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Predicting Risk-Mitigating Behaviors from Indecisiveness and Trait-Anxiety: Two Cognitive Pathways to Task Avoidance

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Abstract

Objective: Past research suggests the traits indecisiveness and trait-anxiety may both decrease the likelihood of performing risk-mitigating preparatory behaviors (e.g. preparing for natural hazards), and suggests two cognitive processes (perceived control and worrying) as potential mediators. However, no single study to date has examined the influence of these traits and processes together. Examining them simultaneously is necessary to gain an integrated understanding of their relationship with risk-mitigating behaviors.

Method: We therefore examined these traits and mediators in relation to wildfire preparedness in a two-wave field-study amongst residents of wildfire-prone areas in Western Australia (total $N = 223$).

Results: Structural equation modeling results showed that indecisiveness uniquely predicted preparedness, with higher indecisiveness predicting lower preparedness. This relationship was fully mediated by perceived control over wildfire related outcomes. Trait-anxiety did not uniquely predict preparedness or perceived control, but did uniquely predict worry, with higher trait-anxiety predicting more worrying. Also, worry trended towards uniquely predicting preparedness, albeit in an unpredicted positive direction.

Conclusions: This shows how the lack of performing risk-mitigating behaviors can result from distinct cognitive processes that are linked to distinct personality traits. It also highlights how simultaneous examination of multiple pathways to behavior creates a fuller understanding of its antecedents.

Key words: Indecisiveness, Anxiety, Perceived Control, Worry, Risk-Mitigating Behaviors, Wildfire Preparedness.

Introduction

Practicing a keynote presentation, preparing for a job interview, or forming an emergency response plan when living in a hazard prone area – these are all examples of preparatory tasks that can reduce the chances of negative outcomes from a future event (e.g. embarrassment due to messing up, failing to get the job, or getting harmed by the hazard). Still, even though these risk-mitigating preparatory tasks can reduce the risk of negative outcomes in the future, some people are less likely than others to perform them.

Understanding who will fail to perform these tasks, and why, is an important step in reducing such task avoidance.

Two personality traits that can be expected to lead to the avoidance of risk-mitigating tasks are indecisiveness and trait-anxiety. In addition, past research suggests two different cognitive processes may mediate the relationships between these traits and task avoidance, namely perceived control and worry. However, none of the research to date has tested these relationships in a single study. Investigating both traits concurrently is important, however, to increase our understanding of the interplay between these traits and processes and their combined influence on behavior. This is especially relevant given that indecisiveness and trait-anxiety are highly correlated (Germeijs & Verschueren, 2011a), increasing the likelihood of false conclusions due to spurious relationships when these traits and their cognitive pathways to behavior are examined in isolation of each other.

Our goal in this paper was therefore to test a model that integrates past research on the influence of indecisiveness, trait-anxiety, perceived control and worry on the avoidance of risk-mitigating tasks. It did so in the context of natural hazards and examined the extent to which people who live in wildfire prone areas perform risk-mitigating preparatory behaviors. In the following, the authors review the relevant literature on indecisiveness, trait-anxiety, perceived control and worry, and present a hypothesized model of how these traits and processes can be expected to lead to the avoidance of risk-mitigating tasks.

Indecisiveness and Trait-Anxiety

Before relating indecisiveness and trait-anxiety to the avoidance of risk-mitigating tasks, it is important to define these traits and clarify how they relate to each other. Indecisiveness refers to the personality trait characterized by a general difficulty with making decisions. Compared to people lower on indecisiveness, those who are high on indecisiveness tend to be more concerned about making mistakes in the decision process, and perceive themselves as less able to make sound decisions (Frost and Shows 1993; Rassin, Muris, Franken, Smit, & Wong, 2007). Trait-anxiety, on the other hand, refers to one's propensity to respond with anxiety to a broad range of situations. Individuals who are more trait-anxious tend to experience stronger and more frequent feelings of stress, worry, and discomfort across typical day-to-day situations than those who are less so (Spielberger, Gorsuch, & Luchene, 1970; Spielberger & Sydeman, 1994).

Indecisiveness and trait-anxiety have been linked to one other conceptually, theoretically, and empirically. For one, indecisiveness has been included as a symptom or item on a widely used measure of trait-anxiety, the STAI-T (Spielberger et al., 1970),

implying that it is an inherent aspect of anxiety. Conversely, anxiety has also been suggested to be an important component of indecisiveness (Crites, 1969; Fuqua & Hartman, 1983; Goodstein, 1965; Meyer & Winer, 1993) with some arguing that it is the best indicator of indecisiveness (Fuqua & Hartman, 1983).

From a theoretical perspective, trait-anxiety can be expected to cause indecisiveness. More specifically, people higher in trait-anxiety are said to be more likely to expect negative outcomes than those lower in trait-anxiety, and when decisions are expected to have negative outcomes, people become more risk-avoidant by delaying the decision (Maner & Schmidt, 2006; Wray & Stone, 2005). Higher trait-anxiety can thus lead to increased indecision through the increased expectation of negative outcomes. Also, indecisiveness can be seen as a way of coping with anxiety. For example, one effective way to reduce the anxiety experience towards decision tasks is by avoiding the task altogether (Milgram & Tenne, 2000; Miu, Heilman, & Houser, 2008), which is an important characteristic of indecisiveness. Given these conceptual and theoretical links between the two traits, it is not surprising that correlations between measures of indecisiveness and trait-anxiety are consistently found to range from medium to large (e.g. Chartrand, Robbins, Morril, & Boggs, 1990; Rassin et al., 2007; Santos, 2001).

Although trait-anxiety and indecisiveness are strongly related, it is important to stress that the two traits are not the same construct. Indeed, recent confirmatory factor analytic results by Germeijs and Verschueren (2011a) showed support for a two-factor model over a single factor model. In addition, their study showed that indecisiveness uniquely predicted post-decisional problems after controlling for trait-anxiety. The authors thus concluded that the two traits should be treated as separate factors. Still, surprisingly

few studies have tested this assumption, and so the current study set out to replicate the results of Germeijs and Verschueren before running any additional analyses.

