

The relevance of uncertainty and goal conflict to mental disorders, their prevention and management: a unifying approach

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Abstract. Intolerance of Uncertainty (IU) has been shown to underlie a range of disorders. Technological advances have produced a decline in our development of an ability to wait in the face of uncertainty. The paper provides an update on empirical, theoretical and neural research in IU. Einstein's extended transdiagnostic model of IU is described. This model is based on control theory. The research update and IU model propose specific tools which can be implemented within transdiagnostic treatment approaches.

Key words: Goal conflict, intolerance of uncertainty, transdiagnostic, treatment

Introduction

Over the past 25 years, burgeoning research on the impact of 'intolerance of uncertainty' (IU) on general health and on psychiatric disorders has begun to command attention in clinical arenas. IU has been defined as the dispositional tendency 'to react negatively on an emotional, cognitive, and behavioural level to uncertain situations' (Buhr & Dugas, 2009, p. 216). Individuals vary in their willingness to experience uncertainty, and discomfort with uncertainty has been shown to increase with escalating comorbidity in Axis I diagnoses (Mahoney & McEvoy, 2011; Carleton, 2012, 2016; Einstein, 2014). IU is argued to significantly contribute to personal and economic costs on the health system (Carleton, 2012).

Do existing psychological treatments target IU?

Estimates of certainty underlie cognitive models of anxiety. The traditional danger expectancy model (Reiss, 1991; Chan & Lovibond, 1996; Beck & Clark, 1997) argues that anxiety may arise from either an overestimation of the probability or cost of the feared event; or

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an underestimation of the individual's ability to cope with the feared event should it occur. For example, Beck & Clark (1997) describe danger expectancy as an underlying feature of anxiety. They propose that it is the 'propensity of [the] information processing apparatus to inappropriately generate threat meaning assignments to innocuous stimuli that is the main problem that must be rectified in the treatment of anxiety disorders' (p. 51). Nevertheless, Einstein *et al.* (2016) demonstrated that IU is not automatically altered through cognitive challenging, exposure and behavioural experiments in a high-school prevention programme. However, IU was altered for high-symptom students post-intervention when uncertainty was labelled and specifically targeted within the programme. Robichaud & Dugas (2006) and Whittal & McLean (2002) have designed treatments which successfully alter IU within GAD and OCD populations.

Control theory and the extended transdiagnostic model of IU (Einstein, 2014)

Control theory can provide an explanation of how the individual's reaction to uncertainty leads to arousal and can be used to guide effective clinical treatment (Einstein, 2014). Control theory has its origins in control engineering and proposes that the brain operates in a way analogous to homeostatic control systems in biology – through negative feedback control (Carey *et al.* 2014). Specifically, we base our approach on an integration of independent work by Jeffrey Gray, and William T. Powers (Powers, 1973; Gray, 1982; McNaughton & Gray, 2000; Einstein, 2014). According to control theory, psychological distress arises from the loss of control that results from unresolved conflict between competing goals (Powers, 1973; Mansell, 2005; Higginson *et al.* 2011; Einstein, 2014). Within this context, an uncertain event is one for which there is ambiguity regarding the most adaptive goal to pursue at that moment. This state is marked by persistent arousal because the physiological preparation for action is blocked. Gray and colleagues describe this anxious state as 'defensive approach'. Figure 1 describes the extended transdiagnostic model of uncertainty.

According to the transdiagnostic model of uncertainty (Einstein, 2014; Fig. 1), when faced with uncertainty, the individual first makes a threat estimate (TE). This estimate is an imagined aversive consequence. Gilbert & Wilson (2009) describe the TE as a mental simulation or preview of the future. Multiple TEs may be generated. These estimates are drawn from cognitive biases in our memories of past experiences (see further Gilbert & Wilson, 2009). Figure 1 shows that TEs feed directly into the *comparator system*.

The comparator function is an important component of control theory. While Powers (1973) makes it clear that comparators are present throughout the nervous system to implement control, Gray and colleagues describe how a central comparator system may halt an operating program in an attempt to resolve the mismatch between the perceived threat and the individual's desired outcome during defensive approach. According to Powers (1973), a trial-and-error learning process known as reorganization allows the resolution of goal conflict to occur during this conflicted state. The reorganization requires sustained attention on the systems governing the goal conflict for it to eventually be resolved, and for adaptive actions to proceed (Carey, 2011). Paradoxically, this state entails that people may experience short-term loss of control, in order to regain long-term control. Control of a wide range of variables is itself key to well-being. Examples include physiological variables such as body temperature and blood glucose levels, and psychological variables such as one's desired self-concept, one's

