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# Running head: STRESS AND CONSPIRACY THEORIES

Putting the Stress on Conspiracy Theories: Examining Associations between Psychological Stress, Anxiety, and Belief in Conspiracy Theories

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#### Abstract

Psychological stress and anxiety may be antecedents of belief in conspiracy theories, but tests of this hypothesis are piecemeal. Here, we examined the relationships between stress, anxiety, and belief in conspiracy theories in a sample of 420 U.S. adults. Participants completed measures of belief in conspiracy theories, perceived stress, stressful life events, trait and state anxiety, episodic tension, and demographic information. Regression analysis indicated that more stressful life events and greater perceived stress predicted belief in conspiracy theories once effects of social status and age were accounted for (Adj.  $R^2 = .09$ ). State and trait anxiety and episodic tension were not significant predictors. These findings point to stress as a possible antecedent of belief in conspiracy theories.

Keywords: Conspiracy theories; Stress; Anxiety; Perceived stress

Conspiracy theories allege that multiple actors are intentionally plotting to accomplish malevolent goals (Swami & Furnham, 2014). Examples include the belief that the Apollo moon landings were staged and the assassination of Martin Luther King, Jr., was the result of an organised plot by U.S. government agencies (Swami, Chamorro-Premuzic, & Furnham, 2010). Although *prima facie* evidence supporting conspiracy theories is usually scant, such beliefs are widespread. For example, nationally representative surveys have reported that half of the American public endorse at least one conspiracy theory (Oliver & Wood, 2014). This is concerning because conspiracist ideation is associated with negative health, sociopolitical, and environmental consequences (for a review, see Douglas, Sutton, Jolley, & Wood, 2016).

To date, most research on the antecedents of conspiracist ideation have focused on latent psychopathology (e.g., schizotypy and maladaptive personality traits; Barron, Morgan, Towell, Altemeyer, & Swami, 2014; Swami, Weis, Lay, Barron, & Furnham, 2016), biased cognitions (e.g., errors of probabilistic reasoning; Brotherton & French, 2014), and individual differences in traits such as thinking styles, political cynicism, and self-esteem (e.g., Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Brotherton, French, & Pickering, 2013; Swami et al., 2010, 2011; Swami, Voracek, Stieger, Tran, & Furnham, 2014). Just as important as these perspectives is the broader psychosocial context in which conspiracy theories emerge.

In particular, psychological stress and anxiety have been identified as factors that are related to belief in conspiracy theories. This perspective stems from the idea that conspiracy theories provide simplified, causal explanations for distressing events (Hofstadter, 1966) and conceptualises conspiracy theories as neutral, rational narratives of the world (Nefes, 2015). This perspective also suggests that conspiracy theories help to regulate levels of acute stress. That is, by reinstalling a sense of order, control, and predictability following a distressing external threat, conspiracy theories help individuals to regulate their own negative emotions,

restore a sense of agency, and maintain self-esteem (Robins & Post, 1997). To date, however, evidence of associations between stress, anxiety, and belief in conspiracy theories has been piecemeal.

In terms of anxiety, Grzesiak-Feldman (2013) reported that both state and trait anxiety were significantly and positively correlated with conspiracy thinking about outgroups, although the sample size in this study was small (N = 87). In an earlier study of high school students (N = 118), however, Grzesiak-Feldman (2007) reported that trait, but not state, anxiety was significantly correlated with conspiracist ideation, but the relationship was positive in boys and negative in girls. Two further studies (Grzesiak-Feldman, 2013, Studies 2-3) also found that pre-exam anxiety increased conspiracist ideation about Jewish people, possibly because anxiety led to greater processing of information related to threat-related outgroups. Similarly, Radnitz and Underwood (2016) reported that an anxiety prime increased conspiracist beliefs following exposure to a mock news article.

