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An experimental exploration of behavioral and cognitive–emotional aspects of intolerance of uncertainty in eating disorder patients

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ABSTRACT

Objective: Intolerance of uncertainty (IU) is an important concept in eating disorders (ED). Cognitive, emotional, and behavioral features of IU amongst individuals with and without ED were investigated.
Method: Participants completed the intolerance of uncertainty scale (IUS) and four versions of a data-gathering task varying in difficulty/uncertainty, and rated their Beads task experience.
Results: ED groups had significantly higher IUS scores than healthy controls (HC). Bulimia Nervosa (BN) participants requested more cues than HC and Anorexia Nervosa (AN) participants before making decisions. ED groups found the task more distressing than HC participants, with those with BN feeling more uncertain and less confident in their decisions, and those with AN attributing greater importance in making the correct decision.
Discussion: While both ED groups reported raised IUS scores only BN participants engaged in an elevated evidence requirement data gathering style. Future research might benefit from further exploration of the role of perseverative processes in BN.

1. Introduction

The contribution of anxiety to eating disorders (ED) is an area that provides promise but as yet offers little in the way of experimental data (Dellava et al., 2009; Pallister & Waller, 2008; Strober, Freeman, Lampert, & Diamond, 2007; Strober, 2004; Touyz et al., 2007; Waller, 2008). Within the anxiety disorders literature much is now known about the cognitive and behavioral processes underlying anxiety states and some of these processes may well be relevant to our understanding of the spectrum of ED (Waller, 2008; Wells, 1997). It is known, for example, that ED are commonly predated by anxiety traits or the presence of a full-blown anxiety disorder (Hudson, Hiripi, Pope, & Kessler, 2007; Raney et al., 2008; Swinbourne & Touyz, 2007). Women with Anorexia Nervosa (AN) who report a history of childhood anxiety disorder report more extreme ED related personality traits and attitudes and they engage in more compensatory behaviors compared to those without such comorbidity (Dellava et al., 2009; Raney et al., 2008). Furthermore, anxiety-related comorbidity has a negative effect on outcome of AN (Herpertz-Dahlmann et al., 2001). Thus studies exploring the contribution of anxiety relevant variables to ED may offer fresh insight regarding targets for treatment.

An important component process of anxiety disorders, observed especially in generalized anxiety disorder, obsessive compulsive disorder and social anxiety (Boelen & Reijntjes, 2009; Simmons, Matthews, Paulus, & Stein, 2008), is intolerance of uncertainty (IU). This is a trait which denotes "*a tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events*" (Heimberg, Turk, & Mennin, 2004, pp. 143). People who are intolerant of uncertainty see uncertainty as stressful and upsetting, experience unexpected events as negative and try to avoid them and believe that uncertainty has a negative impact on their ability to act (Buhr & Dugas, 2002). The construct of intolerance of uncertainty is characterized specifically by "*a tendency to perceive the future and the possibility of uncertain events as uncomfortable*" (Gosselin et al., 2008, pp. 1427).

While research on IU is in its infancy in ED, recent findings suggest that this is a relevant concept for people with ED. A qualitative study found that AN patients experienced uncertainty as stressful and wanted to avoid this at all costs. Prominent sources of uncertainty were fear of negative evaluation by others and feelings of being imperfect. Uncertain situations led participants to feel anxious and 'out of control', resulting in a strong desire for control which manifested in extreme organizing and planning (Sternheim, Konstantellou, Startup, & Schmidt, 2010). Questionnaire-based studies found that compared to healthy controls, people with eating disorder behaviors (mainly those with AN behaviors) had high levels of IU, and that in a non-clinical sample, individuals with problematic eating attitudes had higher levels of IU compared to those with non-problematic eating attitudes (Konstantellou &

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Reynolds, 2010; Konstantellou, Campbell, Eisler, Simic, & Treasure, in preparation). Nothing is known about IU in Bulimia Nervosa (BN).

To build on previous research, a robust approach is to consider an individual's behavioral reactions across varying degrees of uncertainty. Uncertainty is closely linked to probability since probabilistic reasoning concerns information processing in uncertain conditions, harder task conditions being associated with more uncertainty (Bensi & Giusberti, 2007; Cavanagh & Dudley, in preparation).

The present study will employ a previously well validated probabilistic reasoning task – the Beads task (Huq, Garety, & Hemsley, 1988) – to capture individual differences in data gathering under various degrees of task difficulty and thus under various levels of uncertainty. Data gathering has been widely studied in different psychiatric populations (Dudley & Over, 2003; Dudley, John, Young, & Over, 1997; Fraser, Morrison, & Wells, 2006; Garety, Hemsley, & Wessely, 1991; Peters & Garety, 2006; Ziegler, Rief, Werner, Mehl, & Lincoln, 2008) but has to date not been explored in ED. In the classical version of the Beads task, participants are shown colored beads (red vs. green) that come from one of two jars containing varying ratios of the different colored beads (such as 15 red vs. 85 green and 85 red vs. 15 green) and they have to make a probabilistic decision regarding from which jar the beads are drawn, the mainly red or mainly green jar (Garety et al., 1991).

