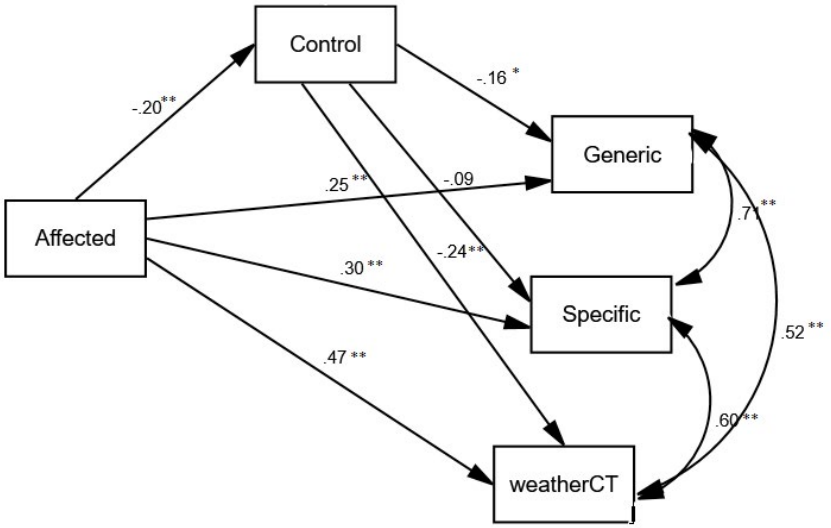
Perceptions of control were significantly related to all three measures of conspiracy beliefs (see Table 2), but the relationship was significantly stronger for weather-related conspiracies than for specific (but weather-unrelated) conspiracy theories, $z = –3.573$, $p < .01$, or for nonspecific conspiracy ideation, $z = –2.317$, $p = .01$ (correlations which did not differ from each other), providing some support for the idea that it is threat-related conspiracy beliefs that are particularly appealing.

**Table 2**
*Matrix of correlations between the conspiracy beliefs, perceived control, and affectedness*

| | Generic conspiracy theories | Specific conspiracy theories | Weather related conspiracy theories | Control |
|---|---|---|---|---|
| Specific CT | .74** | | | |
| Weather related CT | .59** | .65** | | |
| Control | -.21** | -.15* | -.33** | |
| Affectedness | .28** | .32** | .52** | -.20** |

Path analysis using the lavaan package in R (Rosseel, 2012), with affectedness as independent variable, perceived control as mediator, and all three measures of conspiracy beliefs as dependent variables (see Figure 3), revealed mediating effect of control only for weather-related conspiracy beliefs 95%CI [.012, .074], suggesting that loss of control specifically increases belief in threat-related conspiracies (the confidence intervals for the indirect effect for the generic, 95% CI [.000, .051], and specific conspiracy beliefs 95% CI [-.009, .048] crossed zero).

**Figure 3**
*Path analysis from affectedness to conspiracy beliefs via control*




*Note.* ** $p < .01$, * $p < .05$. Regression weights represent standardized coefficients.

To determine the persistence of conspiracy beliefs once the immediate threat had subsided, we contacted participants three months later (September 2019). The retention rate was 61%; those who agreed to participate did not differ from those who declined in terms of Time 1 perceived control, affectedness, or conspiracy beliefs. As expected, feelings of control were higher three months after the tornadoes (see Table 3). A2 (time: Post versus Pre Tornado) x 3 (Conspiracy beliefs type: Generic, Specific[4], or Weather-related) repeated measures ANOVA revealed a main effect of conspiracy beliefs, $F(1.74, 151) = 191.08$, $p < .0001$, $f = 1.13$, such that weather-related conspiracy beliefs ($M = 2.01$, $SE = 0.11$) were endorsed less strongly than either abstract beliefs ($M = 3.69$, $SE = 0.11$), $F(1, 151) = 288.87$, $p < .001$, $f = 1.38$, or specific beliefs ($M = 2.98$, $SE = 0.11$), $F(1, 151) = 119.39$, $p < .001$, $f = 0.89$. Importantly, there was a marginal time x conspiracy belief interaction, $F(1.74, 302) = 2.70$, $p = .08$, $f = 0.13$, such that weather-related conspiracy beliefs were higher, but generic and specific conspiracy beliefs were lower, immediately after the tornadoes than three months later, although none of the three measures differed significantly over time (see Table 3).

Although conspiracy beliefs did not change significantly overall, there was still variability in individuals' beliefs over time. To explore whether that change was related to changes in perceived control over the same period, we computed change scores for all variables (subtracting the September score from the June

4 The 9-point Likert scale was transformed to a 7-point Likert scale.

score) and regressed all three measures of conspiracy beliefs simultaneously on control. The analysis revealed that increases in perceived control post-tornado uniquely and significantly predicted decreases in weather-related conspiracy beliefs (see Figure 4).