To our knowledge, previous research has not directly assessed relationships between psychological stress and conspiracist ideation, although indirect evidence is supportive. For example, distressing experiences (e.g., a perceived lack of control, subjective uncertainty) heighten the tendency to perceive patterns in unrelated stimuli (Whitson & Galinky, 2008) and to make dispositional inferences about others (Sullivan, Landau, & Rothschild, 2010), which promote conspiracist ideation (van Prooijen & Jostmann, 2013). Stressful situations also increase the tendency to think less analytically (Starcke & Brand, 2012), which in turn promotes belief in conspiracy theories (Swami et al., 2014). These studies point to anxiety, and possibly stress, as antecedents of belief in conspiracy theories, but the literature remains equivocal and limited.

Here, we tested the hypothesis that greater psychological stress and anxiety are associated with belief in conspiracy theories. Stress, in this view, is experienced in response to a range of stimuli; within manageable parameters, one's sense of well-being can be maintained, but if these stimuli go beyond normal limits, they become stressors. As such we hypothesised that higher stress would be associated with greater endorsement of conspiracy theories. To operationalise stress, we used self-report measures of perceived chronic stress (i.e., respondents' subjective appraisal of events as threatening or challenging in the last month) and the incidence of major stressful life events in the last 6 months, with the expectation that both variables would be positively associated with belief in conspiracy theories.

We also examined associations between belief conspiracy theories and anxiety, which was operationalised as state anxiety, trait anxiety, and episodic tension. There were two reasons for this. First, inclusion of these measures helps to provide insight into earlier equivocal relationships between anxiety and belief in conspiracy theories (Gzresiak-Feldman, 2007, 2013). Second, because stress and anxiety are inherently linked (Everly, 1990), the concurrent inclusion of these variables allows us to distinguish between stress and anxiety as antecedents of belief in conspiracy theories. Additionally, because those with lower social status are known to report more stressful life events and anxiety (Blair, 2010), we controlled for subjective social status in our analyses.

### Method

#### **Procedures and Participants**

The study was approved by the relevant university ethics committee. Data were collected via Amazon's Mechanical Turk (MTurk) website in September 2015. MTurk samples are more demographically-diverse than standard Internet samples and the site is accepted as a source of high-quality data for social science research (Buhrmester, Kwang, & Gosling, 2011). A brief study description, including estimated duration and compensation, was posted on the website and advertised to MTurk workers who achieved a > 98% approval

rate and completed at least 1,000 hits. We limited participation to MTurk workers from the U.S., because not all our measures have been validated for use outside this national context. After providing informed consent, participants were directed to the measures described below, which were presented in an anonymous form and in random order via the randomisation function with Qualtrics, which hosted the survey. In exchange for completing the survey, participants were paid \$0.50. Participants with large amounts of missing data (n = 34) were excluded from the dataset. All participants received debriefing information at the end of the survey.

The final sample consisted of 225 women and 195 men, ranging in age from 20 to 78 years (M = 44.68, SD = 12.38). The majority of participants self-reported as White (82.6%), while 8.3% were of Black ancestry, 4.8% of Asian ancestry, and 4.3% as some other ethnic background. In terms of educational qualifications, 38.4% had completed secondary schooling, 5.2% were still in full-time education, 42.6% had an undergraduate degree, 13.1% had a postgraduate degree, and 0.7% had some other qualification.

### Measures

**Belief in conspiracy theories**. Participants completed the Belief in Conspiracy Theories Inventory (BCTI; Swami et al., 2010, 2011), a 15-item measure describing a range of conspiracy theories (sample item: "The Apollo moon landings never happened and were staged in a Hollywood film studio"). Participants rated their belief that each conspiracy was true on a 9-point scale, ranging from 1 (*Completely false*) to 9 (*Completely true*). Scores were averaged, with higher scores reflecting greater belief in conspiracy theories. Scores on this measure have good factorial validity (Swami et al., 2011) and correlate strongly with scores from generic measure of conspiracist ideation (e.g., Brotherton et al., 2013). Here, Cronbach's α for the BCTI was .92. **Perceived stress**. We used the 10-item Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), which measures an individual's subjective appraisal of the degree to which situations in her or his life are stressful (sample item: "In the last month, how often have you felt that you were unable to control the important things in your life?"). Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. All items were rated on a 5-point scale ranging from 0 (*Never*) to 4 (*Very often*) and, following reverse-coding of 4 items, an overall score was computed as the mean of all items (higher scores reflect greater perceived stress). The PSS has very good psychometric properties in diverse populations (Lee, 2012). Here, Cronbach's α for the PSS was .90.

