On Post-apocalyptic and Doomsday Prepping Beliefs: A New Measure, its Correlates, and the Motivation to Prep 🏠🏠

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Abstract: Post-apocalyptic scenarios provide the basis for popular television shows, video games, and books. These scenarios may be popular because people have their own beliefs and visions about the apocalypse and the need to prepare. The prevalence of such beliefs might also hold societal relevance and serve as a type of projective test of personality. However, there are no quantitative accounts of post-apocalyptic or prepping beliefs. As such, we conducted seven studies (N_{total} = 1034) to do so. In Studies 1 and 2, we developed a post-apocalyptic and prepping beliefs scale, explored its correlates, and confirmed its structure and psychometric properties. In Study 3, we attempted to activate a 'prepper' mindset and further explore the correlates of the new scale. In Studies 4 and 5, we investigated covariations in daily feelings, thoughts, and events, and prepping beliefs. In Studies 6a and 6b, we compared scores from 'real' preppers and to a non-prepping group. Overall, we found that post-apocalyptic concerns and prepping beliefs are predictive of low agreeableness and humility, paranoia, cynicism, conspiracy mentality, conservatism, and social dominance orientation. We also found that increased belief in the need to prep is associated with God-belief, negative daily experiences, and global political events. © 2019 European Association of Personality Psychology

Key words: post-apocalyptic beliefs; doomsday prepping; cynicism; conspiracy mentality; personality; individual differences

In 2012, the National Geographic Channel began airing a reality television series focused on a subculture called *Doomsday Preppers*. This documentary style show highlighted different 'preppers', who would explain their reasoning for prepping, how they were prepping, give tours of their prepping operation, and describe their plan of action or 'bug out' plan, for a post-apocalyptic world. While some were hoarding supplies and weapons for their own survival and protection, others were training and growing crops so that they could help others and rebuild. In nearly all cases, these 'preppers' had specific beliefs about what the post-apocalyptic world would look like.

The beliefs espoused in *Doomsday Preppers* appear, on their surface, to be the mental playground of fringe groups and extremists. However, we suggest that these beliefs are relatively common in everyday society. Of course, these beliefs will range from non-existent (e.g. no thoughts), to moderate (e.g. specific beliefs, but not enough to motivate behaviour), to strong (e.g. motivating relevant behaviours). Some of these

beliefs will also be more pessimistic than others. We deemed it likely that the relative strength of these beliefs can be leveraged to understand people's current personality and motivations and that focusing on these mainstream beliefs is more informative than focusing on fringe ideas. Furthermore, investigating these relative beliefs in 'normal' populations may be informative for understanding the personality of 'actual' preppers. The current investigation is xan exploration of these beliefs and their correlates.

BELIEFS ABOUT THE POST-APOCALYPSE

The popularity of television shows like *Doomsday Preppers* and *The Walking Dead*, video games like *Fallout 4*, and books like *The Road* suggests that people are fascinated by post-apocalyptic worlds. Popular culture researchers have suggested that the popularity of the apocalyptic genre is reflective of a society's collective perception of coming chaos (or 'anomie') and incipient collapse or, at least, abrupt change (Brummett, 1990). Indeed, it would seem that this genre serves as a way for the consumer to project their current, inarticulable feelings about society (Bendle, 2005; Ruff, 1979). That is, the post-apocalyptic world appears to be an imaginative place for people to project their current belief systems and desires (Wojcik, 1997).

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Leveraging the imaginative environment offered by post-apocalyptic scenarios may be of value to personality and social psychology in terms of understanding people's latent beliefs about humanity and society. Measuring hard-to-articulate attitudes, beliefs, and motives has a long history in psychology (e.g. Murray, 1943). For example, implicit cognitive tasks have been developed in personality and social psychology to solve a similar problem: to measure beliefs and attitudes that are not easily articulable (e.g. implicit associations tests: Greenwald, McGhee, & Schwartz, 1998). Measuring people's beliefs about the post-apocalyptic world and prepping, then, may be revealing of somewhat implicit personality and motivations. That is, it might be easier to say 'I fear what humans will do in a post-apocalyptic world' than to say 'I dislike humans'.

The *relative* strength of post-apocalyptic and prepping beliefs should also be informative. For example, we might compare two people who do not (behaviourally) prep for the post-apocalypse at all and find that one of them believes in the need to prep more than the other. This difference may be important. Research on prejudice provides as an apt comparison. Even if two people do not act on their prejudiced beliefs about race, the fact that one of them has more racist beliefs than the other may be consequential (Dovidio & Gaertner, 1998). As such, the current investigation is not necessarily focused on the 'real' preppers depicted in *Doomsday Preppers*—although we are not uninterested in that population—but is geared in particular to uncover and describe the relative differences in the post-apocalyptic and prepping beliefs of everyday people, and the correlations of these beliefs. These relative differences may be informative for normative personality and social psychological theory, as well as for understanding the psychology of more extremist beliefs (Doosje et al., 2016).

The primary challenge in understanding post-apocalyptic and prepping beliefs, and their everyday personality correlates, is identifying the specific, realistic, and consequential beliefs that should be measured. While some of the aforementioned work has provided critical analysis of post-apocalyptic media, there has been no empirical work identifying specific beliefs. As such, we gathered information by observing relevant media (i.e. *Doomsday Preppers*) and discussion boards and by discussing these beliefs with acquaintances. We then placed these observations into overarching themes. Three themes stood out: human nature, resource availability, and competitive survival. Another theme was general pessimism about the post-apocalyptic world, which appears to be a combination of the three themes. Our qualitative analysis was anything but rigorous, but media theorists from a variety of fields have identified similar themes (e.g. Gross & Gilles, 2012; Murphy, 2013; Wojcik, 1997).

With these considerations in mind, we set out to create a post-apocalyptic and prepping beliefs scale (PAPBS) and explore the correlates of relative differences in these themes of beliefs. We consider this a mostly exploratory venture. Even so, the different themes of beliefs naturally reflect existing variables in psychological science. We, briefly, describe these in the succeeding texts, by theme.

A concern about human nature and resources

In our observations, two common themes were fears about other humans and a concern regarding finite resources. These concerns were often combined (e.g. 'you have to have protection against those seeking to steal your food'), even though we originally conceived of them as separate. This type of belief seems to reflect an underlying distrust of humans. For example, in our observations, people often expressed the idea that without laws, humans will regress towards their baser instincts (e.g. selfishness and violence).

A relatively strong concern about resource availability and fears about humans, in a post-apocalyptic scenario, might speak to underlying anxiety. Indeed, a feature of anxiety is negative future-based thinking (Barlow, 2000; MacLeod & Byrne, 1996) and pessimistic outlooks (Miranda & Mennin, 2007). Of course, all predictions about a post-apocalyptic world are likely to be negative and about the future. Even so, resource concerns and worries over human nature are about the fundamentals of survival, which may be at the core of negative affectivity (Nesse & Ellsworth, 2009). As such, we expect that someone with stronger concerns about resources and human nature might also be prone to neuroticism. In addition, the inherent wariness of humans also suggests that those more worried about other humans would be more withdrawn, shy, and reserved. These are common features of introversion (John & Srivastava, 1999), and we expect some relations with this factor.

Cynicism and conspiracy beliefs go hand in hand with humanity and resource concerns. Cynicism is associated with a lack of trust in other humans and the belief that humans are motivated in a negative manner, deep down (Cook & Medley, 1954; Graham, 1993; Rosenberg, 1956). Conspiracy theories are attempts to identify the cause of a certain event or observation as a secret plot by a nefarious group of powerful people or organizations (Goertzel, 1994). Distrust of humans and conspiracy beliefs often preclude apocalyptic beliefs (Barkun, 2013). We also note that popular conspiracy-oriented media (e.g. the 'Infowars' radio program) actively sell 'preparedness' and 'protective' products on their websites (e.g. http://www.infowarsshop.com) and advertise such products within their programs. Overall, we expected that there would be some positive association between two factors and concerns about humans and resources.

Social Darwinism: beliefs about competition/cooperation and survival

In our observations, we also noted a consistent theme of competition, dominance, and survival. Much like social dominance orientation (SDO) (Pratto, Sidanius, Stallworth, & Malle, 1994), many post-apocalyptic beliefs surround the idea that humans are competitive, rather than cooperative, and relishing the idea of competitive survival: a survival of the fittest mindset. In fact, some people who we observed seemed excited by the idea of post-apocalyptic survival. Renner (2012) even draws a parallel between post-apocalyptic survival and the fetishizing of athletic survivalism (e.g. triathlons, mud runs, and military style obstacle races).

The scarcity of resources in the post-apocalyptic world is a reasonable concern. The competitive mindset might be a direct response to this concern, as scarcity leads to beliefs that certain groups deserve more resources over other groups (Sibley, Wilson, & Duckitt, 2007). This is a common feature of SDO (Pratto et al., 1994), which also includes the belief that certain groups are superior (i.e. the fittest) and a steadfast opposition to resource redistribution (Sidanius & Pratto, 2001). Furthermore, the goal of any competition is to gain a leg up on other people. In order to do so, in a successful competition, one needs to block an opponent from achieving their goal (Campbell, 1965; Deutsch, 1949). In the realm of a doomsday scenario, this would entail taking resources for oneself at the detriment of another or even harming other people. Indeed, competition leads to hostile behaviour (Sherif, 1954, 1966). These considerations suggest that someone endorsing the Social Darwinist mindset of post-apocalyptic survival also tends to be high on SDO, competitiveness, and selfishness and low on agreeableness, which is associated with hostility (John & Srivastava, 1999).

In a related manner, those who believe in competitive survival are also likely to believe that others are thinking similarly. This may lead to greater cynicism and conspiracy mentality and also to paranoid thoughts. One of the hallmarks of paranoid thought is the belief that others are 'out to get me' (Freeman & Garety, 2004). If a person believes that people will be competitive instead of cooperative, they may be particularly paranoid that others are coming to take their supplies and, perhaps, to harm them. In fact, in our discussions with acquaintances, one person responded, 'I'd get my gun', to the question 'what is the *first* thing you would do in a post-apocalyptic scenario?'.

THE CAUSES AND CONSEQUENCES OF PREPPING BELIEFS AND ACTUAL PREPPING BEHAVIOUR

So far, we have outlined the potential profiles of people who hold specific beliefs related to a post-apocalyptic world. We were also interested in the correlates of believing in the need to prepare—and current prepping behaviour—for the post-apocalypse. This is particularly uncharted territory. However, the general predictors of beliefs in impending apocalyptic scenarios might be informative. Traditionally, apocalyptic beliefs were religious in origin, but more recently, world events (e.g. war, nuclear weapons, political strife, economic hardship, and environmental destruction) have come to inspire these beliefs as well (Brummett, 1990; Wojcik, 1997). Even so, religious and supernatural ideologies seem to still be at the top of the heap. In fact, certain fundamentalist religious leaders (e.g. Pat Robertson) make connections between national emergencies (e.g. natural disasters) and God (see also Routledge, Abeyta, & Roylance, 2016). As such, it may be that those high in God-belief are more prone to prepping beliefs or behaviour.

