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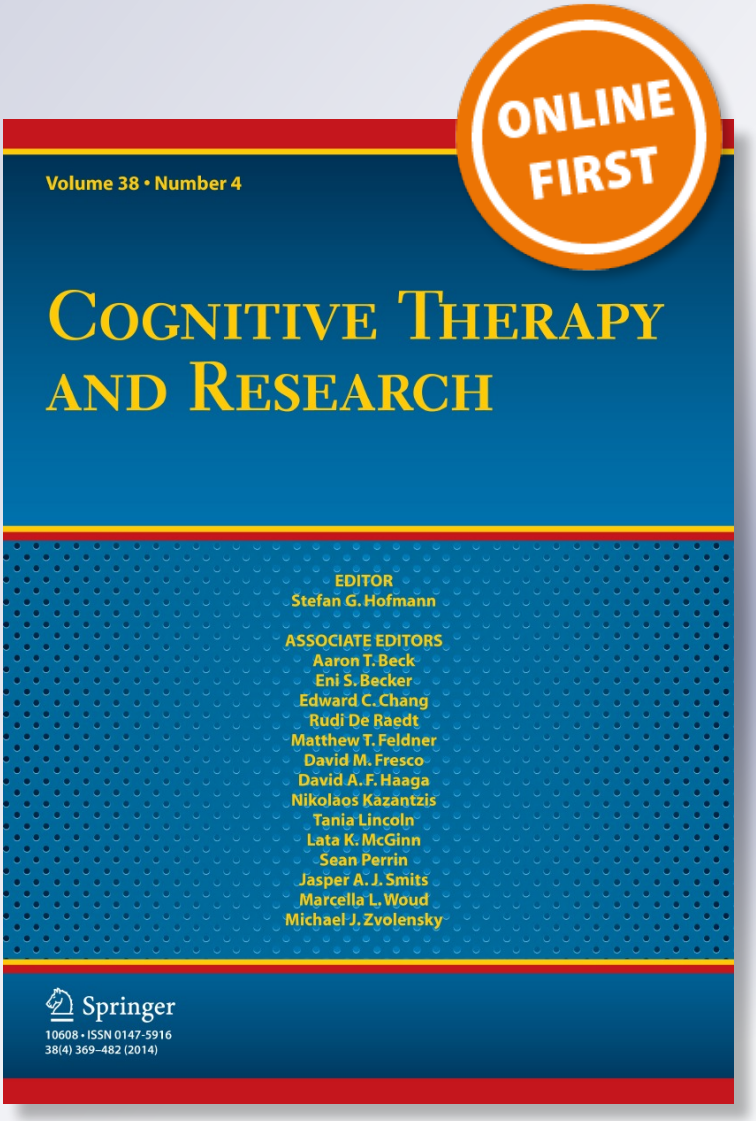

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ORIGINAL ARTICLE

The Cognitive Behavioural Processes Questionnaire: A Preliminary Analysis within Student, Mixed Clinical and Community Samples and the Identification of a Core Transdiagnostic Process

Trishna Patel · Warren Mansell · David Veale

Abstract Theorists have highlighted the commonalities in cognitive and behavioural processes across multiple disorders i.e. transdiagnostic approach. We report two studies that tested the psychometric properties of a new scale to assess these processes. The Cognitive and Behavioural Processes Questionnaire (CBP-Q) was developed as a 15-item measure. In Study 1, the CBP-Q was administered to a student ($n = 172$) sample with a range of standardised measures of the processes and symptom measures. Study 2 repeated the evaluation in a mixed clinical group ($n = 161$) and a community control group ($n = 57$). An exploratory factor analysis resulted in a 12-item version of the CBP-Q, consisting of a single factor. The measure demonstrated good internal consistency, test–retest stability and satisfactory convergent and divergent validity in both studies. Correlations with symptom-based measures showed increased engagement in these cognitive and behavioural processes to be associated with higher levels of symptomatology. The scale was elevated in the clinical relative to the community group and there were no differences in scores between broad diagnostic groupings (anxiety vs. mood vs. other). The CBP-Q has good psychometric properties. The findings are consistent with the transdiagnostic approach and indicate that a single, as yet unspecified factor may account for the shared variance across cognitive and behavioural maintenance processes.