**Major stressful life events**. The List of Threatening Experiences Questionnaire (LTE-Q; Brugha, Bebbington, Tennant, & Hurry, 1985) was used to assess the incidence of stressful life events. The scale consists of 12 items, with dichotomous responses (0 = No, 1 = Yes), about the occurrence of 12 prevalent major stressful events that may have occurred in the preceding 6 months (sample item: "Serious illness, injury, or assault to your person"). A global score was computed as the sum of all affirmative responses, with higher scores reflecting the occurrence of more stressful life events. Global scores on the LTE-Q have been shown to have good psychometric properties (Brugha & Cragg, 1990). Here, Cronbach's  $\alpha$  for this scale was .70.

**State anxiety**. We used Form Y-1 of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) to measure state anxiety (sample item: "I feel strained"). This 20-item measure reflects a feeling of anxiety at the present moment and is a temporary emotional state (Spielberger & Reheiser, 2004). All items were rated on a 4-point scale, ranging from 1 (*Not at all*) to 4 (*Very much so*). Ten items were reverse-coded prior to analyses and an overall score was computed as the mean of all items, with higher scores reflecting greater state anxiety. Test-retest reliabilities are low, as would be expected for a transitory emotional state, but internal consistency coefficients are acceptable (Spielberger et al., 1983). Here, Cronbach's  $\alpha$  for this scale was .73.

**Trait anxiety**. To measure trait anxiety, we used Form Y-2 of the STAI (Spielberger et al., 1983), which measures a differential trait reflective of a tendency to worry (Spielberger & Reheiser, 2004; sample item: "I feel nervous and restless"). The scale consists of 20 items that are rated on a 4-point scale, ranging from 1 (*Almost never*) to 4 (*Almost always*). Nine items were reverse-coded prior to analyses and an overall score was computed as the mean of all items. Higher scores on this scale reflect greater trait anxiety. This form of the STAI has been shown to have good psychometric properties (Spielberger et al., 1983). Here, Cronbach's  $\alpha$  for this scale was .84.

**Episodic tension**. To measure episodic tension, we used the Tension-Anxiety subscale of the Short Form of the Profile of Mood States (POMS-SF; Shacham, 1983). This subscale consists of 6 adjectives (sample item: "Tense"), which participants are asked to rate for the degree to which each adjective described themselves during the past week. As such, it provides a measure of transient or episodic tension. All items were rated on a 5-point scale, ranging from 1 (*Not at all*) to 5 (*Extremely*). A subscale score was computed as the mean of all 6 items, with higher scores reflective of greater tension and anxiety. The POM-SF, including its subscales, has good psychometric properties (Baker, Denniston, Zabora, Polland, & Dudley, 2002). Here, Cronbach's  $\alpha$  for the Tension-Anxiety subscale was .89.

**Socioeconomic status**. We used the MacArthur Ladder of Subjective Social Status (MLSSS; Adler, Epel, Castellazzo, & Ickovics, 2000) to measure respondents' subjective social status. Participants were presented with a "social ladder" and asked to indicate the rung they felt best represented their socioeconomic status. Adler et al. (2000) reported that responses on the MLSSS are strongly correlated with traditional measures of socioeconomic status.

**Demographics**. Participants were asked to provide their demographic details, consisting of sex, age, ethnicity, and educational qualifications.

#### Results

# **Preliminary Analyses**

An independent-samples *t*-test showed that women (M = 2.88, SD = 1.41) and men (M = 2.62, SD = 1.35) did not significantly differ in the belief in conspiracy theories, t(418) = 1.93, p = .054, d = 0.17. Analyses of variance showed that there were significant differences in belief in conspiracy theories between ethnic groups, F(3, 416) = 5.40, p = .001,  $\eta_p^2 = .02$ , and between educational groups, F(4, 416) = 2.87, p = .015,  $\eta_p^2 = .02$ . Younger participants were more likely to believe in conspiracy theories, r = -.15, p = .002, but there was no significant correlation between belief in conspiracy theories and subjective social status, r = -.06, p = .247. Although these analyses suggest some demographic differences in belief in conspiracy theories, effect sizes were negligible-to-small. For this reason, we pooled the data for all subsequent analyses, but controlled for age and subjective social status.