A second factor that likely increases prepping beliefs and behaviour are world events, such as major political ones (Brummett, 1990; Wojcik, 1997). These types of events may be sufficient to scare people into believing in the need

to prep. In fact, in our observations, political strife and threat of war were often cited by actual preppers but were also considered 'justifiable' reasons to believe in the need to prep by non-preppers. As such, prepping beliefs and behaviour are likely to increase following such events.

In addition, each of the three themes (i.e. resource, humanity-based, and competition-based beliefs) should be predictive of belief in the need to prep and, perhaps, actual prepping behaviour. As such, the related constructs we have described previously are likely associated with prepping beliefs and behaviour, as well. In some cases, these correlates should logically lead to prepping beliefs and behaviour, whereas others should follow from them. We make no assumptions about causal direction.

Finally, there are likely some existential anxieties that play a role in prepping beliefs and behaviour. Terror management theory (Greenberg, Solomon, & Pyszczynski, 1997) and other related literatures (e.g. uncertainty management and meaning maintenance) have shown that increases in death thoughts and uncertainty lead to a greater need to control one's environment (for a review of this threat compensation literature, see Jonas et al., 2014). That is, at least according to some of these theoretical perspectives, when one thinks about their own mortality or feels uncertain, they want to feel as if they are in control of their lives (Fritsche, Jonas, & Fankhänel, 2008; Landau et al., 2004). Prepping, in this case, may lead people to feel in control over a chaotic world (post-apocalyptic or current). As such, death thoughts and uncertainty may be positively associated with prepping beliefs and behaviour.

CURRENT STUDIES

Our goals in the current studies were to (A) create a tool that measures beliefs about a post-apocalyptic world and prepping beliefs; (B) identify how these beliefs relate to common motives, beliefs, and behavioural tendencies; and (C) identify factors and events that relate to increased prepping beliefs and behaviour. Doing so adds construct validity by establishing a nomological network around our PAPBS.

In Studies 1a and 1b, we developed a scale of post-apocalyptic and prepping beliefs (Goal A) and began to explore its correlates (Goal B). In Study 2, we confirmed its factor structure. In Study 3, we attempted to prime a 'prepper' mindset to investigate the causal consequences of state prepper thoughts (Goal C). We did this in addition to looking at further correlates of post-apocalyptic beliefs (Goal B). In Studies 4 and 5, we investigated the daily correlates of prepping beliefs and the impact of global political events on prepping thoughts (Goal C). In Studies 6a and 6b, we investigated the correlates of post-apocalyptic beliefs, prepping beliefs, and actual prepping behaviour, in a group of actual preppers compared to non-preppers (Goals B and C).

This project was often running in tandem with other projects. As such, we do not report all variables collected.[1] Even so, we report all variables that we felt were even remotely

[1]We do not report the results from two studies, as the data were not of publishable quality. Neither study withholds any information about post-apocalyptic or prepping beliefs.

relevant. Furthermore, given that a number of our studies used substantially similar correlates, and following suggestions in the editorial process, we report meta-analytic effects when possible using the mini meta-analytic strategy of Goh, Hall, and Rosenthal (2016). In their introduction of this strategy, Goh et al. provide several advantages for including such analyses. Of most importance, providing these analyses can (i) provide evidence for smaller effects that many psychology studies do not have the power to detect in a single study, (ii) encourage the reporting of instances where a null effect is found, and (iii) provide a service to validating new scales by 'amalgamating' (Goh et al., 2016, p. 537) several studies using similar measures to provide a single, more interpretable, indicator of consistent relations. The method for calculating the meta-analytic effect size, in basic terms (see Goh et al., 2016 for full primer), is to convert the effect size estimates across studies to rs or Cohen's ds and then calculate a weighted (by N) mean effect size across the studies.

None of our hypotheses were preregistered. Data, materials, and analysis scripts are available on the Open Science Framework (https://osf.io/zudxp/). The materials include all measures collected, even if we did not analyse them. We also indicate, where applicable, if the datasets have been published or submitted elsewhere. Finally, all p-values are corrected for multiple tests. To do so, we used the Holm method (Holm, 1979). P-values within a given study were first rank ordered from smallest (most significant) to largest (least significant). Each p-value was then evaluated for significance against an α calculated via the formula $.05/(n - m + 1)$, where n represents the number of tests and m represents the rank-ordered position of the current test. Although somewhat more complex than the more standard Bonferroni correction, the Hold method preserves statistical power to a greater degree while still correcting for multiple tests (Holm, 1979). We also adjusted reported confidence intervals, in the same manner, by adjusting the alpha levels in step-wise fashion (see Ludbrook, 2000). As such, reported confidence intervals will vary in size based on the alpha adjustments.

STUDIES 1A AND 1B

We constructed 15 items that reflected the common themes that we had identified in our observations. A large sample of participants responded to these items, and we conducted an exploratory factor analysis to identify its factor structure. In general, we predicted that these scores would be around the midpoint and have sufficient variance to be of importance for mainstream psychological science. We then explored the correlations between our scale, its factors, and measures that we reasoned would be associated with the post-apocalyptic and prepping beliefs, based on our qualitative observations.

First, we investigated correlations between the PAPBS and the Big 6 (HEXACO) personality factors (Lee, Ogunfowora, & Ashton, 2005). We predicted that the PAPBS, and its factors, would be associated with lower agreeableness, openness, extraversion, and humility and

higher neuroticism. We did not have specific predictions for conscientiousness.

We also included measures of SDO (Pratto et al., 1994), God-belief (Fetterman, 2016), political conservatism (Bonanno & Jost, 2006; Knight, 1999), and positive and negative affect (Watson, 2000), in both samples. In Study 1a only, we included measures of regulatory focus (Sassenberg, Ellemers, & Scheepers, 2012) and paranoia (Freeman et al., 2005). We generally predicted that the PAPBS, and its factors, would be associated with higher SDO, political conservatism, God-belief, negative affect, and paranoia, as well as less positive affect. Furthermore, we predicted a positive association between our scale and prevention focus (avoiding loss) and a negative association with promotion focus (seeking reward).

Additional measures were included for other projects.[2] We deemed some relevant and others not. We describe the results for the relevant ones and omit the irrelevant ones. While we had some general predictions, this endeavour was mostly exploratory.

Beyond these general predictions, we also predicted that some of these correlations would vary in size for the specific subscales of the PAPBS. However, because we did not know exactly how these factors would come out, we did not make specific predictions. Additionally, Study 1a and 1b were collected in a German and American sample, respectively. While one might predict that doomsday prepping is a uniquely 'American' phenomenon, there are prepper communities all over the globe. As such, we did not predict differences between the samples regarding the PAPBS and its factors.

Method

Participants and procedures

Study 1a consisted of 130 (80 female, M_{age} = 27.16) participants, in Germany, who completed an online questionnaire in exchange for the chance to win one of ten 50 Euro Amazon gift cards. Study 1b consisted of 103 (53 female, M_{age} = 36.66) American participants from Amazon's Mechanical Turk,[3] who participated in exchange for $1.00. We based our sampling procedures, for both studies, on as many participants we could get and afford. To meet the criteria for sampling adequacy (Tabachnick & Fidell, 2007), we combined these samples. Each participant, who agreed to participate, clicked a link to an online Qualtrics survey, provided consent, and then completed several personality measures. They then saw a debriefing and thank you screen. For the German sample, we used German versions of the measures, if available, or translated English versions.

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[2]Data from this dataset have been published in Fetterman, Curtis, Carre, and Sassenberg (2019). None of the relations explored here were reported there.
[3]In all studies utilizing Amazon's Mechanical Turk, we set the requirements such that all participants were within the United States, had completed at least 50 Hits, and received 90% approval rating for those hits. This ensured participant quality, and only those participants who did not follow instructions were removed.

Post-apocalyptic and prepping beliefs scale
The instructions to our measure state that we are interested in 'people's attitudes about what would happen if society were to collapse due to some sort of catastrophe (e.g., financial collapse, war, natural disaster, asteroids, biblical apocalypse, etc.)'. We framed the questionnaire in terms of societal collapse, as this seemed to provide the most leeway in terms of interpretation. Participants indicated their level of agreement (1 = 'completely disagree' to 5 = 'completely agree') with 15 items (see Appendix A for all items) that reflected beliefs we saw articulated in our observations. We varied the focus of the items to reflect concerns about resources (e.g. 'If society were to collapse, resources for survival will be scarce'), concerns about humanity (e.g. 'Most people are opportunistic and would likely steal or kill others for supplies if society were to fall.'), competition/survival beliefs (e.g. 'If society should fall, it is everyone for him or herself. That is, survival of the fittest'), and general prepping beliefs (e.g. 'If society were to collapse, people had better be prepared'). We reverse scored items that were less pessimistic (e.g. 'Deep down, we are a cooperative species and would likely work together to rebuild society if it were to collapse'). We created a total score by averaging across items ($M = 3.02$, $SD = 0.58$), before exploring for subscales. This total score, which we call 'Post-Apocalyptic Pessimism (PA-Pessimism)', was internally reliable ($\alpha = .77$) and reflects an overall pessimistic view of the post-apocalypse.

Exploring the correlates of post-apocalyptic and prepping beliefs
There is no prior measure of this construct, so we validated it by comparing it to the constructs discussed in our introduction. We have abbreviated this section due to space concerns (see a full material descriptions and justifications in Data S1).

Big 6 (HEXACO) personality traits. We used the HEXACO-PI-R (Ashton & Lee, 2009) to measure the Big 6 personality traits (Ashton & Lee, 2005). Participants rated their agreement (1 = 'strongly disagree' to 5 = 'strongly agree') to 60 statements (10 for each factor). We averaged across items to create openness ($M = 3.56$, $SD = 0.68$), conscientiousness ($M = 3.61$, $SD = 0.59$), honesty/humility ($M = 3.23$, $SD = 0.67$), neuroticism ($M = 3.20$, $SD = 0.67$), extraversion ($M = 3.15$, $SD = 0.75$), and agreeableness ($M = 3.17$, $SD = 0.66$) scores for each participant. The measures were internally reliable (as were .76, .75, .74, .79, .85, and .78, respectively).

Social dominance orientation. We included the 16-item SDO measure (Pratto et al., 1994). Participants indicated how positive (1 = 'very negative' to 7 'very positive') they felt about 16 statements. We averaged across the items to create an SDO score which was internally reliable ($M = 2.45$, $SD = 1.15$, $\alpha = .95$).

Paranoia (German sample only). We included the conviction of paranoid thoughts scale (Freeman et al., 2005). Participants rated how much they believe (1 = 'do not believe it' to 5 = 'absolutely believe it') in 17 statements. We averaged across the items, and this score was internally reliable ($M = 1.93$, $SD = 0.58$, $\alpha = .90$).

Regulatory focus (German sample only). We included the German version of the regulatory focus measure (Sassenberg et al., 2012). Participants indicated their perceived accuracy (1 = 'completely inaccurate' to 7 = 'completely accurate') of 12 statements measuring promotion focus and 12 statements measuring prevention focus. We averaged the promotion-focus ($M = 4.73$, $SD = 0.77$) and prevention-focus ($M = 5.12$, $SD = 0.77$) items separately. These measures were internally reliable (as were .77 and .90, respectively).