Keywords Transdiagnostic · Cognitive processes · Behavioural processes · Control theory

Introduction

Increasingly, clinicians and researchers have begun to recognise the commonalities in cognitive and behavioural processes across different psychological disorders and their role in the development and/or maintenance in a range of symptoms, functioning and quality of life. Consequently, several prominent groups of researchers and clinicians have provided a range of benefits for moving towards a transdiagnostic approach to cognitive behavioural therapy (CBT; Craske 2012; Harvey et al. 2004; Hayes et al. 2013; Mansell et al. 2009; McHugh et al. 2009; McManus et al. 2010). Yet, the empirical, theoretical and clinical status of the transdiagnostic approach lags behind the ambitions of its supporters. More specifically, few researchers have attempted to develop a parsimonious account of the wide variety of different transdiagnostic approaches that have emerged, and in turn, to develop a clinically useful measure that encompasses them. The current study was designed to begin such a scientific endeavour.

Earlier versions of the data were submitted as a Doctoral thesis at the University of East London in 2010 for the Professional Doctorate in Clinical Psychology and presented at the following conferences: International Control Systems Group conference, Manchester, 2010; North East London Foundation Trust Annual Research and Development conference, London, 2011 and British Association for Behavioural and Cognitive Psychotherapies Annual conference, Guildford, 2011.

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The term 'cognitive and behavioural processes' will be used in this article to refer to the psychological processes across the domains of attention, memory/imagery, thinking, reasoning and behaviour that have been found to maintain distress in people with psychological disorders. In their key systematic review, Harvey et al. (2004) analysed the large number of published studies that examined these processes in samples with diagnosed psychiatric disorders. They identified that 12 of these were identified as 'definitely transdiagnostic' in that they were elevated in all disorders tested and in at least four different disorders. A further three were identified as 'possibly transdiagnostic'. Readers are referred to Harvey et al. (2004) and Mansell et al. (2008) for a complete list of these processes. Since then, a number of studies have further supported the review and identified other possible cognitive and behavioural processes as transdiagnostic, such a emotion-reactive impulsivity (Johnson et al. 2013) and intolerance of uncertainty (McEvoy and Mahoney 2012). Thus, there is a significant challenge to begin to assess this wide range of processes and to understand their similarities and differences from one another.

Importantly, there is increasing evidence that these cognitive and behavioural processes are themselves highly correlated. Several studies have discovered this through conducting a factor analysis of multiple measures of cognitive and behavioural processes and finding that a one-factor solution explained the majority of variance among the scales. An analogue study of 559 students revealed that a single factor accounted for the majority of variance in intrusion interpretation, rumination, worry, obsessive beliefs and shame and this correlated more strongly with social anxiety than the individual scales (Field and Cartwright-Hatton 2008). They termed this factor a 'transprocess' but could not specify exactly what it measured. Similarly, a single factor derived from experiential avoidance, worry and rumination, correlated with distress in a chronic physical illness sample, and predicted distress at three month follow-up in a student sample (Bird et al. 2009). The extracted factor in this study was termed 'uncontrollable negative thinking'.

Two further relevant studies of analogue samples can be identified from the literature. One study of 252 students assessed four processes (rumination, thought suppression, reappraisal and problem-solving) and found that both rumination and thought suppression loaded on a single process termed 'cognitive emotion regulation' This was defined as a set of "cognitive responses to emotion-eliciting events that consciously or unconsciously attempt to modify the magnitude and/or type of individuals' emotional experience or the event itself". The single factor was associated with symptoms of anxiety, depression and eating disorders in this cross-sectional sample (Aldao and Nolen-Hoeksema 2010). A further cross-sectional study of 312 undergraduates found that a single factor of 'emotion-reactive impulsivity' could be extracted from diverse measures of impulsivity (Johnson et al. 2013). A regression analysis revealed that this factor was associated with transdiagnostic symptoms including aggression, anxiety, borderline personality symptomology, and alcohol problems, and the factor was defined as "poor control over impulsive reactions to emotions".

It is evident from the research reviewed above that there is no consensus with regards to explaining the reason why measures of cognitive and behavioural processes are closely correlated and what this overlap represents from a theoretical perspective. Nevertheless, it holds promise that a transdiagnostic form of CBT could target this factor, which we shall term a 'core process'. Furthermore, the above studies have utilised a limited range of existing standardised self-report measures within either analogue samples, or a relatively circumscribed clinical sample. This entails a limit to the range of potential processes that can be assessed and the generalizability of the findings. Indeed, there are no studies that have combined measures of multiple cognitive and behavioural processes in a single questionnaire. Our novel approach was therefore to develop a new questionnaire that samples the full range of cognitive and behavioural processes identified by Harvey et al. (2004), and that surveys a wide range of psychological disorders. This scale would not only benefit from greater generalizability through its use of a wider range of cognitive and behavioural processes, but also serve as a clinical tool to use in transdiagnostic approaches to CBT.

