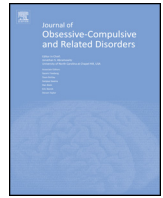




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Cognitive factors predicting checking, procrastination and other maladaptive behaviours: Prospective versus Inhibitory Intolerance of Uncertainty

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ABSTRACT

Intolerance of Uncertainty (IU) is a cognitive construct which is strongly linked to psychopathology, particularly anxiety and obsessive-compulsive symptoms. IU has also been proposed to be linked to maladaptive behaviours such as checking and procrastination in uncertain situations. Additionally, two subfactors of IU have recently been identified, *Prospective IU (Desire for Predictability)* and *Inhibitory IU (Uncertainty Paralysis)*. These factors may differentially predict approach and avoidance behaviours respectively, however research is lacking. This study investigated associations between IU subfactors and self-reported maladaptive behaviours. University students ($n=110$; 74.3% female) completed self-report measures of behaviours including checking, procrastination, general avoidance and controlling behaviours. We hypothesised that *Prospective IU* would be associated with checking behaviours while *Inhibitory IU* would be associated with procrastination. Procrastination was predicted only by *Inhibitory IU*, however Checking was predicted equally by *Inhibitory IU* and *Prospective IU*. The results provide the first evidence of a differentiation between the two IU subfactors in predicting maladaptive behaviours. *Uncertainty Paralysis* may be an important cognitive factor reflecting tendencies to freeze during uncertainty, which predicts both checking and procrastination. Checking behaviours may be associated with additional unwillingness to leave outcomes to chance. This research provides new information about specific cognitive factors associated with checking and procrastination and other maladaptive behaviours, which could potentially be targeted in interventions.

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1. Introduction

Intolerance of Uncertainty (IU) has recently received increasing attention as a potentially important trans-diagnostic factor spanning anxiety, obsessive-compulsive and depressive disorders. It is defined as the “tendency of a person to consider the possibility of a negative event occurring as unacceptable and threatening irrespective of the probability of its occurrence” (Carleton, Sharpe, & Asmundson, 2007, pg. 1). While numerous studies have investigated links between IU and psychopathology (Birrell, Meares, Wilkinson, & Freeston, 2011), its role in contributing to common maladaptive behaviours including checking, procrastination, avoidance and control has received relatively little attention.

IU was originally proposed as a specific vulnerability factor for generalised anxiety disorder (GAD; Dugas, Gosselin, & Ladouceur,

2001; Dugas, Schwarz, & Francis, 2004). Recent studies, however, have found associations between IU and symptoms of obsessive-compulsive disorder (OCD; Fergus & Wu, 2010), social phobia (Boelen & Reijntjes, 2009; Carleton, Collimore, & Asmundson, 2010), panic disorder (McEvoy & Mahoney, 2012; Sexton and Dugas, 2009; Carleton, Fetzna, Hackl, & McEvoy, 2013), post-traumatic stress disorder (PTSD; Fetzner, Horswill, Boelen, & Carleton, 2013) and depression (Yook, Kim, Suh, & Lee, 2010). Despite many studies linking IU to psychopathology, questions remain about the specific nature of the construct and how it may contribute to psychopathological symptoms (Birrell et al., 2011). A recent review of factor analysis studies strongly suggested that the Intolerance of Uncertainty Scale (IUS) is made up of two factors, both in the original 27-item and the 12-item versions (Birrell et al., 2011). Birrell et al. (2011) concludes that ‘*Desire for Predictability*’ and ‘*Uncertainty Paralysis*’ are appropriate labels for these two subfactors. *Desire for Predictability* comprises items that describe an active engagement in seeking certainty. It represents a desire to know what the future holds and may motivate attempts to increase predictability through seeking information and engaging in

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preparation and planning (Birrell et al., 2011). *Uncertainty Paralysis* represents a sense of being stuck and unable to respond effectively when faced with uncertainty, resulting in a paralysis of cognition and action (Birrell et al., 2011). In the *Intolerance of Uncertainty Scale, Short Form* (IUS-12; Carleton, Norton, & Asmundson, 2007), these two subfactors are referred to as *Prospective* and *Inhibitory IU*, respectively.

Evidence suggests that the two IU subfactors are differentially associated with specific psychopathology. *Uncertainty Paralysis* is more strongly associated with symptoms of social anxiety, panic disorder, agoraphobia, PTSD and depression; while *Desire for Predictability* is more strongly associated with symptoms of OCD and GAD (Boelen, Vrinssen, & van Tulder, 2010; Carleton et al. 2012; Carleton et al., 2007; McEvoy & Mahoney 2012; Fetzner et al., 2013; Boelen & Reijntjes, 2009; Gentes & Ruscio, 2011; McEvoy & Mahoney, 2011; Tolin, Abramowitz, Brigidi, & Foa, 2003). These studies suggest that while *Uncertainty Paralysis* may be associated more strongly with anxiety and depression symptoms generally, *Desire for Predictability* may be the facet of IU with the greatest specificity to checking, worry and control behaviours, seen particularly in OCD and GAD.

A number of hypotheses have been put forward to explain the differences between the two sub-factors. According to Birrell et al. (2011) these two factors represent different ways of dealing with uncertainty with *Desire for Predictability* reflecting approach responses and *Uncertainty Paralysis* reflecting avoidance responses. Berenbaum, Bredemeir, and Thompson (2008) further hypothesised that “*Desire for Predictability* may directly increase worry, while *Uncertainty Paralysis* likely contributes to avoidant behaviour that helps maintain a pattern of worrying” (pg. 124).