Politics and religion. We measured political ideology using one question (Bonanno & Jost, 2006; Knight, 1999): 'Where would you place yourself on this scale?' Participants responded on a 7-point scale (1 = 'extremely liberal' to 7 = 'extremely conservative'; $M = 3.37$, $SD = 1.46$). We also measured God-belief with one item used successfully in past studies (e.g. Fetterman, 2016; van Elk, Rutjens, van der Pligt, & Van Harreveld, 2016): 'To what extent do you believe in a god' (1 = 'not at all' to 5 = 'fully and completely'; $M = 2.94$, $SD = 1.56$).

Positive/negative affect. We measured positive and negative affect using the Positive and Negative Affect Schedule (PANAS: Watson & Clark, 1994). Participants rated how much (1 = 'not at all or very little' to 5 = 'extremely') they felt 10 positive affective states and 10 negative affective states. We created a positive affect score by averaging across positive items ($M = 3.23$, $SD = 0.76$; $\alpha = .86$) and negative affect score by averaging across negative items ($M = 2.08$, $SD = 0.68$; $\alpha = .89$). Additional subscales from the expanded version of this instrument were administered but are not reported here, as they are not of substantive interest.

Moral dilemmas (US sample only). We included five classic moral dilemmas (e.g. the trolley dilemma) aimed at measuring deontologist (intuitive) versus consequentialist (rational, greater good) moral decision making (Conway & Gawronski, 2013; Greene, 2011). We coded deontological responses as '1' and consequentialist responses as '0' and then averaged across the items ($M = 0.50$, $SD = 0.30$). This measure showed acceptable internal consistency ($\alpha = .61$).

Other potentially related constructs. We constructed the PAPBS at the same time as several other measures. As such, we include the relevant measures. The willingness to admit wrongness measure (Fetterman et al., 2019) is a seven-item, scenario-based scale measuring the likelihood that the respondent will admit when they are wrong, on a 5-point scale (1 = 'very unlikely' to 5 = 'very likely'). We averaged across the items and found it to be internally reliable ($M = 3.66$, $SD = 0.78$, $\alpha = .82$). The second related construct was resistance to persuasion (1b only) (Briñol, Rucker, Tormala, & Petty, 2004). Participants responded to 16 items on a 5-point scale (1 = 'extremely characteristic of you' to 5 = 'extremely characteristic of you'). It was internally reliable ($M = 3.18$, $SD = 0.63$, $\alpha = .90$).

The third related construct was the construal of power as a responsibility (1a only) (Scholl, Sassenberg, Ellemers, Scheepers, & De Wit, 2018). Participants read a scenario in which their friend needs help. They then indicated their level of agreement (1 = 'strongly disagree' to 7 = 'strongly agree') to five statements meant to measure whether they felt the

responsibility to help. We averaged across items and found the measure to be reliable ($M = 5.13$, $SD = 1.13$, $\alpha = .85$).

Finally, we included the situational test of emotional understanding (MacCann & Roberts, 2008), as we deemed it of potential relevance (1a only). Participants indicated which emotion (e.g. 'guilty', 'distressed', 'sad', 'scared', and 'angry') is most likely present in a set of 42 situational descriptions. We scored correct answers with a '1' and incorrect answers with a '0'. We averaged across the items to get an accuracy score for each participant and found an acceptable level of internal reliability ($M = 0.62$, $SD = 0.12$, $\alpha = .73$).

Results

The structure of the post-apocalyptic and prepping beliefs scale

The primary goal of Studies 1a and 1b was to develop the PAPBS and identify its sub-factors. To determine the proper number of factors to retain, we first consulted a number of relevant indices (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Goldberg & Velicer, 2006). Results of an exploratory Principle Components Analysis (PCA) yielded four factors with eigenvalues greater than 1.00 (Figure 1). Although frequently employed, statistical simulations indicate that the eigenvalue-greater-than-one rule of Kaiser (1960) often overestimates the proper number of factors (Fabrigar et al., 1999; Goldberg & Velicer, 2006). An examination of the scree plot showed a steady tapering off after roughly the fourth or fifth factor (Figure 1). However, such visual inspections are inherently subjective, somewhat unreliable, and also tend to overestimate the proper number of factors. A minimum average partial analysis (Velicer, 1976) suggested that only two factors should be retained, as the average partial correlation between items after controlling for the extracted factors reached its minimum when two factors were extracted. The parallel analysis (e.g. Horn, 1965) suggested that three factors should be extracted, as three eigenvalues exceeded those extracted from parallel, randomly generated datasets (i.e. with 234 participants, 15 variables, and 100 randomly generated datasets). Statistical simulations indicate that both of these indices are largely accurate but that the minimum average partial test tends to underestimate when inaccurate and the parallel analysis tends to overestimate when inaccurate
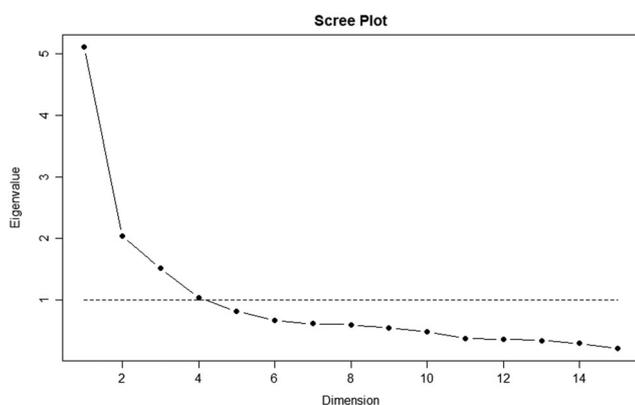
(Fabrigar et al., 1999; Goldberg & Velicer, 2006). Thus, these indices indicate that two to three factors should be retained.

We next inspected the two and three component solutions for conceptual interpretability and statistical viability. A promax rotation was employed, as initial analyses indicated that all factors were positively correlated (Fabrigar et al., 1999). The Kaiser–Meyer–Olkin test of sampling adequacy suggested that our sampling was adequate, .825 (Cerny & Kaiser, 1977), and Bartlett's test of sphericity was significant, $\chi^2 (105) = 1349.69$, $p < .001$. Items were considered to load on a factor if their maximum loading was $\geq |.30|$, and there were no secondary loadings within $|.10|$.

In the two-component solution, general prepping beliefs (component 2) were distinguished from all other items (component 1). In the three-component solution, concerns about humanity/resources (component 1) were further distinguished from social Darwinism (component 2). Prepping beliefs again appeared (as component 3). Because this provided a useful conceptual distinction and was otherwise statistically viable (see in the succeeding texts), we ultimately retained the three-component solution. This solution is displayed in Table 1.

Four items uniquely loaded on both the concerns about humanity/resources factor and the prepping beliefs factor, while three items uniquely loaded on the social Darwinism factor. Four additional items (all describing trust in others) loaded almost equally well on the concerns about humanity/resources and social Darwinism components, and they were thus discarded from the PAPBS factors. All factors exhibited at least adequate levels of internal consistency (see Table 2 for descriptive statistics and internal reliability coefficients). Further, most means were in the middle of the response scale indicating that post-apocalyptic and doomsday prepping beliefs are common in the general population and worthy of empirical attention.

Exploring the correlates of the post-apocalyptic and prepping beliefs scale and its factors

We ran a simple correlation analysis including all variables (see Table 3 for correlations between PAPBS factors and Table 4 for PAPBS-specific results with at least some significant relations with the variables of interest and Data S2 for a full matrix). As expected, PA pessimism and all subscales were significantly intercorrelated, with prepping beliefs showing the smallest correlation with all others.

Big 6 (HEXACO) personality traits. Both agreeableness and honesty/humility were negatively related to PA-pessimism and social Darwinism. Extraversion was negatively correlated with PA pessimism and all subscales, except prepping beliefs. Neuroticism was significantly positively correlated with humanity/resource concerns. Additionally, openness was significantly negatively correlated with PA-pessimism and social Darwinism.

Social dominance orientation. We predicted that the PAPBS and its factors would be positively associated with SDO. Interestingly, there were only significant relations with PA-pessimism and one subscale: social Darwinism.

Paranoia. Paranoia was positively related to PA-pessimism and social Darwinism.

Figure 1. Principle components factor analysis scree plot, Study 1.

Table 1. Factor loadings for the PAPBS and sub-factors

| | Factor | | |
Item	1 'Humanity/resource concerns'	3 'Social Darwinism'	4 'Prepping beliefs'
(13) Scarce resources	.796	—	—
(14) Enough resources for everyone	−.872	—	—
(07) People will kill for supplies	.750	—	—
(02) People will go crazy and fight	.612	—	—
(10) I would share my supplies	—	.782	—
(09) Shoot first and ask questions second	—	−.672	—
(11) Survival of the fittest	—	−.694	—
(04) Important to stockpile food and supplies	—	—	.850
(05) Important to stockpile weapons and ammo	—	—	.716
(15) People had better be prepared	—	—	.693
(01) Fall of society is coming, likely soon	—	—	.523
(03) People will work together	*−.427*	*.465*	*—*
(12) We are a cooperative species	*−.440*	*.496*	*—*
(06) I can trust my fellow humans	*−471*	*.444*	*—*
(08) I would not trust most people	*.488*	*−.345*	*—*

Note: Discarded items in italics. PAPBS, post-apocalyptic and prepping beliefs scale.

Table 2. Descriptive statistics and internal reliability coefficients for the PAPBS and its factors in all studies

Study	PA-pessimism (total score) M (SD), alpha	Humanity/resource concerns M (SD), alpha	Social Darwinism M (SD), alpha	Prepping beliefs M (SD), alpha	Current prepping M (SD), range (max poss.)
Studies 1a and 1b	3.02 (0.60), .77	3.67 (0.79), .80	2.48 (0.80), .68	2.77 (0.83), .69	-
Study 2	3.14 (0.67), .84	3.52 (0.83), .79	2.66 (0.87), .73	3.12 (0.92), .78	1.59 (0.92), 1–5 (5)
Study 3	3.23 (0.73), .88	3.71 (0.88), .85	2.72 (0.94), .76	3.13 (0.82), .74	1.37 (0.51), 1–3 (3)
Study 4	2.97 (0.54), .76	3.44 (0.74), .72	2.32 (0.72), .72	2.99 (0.67), .62	1.15 (0.39), 1–3 (3)
Study 5	3.25 (0.74), .71	3.64 (0.64), .66	2.58 (0.76), .73	3.37 (0.62), .55	1.18 (0.41), 1–3 (3)
Study 6a	3.35 (0.59), .82	3.72 (0.75), .72	2.51 (0.73), .63	3.60 (0.76), .82	2.95 (0.96), 1–5 (5)
Study 6b	3.00 (0.69), .83	3.39 (0.84), .76	2.48 (0.85), .66	3.01 (0.92), .79	1.41 (0.74), 1–4 (5)

Note: PAPBS, post-apocalyptic and prepping beliefs scale.

Politics and religion. We predicted and found significant positive correlations between conservatism and PA-pessimism and all subscales, aside from social Darwinism. We also predicted significant positive correlations between God-belief and PA-pessimism and the subscales. Prepping beliefs were uniquely significantly correlated with greater God-belief.

Other potentially related constructs. There were no significant correlations with the other measured constructs after p-value adjustments (all $ps > .101$).