We therefore developed a short, efficient, personalised, self-report scale of a wide range of cognitive and behavioural processes, within a consistent format that is anchored within the individual's current problem situations. The scale is designed to be used to both refine disorder-based CBT and to inform transdiagnostic CBT, which does not require information about diagnosis to begin formulation and treatment (Mansell et al. 2009). It is designed to easily monitor the key cognitive and behavioural processes known to maintain distress across psychological disorders, so that they can be discussed, formulated, and targeted, such as through behavioural experiments.

We conducted two studies to examine the scale's psychometric properties and tested specific hypotheses. First, following on from earlier studies extracting a single factor from a number of measures of cognitive and behavioural processes, we predicted that the 15 cognitive and behavioural processes assessed by the new scale would share substantial variance, potentially leading to a single factor solution. Second, consistent with the scale assessing transdiagnostic processes that maintain distress, we predicted that scores on the scale would correlate with symptoms of both anxiety and depression, and that they would be elevated in clinical versus community samples.

Finally, we predicted that, given the scale assesses the features of cognitive and behavioural processes that are shared across disorders, the total scores on the scale would not be different between diagnostic groupings within a clinical sample.

Study 1

Introduction

At an initial stage, it was important to provide a preliminary test of the psychometric properties of the scale prior to assessing clinical and community samples. A sample of psychology students was therefore recruited through a course credit scheme. This represented a relatively homogenous sample in terms of age, social class, experience and environment.

Method

Design

A cross-sectional study of students using self-report measures examined test–retest reliability, convergent validity and factor analytic structure of a new questionnaire.

Participants

A total of 172 students were recruited: Five males and 167 females, *M* age (*SD*) = 19.50 (2.97). Their ethnic status was as follows: 72.6 % White British, 6.4 % White Other, 0.6 % Black or Black British, 19.8 % Asian or British Asian and 0.6 % Mixed background. We found that 6.4 % of the sample reported a mental health diagnosis: 3 (1.7 %) obsessive compulsive disorder, 1 (0.6 %) panic disorder, 6 (3.5 %) depression and 1 (0.6 %) borderline personality disorder. There was a comorbidity rate of 1.2, 1.7 % taking psychotropic medication and 1.7 % receiving psychological therapy.

Materials

Cognitive and Behavioural Processes Questionnaire (CBP-Q)

This scale was developed in a series of stages involving feedback from researchers and piloting with ten clinical and ten non-clinical participants who were not included in the main analysis. The first stage of construction involved reviewing the cognitive and behavioural processes identified as transdiagnostic (e.g. Harvey et al. 2004) in order to assess which ones could be represented within a questionnaire format. This was a challenge because many earlier studies had largely used experimental paradigms to assess some of the processes. For this reason, explicit selective memory, and interpretative biases were omitted. Metacognitive beliefs were also omitted because they assessed beliefs about processes rather than capturing the main aim of the questionnaire—to measure the processes themselves.

The researchers adhered to key principles regarding questionnaire construction in terms of wording and rating scales (Barker et al. 2002). The questionnaire stated that the questions referred to when participants 'feel bad' in the past week in order to ground the responses in everyday problematic situations that would be sensitive to change.

It was also a challenge to generate items that were brief, reader friendly and able to encapsulate experiences across multiple disorders, without referring to disorder-specific concerns. To help structure items, attention shifted to layout. As the focus of the questionnaire was on cognitive and behavioural processes, it was decided that the scale should be divided into these two domains. Once this decision had been made, it became apparent that many of the processes within the cognitive section could be collapsed further, thus specific questions on thoughts, or recurrent memories for example, would not be necessary. Consequently in part A (cognitive section), it was decided not to differentiate between thoughts, feelings, bodily sensations, voices, urges, memories, or images, because they would be experienced across disorders in some form or another. They were therefore termed 'internal experiences' and questions were generated based on what individuals might do mentally in response to those experiences. These were: avoidance/suppression, mental control, thought-action fusion, rumination, worry and self-criticism. Part B referred to various processes that interfaced with the environment rather than internal experiences. They were: hypervigilance for threat, safety-seeking behaviour, behavioural avoidance (including inactivity and overactivity), and experiential avoidance using alcohol, drugs, food or activities.