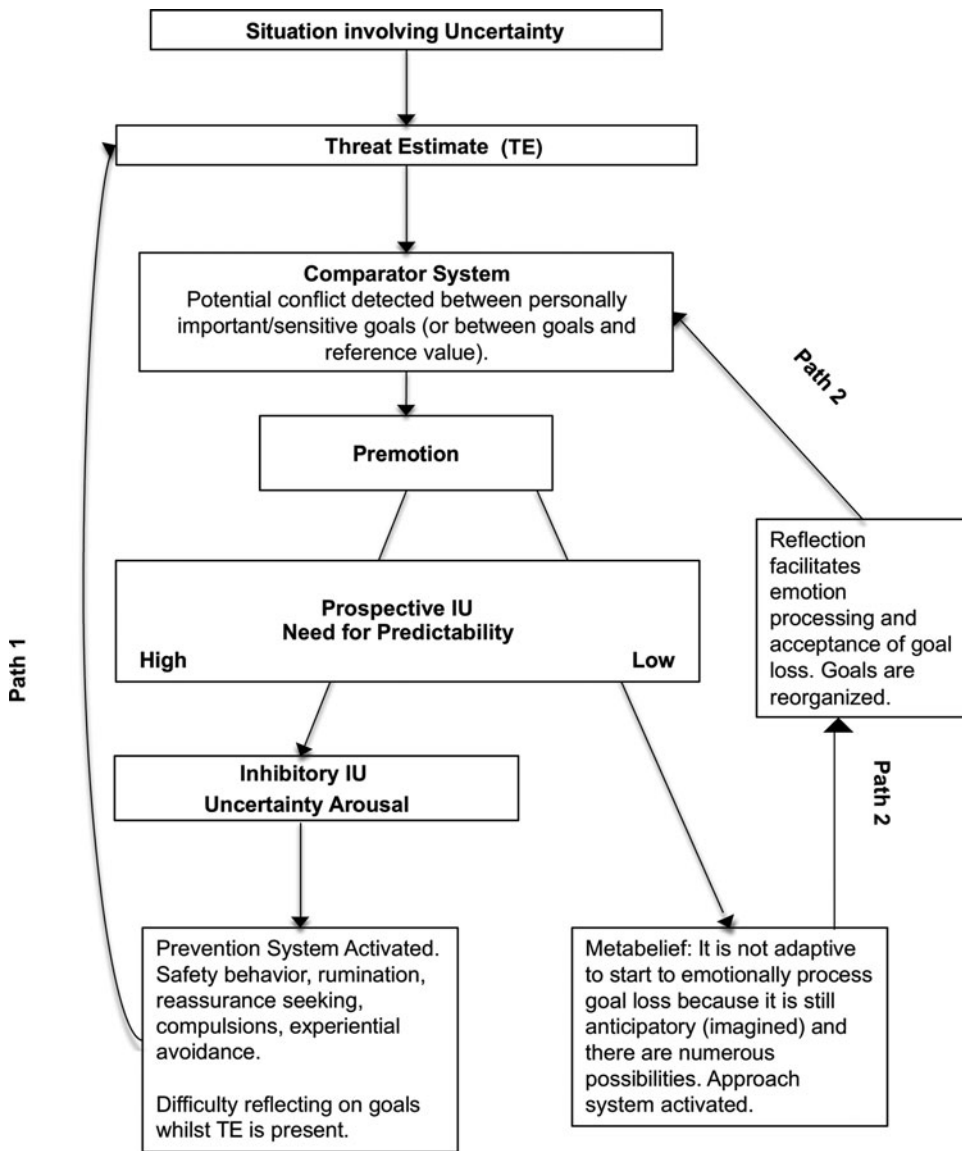


Fig. 1. Model of Intolerance and Uncertainty. IU, Intolerance and Uncertainty; TE, threat estimate.

social relationships and one’s principles. However, because of the inevitability of conflict, control of one or more of these variables may be temporarily suspended to allow conflict to reduce and change to occur. For example, one might need to let go of one’s attempt to be dominant in social relationships in order to allow a therapist to ask questions to help one explore one’s priorities in relationships. In letting go of control at this time, changes in priorities may occur spontaneously or other ways to solve related problems may emerge.



Fig. 2. The Effort Intensity Continuum.

A key question therefore, is what kind of ‘stance’ towards one’s experiences can facilitate change in this way (see also Carey, 2011).