Previous studies exploring IU in relation to data gathering have not found an interaction between IU and task performance depending on task difficulty. However, IU is related to performance when the task occurs under moderate levels of ambiguity. In this situation higher levels of IU are associated with poorer performance.

A study using the Beads task by Ladouceur, Talbot, and Dugas (1997) found that those individuals with high levels of IU required more beads before making a decision, and thus performed worse, than those individuals with low levels of IU. A positive relation between IU and the number of beads was reported, suggesting that IU is related to elevated evidence requirements and that this effect is greatest in moderately ambiguous situations (Ladouceur et al., 1997).

The tendency toward elevated evidence requirements during problem solving has been found previously in individuals with anxiety disorders and obsessive compulsive disorder across various task conditions (Davey, Startup, Zara, MacDonald, & Field, 2003; Dudley & Over, 2003; Tallis & Eysenck, 1994).

Furthermore, it is known that people with ED have impaired social cognition, including difficulties recognizing and regulating emotions, and a recent study showed that compared to HCs, those with ED showed attentional biases to angry faces over neutral faces (Harrison, Tchanturia, & Treasure, 2010; Harrison, Sullivan, Tchanturia, & Treasure, 2010; Oldershaw, Hambrook, Tchanturia, Treasure, & Schmidt, 2010).

The aim of the present study was to investigate cognitive, emotional, and behavioral correlates of intolerance of uncertainty amongst a sample with ED. By varying the Beads task along dimensions of task difficulty it was possible to explore new hypotheses regarding the information processing style of individuals under varying degrees of uncertainty (White & Mansell, 2009).

1.1. Hypotheses

1.1.1. Task 1

First, it was hypothesized that compared to healthy controls, people with AN and BN would have higher levels of IU on a widely used questionnaire measure assessing this; second, we hypothesized that on the Beads task a greater proportion of people with AN and BN would display an elevated evidence requirement data-gathering style and that they would on average request more beads than healthy controls; third, we hypothesized that there would be a positive correlation between scores on the IU questionnaire and the number of beads requested. Finally, we hypothesized that on the visual analogue scales assessing the Beads task experience people with AN and BN would feel more distressed and less confident during the task, and would place greater importance on making the correct decision.

1.1.2. Task 2

Following Broome et al. (2007), we created an emotionally salient data gathering task in which we replaced the beads with pictures of happy and angry faces. It was predicted that the emotionally salient version of the Beads task compared with a neutral version would increase the elevated evidence requirements effect in the ED groups.

2. Methods

This research was reviewed and approved by the Joint Institute of Psychiatry and South London and Maudsley NHS Foundation Trust ethics committee, and all participants provided informed consent according to the ethical standards laid down in the 1964 Declaration of Helsinki.

2.1. Participants

A total of 111 women aged between 16 and 53 were assessed for participation. Eating disordered participants were recruited via the Eating Disorders Outpatient Department of the Maudsley Hospital, South London and Maudsley NHS Foundation Trust and the Phoenix Wing, an inpatient eating disorders service at St Ann's Hospital, Barnet, Enfield, and Haringey Mental Health Trust. ED diagnoses were made by experienced clinicians at the outpatient department using a semi-structured assessment template to formulate DSM IV diagnoses or by the researcher (LS), using the Eating Disorder Examination (EDE (Fairburn & Cooper, 1993)), a semi-structured interview widely used to assess psychopathology associated with eating disorders. Seventeen out of 37 AN participants and 12 out of 22 BN participants received the EDE. The researcher (LS) had undergone intense EDE training before starting recruitment. ED participants were asked about current diagnoses of clinical depression and anxiety disorders and excluded if they answered in the affirmative. Healthy control (HC) participants were recruited via circular emails to King's College London students and staff, as well as via flyers in the community. HC participants were screened using questionnaire measures of eating disorders Eating Disorder Examination-Questionnaire (EDE-Q (Fairburn & Beglin, 1994)) and affective symptomatology depression anxiety & stress scale short version (DASS-21: Lovibond & Lovibond, 1995) in the last 28 days (for details about both these questionnaires see below). Participants were also asked if they had ever had an eating disorder. HC participants were excluded if they had self-reported learning difficulties, current or life-time eating disorder symptoms, or symptoms of depression or anxiety in the last 28 days.

2.2. Procedure & assessments

Eligible participants were asked to complete various self-report measures before a 1-h meeting with the researcher (LS).

2.2.1. Clinical measures

2.2.1.1. National adult reading test (NART) (Nelson, 1991). The National Adult Reading Test is a widely accepted and commonly used measure for estimating premorbid intelligence levels and correlates significantly with level of education and with full score IQ, as measured using the British version of the Wechsler Adult Intelligence Scale (WAIS-R (Wechsler, 1981)). Participants are requested