Each item utilised the semantic differential method (Snider and Osgood 1969) to counter response acquiescence. It provided a verbal description of the two extremes of a process, e.g. for hypervigilance, "How much have you looked for possible harm or threats in your surroundings when feeling bad, rather than just noticing things around you?" This was followed by a 9-point (0–8) graphic Likert scale that was used to assess the degree of self-reported engagement with each process, e.g. 0 = *Always looked for threats*; 2 = *Mostly looked for threats*; 4 = *Equal*; 6 = *Mostly just noticed things around you*; 8 = *Always just noticed things around you*. Total scores range from 0 to 120. Table 1 reproduces the exact statements used in the scale, but readers are invited to contact the authors to

Table 1 Factor loadings of CBP-Q items for student and clinical samples

Item	Student	Clinical
Part A		
1: How much have you focused on your internal experiences when feeling bad, rather than focusing on what is happening in your surroundings	0.19	0.38
2: How much have you tried to mentally avoid or get rid of unpleasant internal experiences, rather than just noticing them and letting them pass	0.04	−0.07
3: How much have you tried to change or mentally control your internal experiences when feeling bad, rather than just noticing them and letting them pass	−0.13	0.01
4: How much have you gone over and over past experiences when feeling bad, rather than doing the things that are important to you	**0.44**	**0.46**
5: How much have you worried about bad things that might happen in the future, rather than doing the things that are important to you	**0.43**	**0.52**
6: How much have you judged yourself or your appearance to other people when feeling bad, rather than just noticing people around you	**0.62**	**0.49**
7: How much have you let your internal experiences rather than what you see and hear in the moment, guide what you do	**0.40**	**0.52**
8: How much have you analysed past events for answers when feeling bad, rather than doing the things that are important to you	**0.45**	**0.50**
Part B		
9: How much have you looked for possible harm or threats in your surroundings when feeling bad, rather than just noticing things around you	**0.59**	**0.70**
10: How much have you looked for things in your surroundings to make you feel safe when feeling bad, rather than just noticing things around you	**0.40**	**0.64**
11: How much have you avoided dealing with an actual problem when feeling bad, rather than doing something to solve the problem	**0.79**	**0.48**
12: How much have you distracted yourself from feeling bad by doing an activity too often, rather than doing the things that are important to you	**0.77**	**0.69**
13: How much have you been inactive or avoided situations, activities or people when feeling bad rather than doing the things that are important to you	**0.70**	**0.61**
14: How much have you done something negative to stop yourself feeling bad, rather than just experienced feeling bad	**0.70**	**0.71**
15: How much have you used alcohol, drugs, food or an activity to reduce or prevent unpleasant internal experiences, rather than just "be with them"?	**0.80**	**0.70**
Eigenvalue	*6.2*	*5.8*
% of variance	*42*	*38*

Loadings > .40 are displayed in bold

Values are italicized to differentiate them from the factor loadings

obtain the appropriately formatted scale for further research. This includes the full written instructions given to participants around how to complete the scale, and how 'internal experiences' were defined.

White Bear Suppression Inventory (WBSI)

The WBSI (Wegner and Zanakos 1994) was developed to assess the extent to which individuals suppress unwanted negative thoughts. It is a 15-item self-report questionnaire, adopting a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores range between 15 and 75, with a higher score indicative of higher levels of suppression. The WBSI has demonstrated good reliability (i.e. internal consistency and test–retest stability) and validity (Muris et al. 1996).

Acceptance and Action Questionnaire (AAQ)

This is a 9-item self-report scale, measuring experiential avoidance, i.e. the avoidance of unwanted internal experiences (Hayes et al. 2004). It consists of self-statements (e.g. 'I'm not afraid of my feelings'), which are rated on a scale of 1 (*never true*) to 7 (*always true*). Items 1, 4, 5 and 6 are inversely scored. A higher score is indicative of higher experiential avoidance, scores range from 9 to 63. The AAQ has demonstrated moderate reliability in terms of internal consistency and good discriminant validity (Baracca Mairal 2004; Boelen and Reijntjes 2008; Hayes et al. 2004). It has adequate criterion-related, predictive and convergent validities (Bond and Bunce 2003; Hayes et al. 2004).

Cognitive Attentional Syndrome (CAS-1)

This is a 16-item self-report measure of cognitive processes and meta-cognitive beliefs held by individuals diagnosed with a range of anxiety disorders and depression (Wells 2009). Responses to questions 1–3 are restricted to the past week and rated on a scale of 0 (*none of the time*) to 8 (*all of the time*). Question 1 assesses worry and rumination, producing a single score. Question 2 evaluates threat monitoring. Question 3 looks at unhelpful self-regulatory behaviours; the 6-items within this question are summed to produce a score between 0 and 48. Question 4 looks at meta-cognitive beliefs held by individuals: negative and positive beliefs. The items are rated from 0 (*I do not believe this at all*) to 100 (*I'm completely convinced this is true*). The 4-items within each column are summed to produce two scores, one for negative meta-cognitive beliefs and one for positive meta-cognitive beliefs.