Nationality. Because the data from these samples were collected in the United States and Germany, we could investigate differences between US and a European culture. PA-pessimism scores were slightly higher in the United States ($M = 3.12$, $SD = 0.64$) than in Germany ($M = 2.93$, $SD = 0.52$), $F(1, 232) = 6.61$, $p = .033$, $\eta^2_{part} = .03$, 95% CI [0.000, 0.096]. Additionally, prepping belief scores were much higher in the United States ($M = 3.12$, $SD = 0.82$) than in Germany ($M = 2.49$, $SD = 0.72$), $F(1, 232) = 38.93$, $p < .001$, $\eta^2_{part} = .14$, 95% CI [0.053, 0.250]. Humanity/resource concerns and social Darwinism scores did not differ by country ($ps > .05$).

Discussion

We combined Studies 1a and 1b to create a PAPBS and identify its factors. The PAPBS can be scored in total (PA-pessimism) but also has three subscales. These subscales deal with the types of concerns people have about a post-apocalyptic world (i.e. about humanity and resources), the belief in competitive social hierarchy (i.e. social Darwinism), and general beliefs in the need to prepare for a post-apocalyptic world. We save the summary of PAPBS correlates till the general discussion but point to the fact that the PAPBS factors scores suggest that these beliefs are not uncommon in the general public and do serve as latent indicators of everyday motives and personality.

STUDY 2

Study 2 was designed to confirm the factor structure obtained in Study 1. A separate sample of participants completed the PAPBS, and a confirmatory factor analysis was conducted.

Table 3. Correlations and meta-analytic effects among the PAPBS factors across variables and studies

Variable	Study (N)	PAPBS factor			
		Human/resource concerns	Social Darwinism	Prepping beliefs	Prepping behaviour
PA-pessimism (total score)	Study 1 (234)	.76**	.68**	.72**	-
	Study 3 (133)	.88**	.82**	.81**	.40**
	Study 4 (90)	.81**	.75**	.67**	.23
	Study 5 (137)	.78**	.68**	.68**	.14
	Study 6a (79)	.83**	.73**	.78**	.37**
	Study 6b (80)	.80**	.71**	.82**	.35**
	Meta-analysis	.807**	.726**	.745**	.294**
Human/resource concerns	Study 1 (234)	-	.37**	.25**	-
	Study 3 (133)	-	.64**	.53**	.23
	Study 4 (90)	-	.50**	.24	.08
	Study 5 (137)	-	.37**	.28*	−.04
	Study 6a (79)	-	.49**	.42**	.22
	Study 6b (80)	-	.40**	.46*	.25
	Meta-analysis	-	.456**	.352**	.136**
Social Darwinism	Study 1 (208)	-	-	.23**	-
	Study 3 (133)	-	-	.48**	.20
	Study 4 (90)	-	-	.25	.13
	Study 5 (137)	-	-	.15	−.04
	Study 6a (79)	-	-	.35**	.27
	Study 6b (80)	-	-	.40**	.17
	Meta-analysis	-	-	.297**	.130**
Prepping beliefs	Study 3 (133)	-	-	-	.55**
	Study 4 (90)	-	-	-	.31*
	Study 5 (137)	-	-	-	.36**
	Study 6a (79)	-	-	-	.39**
	Study 6b (80)	-	-	-	.37**
	Meta	-	-	-	.413**

Note: PAPBS, post-apocalyptic and prepping beliefs scale.

Method

Participants and procedure

A Monte Carlo simulation (with 10 000 replications; Muthén & Muthén, 2002; cf. Brown, 2015) indicated that 350 participants would provide sufficient power to conduct a confirmatory factor analysis of the factor structure obtained in Study 1 (see Data S1 for more information on this simulation and on its usefulness over more traditional 'rules of thumb'). As such, 350 workers (172 female, M_{age} = 35.7) from Amazon's Mechanical Turk were recruited to participate in this study. After providing informed consent, participants completed the PAPBS (see Table 2 for descriptive statistics), provided demographic information, and were paid upon completion.

Results

A confirmatory factor analysis (CFA) using maximum likelihood estimation was conducted with MPlus software (version 7.4). All 11 items retained for the factors were specified to load onto their respective factors. Initial analyses of the Study 1 dataset indicated that two items (i.e. 'enough resources' and 'scarce resources') exhibited correlated error terms. Because these items were clearly more similar in wording and content than other resource-concern items, we allowed their error terms to correlate in this model. All items loaded strongly (bs > .57, ps < .001) onto their specified factor, and the latent factors were all correlated with one another. Global model fit was judged to be adequate, χ^2 (40) = 126.36, $p < .001$;

RMSEA = 0.079; CFI = 0.94; SRMR = 0.053, according to criteria generally proposed in the literature (e.g. Bentler, 1990; Hu & Bentler, 1999; Kline, 2011; see Marsh, Hau, & Wen, 2004, for an argument against rigid application of these rules). In sum, Study 2 provided additional evidence for the three-factor structure of the PAPBS.[4]

STUDY 3

In Study 3, we assessed further correlates of the PAPBS. The additional correlates were cooperativeness in a common goods game, cynicism, and conspiracy beliefs. If people are worried about resources, humanity, competition, and believe in the need to prep, they may be more likely to harvest more than their share from, and less likely to contribute to, a common good. We predicted significant negative relations with willingness to contribute, and significant positive relations with the amount harvested from, a common good.

Based on our observations, we investigated and predicted positive relations between PA-pessimism, the subscales, cynicism, and conspiracy mentality. We picked a cynicism measure that focuses solely on cynicism regarding human

[4]At the request of a reviewer, we also conducted a multi-group CFA on a larger dataset, which combined the samples from Studies 2–6 (total n = 864). When factor loadings were constrained to be equal across samples, model fit was again adequate, χ^2 (232) = 457, $p < .001$; RMSEA = 0.075; CFI = 0.93; SRMR = 0.076. Data S1 provides further information on this model and its proper interpretation.

Table 4. Correlations and meta-analytic effects for the PAPBS factors across variables and studies

Variable	Study (N)	PA-pessimism (total score)	Human/resource concerns	Social Darwinism	Prepping beliefs	Prepping behaviour
		PAPBS factor				
Humility	Study 1 (214)	−.29**	−.19	−.35**	−.12	-
Neuroticism	Study 1 (214)	.18	.24**	.04	.09	-
Extraversion	Study 1 (214)	−.30**	−.22**	−.24**	−.19	-
Agreeableness	Study 1 (214)	−.26**	−.20	−.33**	−.06	-
Conscientiousness	Study 1 (214)	−.13	−.07	−.20*	−.04	-
Openness	Study 1 (214)	−.26**	−.13	−.33**	−.14	-
Paranoid	Study 1 (105)	.32*	.14	.29*	.25	-
Wrongness admission	Study 1 (234)	−.15	−.14	−.33**	.08	-
	Study 1 (209)	.33**	.20**	.18	.32**	-
	Study 3 (133)	.22	.10	.10	.34**	.20
	Study 6a (77)	.18	.04	.14	.24	.00
	Study 6b (80)	.42**	.24	.42**	.35**	.27
Conservatism	Meta-analysis	.296**	.157**	.195**	.320**	.172**
	Study 1 (209)	.14	−.03	−.01	.26**	-
	Study 3 (133)	.12	.08	.01	.23**	.22
	Study 6a (78)	.03	−.04	.01	.11	−.04
	Study 6b (80)	.14	.00	.10	.23	.09
God-belief	Meta-analysis	.119**	.003	.016	.226**	.117*
	Study 1 (208)	.25**	.05	.42**	.13	-
	Study 3 (133)	.33**	.16	.37**	.32**	.25**
	Study 6a (78)	.28	.11	.35*	.25	−.01
	Study 6b (80)	.19	.02	.45**	.06	.03
Social dominance orientation	Meta-analysis	.269**	.085	.403**	.191**	.125*
	Study 3 (133)	−.12	−.06	−.07	−.16	−.15
	Study 6a (71)	.09	.11	.06	.04	.15
	Study 6b (80)	−.39**	−.35*	−.29*	−.28	−.01
Contribute (PBS)	Meta-analysis	−.152*	−.105*	−.104*	−.149*	−.038
	Study 3 (133)	.18	.14	.20	.12	−.01
	Study 6a (72)	−0.16	−.08	−.13	−.17	−.20
	Study 6b (80)	−.02	.08	.22	−.12	−.13
Harvest (fish)	Meta-analysis	.052	.070	.127*	−.020	−.094
	Study 3 (133)	.52**	.53**	.44**	.32**	.20
	Study 4 (84)	.24	.31	.14	.07	−.04
	Study 5 (125)	.32**	.21	.32**	.15	.08
	Study 6a (79)	.62**	.61**	.49**	.37**	.34*
	Study 6b (80)	.50**	.48**	.51**	.23	.03
Cynicism	Meta-analysis	.445**	.428**	.385**	.232**	.127**
	Study 3 (133)	.46**	.43**	.30**	.42**	.15
	Study 4 (84)	.31*	.25	.26	.19	.09
	Study 5 (125)	.13	−.01	.18	.1	.07
	Study 6a (79)	.41**	.22	.33*	.41**	.36*
	Study 6b (80)	.38**	.18**	.17	.49**	.12
Conspiracy mentality	Meta-analysis	.337**	.223**	.248**	.318**	.150**
	Study 4 (84)	.46**	.33*	.38**	.32*	.35*
	Study 5 (125)	.37**	.32**	.20	.27*	.28*
Daily prepping thoughts	Meta-analysis	.407**	.324**	.274**	.290**	.308**
	Study 4 (84)	.19	.26	.07	.07	−.17
	Study 5 (125)	.06	.12	.24	−.22	−.14
Daily stress	Meta-analysis	.112	.177*	.173*	−.106	−.152*
	Study 4 (84)	.10	−.08	−.06	.19	.30
	Study 5 (125)	.28*	.25	.16*	.18*	.03
Daily death thoughts	Meta-analysis	.210**	.121	.07	.184**	.141*
	Study 4 (84)	.27	.25	.14	.21	.19
	Study 5 (125)	.13	.21*	.09	−.03	.18
Daily protective object	Meta-analysis	.187**	.226**	.11	.067	.184**
Daily anger	Study 5 (125)	.20	.16	.27*	.00	.03

Note: P-values adjusted for multiple tests. Meta-analyses calculated using the methods of Goh et al. (2016). PAPBS, post-apocalyptic and prepping beliefs scale. *$p < .05$. **$p < .01$.

nature (Rosenberg, 1956). Our conspiracy mentality measure was that of a general conspiracy ideation (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013).

In addition, we wanted to see whether temporarily increasing prepping thoughts would increase beliefs in line with prepping beliefs. Doing so would show that putting

someone in a prepper mindset would also make them 'think' more like someone high in prepping beliefs (i.e. showing a causal direction of influence). As such, we created a writing task with two conditions to induce a prepper mindset. In one condition, participants wrote about what they would do to prepare for societal collapse. In the other condition, participants wrote about preparing for a hiking and camping trip. We found that those in the prepping condition scored higher on prepping beliefs than those in the camping condition. This increase in prepping beliefs was related to higher scores on the other outcome measures. Even so, because this indirect model was not part of our initial predictions, we interpret these results with caution and report the full details of the experiment in Data S1 and omit it here.