For the first time, we describe here how an *Effort Intensity Continuum* integrates a wide range of psychological models of engagement with internal states such as uncertainty (Fig. 2). This is demonstrated as follows. A successful shift in stance moves from effortful suppression (Richards & Gross, 1999) and avoidance of the internal state (e.g. Hayes *et al.* 1996) at one end, through intolerance (Buhr & Dugas, 2009), towards a gradient of tolerance, to an ability to simply notice an uncertain state with a small amount of effort as often described within mindfulness meditation (Bishop *et al.* 2004) and metacognitive awareness (Wells, 2002). From a control theory perspective, this shift allows awareness to be sustained on the most relevant personal goals, with sufficient time for reorganization to generate a successful resolution. ‘Insight’ may be also experienced as going ‘up levels’ to become aware of the superordinate goals that are driving conflict within a hierarchy. For example, a person who is uncertain as to whether to try to avoid meeting strangers or to approach them may realize that both goals are driven by the goal to be liked (and not rejected) by other people.

There are two paths within the Transdiagnostic model. According to path 1 (Fig. 1), a TE is detected as conflicting with one’s goals and is associated with emotional arousal described as a ‘premotion’ (Gilbert & Wilson, 2009). Within the model a separate component of arousal that follows in high Prospective IU individuals has been labelled ‘uncertainty arousal’. Uncertainty arousal may be subtle and is generally not accompanied by insight; the arousal is nonetheless experienced as unacceptable and is linked with a range of behaviours aimed at an immediate reduction of the arousal. Such behaviours include reassurance seeking, safety behaviours, and compulsions. They strive to manage the arousal without returning to sustain attention and reorganize goals. Path 2 within the model emphasizes the value of reflection. It suggests that reflection is indicated. This sometimes necessitates social support. Activation of the approach system occurs on this path. The model emphasizes that responses to uncertainty only trigger arousal when they occur in an area of importance to the individual (through activation of the central comparator system).

Neural support for the model

The Neural model explains the integration of emotion with uncertainty in the form of a distinct feeling state (Singer *et al.* 2009). This interoceptive state is represented in the Uncertainty model (Fig. 1; Einstein, 2014) under the label of Uncertainty Arousal. Uncertainty Arousal possesses a motivational function, as it activates a behavioural prevention system. The anterior insula has been hypothesized to underlie this state by integrating somatic, affective and sensory responses to uncertainty. Evidence for this hypothesis is accumulating (Critchley *et al.* 2001; Simmons *et al.* 2008; Singer *et al.* 2009). Shankman *et al.* (2014) examined healthy controls. Using functional magnetic resonance imaging (fMRI) analyses, they observed

that the right anterior insula cortex was more strongly activated during the anticipation of unpredictable aversive images compared to predictable aversive images. Moreover, activation within this area was related to subjective reports of intolerance of uncertainty. Findings of increased activation in this area have also been noted in fMRI studies involving healthy volunteers (Rubio *et al.* 2015).

In processing uncertainty, hypervigilance is proposed to correspond to amygdala activation (Grupe & Nitschke, 2013). Krain *et al.* (2008) suggested that individuals with low IU exhibit amygdala deactivation when faced with uncertainty while individuals with high IU display the opposing neural response. Williams *et al.* (2015) examined fMRI results for children with anxiety disorders and matched controls. Children with anxiety disorders demonstrated greater amygdala activation than the matched controls when presented with unpleasant facial expressions.

Transdiagnostic approach to treatment

The question of how and why to provide a transdiagnostic psychological intervention as opposed to a disorder-specific intervention applies to interventions that are informed by any theoretical approach and is covered in detail elsewhere (e.g. Mansell *et al.* 2009; McHugh *et al.* 2009). Advantages of the transdiagnostic approach include the efficiencies involved in training and delivery when diagnosis is not required. With regards to more recent evidence on efficacy, there appears to be no clear advantage of either approach. For example, in a recent meta-analysis, transdiagnostic and disorder-specific CBT were seen to produce comparable effects with regard to clinical significance after acknowledging multiple sources of bias (Pearl & Norton, 2016). A second meta-analysis drew a preliminary conclusion that transdiagnostic approaches may be equivalent to disorder-specific approaches for the treatment of anxiety and have superior effects for the treatment of depression, thereby implicating a slight preference for use in presentations of comorbid anxiety and depression (Newby *et al.* 2015). However, this conclusion was based on four studies, reflecting a general paucity of research to firmly establish relative efficacy. In practice, the extent to which disorder-specific information is used often depends on the tradition within the service. Our model is therefore often applied in the context of psychoeducation about the meaning of symptoms of a disorder with which the patient has been diagnosed. For example, panic attacks in clear presentations of panic disorder may be explained and normalized, as might intrusive thoughts in people diagnosed with a primary obsessive compulsive disorder. Yet, it is clear that the symptoms of a disorder are rarely unique to that disorder (Mansell *et al.* 2015), and so even psychoeducation rarely proceeds on purely diagnostic lines.