Penn State Worry Questionnaire (PSWQ)

The PSWQ (Meyer et al. 1990) is a 16-item self-report questionnaire measuring worry across time and contexts, as well as the intensity and perceived uncontrollability of worry. Items are scored on a 5-point Likert scale, from 1 *(not at all)* to 5 (*very*). Items 1, 3, 8, 10 and 11 are inversely

scored. Scores range between 16 and 80, with a higher score indicating high levels of worry. The PSWQ has demonstrated good test–retest reliability, internal consistency and high validity (Meyer et al. 1990; Molina and Borkovec 1994).

Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a brief self-report measure of depression restricted to experiences over the last 2 weeks (Kroenke et al. 2001). Items are rated from 0 (*not at all*) to 3 (*nearly every day*), with scores ranging from 0 to 27. Kroenke and Spitzer (2002) stated the following cut-off points have been assigned to denote different levels of depression: 5–9 (mild), 10–14 (moderate), 15–19 (moderately severe) and 20–27 (severe). The PHQ-9 has demonstrated good validity properties: construct and criterion validity (Kroenke et al. 2001). Internal consistency of the measure has been shown to be high (Cameron et al. 2008; Lee et al. 2007).

Generalised Anxiety Disorder Questionnaire (GAD-7)

The GAD-7 was developed as a self-report measure of generalised anxiety (Spitzer et al. 2006). The 7-items are confined to experiences over the last two weeks and rated on a scale from 0 (*not at all*) to 3 (*nearly every day*). Scores range from 0 to 21, with a higher score suggestive of higher levels of anxiety (5–9: mild, 10–14: moderate, 15–21: severe). The measure has demonstrated good reliability and criterion, construct, factorial and procedural validity (Spitzer et al. 2006). Good reliability and validity properties have not only been shown in primary care settings but in the general population as well (Löwe et al. 2008).

Procedure

The study received university ethics approval. All participants read an information sheet and completed a consent form. They then completed the questionnaires, in the order presented within the Material section, either in paper form or electronically online via a URL created through Select Survey. To assess the test–retest reliability of the CBP-Q, the questionnaire was re-administered a week later to 52 participants who agreed to be re-contacted.

Analyses

The z-scores of skewness and kurtosis were utilised, Shapiro–Wilk tests were conducted and histograms visually examined, confirming the total CBP-Q scores were normally distributed. Internal consistency was examined using Cronbach's alpha. Pearson's correlation was used to examine test–retest reliability.

An exploratory factor analysis was conducted using FACTOR version 9.2 (Lorenzo-Seva and Ferrando 2013), to investigate the factor structure of the CBP-Q. Optimal implementation of Parallel Analysis (PA) (Timmerman and Lorenzo-Seva 2011) was used. This method was chosen as it is more accurate than other methods in determining the number of components/factors to extract during factor analysis (Timmerman and Lorenzo-Seva 2011; Wilson and Cooper 2008; Zwick and Velicer 1986). Factors were extracted using a principal components extraction method, with this being followed by oblique rotation (direct oblimin), permitting correlation between the emergent factors. This was chosen because previous research, reviewed in the Introduction, had indicated that the constructs to be assessed in the scale were likely to overlap. We used the questionnaire items that were associated ($r > .4$) with the extracted factor structure within further analyses.

Convergent validity was evaluated using Pearson's correlation between the total CBP-Q score (adjusted to include only the reliable items) and both the process and symptom measures.

Results

Reliability

Internal consistency was high ($\alpha = .90$) and no item significantly reduced the scale's overall reliability. Test–retest reliability was high ($r = .74$, $p < .001$): baseline, $M = 59.92$ ($SD = 17.94$) and follow-up, $M = 54.25$ ($SD = 18.27$).

Factor Structure

There was no missing data within the student sample, with all participants being included in the analysis, $N = 172$. Optimal implementation of PA (Timmerman and Lorenzo-Seva 2011) was used to examine the factor structure of the CBP-Q. This was computed using FACTOR version 9.2 (Lorenzo-Seva and Ferrando 2013). Scores were normally distributed and as a result Pearson correlation matrix was computed. A principal components extraction method was employed, using direct oblimin rotation. The Bartlett's test of sphericity ($\chi^2 = 1{,}049.0$, $df = 105$, $p < .001$) demonstrated that the correlations between items were sufficiently substantial and the Kaiser–Meyer–Olkin statistic (KMO = .90) suggested the sample size was adequate for the analysis. One principal factor was extracted, accounting for 42 % of the variance. The factor loadings after rotation are reported in Table 1, with all items apart from item 10 demonstrating adequate communality. Items 4 to 15 correlated $r > .4$ with the single factor and were retained for a 12-item version. Notably, when the analysis was repeated with a forced single factor solution, all items loaded at $r > .4$.