Methods

Participants and procedure
We based our sample on detecting a medium effect with our manipulation. As such, we recruited 133 (56 female) participants via Amazon Mechanical Turk. This would have provided sufficient power $(1 - \beta = .80)$ to detect a medium-sized effect $(d = 0.50)$. Participants earned \$0.75 for participation. After accepting the study, participants clicked a link to an online Qualtrics study. Qualtrics randomly assigned the participants to the 'doomsday prepping' or 'camp/hike prepping' writing condition (results reported in Data S1). Participants then completed the battery of questionnaires and provided demographic information. We then provided them with a code to enter into Amazon Mechanical Turk to receive payment.

Materials
Post-apocalyptic and prepping beliefs scale. Participants completed the PAPBS, with one difference. We added a question to assess participants' current amount of prepping. This item is meant to be separate from the PAPBS and to serve as a behavioural measure that may provide some criterion validity for the scale and allow us to explore the correlates of prepping behaviour. The question read, 'Are you currently preparing for a doomsday scenario, disaster, or any other societal collapse?' Participants responded on a 3-point scale (1 = 'not at all' to 3 = 'Yes, very much'). We called this the 'current prepping' score. We scored PAPBS based on our three factor solution (see Table 2 for descriptive statistics).

Public goods. We used classic public goods/tragedy of the commons scenarios (Brewer & Kramer, 1986) to measure selfishness/cooperativeness. The first scenario was about the Public Broadcasting Service (PBS). Participants read about how PBS is a public good, but that it can only stay viable if people donate. However, they also read that the service is free regardless of whether they donate or not. Participants indicated how much money they were willing to donate in US dollars, with zero as an option. We removed one participant's response, which was extreme. Responses to this question served as a 'contribution to a public good' score $(M = 13.15, SD = 28.03)$. In the second scenario, participants read about a single lake that everyone

can fish from and that if everyone takes two fish per week, the fish population will replenish itself. They also read that no one would know if they take more than two fish, and doing so would ensure that their family has enough food. Participants then indicated how many fish they would harvest. We removed the same participant's response, as it was an extreme outlier. Responses to this question served as a 'fish harvesting' score $(M = 3.28, SD = 5.99)$.

Human-based cynicism. We measured human-based cynicism using three items from the 'faith in humans' scale of Rosenberg (1956). Participants responded to three items (e.g. 'Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?') on a 5-point scale (e.g. 1 = 'you cannot be too careful' to 5 = 'most people can be trusted') $(M = 3.19, SD = 1.14, \alpha = .90)$.

Conspiracy mentality. To assess general conspiracy beliefs, we utilized the Conspiracy Mentality Questionnaire (Brude et al., 2013). Participants indicated their level of certainty (0% = 'certainly not' to 100% = 'certain', in 10% increments) for five statements (e.g. 'I think that many very important things happen in the world, which the public is never informed of') $(M = 7.03, SD = 2.13, \alpha = .85)$.

Social dominance orientation, God-belief, and conservatism. We used the same SDO $(M = 2.22, SD = 1.26)$, God-belief $(M = 2.38, SD = 1.56)$, and conservatism $(M = 3.18, SD = 1.81)$ measures used in Study 1.

Results

We ran a correlation analysis (see Table 2 for relations between PAPBS factors and Table 3 for relations between the PAPBS and the other measures and Data S2 for a full matrix). All factors of the PAPBS were significantly correlated with each other. Prepping beliefs predicted current prepping to a greater degree than the other factors.

There were no significant correlations between PA-pessimism or the subscales and the public goods contribution question (PBS). There were, however, small significant positive correlations between PA-pessimism and social Darwinism and the amount of fish harvested.

There were strong positive correlations between PA-pessimism and all subscales and the human-based cynicism measure. Conspiracy mentation scores were also positively and significantly correlated with PA-pessimism and all subscales. However, it was not significantly correlated with current prepping. This begins to suggest that these beliefs systems (conspiracy and cynicism) are precursors to prepping.

As with Study 1, God-belief was positively and significantly correlated with prepping beliefs. This was also the case for current prepping. Conservatism was also positively and significantly correlated with PA-pessimism, prepping beliefs, and current prepping, but not the other subscales. Finally, SDO was positively and significantly correlated with PA-pessimism, current prepping, and the subscales, except for humanity/resource concerns.

Discussion

Study 3 was able to partially replicate correlations from Study 1. Moreover, we discovered additional correlates for PAPBS and its factors: cooperation, cynicism, and conspiracy beliefs. We added a new item that measured current prepping behaviour that was strongly related to prepping beliefs, adding criterion validity for our scale. Furthermore, a writing task that was meant to temporarily activate a prepping mindset successfully increased prepping beliefs, which then significantly predicted the other measures. However, the writing task did not directly affect any other scores (Data S1).

STUDIES 4 AND 5

In Studies 4 and 5, we shifted our focus to Goal C: identifying factors and events that relate to stronger prepping beliefs and behaviour. In both studies, we investigated daily correlates of prepping beliefs using a 2-week daily survey protocol. We predicted that on days in which people reported more negative events, feelings, and thoughts (e.g. negative emotion, death thoughts, or negative events), they would report more prepping ideation. We also predicted that on days in which people had more prepping ideation, they would be more likely to carry an object that could serve a protective purpose (e.g. ranging from a gun to a pencil to keys).

We also investigated whether important political events, with the potential to lead to unrest (e.g. protests), were associated with higher prepping ideation. As such, we set up our daily sampling protocols—Study 4 occurred in the United Kingdom and Study 5 in the United States—so that the 2016 referendum to leave the European Union (Brexit) vote (Study 4) and the 2016 US presidential election (Study 5) would take place toward the end of our 2-week sampling period. Therefore, we were able to look at the change in prepping ideation across these events. We predicted that prepping ideation would be highest following the Brexit vote and US presidential election, depending on the outcome and participant's opinion.

Method

Participants and procedure

We invited participants in both studies to partake in an initial study, followed by a 14-day daily diary protocol. All participants signed up online via SONA. For completing the initial study, participants in Study 4 earned 6 British Pounds and those in Study 5 earned 1 credit toward their psychology class. They could then earn 1 British Pound (Study 4) and 0.5 credit (Study 5) per daily survey completed, and there were 14 daily surveys. For both studies, we monitored participation and dropped participants who missed 5 days: standard procedure in the first author's lab and the intent is to encourage compliance.

In Study 4, 90 participants from the University of Essex completed the initial assessment, while 84 (70 female, M_{age} = 24.12) completed the daily protocol. The study was not restricted to students. Given that the University of Essex has a large international population, over half of the participants (48) were non-native English speakers. In Study 5, 137 participants from the University of Texas at El Paso completed the initial assessment, while 125 (85 female, M_{age} = 20.82) completed the daily protocol. We recruited as many participants as possible for 1 week, which typically leads to sufficient power for these within subject daily protocols.

For both studies, a number of researchers pooled their resources and contributed tasks to the initial assessment and daily questionnaires, as is typical for these time intensive and expensive protocols (Finkel, Eastwick, & Reis, 2015).[5] As such, most of these questionnaires and tasks were unrelated to the current investigation. For the initial survey, participants came to a lab room (Study 4) or clicked a link to an online Qualtrics survey (Study 5) where they completed a battery of questionnaires, including the PAPBS, and a memory task (Study 4 only). They also provided their email addresses and were given instructions for completing the daily survey and the rules regarding missed surveys. For both studies, the initial portion started on a Monday and ended on a Friday. The following Monday, we sent out the first survey at 5:00 pm and participants had until 3:00 am to complete it. This happened every evening for 14 consecutive evenings. Participants completed, on average, 11.13 surveys in Study 4 and 9.59 in Study 5.

Materials

Initial survey. Participants completed the PAPBS in the initial survey (see Table 2 for descriptive statistics).

Daily items Study 4. Participants responded to the daily survey every evening with the past 24 h in mind. First, with the stem 'Today, I felt …', participants reported how much (1 = 'not at all' to 4 = 'very much') negative emotion (M = 2.20, SD = 0.62), positive emotion (M = 2.78, SD = 0.57), depression (M = 1.85, SD = 0.70), and stress (M = 2.30, SD = 0.68) they felt. In addition, they reported how true (1 = 'not true at all today' to 4 = 'very much true today') the statements 'Today, I felt like I couldn't trust other humans' and 'Today, I felt as if I was being monitored for sinister purposes' were for that day. These items were meant to measure daily cynicism (M = 1.66, SD = 0.65) and conspiracy mentality (M = 1.25, SD = 0.43), respectively. They also reported how true (same scale) the statements 'Today, something good happened to me' and 'Today, something bad happened to me' were for that day. These items were meant to measure daily positive (M = 2.42, SD = 0.58) and negative events (M = 1.70, SD = 0.45), respectively. Participants then provided their level of agreement (1 = 'strongly disagree' to 4 = 'strongly agree') to the statements 'Today, my personal existence was purposeful and meaningful', 'Today, I spent some time thinking about how my life will someday end', 'Today, I avoided all thoughts of death',

and 'Today, I thought about how life is short'. The first item was meant to measure daily meaning in life ($M = 2.83$, $SD = 0.51$) and the latter three were averaged, with the second item reversed, as a measure of daily death thoughts ($M = 2.02$, $SD = 0.67$, $\alpha = .68$).

In order to measure daily prepping thoughts, participants indicated how accurate (1 = 'very inaccurate' to 5 = 'very accurate') the statement 'Today, I thought about being prepared for societal collapse' was for that day ($M = 1.45$, $SD = 0.64$). Finally, participants indicated how accurate (same scale) the statement 'Today, I had an object to defend myself at all times' was for that day as well ($M = 1.81$, $SD = 0.77$). This question measured the tendency to carry a tool that they felt would help them defend themselves. Virtually, anything can fit this category, as long as the participant thinks of the object in protective way. We avoided referring to actual weapons (e.g. guns or knives), as these are less available in the United Kingdom and mentioning them would likely preclude participants from thinking of alternative objects (e.g. a pencil).

Daily items Study 5. Participants responded to how they felt emotionally ($M = 6.34$, $SD = 0.1.21$) and how much arousal ($M = 4.39$, $SD = 1.61$) they felt on that day, using the self-assessment manikin (Bradley & Lang, 1994) with a 9-point scale (higher scores = positive valence and more arousal). Then, with the stem 'Today, I felt …', participants reported how accurate (1 = 'very inaccurate' to 5 = 'very accurate') statements regarding depression ($M = 2.34$, $SD = 0.87$), stress ($M = 3.48$, $SD = 0.83$), meaning ($M = 3.43$, $SD = 0.72$), anger ($M = 2.50$, $SD = 0.71$), nervousness about ambiguity ($M = 2.61$, $SD = 0.74$), and uncertainty ($M = 2.88$, $SD = 0.79$) were for them that day. They also reported the accuracy of the same statements used in Study 4 regarding cynicism ($M = 2.38$, $SD = 0.65$) and conspiracy mentality ($M = 1.65$, $SD = 0.65$).