According to the transdiagnostic model of uncertainty (Fig. 1), when exposed to an area of uncertainty, individuals choose to either avoid reflecting on the meaning of the threat (path 1) or to engage in structured reflection (path 2). Path 1 is associated with worry and symptoms of anxiety disorders, whereas path 2 leads to a healthier and more flexible response to the threat.

In order to assist patients manage their response to uncertainty, we carry out the following:

- (1) *Identification of Prospective IU.* This is based on the IUS-12 Scale. The IUS-12 is composed of two subscales: Anticipatory IU and Prospective IU (Carleton *et al.* 2007). Prospective IU emphasizes the individual's rigid need to be prepared to maximize control, e.g. 'I always want to know what the future has in store for me', 'Unforeseen events upset

- me greatly’, ‘I can’t stand being taken by surprise’ and ‘One should always look ahead to avoid surprises’. The rigid need for control assessed by the nature of prospective IU leads to path 1. Once labelled, the clinician is able to target Prospective IU as described below.
- (2) *Management of physical, cognitive and behavioural responses to uncertainty.* The transdiagnostic approach encourages the use of the following techniques that to some degree overlap with Cognitive Behavioural and Acceptance & Commitment approaches.
- (a) *Client-driven exposure to the interoceptive experience of uncertainty*, such that their stance shifts towards tolerating greater intensities of this state with less effort required. The Effort Intensity Continuum (Fig. 2) illustrates how stances towards internal experiences such as states of uncertainty lie on a continuum. The optimum way to effectively deal with uncertainty is through shifting the stance towards the experience of arousal during states of uncertainty. The continuum extends from complete avoidance, through tolerance, to the ability to face, accept or even embrace the benefits of an uncertain state.
- (b) *Curious questioning* regarding any catastrophic thinking that emerges when faced with ambiguity in areas perceived as important.
- (c) *Developing insight into the behavioural response to uncertainty.* Social media apps, iphones and search engines have lowered the threshold with which individuals need to sit with uncertainty in everyday life. Nominating a realistic time-frame within which an answer can be expected assists the individual to refrain from action. This may then be combined with mindfulness and emotion regulation and is best implemented in unison with point (3) below.
- The above techniques target conflict occurring at different levels of a clients’ goal hierarchy (Alsawy *et al.* 2014). Alsawy *et al.* (2014) explain how techniques that address both higher level goals and lower level perceptual experiences should predominate. Take the example of a client with health anxiety who is struggling with the uncertainty of whether they have a life-threatening illness. The therapist would explore with them the life goals that span these levels: ‘When you notice that you might have the illness, what do you start to think about?’; ‘What would things be like for you with the illness, and without it?’ The therapist may use Method of Levels techniques (Carey, 2006) to help catch background thoughts about the goals surrounding the uncertainty, and to explore current feelings, impulses and mental imagery (Alsawy *et al.* 2014). Reflection on goal conflict within specific spheres of life (e.g. work, school, peers, family, self) supports the development of healthy responses to uncertainty.
- (3) *Building patience.* Finally, many industries aim to exploit the incredulous person’s desire to avoid uncertainty. People strive for certainty over matters such as child care, medical diagnosis and social approval. Commercial organizations may exploit this need by appearing to provide certainty for a high price. The ability to wait and tolerate uncertainty is therefore more widely advantageous. Tarot card readers, supernatural theorists and clairvoyants also take advantage of uncertainty and these examples may be shared with clients. For a detailed example of such an exercise, see Einstein & Menzies (2007, pp. 23–24). Einstein *et al.* (2016) demonstrated a small but significant lowering of IU, using a one-session internet program (in comparison to a control internet program), when such an exercise was combined with mindfulness. This finding was based on participants drawn from a university and general adult population.

Summary

We have described a transdiagnostic approach to uncertainty that is guided by an established psychological theory of control. The therapy brings together a range of familiar techniques with a central focus on developing insight. By utilizing control theory we have developed the Effort Intensity Continuum that spans a range of psychological approaches in order to accompany exposure within states of uncertainty.

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Declaration of Interest

The authors have no conflict of interest with respect to this publication.

Recommended follow-up reading

Carleton RN (2016). Into the unknown: a review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders* **39**, 30–43.

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Learning objectives

- (1) To integrate a transdiagnostic treatment approach with recent theoretical and empirical developments in our understanding of Intolerance of Uncertainty (IU).
- (2) To understand the role of control theory in contributing to arousal when clients are confronted with uncertainty.
- (3) To consider a range of methods to intervene to reduce IU.
- (4) To provide an update on neural mechanisms which underlie a desire to avoid uncertainty.