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Predicting Task Avoidance

Indecisiveness. Based on past research, one can expect both indecisiveness and trait-anxiety to be related to the avoidance of risk-mitigating tasks. Indecisiveness can be expected to lead to a lack of task performance in general, since one often needs to decide what to do before one can actually start doing it. In line with this, indecisiveness has been shown to correlate slightly to moderately with the personality trait of chronic task procrastination (e.g. Ferrari, 1992; Ferrari & Emmons, 1995; Milgram & Tenne, 2000). Also, although research on indecisiveness and actual task avoidance has been limited, indecisiveness has been related to delay in both decision tasks (Frost & Shows, 1993) and reasoning tasks (Xiong & Zhang, 2012). As many of the tasks involved in the prevention of negative future outcomes need decisions to be made before one can start the task, it can be expected that those high in indecisiveness will be less likely to perform these tasks. For example, in the case of natural hazards, one needs to decide *what* exactly to prepare for (e.g. in the case of wildfire in Australia, one can prepare for evacuation or prepare the property for defense; see Tibbits, Handmer, Haynes, Lowe, & Whittaker, 2008) and *how* one will prepare (e.g. when preparing for defending the house should one start by improving the building structure or by attaining the necessary fire fighting equipment). Those who find it harder to decide on what to focus on (first) can thus be expected to be more likely to delay starting preparations.

Trait-Anxiety. Trait-anxiety can be linked to the avoidance of risk-mitigating tasks through coping mechanisms. More specifically, the coping literature has identified three main strategies in which people may cope with threatening situations, namely task-oriented (cf. rational), emotion-oriented, and avoidance coping (e.g. Endler & Parker, 1990; Lyne &

Roger, 2000). The most adaptive is task-oriented coping, in which a person copes with the situation by performing threat-mitigating tasks or behaviors. With emotion-oriented coping, emotional support is sought, but no action is taken to reduce the threat. Finally, avoidance coping involves seeking distraction and ignoring the threatening stimuli altogether. The performance of risk-mitigating tasks, then, will be less likely whenever people use emotion-oriented or avoidance coping rather than task-oriented coping. Trait-anxiety has been related to a decreased use of task-oriented coping and an increased use of emotion-oriented coping (Endler & Parker, 1990; Gunthert, Cohen, & Armeli, 2002). It can therefore be expected to predict a decreased performance of risk-mitigating tasks. Indeed, higher trait-anxiety has been associated with an increased avoidance of risky decisions (Maner & Schmidt, 2006), and of dealing with social confrontations (Grecucci et al., 2013).

The Role of Perceived Control

Research suggests a common mediator between indecisiveness and trait-anxiety on the one hand and the avoidance of risk mitigating tasks on the other, namely perceived control over outcomes. If people believe that performing a task will not reduce the risk of negative outcomes, either because they perceive the task as ineffective or they perceive themselves as unable to perform the task appropriately, they will not be motivated to perform the task (Maddux & Rogers, 1983; also see Ferrari, 1991a, 1991b). Both indecisiveness and trait-anxiety have been linked to perceived control. For one, research has shown that those scoring higher on indecisiveness report lower self-confidence (Ferrari & Dovidio, 2001) and more negative core self-evaluations, which contains an important element of perceived control over outcomes (Di Fabio & Palazzeschi, 2012). Indecisiveness

has also been related to higher levels of neuroticism (e.g. Germeijs & Verschueren, 2011b) and a greater external locus of control (Bacanli, 2006). Anxiety, in turn, has been related to perceiving oneself to be unable to effectively deal with a threatening situation (Lazarus & Folkman, 1984; Milgram & Tenne, 2000; Viana & Gratz, 2012). Also, people higher in trait-anxiety have a more negative biased evaluation of their behavioral skills (Hirsch, Meynen, & Clark, 2004). The current study thus set out to examine the role of perceived control in both the predicted relationship between indecisiveness and task avoidance and the relationship between trait-anxiety and task avoidance.

The Role of Worry

There is a second factor that could potentially mediate the relationship between trait-anxiety and task avoidance, namely worry. Worry has a significant relationship with trait-anxiety, even to the extent that excessive worry was added as a defining diagnostic criterion of Generalized Anxiety Disorder in the fourth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR, 2000). Also, research on anxiety related worrying and task avoidance has shown that this type of worrying is positively related to avoidance coping and emotion-oriented coping (Jung, 1993), and task procrastination (Stöber & Joormann, 2001a)³. A suggested reason for the relationship between worry and task avoidance is that when a person is worrying, he or she is trapped in a faulty feedback loop of thoughts that inhibits him or her from moving on to task execution (Breznitz, 1971).

³ The authors acknowledge that worry can have both positive and negative effects on behavior, but wish to point out that the worry related to negative psychological states such as anxiety appears to be related to negative effects on behavior (for a discussion of different types of worry see Watkins, 2008).

It is therefore possible that anxiety may lead to task avoidance through an increase in worrying.

The Present Study

The hypothesized relationships are shown in the model in Figure 1. To test this model we conducted a study on community wildfire preparedness, and examined to what extent residents in wildfire prone areas had performed preparatory planning tasks (e.g. thinking about what each person in the household would need to do in the event of a wildfire) that would benefit their response in case of a wildfire threatening their community and/or household.

INSERT FIGURE 1 HERE

Method

Study Context and Procedure

This study was undertaken as part of a larger study on community wildfire safety and preparedness. Data were collected via two waves of questionnaires that were sent to households in wildfire prone areas in rural and peri-urban communities in Western Australia. The first wave of questionnaires was sent out just prior to the 2011-2012 Western Australian wildfire season (September, 2011) and the second wave was sent out in the final month of the wildfire season (March, 2012). Questionnaires were received over a four-week period following distribution. Only participants that provided responses at wave 1 received the follow-up questionnaire.

Participants

Wave 1. A total of 1700 questionnaires were distributed to households in wildfire prone areas, and 402 responses were received (response rate = 23.6%). Of these, 46 participants were excluded because they did not complete the section of the survey with the key measures of interest. An additional 12 participants were excluded because they either reported that they did not spend any time at the property or that the property was vacant or non-residential. The final number of useable responses at wave 1 was 344.