Validity

Table 3 shows the correlations between the 12-item CBP-Q and the various process and symptom measures. Convergent validity was demonstrated with significant moderate to strong correlations between the CBP-Q and all process measures. As predicted, the scale correlated with both anxiety and depression.

Discussion

Study 1 established good internal consistency, test–retest reliability and construct validity for the scale. As expected the scale correlated with symptoms of both anxiety and depression. The extraction of a single factor also suggested support for the core process account (Bird et al. 2009; Field and Cartwright-Hatton 2008). The finding of a weak correlation with positive metacognitive beliefs is somewhat unexpected as these are related to other cognitive and behavioural processes such as worry and compulsions as assessed by the Metacognitions Questionnaire (MCQ) (Cartwright-Hatton and Wells 1997; Wells and Papageorgiou 1998). It is possible that the CAS-1 assesses these beliefs differently. Overall, these promising findings required replication in a clinical sample. Furthermore, owing to the idiosyncratic nature of a student sample, a further control group—centred in the community—would provide a suitable comparison group to further evaluate the scale for its capacity to discriminate clinical from non-clinical samples.

Study 2

Introduction

Study 2 attempted to replicate the psychometric properties of the CBP-Q in a clinical sample. In addition it also allowed the remaining hypotheses to be tested: to compare the CBP-Q across diagnostic groups, and through inclusion of a community sample, allowed a comparison between clinical and non-clinical groups on the questionnaires. The community sample was recruited via a database of non-clinical participants willing to take part in psychological research. This provided data from people differing in a range of variables, and hence, more representative of the general population. It allowed a more appropriate comparison group for the clinical sample.

Method

Design

The internal consistency and construct validity of the scale were examined in two separate cross-sectional samples—clinical and community. The factor analytic structure of the scale was assessed in the (larger) clinical sample. In addition, group comparisons were made between the clinical and community groups, and between the broad diagnostic groupings within the clinical sample.

Participants

A heterogenous treatment-seeking clinical sample was recruited via adverts, service user organisations and clinicians, from a range of primary and secondary care inpatient and outpatient services. They were required to have received a mental health diagnosis and to report as currently symptomatic. The 161 individuals in the clinical sample constituted 49 males, 102 females and 10 unknown with a *M*age (*SD*) of 39.9 (13.1). Their ethnic status was as follows: 88.8 % White British, 5 % White Other, 1.9 % Black or Black British, 1.9 % Asian or British Asian, 1.2 % Mixed background and 0.6 % unknown. A sizeable proportion (36.8 %) reported comorbid diagnoses and the reported number of years diagnosed with the 'primary' disorder ranged from one to over 10 years, with 38.5 % participants experiencing these difficulties for more than 10 years. We found that 55.3 % participants were on psychotropic medication and 71.4 % were receiving psychological therapy. The vast majority of participants reported mood (40.9 %) and anxiety (47.1 %) disorders, with a minority reporting eating disorders (4.9 %), psychosis (2.4 %) or somatoform disorders (1.2 %). Four (2.5 %) participants did not specify their diagnosis. A full breakdown of different diagnoses, including the number with each diagnosis who have a comorbid condition is presented in Table 2.

The community sample constituted 57 individuals: 13 males and 44 females, *M*age (*SD*) = 33.18 (11.25). Their ethnic status was as follows: 63.1 % White British, 12.3 % White Other, 8.8 % Black or Black British, 10.5 % Asian or British Asian and 5.3 % Mixed background. A sizeable proportion (19.3 %) of the sample reported a mental health diagnosis: 1 (1.8 %) post-traumatic stress disorder, 2 (3.5 %) social anxiety disorder, 7 (12.3 %) depression and 1 (1.8 %) borderline personality disorder. There was a comorbidity rate of 3.5, 8.8 % taking psychotropic medication and 3.5 % receiving psychological therapy.