**Figure 4**
*Path analysis from change in perceived control to change in conspiracy belief*

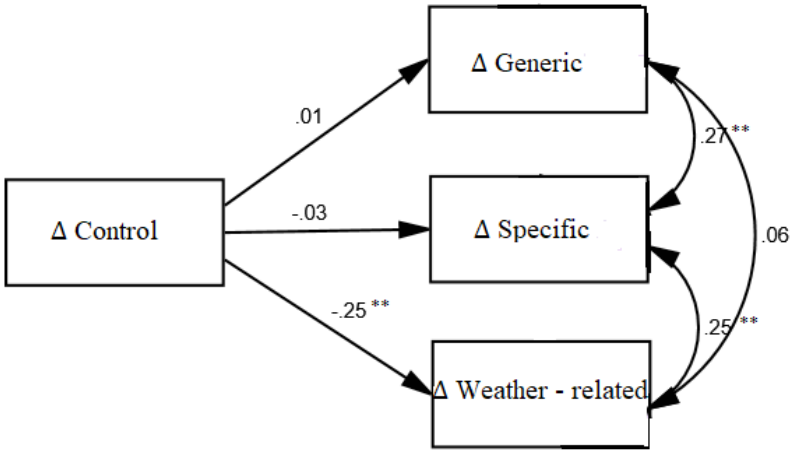



**Table 3**
*Means, standard deviations, and paired samples t-test results*

| | *M*(*SD*) at Time 1 | *M*(*SD*) at Time 2 | *Marginal means (type of conspiracy)* | *t* (*df*) | *p* |
|---|---|---|---|---|---|
| Specific conspiracy theories | 2.92 (1.41) | 3.03(1.31) | 3.64 (0.14) | -1.73 (151) | .09 |
| Generic conspiracy theories | 3.64(1.48) | 3.76(1.46) | 3.70 (0.11) | -1.32 (151) | .19 |
| Weather related conspiracies | 2.06 (1.56) | 1.96 (1.43) | 2.01 (0.11) | 1.12 (151) | .26 |
| *Marginal means (wave)* | 3.09 (0.12) | 3.14(0.11) | / | / | / |
| Perceived control | 2.81 (0.56) | 2.91 (0.59) | / | -3.27 (151) | .00 |
| Affectedness | 1.35 (1.87) | 1.20 (1.75) | | 1.71 (151) | .09 |

## Discussion and Conclusion

Conspiracy theories continue to be strongly endorsed by the public (Jensen, 2013), with increasingly dangerous social consequences, including threats to health, the environment, and political engagement (Douglas et al., 2015). And while social media can legitimately be blamed for the ease of their propagation (Shao et al., 2018; del Vicario et al., 2016), scientific scrutiny of

the underlying motivational causes is needed to understand their etiology and individuals' receptivity to them. To that end, feelings of powerlessness and lack of control are often cited as motivating factors (e.g., Douglaset al., 2017), but the experimental evidence is mixed.

The current studies were therefore conducted to complement the existing experimental research on the effects of lack of control on conspiracy theory beliefs by examining this relationship in naturalistic settings. Study 1 involved a political referendum on Macedonia's name, a polarizing and personal issue that touched on a complex array of pragmatic concerns, intergroup identities, and interstate politics. Each of these factors is apparent in many conspiracy theories (Bale, 2007; van Prooijen & Douglas, 2018), but they are rarely, if ever, captured in the laboratory. In Study 2, we examined participants' perceptions of control and belief in conspiracy theories in the wake of a natural disaster.

The results of Study 1 indicated that people who opposed the name change, and thus presumably felt lower personal control, marginally increased their generic conspiracy beliefs from 2018 to 2019, while the beliefs of those who supported the name change remained stable. Study 2 showed that the effects of lack of control effects were limited to conspiracy beliefs relevant to the control-threatening event.

It is not clear why the specificity of the effects differed between the two studies. One possibility is that the ambiguity and complexity of the threat in Study 1 was amenable to multiple interpretations, such that even "generic" conspiracies appeared relevant. For example, the statement that "Events throughout history are carefully planned and orchestrated by individuals for their own betterment," intended as a generic statement about vague and unnamed forces, might have been given specific meaning in the context of the national referendum, which involved so many "events" and "individuals" that anyone could find aspects that appeared relevant to their interpretation of events. Tornadoes, in contrast, might be more constrained in their interpretation, permitting only limited extrapolation. Alternatively, the effects of the tornadoes might have been more constrained simply because more specific weather-related conspiracies were available. In other words, people may attempt to restore their sense of control via whatever means are available, and although they gravitate toward theories with direct implications for the particular threatening events confronting them, more general claims will suffice when necessary. If so, then the link between lack of perceived control and conspiracy beliefs may be more nuanced than previously believed.