Although IU is thought to be associated with particular cognitive, affective, and behavioural responses to uncertain situations (Dugas et al., 2004), few studies have explored specific behaviours in relation to IU or its two subfactors (Luhmann, Ishida, & Hajcak, 2011; Thibodeau, Carleton, Gomez-Perez, & Asmundson, 2013). There is some evidence that IU shapes people's behaviour. In particular, those with high IU may seek more information before making decisions (Ladouceur, Talbot, & Dugas, 1997; Rosen & Knauper, 2009). For example, in a study of information seeking in a health context those higher in IU were more likely to acquire health-related brochures, as a way of reducing their health worries (Rosen & Knauper, 2009). IU may also lead people to behave in ways that reduce the time spent in uncertainty, which they find difficult. Luhmann et al. (2011) found that those with higher IU were more likely to repeatedly choose smaller and fewer probable awards if they were immediately made aware of the outcome, than larger and more probable rewards that would require a longer period of uncertainty before outcomes.

In terms of relationships between the IU subfactors and behaviour, Thibodeau et al. (2013) examined this in relation to speed and accuracy of typing performance. Both subfactors were similarly associated with slower typing speed and neither were associated with typing errors. These findings are contrary to the proposal that *Desire for Predictability* is associated with cognitive but not behavioural responses to uncertainty, as both subfactors were associated similarly with typing performance. Other studies have explored associations between the two subfactors and behavioural symptoms of different anxiety disorders. These studies have found *Uncertainty Paralysis* to be associated with avoidance in panic disorder (Carleton et al., 2013), with avoidance, emotional numbness and hyperarousal (but not re-experiencing) in PTSD (Fetzner et al., 2013), and hoarding severity (both buying and keeping) among people with hoarding disorder (Oglesby et al., 2013). In these studies *Desire for Predictability* was not associated with these symptoms, suggesting that it is more predictive of cognitive rather than behavioural responses.

Checking is a behavioural response associated with psychopathology which may be useful in differentiating the two IU

subfactors. Checking is primarily an approach response designed to reduce the uncertainty of possible future threat. If *Desire for Predictability* reflects an approach response to uncertainty and *Uncertainty Paralysis* an avoidance response then it would be expected that checking would be more closely related to *Desire for Predictability* than *Uncertainty Paralysis*. No prior studies have explored this possibility. Checking is common in individuals with OCD (> 80%; Lind & Boschen, 2009), and is seen as a type of compulsion performed to reduce the distress and anxiety associated with obsessions. There is also evidence that checking may occur commonly in GAD. Many GAD patients report engaging in repetitive compulsive behaviours at a similar frequency and impairment level to OCD patients, with the most frequent being checking (Schut, Castonguay, & Borkovec, 2001; Townsend, Weissbecker, & Barbee, 1999). The type of checking behaviour may differ, however, from people with OCD. A recent study of undergraduate students found that OCD symptoms were associated with object and interpersonal checking, while GAD symptoms were associated only with checking in an interpersonal context (e.g. Reassurance Seeking; Coleman, Pieterfesa, Holaway, Coles, & Heimberg, 2011). As well as being relevant to both OCD and GAD patients, previous findings support an association between checking and IU (Lind & Boschen, 2009). Using undergraduate students and a clinical OCD sample Lind and Boschen (2009) found that IU mediated the association between beliefs about responsibility to prevent harm and checking behaviour. Therefore, exploring the associations of checking with the two IU subfactors will contribute to understanding the possible influence of IU beliefs on checking behaviour, and potentially inform treatment approaches. If, for example, checking behaviour is associated with *Desire for Predictability*, interventions could aim to increase individuals' confidence in their abilities to deal with common events, even though they involve unpredictability. If, however, checking is related to *Uncertainty Paralysis*, interventions could aim to shape individuals' capacity to continue to perform goal-directed behaviour even in the face of uncertainty, through exposure, behavioural experiments and reinforcement.

Procrastination is another type of behaviour related to psychopathology which may also be differentially associated with the two IU subfactors. It is a form of avoidance which involves the “voluntarily delay (of) an intended course of action despite expecting to be worse off for the delay” (Steel, 2007 pg.66). Procrastination is highly common and problematic. It can not only cause practical problems but can also prolong anxiety and stress related to the task being avoided (Steel, 2007). It is particularly common for students, with up to 50% of university students acknowledging that they engage in consistent and problematic procrastination (Steel, 2007). The items making up the *Uncertainty Paralysis* scale describe a tendency to freeze into inertia in the face of uncertainty and this may reflect a procrastination response to uncertain tasks. Evidence suggests that anxiety and a low sense of self-efficacy are associated with greater procrastination (Haycock et al., 1998), however, no previous studies have investigated the association between IU and student procrastination.

Additional maladaptive behaviours which are prominently associated with psychopathology and uncertainty are avoidance as a general and maladaptive means of attempting to cope with stressors, and excessive attempts to control life circumstances. The recently developed Intolerance of Uncertainty Index (IUI) has subscales assessing both Avoidance and Control (Carleton et al., 2010). Measurement of these behaviours in relation to IU subfactors may help to determine the extent to which *Prospective* and *Inhibitory IU* relate to approach and avoidance behaviours respectively.

This study aims to investigate the role of cognitive constructs including IU and its subfactors *Prospective IU* and *Inhibitory IU*, and their individual roles in contributing to problematic behaviours.

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