## **Regression Analysis**

Partial correlations (controlling for social status and age) between belief in conspiracy theories and our measures of stress and anxiety are reported in Table 1. As seen, stronger belief in conspiracy theories was significantly associated with more stressful life events in the last 6 months, greater perceived stress in the last month, and higher trait anxiety. Effect sizes were small-to-moderate (rs = .10-.29). We next conducted a hierarchical linear regression with subjective social status and age entered in a first step<sup>1</sup> and the stress and anxiety measures entered in a second step. The first step of the regression with subjective social status and age was significant, F(2, 417) = 5.30, p = .005, Adj.  $R^2 = .02$ , with only age emerging as a significant predictor, B = -.02, SE = .01, B = -.05, t = -0.96, p = .002. The second step of the regression was also significant, F(7, 412) = 7.88, p < .001, Adj.  $\Delta R^2 = .09$ . Of the variables entered into the model, the only significant predictors were stressful life events, B = .22, SE = .04,  $\beta = .28$ , t = 5.61, p < .001, age, B = -.02, SE = .01,  $\beta = -.13$ , t = -2.77, p = .006, and perceived stress, B = .26, SE = .12,  $\beta = .12$ , t = 2.21, p = .028. Multicollinearity was not a limiting factor in this analysis (all variance inflation factors < 2.52).

#### Discussion

Here, we examined associations between stress, anxiety, and belief in conspiracy theories. Our findings suggested that two separate indices of psychological stress were positively associated with belief in conspiracy theories once the effects of subjective social status and respondent age had been accounted for. Conversely, indices of anxiety were not significantly associated with belief in conspiracy theories once all other effects had been taken into account. Broadly speaking, our findings are consistent with theoretical discussions of the role that conspiracy theories play, particularly in terms of providing rational narratives of the world (Nefes, 2015). Below, we provide a fuller account of stress as a possible antecedent of belief in conspiracy theories.

Major world events, particularly those that are traumatic and emotive, are known to increase levels of stress (e.g., Goenjian et al., 2000). In addition to being stressful, such events also increase feelings of uncertainty, confusion, and existential threat (van Prooijen & Jostmann, 2013). In such a climate, some individuals may engage in sense-making processes aimed at restoring individual agency and a belief that the world is orderly and predictable (van Prooijen & Acker, 2015). In this view, some individuals may seek out and assimilate the sorts of all-encompassing explanations for events that conspiracy theories provide. By simplifying and by linking a series of events in relation to its supposed causes and effects, conspiracy theories may offer seemingly coherent explanations for distressing phenomena. Of course, this view suggests that stressful events give rise to sense-making processes that favour conspiracy theories, whereas our data suggest that intra-individual subjective experiences of stress and the experience of negative life events are related to belief in conspiracy theories. Nevertheless, there may be parallels between the two pathways. For example, an individual experiencing stressful life events may begin to engage in cognitive patterns (e.g., seeing patterns in unrelated stimuli, making dispositional inferences about others; Sullivan et al., 2008; Whitson & Galinsky, 2008) that promote conspiracist ideation. Thus, stressful intra-individual life events may sometimes lead to a tendency to adopt a conspiracist mind-set. Once this worldview has become entrenched, other conspiratorial ideas are more easily assimilated and reinforced (Wood, Douglas, & Sutton, 2012).

Alternatively, it is not stress that is driving our findings, but rather threats to a sense of control (van Prooijen & Acker, 2015). That is, in the aftermath of repeated distressing events, it is possible that some individuals may seek out conspiracist explanations that reinstall a sense of order or control, which in turn restore a sense of agency (Robins & Post, 1997). Another possibility is that individuals who more strongly endorsed the stress or stressful life event measures may feel more disaffected, alienated from society, or victims of structural power. These individuals may also potentially reject civic structure that are meant (but have failed) to prevent such harm, which in turn makes them more receptive to conspiracy theories. One way of pushing this research forward might be to examine complex mediatonal relationships between stress, alienation, perceptions of control, and belief in conspiracy theories.