Wave 2. Wave 2 surveys were sent to the 344 participants who provided responses at wave 1. Of those returned, we successfully matched 254 surveys. Sixteen of these matched surveys had not been completed by the same householder, however, and were removed. Another 15 were screened out because they had not answered any of the items on one or more of the key measures. The final study sample size was therefore 223.

The mean age of the participants was 54.5 years ($SD = 12.6$), and 52.5 percent were male. More than half of the participants (55.9%) lived in a house on a hobby farm or small acreage block, 38.7 percent lived on in a house or unit on a residential block, 5.4 percent reported other property types, and one person did not provide this information. Participants had lived in their properties for an average of 13.0 years ($SD = 9.1$) and in their neighborhood for an average of 13.8 years ($SD = 10.2$). Almost all participants reported that they owned the property they lived in (95.9%). When comparing these sample demographics to the populations in the study areas (Australian Bureau of Statistics, 2011), our study sample differs mainly in that it has a higher number of property owners and a higher average age. These differences are common to survey studies of wildfire preparedness and responses (e.g. McNeill, Dunlop, Heath, Skinner, & Morrison, 2013; Paton, Kelley, Buergelt, and Doherty, 2006; Whittaker, Haynes, McLennan, Handmer, &

Towers, 2010), and are likely explained by a greater interest of homeowners (versus renters) in the survey's subject matter (wildfire preparedness).

Measures

Indecisiveness. Indecisiveness was captured via the 15-item Frost and Shows (1993) questionnaire during wave 1. Participants responded to the items (e.g. "It seems that deciding on the most trivial things takes me a long time", "I try to put off making decisions") on a 9-point scale ranging from 1 (very strongly disagree) to 9 (very strongly agree).

Trait-Anxiety. Trait-anxiety was assessed via the trait scale from the State Trait Anxiety Inventory (STAI-T; Spielberger et al, 1970). The full scale contains 20 items (e.g. "I feel nervous and restless", "I get in a state of tension or turmoil as I think over my recent concerns and interest") with a 5-point response scale ranging from 1 (never) to 5 (almost always). This variable was measured at wave 2 rather than wave 1 so as to balance the overall length of the two surveys, and being a trait measure, it was expected not to change substantially between waves 1 and 2. Indeed, Barnes, Harp, and Jung (2002) reviewed the reliability of the STAI measures across studies and observed a mean test-retest reliability of .88 for this measure (SD = .05) over seven studies. Also, one of the items from the STAI-T, "I make decisions easily", was removed from analyses of this scale because it confounded with the Indecisiveness construct.

Perceived Control. Perceived control over outcomes, was assessed via three items at wave 1 (e.g. "In my opinion, I can greatly reduce the threat posed by a bushfire occurring by preparing in the right manner", "In my opinion, I can overcome any unexpected situations or obstacles that occur during a bushfire by preparing in the right manner") to which they responded on a 9-point scale from 1 (very strongly disagree) to 9 (very strongly agree).

Wildfire Worry. Worry about wildfire was assessed at wave 1 with two items that were based on the Worry Domains Questionnaire (Stöber & Joormann, 2001b), but applied to a wildfire setting. The items were “I have worried that my community may be badly hit by a bushfire” and “I have worried that I could lose people close to me as a result of bushfire”. Participants responded to these items on a 5-point scale from 1 (not at all) to 5 (all the time).

Preparedness through Planning. We assessed the extent to which participants had taken steps to prepare for a wildfire event through planning via eight items at wave 2 (e.g. “You have thought carefully about what each person in your household would need to do in the event of a bushfire”, “You have considered atypical or unexpected situations (e.g., family members not all being at home, or in the same location, or friends/family visiting who are not physically fit enough to defend), and have ensured your household has an appropriate contingency plan”). This variable was captured at wave 2 for two reasons. First, we felt that householders were likely to do a significant part of their planning during the season rather than all before wave 1. Therefore, measuring planning at wave 2 allowed us to capture individual differences in the overall level of planning over the 2011-2012 fire season, rather than looking at who planned more early on in the season. Second, where possible, we wanted to avoid measuring our independent and dependent variables at the same time so as to avoid common method effects. Participants indicated which of the eight items were true at the time they completed the questionnaire by selecting one of three options; 0 (currently not true), 1 (currently true), and 2 (not applicable to my household situation; later recoded as a missing value), thus scores could range from 0 to 1. A proportion was used in favor of a summed score so as not to ‘penalize’ participants that are not in a position to undertake certain planning activities (e.g. “All of your family members

are comfortable with the intended fire plan”, in the case of a single person household). The full set of items used in this measure, along with descriptive statistics and psychometrics is presented in Appendix A.

Results

Preliminary Analyses

Scale means, standard deviations, intercorrelations, and Cronbach’s alpha are presented in Table 1, along with two demographic variables, age and gender. As can be seen from Table 1, Indecisiveness and Trait-Anxiety were moderately correlated. Trait-Anxiety correlated significantly and positively with Wildfire Worry, and both Trait-Anxiety and Indecisiveness correlated negatively with Perceived Control. Preparedness through Planning correlated significantly and negatively with both Indecisiveness and Trait-Anxiety, and also significantly and positively with Perceived Control.

INSERT TABLE 1 HERE

Evaluating the Distinctiveness of Trait-Anxiety and Indecisiveness

First, we set out to empirically determine whether Indecisiveness and Trait-Anxiety are indeed separable constructs. To this end, we undertook two Confirmatory Factor Analyses (CFAs) on item parcels. Item parcels were analyzed as indicators in lieu of the individual items because the total number of items involved (34) would have required the estimation of too many parameters relative to the sample size (West, Finch, & Curran, 1995). Some researchers have argued that parceling item can obfuscate model-misspecification due to potential construct multidimensionality (see Little, Cunningham,

Shahar, & Widaman, 2002; Little, Rhemtulla, Gibson, & Schoemann, 2013, for discussions).

We argue, however, that the two scales under analysis are very well established and validated, and the focus was to investigate the dimensionality *across* the two constructs, rather than *within* the measures. We therefore created three item parcels by assigning item 1 to parcel 1, item 2 to parcel 2, item 3 to parcel 3, item 4 to parcel 3, item 5 to parcel 2, item 6 to parcel 1, and so on, resulting in three Indecisiveness parcels and three Trait-Anxiety parcels. Any missing responses were replaced by the mean of the responses to the other items that were assigned to the same parcel as the missing response.