Procedure

The study received NHS ethical approval in addition to R&D approval within the necessary trusts. The procedure was the same as Study 1. Patients were given 24 hours to read the information sheet before consenting to the study. They completed the questionnaires either in their own time and returned them to their clinician or to the service involved in

Table 2 Numbers and percentages of individuals in the clinical group with each diagnosis, including the number of comorbid cases for each diagnosis

Diagnostic category	*N*	%	Comorbidity (*N*)
Anxiety disorders			
Agoraphobia	1	0.6	1
Generalised-anxiety	3	1.9	0
Obsessive–compulsive	11	6.8	5
Panic	2	1.2	1
Post-traumatic stress	4	2.5	3
Anxiety (unspecified)	55	34.1	12
Mood disorders			
Bipolar (type 1 and 2)	25	15.5	3
Depression	40	24.8	15
Seasonal affective	1	0.6	0
Eating disorders			
Anorexia	4	2.5	3
Bulimia	2	1.2	0
Eating disorder NOS	3	1.9	1
Schizophrenia and other psychotic disorders			
Delusional	1	0.6	0
Paranoid	1	0.6	1
Schizoaffective	1	0.6	0
Schizophrenia	1	0.6	1
Somatoform disorders			
Body dysmorphic	2	1.2	0

their recruitment or they completed them electronically online via a URL created through Select Survey.

Analyses

The majority of analyses were the same as Study 1. In addition, an independent samples t-test compared scores between the clinical and community samples. A one-way analysis of variance (ANOVA) was performed to compare the CBP-Q scores between diagnostic groups, followed up by Tukey HSD post hoc tests.

Results

Reliability

Internal consistency of the 15-item questionnaire was high at $\alpha = .92$ in both groups. Within each group, no item significantly reduced the scale's overall reliability.

Factor Structure in the Clinical Sample

Seven participants had missing data and were thus removed from this analysis, as a result $N = 154$. Scores from the CBP-Q were not normally distributed, with analysis of Mardia's multivariate asymmetry demonstrating a significant kurtosis (coefficient 286.41, statistic 8.63, $p < .001$). Consequently, the Polychoric correlation matrix was computed. A principal components extraction method was employed on the 15 items, with direct oblimin rotation. Bartlett's test of sphericity ($\chi^2 = 1{,}125.9$, $df = 105$, $p < .001$) suggested that correlations between items were sufficiently large for the analysis to be run. The Kaiser–Meyer–Olkin test verified the sampling adequacy for the analysis, KMO = .92. One principal factor was extracted, accounting for 38 % of the variance. The factor loadings after rotation are reported in Table 2. The same 12 items as Study 1 had a factor loading of >.4. Notably, when the analysis was repeated with a forced single factor solution, all items loaded at $r > .4$.

Validity

The correlations between the 12-item version and both symptom and process measures are displayed in Table 3. They reflect many of the same patterns of moderate to strong correlations as Study 1, and they confirmed the hypothesised association between the scale and both anxiety and depression. However, the strength of correlation with process measures was weak for negative meta-cognitive beliefs and not significant for positive meta-cognitive beliefs in the clinical sample.

Group Comparisons

As predicted, an independent samples t-test showed that the mean score for the clinical group ($M = 53.7$, $SD = 19.3$, $SE = 1.5$) was significantly higher than the community sample ($M = 43.5$, $SD = 18.2$, $SE = 2.4$), $t(214) = 3.5$, $p \leq .001$.

To test the third hypothesis that there would be no difference in scores between diagnostic groups, a one-way ANOVA was conducted. Due to small sample sizes, participants with a diagnosis other than an anxiety or mood disorder were placed into a 'mixed other' category. The mean scores between three diagnostic categories were compared: anxiety ($n = 75$), mood ($n = 65$) and 'mixed other' ($n = 15$). As predicted, there was no effect of diagnosis on the CBP-Q score [$F(2, 152) = 1.34$, $p = .26$]. An exploratory analysis of group differences on individual scale items using independent samples t-tests was also conducted. Yet, even when not correcting for multiple comparisons, no individual item on the CBP-Q differentiated any of the three groups from one another, $p > .05$.