Participants also indicated their level of agreement (1 = 'strongly disagree' to 5 = 'strongly agree') to the statements 'Today, something bad happened to me' ($M = 2.20$, $SD = 0.67$) and 'Today, something good happened to me' ($M = 3.51$, $SD = 0.69$). They also indicated how true (1 = 'completely false' to 4 'completely true') the statement 'Today, I carried an object or weapon to defend myself' ($M = 1.27$, $SD = 0.55$) was for them that day. Again, we kept this item vague. Finally, participants rated how often (1 = 'never' to 4 = 'very often') they thought about how their lives would someday end ($M = 1.89$, $SD = 0.80$) and thought about preparing for societal collapse ($M = 1.47$, $SD = 0.55$). We changed the response scales so that they were more intuitive.

Results

Between-person correlations

In order to evince the validity of our daily measure of prepping ideation, we averaged the daily items and analysed the correlations between these scores and the initial PAPBS scores. However, we emphasize daily covariations for relations between the daily variables using multi-level modelling (Raudenbush & Bryk, 2002). As such, Table 3 only presents

the relations and meta-analytic effects between PA-pessimism and the subscales with the daily measures that resulted in at least one significant correlation (see Table 2 for relations between the PAPBS factors and Data S2 for a full matrix). Looking at the meta-analytic effects, there were significant correlations between the daily prepping ideation item and PA-pessimism and all subscales. This suggests that this daily item has some validity for measuring daily prepping thoughts. Some other notable findings, looking again at the meta-analytic effects, are the positive relations between humanity/resource concerns, social Darwinism, and daily stress. Interestingly, current prepping was negative associated with stress, speaking, perhaps, to the idea that prepping increases a sense of control. Humanity/resource concerns was positively correlated with daily tendencies to carry protective objects. Finally, prepping beliefs and current prepping were positively associated with daily death thoughts.

Within-person relationships

Our primary analyses used multi-level modelling (Raudenbush & Bryk, 2002). We person-centred all daily variables to use them as level 1 predictors (Enders & Tofighi, 2007). We also included corresponding random effects for these predictor variables to specify the proper standard errors (Barr, Levy, Scheepers, & Tily, 2013). In order to conduct the analyses, we used SAS PROC MIXED (Singer, 1998). All models included random and autoregressive effects. However, the effects of interest were the fixed effects, so we report them alone.

We hypothesized that, on days in which participants reported high negative feelings, they would also report more daily prepping thoughts. Our results supported this hypothesis. In Study 4, on days in which participants reported more negative emotion, they reported more prepping thoughts, $b = .11$, $t = 3.53$, $p = .004$, 99.44% CI [0.022, 0.189]. The effect for positive emotion (Study 4) was significant, $b = -.08$, $t = -3.78$, $p = .002$, 99.50% CI [−0.147, −0.021], but this was not the case for valence (Study 5), $b = -.05$, $t = -2.62$, $p = .081$, 99.44% CI [−0.110, 0.003]. In Study 4, on days in which participants reported more stress, they also reported more prepping thoughts, $b = .10$, $t = 3.81$, $p = .001$, 99.55% CI [0.024, 0.166]. This was not the case for Study 5 ($p = .563$). There were no associations between daily prepping thoughts and daily meaning in life or depression in either study ($ps > .072$). Finally, in Study 5, on days in which participants reported more anger, $b = .08$, $t = 3.68$, $p = .003$, 99.62% CI [0.016, 0.137], and uncertainty, $b = .06$, $t = 3.08$, $p = .023$, 99.55% CI [0.005, 0.123], they also reported more prepping thoughts.

In terms of thoughts, we predicted that daily cynical, conspiratorial, and death thoughts would be predictive of daily prepping thoughts. Indeed, on days in which participants reported more cynical thoughts, they reported more prepping thoughts in Study 4, $b = .11$, $t = 3.25$, $p = .008$, 99.29% CI [0.019, 0.209], and in Study 5, $b = .14$, $t = 5.60$, $p = .001$, 99.64% CI [0.067, 0.212]. However, there was no relation between daily conspiratorial thoughts and prepping thoughts in Studies 4 or 5 ($ps > .524$). Finally, as predicted, on days in which participants reported more death thoughts, they also

reported more prepping thoughts in Study 4, $b = .14$, $t = 3.16$, $p = .010$, 99.17% CI [0.023, 0.258], and Study 5, $b = .08$, $t = 3.19$, $p = .018$, 99.58% CI [0.008, 0.151].

Finally, we predicted that daily events would be associated with daily prepping thoughts and that daily prepping thoughts might lead to the tendency to carry objects of protection. For the former prediction, on days in which participants reported more negative events, they reported more prepping thoughts in both Study 4, $b = .09$, $t = 2.56$, $p = .053$, 99% CI [−0.001, 0.151], and Study 5, $b = .06$, $t = 2.98$, $p = .029$, 99.50% CI [0.003, 0.115], although the former was marginal after p-value correction. However, there were no relations between daily positive events and prepping thoughts in either study ($ps > .165$). For the latter prediction, we used person-centred daily prepping thoughts as the predictor, as we found this to be a more intuitive direction of interpretation. We found that on days in which participants reported more prepping thoughts, they were more likely to carry objects they deemed as protective in Study 4, $b = .20$, $t = 3.56$, $p = .004$, 99.38% CI [0.045, 0.349], but not Study 5 ($p = .631$).

The impact of political events on prepping thoughts
In Figure 2, we have plotted average prepping thoughts by day for Study 4. There was a peak on day 12, which was the day following the Brexit vote. We attempted to establish that this was a significant peak in two ways. First, we ran an analysis of variance with day as the predictor and prepping thoughts as the dependent variable. The effect was significant, $F(13, 921) = 1.94$, $p = .023$, $\eta^2_{part} = .03$, 95% CI [0.000, 0.036]. *Post hoc* analysis, using Tukey's test of multiple comparisons, showed that day 12 significantly differed from days 5 ($M_{diff} = 0.544$), 6 ($M_{diff} = 0.653$), and 8 ($M_{diff} = 0.578$), but not the other days. However, this might not be an optimal assessment of this peak. As such, we created a 'pre-Brexit' prepping thoughts score, which was an average across prepping thoughts on days 1–10 (the days before the vote) and a 'post-Brexit' prepping thoughts score, which was an average across daily prepping thoughts on days 11–14 (the day of and days after the vote). We then
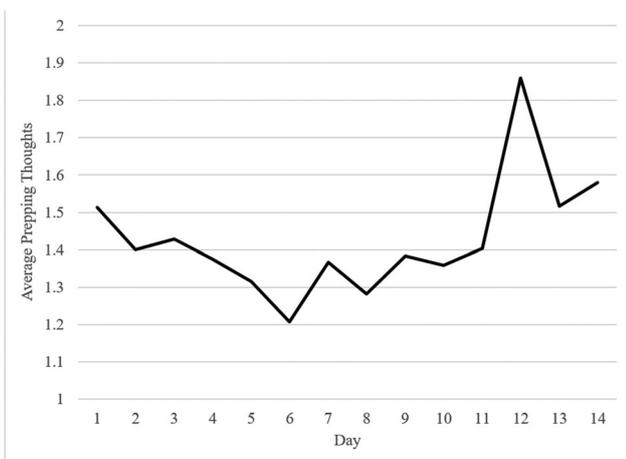
submitted theses scores to a repeated measures analysis of variance. This effect was also significant, $F(1, 71) = 5.52$, $p = .022$, $\eta^2_{part} = .07$, 95% CI [0.001, 0.205]. Pre-Brexit prepping thoughts ($M = 1.40$, $SD = 0.66$) were lower than post-Brexit prepping thoughts ($M = 1.58$, $SD = 0.81$). We could not compare daily prepping thoughts between Brexit supporters versus detractors, as we only had five participants indicate preference for the United Kingdom leaving the European Union.

In Figure 3, we have plotted average prepping thoughts by day for Study 5. There was a peak on day 10 which was the day following the 2016 US presidential election. We attempted to establish that this was a significant peak, as earlier. The analysis of variance with day as the predictor and prepping thoughts as the dependent variable was significant, $F(13, 1198) = 5.23$, $p < .001$, $\eta^2_{part} = .05$, 95% CI [0.023, 0.071]. The *post hoc* analysis showed that day 10 significantly differed from all days ($M_{diff} = 0.43–0.64$), except days 5, 9, and 11. We created a 'pre-election' prepping thoughts score, which was an average of days 1–8 (the days before the election), and a 'post-election' prepping thoughts score, which was an average of days 9–14 (the day of and days after the election). The repeated measures analysis of variance was also significant, $F(1, 106) = 24.56$, $p < .001$, $\eta^2_{part} = .19$, 95% CI [0.071, 0.313]. Pre-election prepping thoughts ($M = 1.37$, $SD = 0.52$) were lower than post-election prepping thoughts ($M = 1.67$, $SD = 0.78$). These findings replicate Study 4's Brexit results. We could not compare daily prepping thoughts between Clinton supporters versus Trump supporters, as we only had 14 participants indicate clear support for Donald Trump in the election (see Data S1 for a descriptive figure split by candidate support).

Discussion

Studies 4 and 5 provided evidence of more momentary contributors to prepping thoughts. Specifically, daily thoughts of death and cynicism were consistent predictors of daily prepping thoughts in both studies. Daily negative

NOTE: Day 12 was the day after the Brexit vote in the United Kingdom.

Figure 2. Average daily prepping thoughts by day, Study 3.
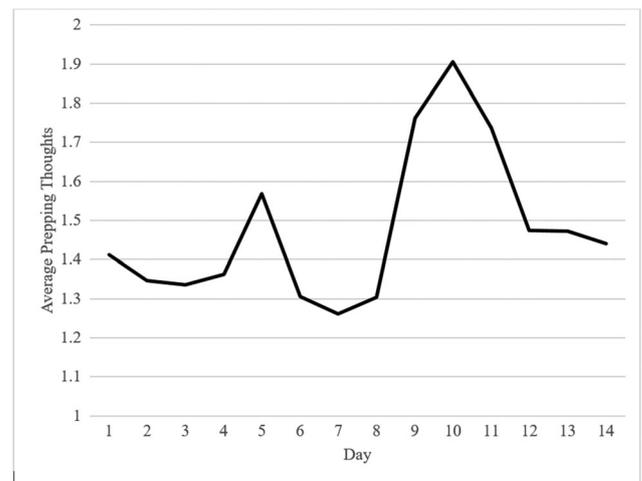
NOTE: Day 10 was the day after the 2016 Presidential Election in the United States.

Figure 3. Average daily prepping thoughts by day, Study 4.

emotions, stress, uncertainty, and negative events were less consistent positive predictors of daily prepping thoughts across studies. Additionally, daily prepping thoughts were also associated with a greater tendency to carry objects of protection in Study 4. These results indicate that when things are not going well, people feel the need to prep, perhaps as a way to gain control over their lives. The peak in daily prepping beliefs on the days following the Brexit vote and the US presidential election further supported this conclusion.

These results should be interpreted with caution, however. First, our Study 4 sample consisted heavily of international students who indicated that English was not their first language. This means they may not have understood the context or language within the daily diary or initial session questionnaires. This could explain some of the lack of replication in Study 5. Further, in neither study were we able to test the pattern of prepping thoughts for those who supported Brexit and Donald Trump.