We specified two competing CFA models and analyzed data using Mplus version 7.12 with Maximum Likelihood Robust estimation (MLR; Asparouhov & Muthén, 2005), due to evidence of skewness in the item parcels (maximum z (skewness) = 3.461, $p < .001$). MLR is a maximum likelihood estimation technique that yields standard errors that are robust to non-normality. MLR also yields a χ^2 statistic which is asymptotically equivalent to the Yuan-Bentler T2* test statistic (Muthén & Muthén, 2012).

The first model included a single factor indicated by all six parcels, thus testing the hypothesis that Indecisiveness and Trait-Anxiety are a unitary construct. This model exhibited very poor fit to the data ($\chi^2(9) = 273.92$, $p < .001$; RMSEA = .363 (90% C.I. = .327, .401); CFI = .693), as per conventional criteria (Hu & Bentler, 1999). An alternative model was specified with two factors, one indicated by the three Indecisiveness parcels, and the other indicated by the three Trait-Anxiety parcels. This two-factor model offered good fit to the data ($\chi^2(8) = 17.20$, $p = .029$; RMSEA = .072 (90% C.I. = .022, .119); CFI = .989), and indeed a much better fit relative to the one-factor model. The correlation between the Trait-Anxiety and Indecisiveness factors was moderate ($r = .63$, $p < .001$). This set of results

supports the hypothesis that Trait-Anxiety and Indecisiveness are indeed separate but related constructs⁴.

The Discriminant Predictive Power of Indecisiveness vs. Trait-Anxiety

To test whether Indecisiveness and Trait-Anxiety uniquely predicted variance in the in Preparedness through Planning, we specified a structural equation model in Mplus 7.12 with MLR estimation. The model contained two latent variables, namely Indecisiveness and Trait-Anxiety (both indicated by their respective item parcels). Preparedness through Planning was also included in the model but was treated as a non-latent variable since it reflects a proportion of completed actions rather than being a conceptually latent construct. Preparedness through Planning was regressed on the Indecisiveness and Trait-Anxiety factors, and the regression residuals were free to co-vary with one another other.

The analyses revealed that Indecisiveness was a significant predictor of Preparedness through Planning ($\beta = -.224, p < .01$) but Trait-Anxiety was not ($\beta = -.086, ns$; overall proportion of variance explained = .082). The overall model fit was sound ($\chi^2 (12) = 21.17, p = .048$; RMSEA = .059 (90% C.I. = .005, .099); CFI = .990). It thus appears that Trait-Anxiety has no unique predictive power in predicting Preparedness through Planning after controlling for Indecisiveness.

⁴ As suggested by an anonymous reviewer, we verified that the results observed in this paper were not unique to the parceling method presented here by repeating the parceling process, and analyses, an additional eight times. For each analysis, we randomly assigned items into parcels but found very little variation in the results across the different parcel allocations.

Testing our Hypothesized Model

The substantive analysis tested the indirect effects of Indecisiveness and Trait-Anxiety on Preparedness through Planning via Perceived Control and Wildfire Worry, respectively. To do so, we specified the model depicted in Figure 1 in Mplus version 7.12 and computed MLR parameter estimates. More specifically, Perceived Control, Wildfire Worry, and Preparedness through Planning were regressed on the Indecisiveness and Trait-Anxiety factors, and the regression residuals were free to co-vary with one another other. The indirect effects were estimated via the delta method (see MacKinnon, 2008; Muthén & Muthén, 2012). This model is reproduced in Figure 2 with standardized parameter estimates.

INSERT FIGURE 2 HERE

The overall model fit was sound ($\chi^2(46) = 66.77, p = .024$; RMSEA = .045 (90% C.I. = .017, .067); CFI = .983). Trait-Anxiety significantly and positively predicted Wildfire Worry, and Indecisiveness significantly and negatively predicted Perceived Control. Perceived Control was a significant and positive predictor of Preparedness through Planning, and Wildfire Worry showed a trend toward positively predicting Preparedness through Planning too (observed $p = .062$). The latter result is surprising, both given the hypothesized negative relationship between Wildfire Worry and Preparedness through Planning, and given the non-significant zero-order correlation observed in Table 1. The latter suggests that Anxiety, Indecisiveness, or Perceived Control were acting as a suppressor variable. We will return to this at the end of the results section.

There were no significant direct effects of Indecisiveness or Trait-Anxiety on Preparedness through Planning after controlling for the indirect paths. The test of the indirect effect of Trait-Anxiety on Preparedness, through Wildfire Worry, was small and non-significant (standardized indirect coefficient = .008, $p=.858$). By contrast, the test of the indirect effect of Indecisiveness through Perceived Control was significant (standardized indirect coefficient = $-.112$, $p=.002$). Overall, the proportion of variance explained in Preparedness through Planning was .185.

Exploratory Analyses

To examine which factor acted as a suppressor for the effect of Wildfire Worry on Preparedness through Planning, we ran some additional analyses. For these analyses, all factors were specified using the factor loadings observed in the full structural model discussed above. We first calculated the zero-order correlation between Preparedness through Planning and the Wildfire Worry factor ($r = .075$, $p = .351$). We then undertook three structural regression analyses of Preparedness through Planning on Wildfire Worry, and, individually, each of the three potential suppressor variables (i.e. Indecisiveness, Perceived Control, and Anxiety). The standardized regression coefficient for Wildfire Worry in each of these structural regressions therefore represents the partial correlation of Wildfire Worry and Preparedness through Planning, after controlling for the candidate suppressor variable. When Indecisiveness, Perceived Control, and Anxiety were controlled for, the standardized regression coefficients for Wildfire Worry were, respectively, 0.108 ($p = .179$), 0.117 ($p = .126$), and 0.152 ($p = .064$). These analyses show that all three controls acted as suppressors to some extent, but Anxiety was the strongest suppressor. Further, as Figure 2 shows, the standardized coefficient for Wildfire Worry, with all three of the

remaining factors as controls, was almost the same as that when Anxiety alone was controlled for. This suggests that the suppression caused by Indecisiveness and Perceived Control was most likely due to variance that these two factors shared with the Anxiety factor. We will return to these results in the Discussion.