If the relationship between lack of control and conspiracy beliefs is not domain-general, but domain-specific, as these studies seem collectively to suggest, it would imply that the lack of control in a particular domain threatens perceptions of order in that domain, and compensatory efforts to restore perceptions of control and order will be focussed, and more effective, in that same domain. Thus, following a random, devastating weather event, believing that the pharmaceutical industry deliberately produces harmful vaccines may not be as appealing a source of compensatory order as believing that the weather is manipulated by the government. Future studies could systematically test these ideas about domain specificity, for example by depriving participants in different

domains of control (e.g., health vs politics) and measuring belief in health and political conspiracies, or endorsement of health vs political institutions. Depending on the results, future instantiations of compensatory control theory may include the notion of domain specificity of control threats and compensatory attempts. As they currently stand, these findings challenge the notion of fluid compensatory processes.

The present research was not without limitations, of course. Most obviously, an unavoidable aspect of the designs was that participants could not be randomly assigned to groups, leaving open the possibility that some other aspect besides low perceived control could account for observed differences over time. Relatedly, there was no neutral control group, so it is not certain whether low perceived control increased conspiracy beliefs, or whether high perceived control buffered against increases in them (or some combination of these two scenarios). It is also possible that beliefs would have changed even if the threatening events had not occurred, although there is no reason to suppose that this true, and, at least in Study 2, the role of tornado affectedness argues against it. The mediation model showed that the tornado affectedness was related to conspiracy beliefs via perceived control. Subsequent work in this area might nonetheless seek to rule out potential confounding variables. Despite these limitations with the current studies, however, we believe that any sacrifices to internal validity were more than earned back in terms of ecological validity. The present data offer a rare look at conspiratorial thinking following the kind of major social upheaval or traumatic events that are thought to prompt it.

In summary, the present studies suggest that the link between perceived control and conspiracy beliefs may be more nuanced than previously thought and pose some challenges for a version of compensatory control theory that supposes fully fluid compensatory processes.

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# Percipirani doživljaj nedostatka kontrole i verovanja u teorije zavere u sklopu političkih borbi i prirodne katastrofe

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Dok je nedostatak kontrole jedno od mogućih objašnjenja verovanja u teorije zavere, eksperimentalni dokazi daju mešane rezultate. Predstavljamo dve naturalističke studije (studije u prirodnim uslovima, prim. prev.) koje daju ograničenu potporu hipotezi o kontroli. U prvoj studiji, Makedonci koji žive u (Severnoj) Makedoniji ($N$ = 116) su popunili skalu ideacije o zaveri (eng. conspiracy ideation scale, prim. prev.) neposredno nakon što je na osnovu referenduma ime zemlje promenjeno iz "Makedonija" u "Severna Makedonija" i nakon godinu dana (od promene imena, prim. prev.). Protivnici (promene imena, prim. prev.), čija je kontrola snižena nakon promene imena su imali viši nivo verovanja u zavere, što nije bio slučaj sa onima koji su podržavali promenu. Dobijeni rezultati su replicirani i prošireni u drugoj studiji koja je sprovedena sa Amerikancima ($N$ = 266) nakon niza udara ozbiljnih i razarajućih tornada: efekti su bili potvrđeni samo za verovanja u zavere koja su bila povezana sa pretećim događajem. Ove studije ukazuju na moguću vezu između nedostatka kontole i verovanja u zavere u realnom svetu.

*Ključne reči*: verovanja u zavere, opažena kontrola, kompenzatorna verovanja, prirodne katastrofe, politička previranja

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## Appendix A

**Table 1**
*Uncontrollable and controllable situations*

| Situation that participants experience as uncontrollable | frequency |
|---|---|
| Other people | 85 |
| Transport problems | 48 |
| Climate/weather | 47 |
| Prices | 30 |
| Sickness | 21 |
| Emotion | 19 |
| Loses | 19 |
| Politics | 18 |
| Queue /overcrowding | 13 |
| Lotto /chance(uncertainty) | 12 |
| Entertainment availability | 11 |
| Outages, (e.g. internet, power) | 8 |
| Body/bodily functions | 8 |
| Aging | 7 |
| Car accident | 6 |
| Genes | 6 |
| Space objects | 5 |
| Work schedule | 5 |
| Laws of physics | 4 |
| Love | 3 |
| Dreams | 2 |
| Miscellaneous | 70 |
| Invalid answers | 23 |

| Situations that participants experience as controllable | frequency |
|---|---|
| Consumption | 64 |
| Leisure time | 61 |
| Clothes | 29 |
| Sleeping | 28 |
| Work | 27 |
| Money | 24 |
| Attitude | 21 |
| Exercise | 20 |
| Shopping | 18 |
| Body | 17 |
| Emotions | 16 |
| Vacation | 12 |
| Friends | 11 |
| Objects | 9 |
| Where I live | 7 |

| | |
|---|---|
| Study | 7 |
| Who I date | 6 |
| Who I talk to on the phone | 6 |
| Religious activities | 6 |
| Children | 6 |
| Home Chores | 5 |
| Showering | 5 |
| Life | 5 |
| Who I vote for | 4 |
| Dog | 4 |
| Mode of transport | 3 |
| Gifts | 3 |
| Smoking | 3 |
| Habits | 3 |
| Favourite things | 2 |
| Media consumption | 2 |
| Miscellaneous | 65 |