STUDIES 6A AND 6B

The purpose of Study 6a was to investigate the PAPBS, its factors, and correlates in supposed 'real preppers'. This is a 'known groups' design and helps to provide construct validity. That is, if we are actually measuring prepping beliefs, these scores should be higher in a group of 'known' preppers. However, locating 'real preppers' is a difficult task. By their nature, preppers are reclusive and suspicious. Even so, we attempted to locate a prepper group on Reddit.com—a massive social media site where people can sign up and have discussions on any topic. According to Alexa.com, Reddit is the eighth most popular website in the world. It also consists of 'subreddits' which are discussion boards that are specific to a topic of interest. As such, we were able to locate a 'preppers' subreddit, which had >53 000 subscribers as of October 2017. We created a survey and posted it to the subreddit. Our prediction was that we would replicate the correlational findings of Study 3 within this sample.

The purpose of Study 6b was to have a comparison group for Study 6a. As such, we went to a different subreddit meant for online surveys. We posted an identical survey to that of Study 6a, to this subreddit. However, the administrators of the group removed our survey numerous times for 'violating' the subreddit's rules. Unfortunately, this took time to figure out, and we ended up collecting a comparison group, months after Study 6a, via Amazon Mechanical Turk. Even so, we predicted that the participants from Study 6a would score higher on PA pessimism, the subscales, and the relevant variables that we measured.

Method

Participants and procedure

For Study 6a, we created a post on the identified subreddit. This post provided all the information about the study purpose and contact information for the lead author in order to instil trust in the community. At the end of the post, there was a link to the Qualtrics survey. Of those who clicked the link, 79 (17 female) participants agreed to participate

and completed the study. There was a wide range of ages ($M = 34.07$, $Min = 18$, $Max = 62$). In Study 6b, we created 80 hits on Amazon Mechanical Turk. Eighty (41 female, $M_{age} = 35.45$) participants accepted our study and completed our short survey in exchange for $0.50.

All participants completed a number of personality measures, which included the PAPBS, provided their demographic information, and had an opportunity to comment. They could skip any questions they did not feel like answering. Given the difficulty in obtaining participants in Study 6a, our sampling procedure was to get as many participants as possible and to match that number in Study 6b.

Materials

Post-apocalyptic and prepping beliefs scale. Participants completed the PAPBS (see Table 2 for descriptive statistics). However, we changed the current prepping item slightly to increase the range. The question was 'Are you currently doing things to prepare for a doomsday scenario, disaster, or any other societal collapse?', and they responded on a 5-point scale (1 = 'No, not at all' to 5 = 'Yes, a great deal').

Correlates. As with Study 3, we collected responses to the same public goods dilemmas. Participants indicated how much they would donate to PBS ($M_{6a} = 33.45$, $SD_{6a} = 121.31$; $M_{6b} = 12.15$, $SD_{6b} = 21.64$) and how many fish they would harvest per week from the lake ($M_{6a} = 1.73$, $SD_{6a} = 0.56$; $M_{6b} = 3.52$, $SD_{6b} = 8.03$). They also responded to the same three-item human-based cynicism measure ($M_{6a} = 3.32$, $SD_{6a} = 0.93$, $\alpha_{6a} = .76$; $M_{6b} = 3.03$, $SD_{6b} = 0.90$, $\alpha_{6b} = .80$), the Conspiracy Mentality Questionnaire ($M_{6a} = 7.38$, $SD_{6a} = 1.91$, $\alpha_{6a} = .81$; $M_{6b} = 6.85$, $SD_{6b} = 2.16$, $\alpha_{6b} = .87$), the SDO questionnaire ($M_{6a} = 2.74$, $SD_{6a} = 1.10$, $\alpha_{6a} = .92$; $M_{6b} = 2.25$, $SD_{6b} = 1.28$, $\alpha_{6b} = .96$), and conservatism item ($M_{6a} = 3.69$, $SD_{6a} = 1.41$; $M_{6b} = 3.45$, $SD_{6b} = 1.67$). The only measure that differed from Study 3 was the God-belief item. Here, we wanted to give more information to the respondents so that they could more accurately specify their belief level. We used the 7-point theism scale created by Richard Dawkins (Dawkins, 2016). For this item, we provided a description for each point of the scale:

(1) Strong atheist—I am 100% certain there is no God.
(2) *De facto* atheist—I am pretty sure that there is no God.
(3) Weak atheist—I am not really sure if there is a God, but I lean towards no.
(4) Pure agnostic—I am not sure either way.
(5) Weak theist—I am not really sure if there is a God, but I lean towards yes.
(6) *De facto* theist—I am pretty sure there is a God.
(7) Strong theist—I am 100% certain that there is a God.

Participants indicated which description fit them the most ($M_{6a} = 3.33$, $SD_{6a} = 1.96$; $M_{6b} = 4.29$, $SD_{6b} = 2.11$).

Results and discussion

We ran a correlation analysis on all the self-report measures (Table 2 displays the correlations between the PAPBS factors

and Table 3 displays the correlations between the PAPBS factors and variables of interest; see Data S2 for full matrix). All PAPBS factors were positively and significantly correlated with each other. PA-pessimism and prepping beliefs were the only predictors of current prepping behaviour.

There were no significant correlations between PA-pessimism, the subscales, and God-belief or the public goods questions in Study 6a. Contributions to PBS was significantly negatively correlated with PA-pessimism, human/resource concerns, and social Darwinism, in Study 6b. There were strong significant correlations between PA-pessimism, the subscales, and human-based cynicism in both samples. There were also significant correlations between conspiracy mentality and PA-pessimism, prepping beliefs, and current prepping (6a only). There were also significant positive correlations between SDO and PAPBS and social Darwinism. Conservatism was positively and significantly correlated with prepping beliefs (6b only). As such, we partially replicated Study 3 in these samples.

'Real preppers' versus the 'comparison' group
Combining the data from Studies 6a and 6b, we ran a set of one-way analyses of variance with group (real vs. comparison) as the independent variable and the PAPBS, its factors, and the relevant measures as the dependent variables. We predicted that the 'real preppers' would score higher on PA pessimism and the subscales. Indeed, there was an effect of group on PA-pessimism scores, $F(1, 158) = 11.47$, $p < .001$, $\eta^2_{\text{part}} = .07$, 99.50% CI [0.002, 0.197], such that a pessimistic outlook of the post-apocalypse was higher for the preppers ($M = 3.35$, $SD = 0.59$) than for the comparison group ($M = 3.00$, $SD = 0.69$). Also, as predicted, there was an effect of group on prepping beliefs scores, $F(1, 158) = 19.32$, $p < .001$, $\eta^2_{\text{part}} = .11$, 99.58% CI [0.013, 0.253], such that the belief in the need to prep was higher for the preppers ($M = 3.60$, $SD = 0.76$) than for the comparison group ($M = 3.01$, $SD = 0.92$). This provides evidence for the validity for our scale. However, it also suggests that we were successful in locating a group that was, at least, more likely to be preppers. This would be even more evident if we found a group effect for the current prepping item. This was, in fact, the case, $F(1, 158) = 127.97$, $p < .001$, $\eta^2_{\text{part}} = .54$, 99.55% CI [0.284, 0.575]. Reported prepping behaviour was higher in the prepper group ($M = 2.95$, $SD = 0.96$) than the comparison group ($M = 1.41$, $SD = 0.74$). Even so, the mean level of prepping behaviour reported by the prepper group is moderate, suggesting that we probably were not reaching many full-on preppers in our sample. Group effects were not significant for the human/resources concern or social Darwinism scales (ps > .079).

We predicted that the prepper group would score higher in each of the other variables than those in the comparison group. After p-value correction for multiple tests, all effects were non-significant (ps > .079), except for God-belief, $F(1, 158) = 8.69$, $p = .004$, $\eta^2_{\text{part}} = .05$, 99.44% CI [0.000, 0.173]. However, contrary to predictions, God-belief was higher for the comparison group ($M = 4.29$, $SD = 2.11$) than for the preppers ($M = 3.33$, $SD = 1.96$).

We would like to point out that prior to p-value and confidence interval correction, there was a medium sized effect of group on human/resources concerns, $F(1, 158) = 6.82$, $p = .010$, $\eta^2_{\text{part}} = .04$, 95% CI [0.002, 0.117], such that concerns about humanity and the availability of resources were higher for the preppers ($M = 3.72$, $SD = 0.75$) than for the comparison group ($M = 3.39$, $SD = 0.84$). This provides tentative evidence for the role of these concerns in actual prepping.

Discussion

Studies 6a and 6b partially replicated the previous studies in a sample of 'real preppers' and a comparison group. Pessimistic post-apocalyptic beliefs, prepping beliefs, and prepping behaviour were higher for the real preppers than the comparison group.

We would also like to highlight some of the comments that the members of the preppers subreddit made in regard to our study. First, a common response was that the SDO measure was offensive. Commenters suggested that just because they believe certain groups are superior to others does not mean that they are racist (which was not insinuated). The second most common comment was that we were trying to make 'preppers' look ridiculous. This may have changed how they were responding. A third common comment was the insinuation that not all preppers are right-wing 'nutjobs'. Indeed, some preppers in our observations appear to be 'hippy leftovers' and have more left-leaning concerns about government conspiracies. Finally, and perhaps most importantly, several of the members noted that we would not find 'true preppers' on Reddit.com. They suggested that most members of the subreddit are 'prepper enthusiasts' and that 'true preppers' would (i) never be found on social media sites and (ii) would never respond to a questionnaire. As such, we interpret these results with due hesitation.

GENERAL DISCUSSION

The way a person thinks about future possibilities or fantasizes about different uncertain situations may be indicative of their underlying thoughts, feelings, and behavioural tendencies (Henry, 1956). A common trope in popular media provides such an imaginative environment: post-apocalyptic scenarios. Everyday post-apocalypse and prepping beliefs, in a relative sense, might be informative for personality and social psychologists. The current investigation sought to (i) create a tool to measure post-apocalyptic and prepping beliefs; (ii) identify motive, belief, and behavioural tendency correlates of these beliefs; and (iii) identify factors that relate to increased prepping beliefs, creating a nomological network around our scale. We created the 11-item PAPBS which can be scored as total post-apocalyptic pessimism and as subscales that measure concerns about resources and humanity, beliefs about competitive survival, and beliefs about the need to prep (Studies 1a and 1b). Later, we added a question about prepping behaviours to address criterion validity, among other purposes, that should be considered

separate from the main scale. We summarize the findings for each factor, based on meta-analytic effects (Goh et al., 2016), in the succeeding texts.

Post-apocalyptic pessimism (PA-pessimism; the total score) was unsurprisingly positively correlated with each of the subscales, but most strongly related to concerns about humans and resource availability. It was only moderately associated with self-reported prepping behaviours. Furthermore, it was most strongly positively related to cynicism, daily prepping thoughts, conspiracy mentality, paranoia, and introversion. Other moderate correlates included lower agreeableness, humility, and openness and higher SDO, conservatism, and daily death thoughts. Weaker correlates included higher God-belief and tendency to carry protective objects, as well as less willingness to contribute to public goods.