Discussion

This study tested a model in which the avoidance of risk-mitigating preparatory behaviors was predicted by the two traits indecisiveness and trait-anxiety, and by two potentially mediating cognitive processes, namely perceived control and worry. Results showed support for the idea that all four predictors were related to task avoidance (three out of four had significant zero-order correlations, and the fourth, worry, showed a trend towards significance in the model). However, results also showed that testing all predictors in a single model was necessary to gain a fuller understanding of how they collaborate in their influence on task avoidance.

First, the study showed support for the prediction that people who score higher on indecisiveness are less likely to perform risk-mitigating preparatory tasks, and that this effect is fully mediated by perceived control, with those higher in indecisiveness experiencing lower perceived control, which in turn leads to lower preparedness. In other words, they do not prepare because they do not believe they are able to reduce the risk of negative outcomes through doing so.

Second, this study showed initial support for the prediction that those who score higher on trait-anxiety are less likely to perform risk-mitigating preparatory tasks, and also appear to have lower perceptions of control (based on zero-order correlations). However, these relationships disappeared when controlling for indecisiveness, and thus appear to

have emerged primarily because those scoring higher on trait-anxiety *also tend to score higher on indecisiveness*; that is, the impact of trait-anxiety appears to be spurious, and is fully explained by its relationship with indecisiveness.

Third, although this study did not find evidence for the idea that trait-anxiety uniquely predicts task avoidance, it did show support for the prediction that those who score higher on trait-anxiety tend to worry more about wildfires. In addition, this study found an unpredicted positive relationship between worry and the performance of risk-mitigating preparatory tasks, but only after controlling for trait-anxiety. Such an effect is often referred to as suppression. One way to explain the suppression effect is that our worry measure may have captured elements of both unconstructive worry and constructive worry. By suppressing the unconstructive worry variance that was shared with trait-anxiety, the model revealed the positive relationship between the leftover, and more constructive, worry and the performance of risk-mitigating preparatory tasks. Indeed, this pattern of suppression is in line with other research that has also shown a positive effect of worry on problem solving (Davey, Hampton, Farrell, & Davidson, 1992) and on academic performance (Siddique, LaSalle-Ricci, Glass, Arnkoff, & Diaz, 2006), but only after controlling for anxiety. The current study thus supports the idea that certain types of worry may be beneficial for task performance, whilst simultaneously showing that the type of worry associated with anxiety lacks this positive effect. The fact that anxiety appeared to have no unique effect on task performance after controlling for indecisiveness shines an interesting light on the trait-anxiety construct, which is generally associated with negative effects on behavior.

More generally speaking, the current study supports the idea of Germeijs and Verschuere (2011a; 2011b) that indecisiveness and trait-anxiety are separate constructs that have unique predictive validity. In addition, it shows that these constructs relate to

different cognitive processes. Furthermore, it illustrates the importance of assessing the predictive power of one trait in a model with the other trait present when indecisiveness or trait-anxiety are involved.

Limitations and Directions for Future Research

The conclusions based on this study should be viewed bearing certain limitations in mind. First, all of the measures in this study were self-reported. Although it is possible that the processes required to generate self-reports superimpose variance (e.g., related to social desirability or expectations) over and above actual experiences, most of our measures were either established and validated (indecisiveness and trait-anxiety) or inherently introspective in nature (perceived control and worry), and therefore difficult to access in a more objective manner. However, within the context of wildfires, one might reasonably argue that objectively measurable actions (e.g. reducing the property's fuel load or installing gutter protection) are preferred over cognitive actions to detect the likelihood of task avoidance. We decided to use planning actions instead, because 1) the performance of the planning actions is not dependent on physical limitations such as muscle strength or money, whereas many of the other actions are, and 2) the more objectively measurable actions often suffer from interdependence, where performing one of several actions suffices (e.g. one does not need to clear gutters when one has installed gutter protection and vice versa). Still, future researchers might consider testing the model proposed here with behavioral outcome measures.

In addition to the above, the current study focused on preparing for wildfires, which may or may not become an actual threat. However, sometimes a future event is more certain to happen, for example with an upcoming job interview or keynote speech. More

research is needed to test whether the relationships found in the current study are bound to specific conditions such as threat certainty, or whether some of the predictors are related to a more general inaction goal, in which the avoidance of any task is simply preferred across the board, regardless of its content or consequences (Albarracin, Hepler, & Tannenbaum, 2011)⁵.

Third, this study highlights the need to re-examine the measurement of worry. Several worry measures, including our own, appear to capture both unconstructive and constructive worry, which shows through the suppressor effect of anxiety. Our current wildfire worry measure was based on a well-known and validated measure of general worry, namely the Worry Domains Questionnaire (Stöber & Joormann, 2001b). One of the other studies used a measure developed by the authors (Davey, Hampton, Farrell, & Davidson, 1992), whereas the other used the Penn State Worry Questionnaire, which is another widely used measure of worry (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990; used in Siddique, LaSalle-Ricci, Glass, Arnkoff, & Diaz, 2006). Future research should focus on finding ways to separate the two forms of worry in measurement.

Fourth, this study was limited to the examination of two traits and two cognitive processes. Still, it is possible that other related traits and processes play a role in the current model. For example, those who score higher on indecisiveness also tend to score higher on neuroticism (Germeijs & Verschueren, 2011b), which can also be expected to influence task performance. Similarly, worry has been related to perceived threat (Berenbaum, Thompson, & Bredemeier, 2007), which is not surprising since worry involves repeating thoughts about a future threat. Perceived threat, in turn, has also been shown to influence risk-mitigating

⁵ We would like to thank one of our anonymous reviewers for directing our attention to this research.

behaviors (McNeill et al, 2013). Future research should thus expand on the current model and examine how these related traits and processes fit in.

Finally, the study lacks a controlled experimental design, and therefore precludes firm statements about causality. Although traits are difficult to change within a study, future research could influence situational indecisiveness or state-anxiety and test whether these demonstrate similar relationships to those observed here with the mediators and inaction. Furthermore, future research could test whether manipulating perceived control and worry might drown the influence of indecisiveness and trait-anxiety on task avoidance.