While our results are supportive of the stress-conspiracy theories link, our findings in relation to anxiety present a mixed picture. Trait anxiety was significantly correlated with belief in conspiracy theories, but did not emerge as a significant predictor in our regression analysis once the effects of stress had been account for. This weaker effect of anxiety was

possibly obtained because anxiety is largely reactive in nature (Spielberger, Gorsuch, & Lushene, 1970). According to this view, highly anxious individuals react more strongly to stressful events, but in the absence of stress they tend to be no more anxious than those low in anxiety. In other words, it is the experience of stress *per se* that may be the influencing factor *vis-à-vis* whether or not individuals begin to adopt a conspiracist worldview. Another possibility is that anxiety only becomes problematic when it reaches maladaptive levels: one previous study reported a significant association between maladaptive anxiety and belief in conspiracy theories (Swami et al., 2016).

A number of issues limit the present findings. Given our recruitment method, our sample should not be considered representative of the wider U.S. population. There is evidence that MTurk workers have distinct personality profiles compared with offline samples (Goodman, Cryder, & Cheema, 2013), which limits the generalisability of our findings. It is also notable that perceived stress and stressful life events only accounted for 9% of the variance in belief in conspiracy theories. Although this is comparable to other studies (e.g., thinking styles account for 8% of the variance in belief in conspiracy theories; Swami et al., 2014), it does point to neglected variables that could contribute to a fuller picture of the antecedents of conspiracist ideation. Additionally, our data are cross-sectional and the direction of causation should, therefore, be interpreted with caution. For example, it is possible that assimilating a conspiracy theory increases cognitive load or negative affect, which in turn increases stress and anxiety. Future work would do well to more carefully unpack direction of causation in future work.

There are a number of other ways in which our findings could be developed further. It would be useful to examine the impact of acute stress on belief in conspiracy theories, something we did not measure in the present work. One way of achieving this would be to compare belief in conspiracy theories before and after participants take part in an acute stress induction paradigm (e.g., Kirschbaum, Pirke, & Hellhammer, 1993). In addition, it would be useful to examine fine-grain associations between belief in conspiracy theories and neurophysiological responses to stress. For instance, there is evidence that hypothalamicpituitary-adrenal (HPA) axis functioning is associated with greater internalised racism (Tull, Sheu, Butler, & Cornelious, 2005) and that elevated cortisol response is associated with selfreported prejudice (Bijleveld, Sheepers, & Ellemers, 2012). It would be useful to extend these findings to examine associations with belief in conspiracy theories.

The above limitations notwithstanding, our findings may be useful for policy-makers seeking to reduce belief in conspiracy theories that are associated with negative behavioural outcomes (Douglas et al., 2016). For example, it may be possible to indirectly reduce belief in conspiracy theories through stress reduction techniques. Before such interventions can be developed, however, further research is necessary to examine the associations between stress and conspiracist ideation more fully. The present findings shed light on a hitherto neglected aspect of such beliefs and it is our hope that this preliminary study stimulates further research in this area. Given the range of negative consequences of belief in conspiracy theories (Douglas et al., 2016), this remains an urgent issue for scholars and policy-makers.

### Footnotes

<sup>1</sup>We also repeated this analysis, including ethnicity and education in the first step of the regression with age and subjective social status. Neither of the former variables reached significance, either in the first or second steps of the regression. Stressful life events, age, and perceived stress remained the only significant predictors in the second step.

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Table 1. Partial Correlations between Belief in Conspiracy Theories, Stress, and Anxiety,Controlling for Subjective Social Status and Age.

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Belief in conspiracy	-	.15*	.29**	.06	.10*	.07
theories						
(2) Perceived stress			.25**	.41**	.22**	.43**
(3) Stressful life events				.29**	.22**	.30**
(4) State anxiety					.44**	.74**
(5) Trait anxiety						.39**
(6) Episodic tension						-

*Note*. N = 420; \* p < .05, \*\* p < .001.