Post-apocalyptic concerns about humanity and resources were strongly positively correlated with social Darwinism and prepping beliefs, and prepping behaviours to a lesser degree. These concerns were also most strongly correlated with higher cynicism and daily prepping thoughts. Other moderate correlates of these concerns were higher neuroticism, introversion, conspiracy mentality, and the tendency to carry protective objects. Weaker correlates included higher conservatism and daily stress, and lower willingness to contribute to a public good. Moreover, we tentatively conclude that these concerns are primary in contributing to prepping beliefs and behaviours, given the higher scores in a sample of supposed preppers.

A competitive view of survival, which we refer to as social Darwinism, was the least—although still significantly—predictive of prepping beliefs and behaviour. Furthermore, this view was most strongly associated with higher SDO and cynicism and lower humility, agreeableness, and openness. Moderate correlates of this competitive view were higher paranoia, conspiracy mentality, daily prepping thoughts, and daily anger and lower extraversion and conscientiousness. Weaker correlates included higher conservatism, harvesting more than their fair share from public resources, and higher daily stress, and lower willingness to contribute to a public good.

Belief in the need to prep was the only consistent predictor of prepping behaviour, as would be expected from a theory of planned behaviour perspective (Ajzen, 1991). Prepping beliefs were most strongly associated with higher conservatism and conspiracy mentality. Moderate correlates of prepping beliefs were daily prepping thoughts, God-belief, and cynicism. Weaker correlates included higher SDO and daily death thoughts, and lower willingness to contribute to public goods. We further found that daily prepping beliefs were positively associated with daily negative feelings and uncertainty, daily cynical and death thoughts, and daily negative events. They were also inconsistently associated with the daily tendency to carry protective objects. Finally, prepping thoughts increased after major political events that were deemed negative. Taken a step further, some people saw these events as potentially apocalyptic.

These findings suggest that post-apocalyptic and prepping beliefs are associated with everyday thoughts, feelings, and behavioural tendencies. Furthermore, they suggest that various events are associated with increases in prepping thoughts and, perhaps, prepping behaviours. Importantly, mean scores on the PAPBS factors suggest that these are not fringe beliefs. As such, it seems that these types of beliefs are important to consider for today's society and not just in the purview of entertainment and fantasy.

Implications

Post-apocalyptic and prepping beliefs are, in our view, of relevance to normative personality and social psychological outcomes. Indeed, the mean scores on our measure's factors hang roughly around the midpoint and, as such, are not reflective of fringe beliefs. This work could be of interest to numerous literatures (e.g. implicit personality testing, misanthropy, political and religious psychology, conspiracy beliefs, and competition/cooperation), but we point specifically to the area of existential psychology as just one example.

Prepping thoughts appear to be associated with death and uncertainty. Thus, it seems likely that death thoughts and uncertainty lead to increased prepping beliefs. This is a similar defensive response to threat that is found in terror management theory (Greenberg et al., 1997) and various other threat compensation theories (Jonas et al., 2014). And, much like these literatures, prepping thoughts seem to follow world events that some people find threatening (e.g. Brexit and Trump's election). However, the fact that people might turn to prepping beliefs in these situations could speak to the function of prepping thoughts or behaviours. It could be that prepping thoughts and behaviours provide some sense of control over one's uncertain environment. Existential psychologists might look at how prepping thoughts and behaviour give the threatened an outlet for their feelings.

Taken to the extreme

Our focus on mainstream citizens was by design. Most of the beliefs and behaviours of 'actual' preppers have been shown in documentaries, and it would not be surprising to learn that preppers have specific thoughts about humanity, resources, competitiveness, and prepping. It is more surprising to learn that these beliefs are common in mainstream society. As such, we focused on what these beliefs mean in terms of personality for average citizens. Even so, our results might provide insights into more extreme beliefs.

While we clearly showed that post-apocalyptic and prepping beliefs are not the mental playground of extremists, our results might provide hints to how extreme beliefs might come about. Taken too far and the beliefs we measured might have important consequences for how society runs and how people cooperate (Balliet, Tybur, & Van Lange, 2016). Conspiracy theorists and extreme right-wing radio hosts reinforce human and resource fears, competitive survival, and even prepping beliefs. Stoking distrust and existential threat among humans leads to dangerous situations such as intergroup violence (Jonas & Fritsche, 2013), officer-involved shootings (Sharp & Johnson, 2009), school shootings (Warnick, Johnson, & Rocha, 2010), and the desire to form militias (Carey, Mitchell, & Lowe, 2013; George & Wilcox, 1996). In fact, the correlates we found for any and all of the post-apocalyptic

beliefs seem to be a recipe for terroristic behaviour (Krieger & Meierrieks, 2011) at their extreme. As such, it is prudent for future research to uncover the sources of these beliefs and their tendency to become extreme (e.g. in impressionable minds).

Additional considerations and future directions

Our goal was to investigate the correlates of specific post-apocalyptic and, especially, prepping beliefs. This means that we were primarily focused on the aftermath of a doomsday scenario, apocalypse, or societal collapse. Therefore, we did not investigate visions of the apocalypse (e.g. 'I think God will come back and judge us all'). It could be that prepping for the rapture is correlated with different personality factors than prepping for nuclear war. The same could be true of a liberal prepper versus a conservative prepper. Future work should investigate these interesting directions, and this could start by looking at interactive patterns (e.g. God-belief by prepping beliefs) in our data. Unfortunately, this is beyond the scope of the current paper.

In addition, we did not exhaust the list of relevant constructs that could be related to specific post-apocalyptic and prepping beliefs. For example, right-wing authoritarianism (RWA; Altemeyer, 1988) seems a particularly relevant variable. Even so, our unsystematic observations led us to include SDO, given its relation to competitiveness and hierarchy in terms of resources (Sibley et al., 2007; Sidanius & Pratto, 2001). RWA, on the other hand, focuses more on discrimination towards 'deviant' groups (Duckitt & Sibley, 2010). In the latter case, we predicted that post-apocalyptic or prepping beliefs would be associated with distrust of humans in general (cynicism) rather than discrimination toward specific outgroups. However, this does offer an interesting avenue for future research. A final point on RWA: we want to emphasize that while post-apocalyptic and prepping beliefs were correlated with political ideology, these correlations were small (post-apocalyptic beliefs and prepping behaviour) to moderate (prepping beliefs). Further, as our Study 6a participants noted, preppers can range from right-wing conspiracy believers to far-left hippies who distrust the government.

In addition to the aforementioned limits of the current investigation, there are some further avenues for future work. First, the training received in the military is somewhat related to prepping. Every portion of military training is about surviving harsh and hostile situations and eliminating threats. As such, former and current military personnel may be trained to have specific post-apocalyptic and prepping beliefs. Indeed, a number of our observed correlations seem to match pre-military and post-military personality profiles (e.g. see Jackson, Thoemmes, Jonkmann, Lüdtke, & Trautwein, 2012) and pro-military attitudes and values (Bachman, Sigelman, & Diamond, 1987). It could also be the case that military prepping provides the type of control that prepping provides, but for those who trust rather than distrust the government. As such, it would be interesting to compare post-apocalyptic and prepping beliefs in military and non-military samples.

Finally, our investigation elicited mostly negative information about post-apocalyptic and prepping beliefs. Specifically, one could argue that it paints those high in these beliefs in a negative light, depending on one's perspective (e.g. a person high in SDO might not see SDO as particularly negative; Rutjens & Brandt, 2018). However, there are three considerations that might paint these beliefs in a positive light.

First, perhaps it is rational to be concerned about human nature and the availability of resources. In fact, this was the most common comment brought up when we discussed these beliefs with acquaintances. It seems reasonable to believe that the current level of resource consumption is not sustainable. Even so, psychological science has provided insights in to how humans might function in doomsday scenarios. For example, a large amount of evidence suggests that humans are an intuitively and inherently *cooperative* species (for meta-analysis, see Rand, 2016), even in times of scarcity (Balliet et al., 2016). This suggests that competitive depictions and intuitions about post-apocalyptic scenarios may be faulty. Nevertheless, there is also evidence to suggest that cooperation would happen more in close groups than in larger societies (Boyd & Richerson, 1992; Nowak, 2006; Wilson, 2000). This lends credence to *The Walking Dead* style interpretation, where close groups cooperate, but compete against outside groups. Future research might pit these two interpretations against each other in scenario based, game theory, or virtual paradigms.

Second, it could be that competitive survival beliefs motivate productive behaviour. Recall that Renner (2012) draws a connection between post-apocalyptic beliefs and athletic survivalism. It could be that the high social Darwinism scorers sublimate their competitive drive through healthy challenges and productive outlets. Future work might investigate this connection.

Third, and in a related sublimating sense, the television show *Doomsday Preppers* often depicts preppers as well-informed survivalists, horticulturalists, and conservationists. Those who think about prepping may be able to provide essential training, resources, and 'life hacks' for real-life survival situations (e.g. getting lost or injured, natural disasters, and camping). Additionally, and relatedly, 'preppers', anecdotally, come up with creative solutions for survival. As such, prepping beliefs and behaviours might be associated with creativity, for example. Future research should therefore also investigate the positive aspects of prepping beliefs and behaviours.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Data S1: Supporting Information

Data S2: Supporting Information

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APPENDIX A. POST-APOCALYPTIC AND DOOMSDAY PREPPING BELIEFS SCALE

This survey measures peoples' attitudes about what would happen if society were to collapse due to some sort of catastrophe (e.g. financial collapse, war, natural disaster, asteroids, and biblical apocalypse). You will see a series of statements that you may agree with or not. Indicate your level of agreement by choosing numbers from the scale provided. Please be honest. Your answers will remain anonymous.

1 = completely disagree; 2 = moderately disagree; 3 = neither disagree nor agree; 4 = moderately agree; 5 = completely agree

(1) A natural disaster, financial collapse, or some other catastrophe will bring about a fall of society, and likely soon.

(2) If society falls in case of some catastrophe, people will most likely go crazy and we will have to fight each other to survive.

(3) It is important for people to prepare for the collapse of society by stockpiling food and supplies.

(4) It is important for people to prepare for the collapse of society by stockpiling guns and ammunition.

(5) Most people are opportunistic and would likely steal or kill others for supplies if society were to fall.

(6) In a societal collapse where people are wandering around looking for supplies, it would be a better strategy to shoot first and ask questions second.

(7) In a societal collapse, where people are wandering around looking for supplies, I would share supplies and work together.

(8) If society should fall, it is everyone for him or herself. That is, survival of the fittest.

(9) If society were to collapse, resources for survival will be scarce.

(10) If society were to collapse, there will be enough resources for everyone's survival.

(11) If society were to collapse, people had better be prepared.

(12) Are you currently doing things to prepare for a doomsday scenario, disaster, or any other societal collapse? (1 = 'No, not at all' to 5 = 'Yes, a great deal')

Humanity resource concerns/resource concerns = 2, 5, 9, 10(r)
Social Darwinism = 6, 7(r), 8
Prepper beliefs (belief in the need to prep) = 1, 3, 4, 11
Post-apocalyptic pessimism = 1, 2, 3, 4, 5, 6, 7(r), 8, 9, 10(r), 11

Rejected items:

(1) If society falls in case of some catastrophe, people will most likely work together and cooperate.

(2) I can trust my fellow humans in case of a societal collapse.

(3) If society were to collapse, I would not trust most people.

(4) Deep down, we are a cooperative species and would likely work together to rebuild society if it were to collapse.