Establishing causality could have important practical implications for those who aim to increase the performance of risk-mitigating behaviors, whether this concerns career focused preparations (e.g. job interviews) or mitigating the risk posed by natural hazards. Concerning the latter, the incidence of natural hazards is on the rise, and government agencies are increasing their focus on risk-reduction by creating more resilient households and communities. However, a single strategy to do so may not work for all. For example, the current study suggests that some approaches (i.e. increasing householders' perceptions of control) may be more effective when trying to increase preparatory behaviors in people who are higher in indecisiveness compared to those who are higher in trait-anxiety, but relatively low in indecisiveness. Also, using worry as a motivator should be done with care, as it can have both positive and negative effects on behavior.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics

The study protocol was approved by the Ethics Committee of the University of Western Australia before commencement of data collection.

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Author contributions

I.M. McNeill developed the study concept. All authors contributed to the study design. Testing, data collection, and data analysis were performed by I.M. McNeill and P.D. Dunlop. I.M. McNeill drafted the paper, except for the results section, which was drafted by P.D. Dunlop. T.C. Skinner, and D.L. Morrison provided revisions. All authors approved the final version of the paper for submission.

References

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (Revised 4th ed.). Washington DC: Author.

Albarracin, D., Hepler, J., & Tannenbaum, M. (2011). General action and inaction goals: Their behavioral, cognitive, and affective origins and influences. *Current Directions in Psychological Science*, *20*, 119-123.

Asparouhov, T., & Muthén, B. O. (2005). *Multivariate Statistical Modeling with Survey Data*. Paper presented at the Federal Committee on Statistical Methodology (FCSM) Research Conference.

Australian Bureau of Statistics (2011) Community Profiles. Available from <http://www.abs.gov.au/websitedbs/censushome.nsf/home/communityprofiles> [verified April 24, 2013]

Bacanli, F. (2006). Personality characteristics as predictors of personal indecisiveness. *Journal of Career Development*, *32*, 320–332.

Barnes, L. L., Harp, D., & Jung, W. S. (2002). Reliability generalization of scores on the Spielberger State-Trait Anxiety Inventory. *Educational and Psychological Measurement*, *62*(4), 603-618. doi: <http://dx.doi.org/10.1177/0013164402062004005>

Berenbaum, H., Thompson, R. J., & Bredemeier, K. (2007). Perceived threat: Exploring its association with worry and its hypothesized antecedents. *Behaviour Research and Therapy*, *45*, 2473–2482.

Breznitz, S. (1971). A study of worrying. *British Journal of Social and Clinical Psychology, 10*, 271–279.

Chartrand, J. M., Robbins, S. B., Morrill, W. H., & Boggs, K. (1990). Development and validation of the Career Factors Inventory. *Journal of Counseling Psychology, 37*, 491–501.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310–357.

Crites, J. O. (1969). *Vocational psychology*. New York: McGraw-Hill.

Davey, G. C. L., Hampton, J., Farrell, J., & Davidson, S. (1992). Some characteristics of worrying: Evidence for worrying and anxiety as separate constructs. *Personality and Individual Differences, 13*, 133–147.

Di Fabio, A., & Palazzeschi, L. (2012). Incremental variance of the core self-evaluation construct compared to fluid intelligence and personality traits in aspects of decision-making. *Personality and Individual Differences, 53*, 196–201.

Endler, N. S., & Parker, D. A. (1990). Multidimensional assessment of coping: a critical evaluation. *Journal of Personality and Social Psychology, 58*, 844–854.

Ferrari, J. R. (1991a). A preference for a favorable public impression by procrastinators: Selecting among cognitive and social tasks. *Personality and Individual Differences, 12*, 1233–1237.

Ferrari, J. R. (1991b). Procrastinators and project creation: Choosing easy, nondiagnostic items to avoid self-relevant information. *Journal of Social Behavior and Personality, 6*, 619–628.

Ferrari, J. R. (1992). Psychometric validation of two procrastination inventories: Arousal and avoidance measures. *Journal of Psychopathology and Behavioral Assessment*, *14*, 97–110.

Ferrari, J. R., & Dovidio, J. F. (2001). Behavioral information search by indecisives. *Personality and Individual Differences*, *30*, 1113–1123.

Ferrari, J. R., & Emmons, R. A. (1995). Methods of procrastination and their relation to self-control and self-reinforcement. *Journal of Social Behavior and Personality*, *10*, 135–142.

Frost, R. O., & Shows, D. L. (1993). The nature and measurement of compulsive indecisiveness. *Behavior Research Therapy*, *31*, 683–692.

Fuqua, D. R., & Hartman, B. W. (1983). A behavioral index of career indecision for college students. *Journal of College Student Personnel*, *24*, 507–512.

Germeijs, V., & Verschueren, K. (2011a). Indecisiveness: Specificity and predictive validity. *European Journal of Personality*, *25*, 295–305.

Germeijs, V., & Verschueren, K. (2011b). Indecisiveness and Big Five personality factors: Relationship and specificity. *Personality and Individual Differences*, *50*, 1023–1028.

Goodstein, L. D. (1965). Behavioral views of counseling. In D. Steffre (Ed.), *Theories of counseling*. New York, NY: McGraw-Hill.

Grecucci, A., Giorgetta, C., Brambilla, P., Zuanon, S., Perini, L. Balestrieri, M., Bonini, N., & Sanfey, A. G. (2013). Anxious ultimatums: How anxiety disorders affect socioeconomic behaviour. *Cognition and Emotion*, *27*, 230–244.

Gunthert, K. C., Cohen, L. H., & Armeli, S. (2002). Unique effects of depressive and anxious symptomatology on daily stress and coping. *Journal of Social and Clinical Psychology*, *21*, 583–609.

Hirsch, C. R., Meynen, T., & Clark, D. M. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory, 12*, 496–506.

Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.

Janis, I. L. (1958). *Psychological stress: Psychoanalytic and behavioral studies of surgical patients*. New York: Wiley.

Jung, J. (1993). The relationship of worrying, coping, and symptoms among college men and women. *The Journal of General Psychology, 120*, 139-148.

Lazarus R. S. , & Folkman S., (1984). *Stress, Appraisal, and Coping*. New York, NY: Springer.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151-173.

Little, T. D., Rhemtulla, M., Gibson, K., & Schoemann, A. (2013). Why the items versus parcels controversy needn't be one. *Psychological Methods, 18*, 285-300. doi: 10.1037/a0033266

Lyne, K, & Roger, D. (2000). A psychometric re-assessment of the COPE questionnaire. *Personality and Individual Differences, 29*, 321–335.

MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. New York, NY: Elbaum.

Maddux, J. E., & Rogers, R. W. (1983). Protection Motivation and Self-Efficacy: A Revised Theory of Fear Appeals and Attitude Change. *Journal of Experimental Social Psychology, 19*, 469–479.

Maner, J. K., & Schmidt, N. B. (2006). The role of risk avoidance in anxiety. *Behavior Therapy*, 37, 181–189.

McNeill, I. M., Dunlop, P. D., Heath, J. B., Skinner, T. C., & Morrison, D. L. (2013). Expecting the unexpected: Predicting physiological and psychological wildfire preparedness from perceived risk, responsibility, and obstacles. *Risk Analysis*, 33, 1829-1843. doi: 10.1111/risa.12037

Meyer, B. W., & Winer, J. L. (1993). The Career Decision Scale and neuroticism. *Journal of Career Assessment*, 1, 171–180.

Milgram, N., & Tenne, R. (2000). Personality correlates of decisional task avoidant procrastination. *European Journal of Personality*, 14, 141–156.

Miu A. C., Heilman, R. M., & Houser, D. (2008). Anxiety impairs decision-making: Psychophysiological evidence from an Iowa Gambling Task. *Biological Psychology*, 77, 353–358.

Muthén, L. K., & Muthén, B. O. (2012). *Mplus: Statistical analysis with latent variables: User's Guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Paton, D., Kelly, G., Buergelt, P. T., & Doherty, M. (2006). Preparing for bushfires: Understanding intentions. *Disaster Prevention and Management*, 15, 566-575.

Rassin, E., Muris, P., Franken, I., Smit, M., & Wong, M. (2007). Measuring general indecisiveness. *Journal of Psychopathology and Behavioral Assessment*, 29, 61–68.

Santos, P. J. (2001). Predictors of generalized indecision among Portuguese secondary school students. *Journal of Career Assessment*, 9, 381–396.

Siddique, H. I., LaSalle-Ricci, V. H., Glass, C. R., Arnkoff, D. B., & Diaz, R. J. (2006). Worry, optimism, and expectations as predictors of anxiety and performance in the first year of law school. *Cognitive Therapy and Research*, 30, 667–676.

Spielberger, C. D., Gorsuch, R. L., & Lushene R. E. (1970). *Test manual for the State-Trait Anxiety Inventory*. Palo Alto, California: Consulting Psychologists Press.

Spielberger, C. D., & Sydeman, S. J. (1994). State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory. In M.E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcome assessment* (pp. 292-321). Hillsdale, NJ: Lawrence Erlbaum Associates.

Stöber, J., & Joormann, J. (2001a). Worry, procrastination, and perfectionism: Differentiating amount of worry, pathological worry, anxiety, and depression. *Cognitive Therapy and Research*, 25, 49–60.

Stöber, J., & Joormann, J. (2001b). A short form of the Worry Domains Questionnaire: Construction and factorial validation. *Personality and Individual Differences*, 31, 591–598.

Tibbits, A., Handmer, J., Haynes, K., Lowe, T., & Whittaker, J. (2008) Prepare, stay and defend or leave early. In 'Community Bushfire Safety' (Eds J Handmer, K Haynes) pp. 59–71(CSIRO Publishing: Melbourne).

Viana, A. G., & Gratz, K. L. (2012). The role of anxiety sensitivity, behavioral inhibition, and cognitive biases in anxiety symptoms: Structural equation modeling of direct and indirect pathways. *Journal of Clinical Psychology*, 68, 1122–1141.

Watkins, E. R. (2008). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, 134, 163-206.

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks: CA: Sage.

Whittaker, J., Haynes, K., McLennan, J., Handmer, J., & Towers, B. (2010). Victorian 2009 bushfire research response: Household mail survey. Melbourne: Bushfire Cooperative Research Centre.

Wray, L. D., & Stone, E. R. (2005). The role of self-esteem and anxiety in decision making for self versus others in relationships. *Journal of Behavioral Decision Making*, 18, 125-144.

Xiong, H., & Zhang, J. (2012). The difference between indecisiveness and procrastination. *International Journal of Psychology: Personality*, 47, 605–605.

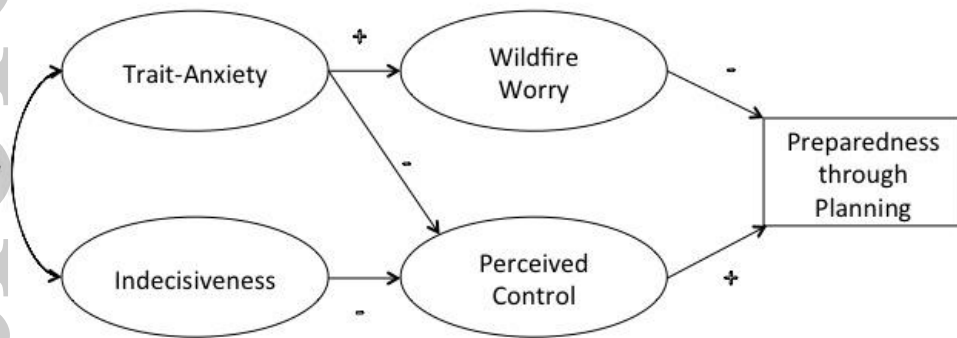


Figure 1. The hypothesized relationships between Trait-anxiety, Indecisiveness, Wildfire Worry, Perceived Control, and Preparedness through Planning.

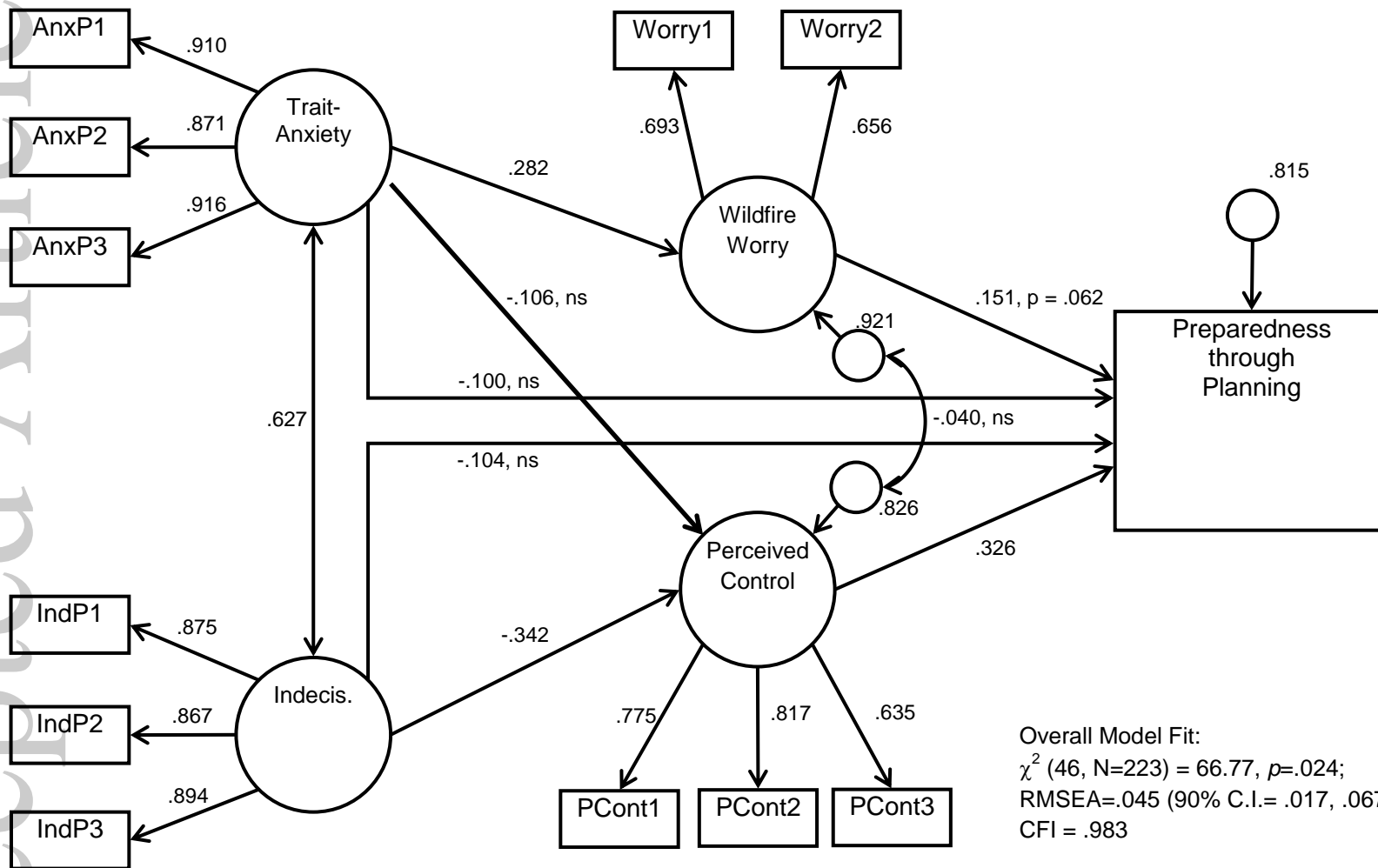


Figure 2. The indirect effects of Trait-Anxiety and Indecisiveness on Preparedness through Planning via Wildfire Worry and Perceived Control.

Note: Indicator residuals have been omitted for brevity. Reported are standardized regression coefficients. All coefficients are statistically significant at $\alpha = .05$, unless marked *ns* or with a specific p -value.

Table 1. Means, Standard Deviations, Intercorrelations, and Cronbach's Coefficient Alpha for all Study Variables

Variable	Mean	SD	1	2	3	4	5	6	7
1. Gender (0 = m; 1 = f)									
2. Age	54.54	12.64	-.35**						
3. Indecisiveness	3.52	1.14	.06	-.11	(.89)				
4. Trait-Anxiety	2.09	0.57	.16*	-.25**	.58**	(.94)			
5. Wildfire Worry	1.98	0.83	.10	.09	.09	.22**	(.62)		
6. Perceived Control	7.07	1.29	-.15*	.11	-.35**	-.28**	-.07	(.77)	
7. Prep. through Planning	0.75	0.30	-.02	.13	-.27**	-.22**	.06	.34**	(.84)

Notes. Bivariate n ranges from 216 (Age) to 223 (all other variables).

* $p < .05$; ** $p < .01$. Cronbach's coefficient alpha is provided along the diagonal in parentheses. Gender was coded 0 = Male 1 = Female. Prep. =

Preparedness

Appendix A.

Means, Standard Deviations, and Cronbach's alpha if Item Removed for all Items used to measure Preparedness through Planning.

Preparedness through Planning Item	Mean	SD	α if item removed
1. You have formed a household bushfire emergency plan	0.73	0.45	0.819
2. Everyone in the family now knows the evacuation route to be used	0.75	0.43	0.810
3. You have thought carefully about what each person in your household would need to do in the event of a bushfire	0.75	0.43	0.814
4. All household members are aware of the fire plan	0.77	0.42	0.804
5. You have considered atypical or unexpected situations and have ensured your household has an appropriate contingency plan	0.66	0.48	0.821
6. You are prepared emotionally for the possibility that your home may be destroyed if you leave	0.76	0.43	0.849
7. You are prepared emotionally for the possibility that your home may be destroyed even if you defend it	0.75	0.44	0.847
8. All of your family members are comfortable with the intended fire plan	0.83	0.38	0.807

Notes. Participants responded to each item by selecting "Currently True" (coded as 1) "Currently Not True" (coded as 0) or "Not Applicable" (coded as missing). Univariate N ranges from 209 (item 5) to 221 (item 1). Listwise N = 189 and Cronbach's alpha = .841.