Discussion

Study 2 largely replicated the findings of Study 1 in a heterogenous treatment-seeking sample. The weak

Table 3 Correlations (Pearson's r) between the CBP-Q (12 item score) and standardised measures

Measures	Study 1	Study 2	
	Student	Clinical	Community
White Bear Suppression Inventory	.66**	.52**	.79**
Acceptance and Action Questionnaire	.70**	.62**	.74**
Penn State Worry Questionnaire	.60**	.66**	.71**
CAS-1: worry/rumination	.56**	.68**	.73**
CAS-1: threat monitoring	.56**	.68**	.72**
CAS-1: unhelpful self-regulatory behaviours	.56**	.53**	.67**
CAS-1: negative meta-cognitive beliefs	.41**	.18*	.50**
CAS-1: positive meta-cognitive beliefs	.21**	.02	.29*
Generalised Anxiety Disorder Questionnaire	.56**	.70**	.72**
Patient Health Questionnaire	.58**	.67**	.69**

CAS-1 Cognitive Attentional Syndrome

* $p < .05$; ** $p < .001$

correlations between the CBP-Q, and the measures of negative and positive metacognitive beliefs within the clinical sample was unexpected, and the reasons were unclear. Nevertheless, the study identified the predicted group differences on the CBP-Q between clinical and non-clinical samples, and provided some indication that the scores on the scale as a whole did not differentiate diagnostic groupings, fitting with predictions of the transdiagnostic approach. Nevertheless, this does not preclude the possibility the specific cognitive and behavioural processes, included in the scale as individual items, might be more evident in some disorders than others, despite being 'transdiagnostic' in the sense that people with any disorder still report the process at higher rates than a non-clinical sample (Harvey et al. 2004). For example, one study with a diverse sample of patients found that different levels of private self-consciousness differentiated social phobia as having higher levels than panic disorder, which in turn were higher than bulimia (Jostes et al. 1999). Yet, when we attempted such an analysis on individual items, no evidence was found for differences between the broad diagnostic groupings we had identified.

General Discussion

The CBP-Q was designed to fit with the transdiagnostic approach to CBT. The principal objective of the research was to undertake preliminary development and analysis of the psychometric properties of the CBP-Q, in both a clinical and control group. Specific hypotheses were that the scale would correlate with symptoms of both anxiety and depression, differentiate the clinical from the non-clinical group, and not differentiate between diagnostic groupings.

The initial 15-item CBP-Q had good internal consistency and test–retest stability. The exploratory factor analysis revealed that most of the variance was explained by a single factor, with items from Part A and Part B not being distinguished by the factor analysis. The same factor structure was extracted within both groups, with 12 items loading highly onto the principal factor. One possible reason for the first three items failing to correlate with the extracted factor is that they were more abstract (e.g. focused on/avoided/controlled internal experiences), in contrast to the more concrete examples of other items (e.g. analysed past events, look for potential harm). It is possible that as the questionnaire progressed, participants developed a clear personal idea of what the questions were referring to. Considering also that the first three items did not cluster together, it is likely that they do not represent a conceptually distinct subcategory of cognitive and behavioural processes. Further evidence to support this view comes from the finding that a forced single factor solution led to all 15 items loading highly with the single factor in both student and clinical samples.

Across studies, the CBP-Q converged appropriately with measures assessing similar processes: AAQ, PSWQ and subscales from the CAS-1: worry/rumination, threat monitoring and unhelpful self-regulatory behaviours. Divergent validity was evident in the weaker correlations between the CBP-Q and subscales on the CAS-1 measuring meta-cognitive beliefs, a construct not assessed by the CBP-Q.

The CBP-Q correlated strongly with measures of both anxiety and depression within each sample, as would be expected if it assesses processes that maintain psychological distress. Similarly as expected, group comparisons showed that the clinical group had a significantly higher mean CBP-Q score than the community group. Analysis of the CBP-Q scores across diagnoses was more difficult than anticipated, due to low numbers of participants within diagnostic categories other than anxiety and mood disorders. Nevertheless, comparison categories of anxiety disorders, mood disorders and 'mixed other' disorders, revealed no effect of diagnostic category, which supports the hypothesis that the processes measured by the CBP-Q are not disorder specific. However, these findings need to be interpreted with caution, as to allow sufficient numbers for comparison many diagnoses were grouped together to form a 'mixed other' category.

Encouragingly, findings from the current study support the feasibility of a transdiagnostic approach to CBT. Notably, items that appeared diverse on the surface—

measuring negative recurrent thinking, emotional reasoning, selective attention towards concern-related external stimuli, attention to sources of safety, avoidance behaviour and safety-seeking behaviour/experiential avoidance—all loaded highly onto one factor. The identification of one principal factor, a potential 'core process', provides preliminary support for adopting a transdiagnostic approach. The finding of one principal factor also provides empirical support to the hypothesis of a core process model as proposed by Field and Cartwright-Hatton (2008). This model assumes that the numerous cognitive and behavioural maintenance processes identified and studied in the literature can be represented by a single factor(s). This implies that efforts should now be directed at investigating core underlying processes that contribute to the development and/or maintenance of psychological distress. However, it is important to note that the principal factor explained less than 42 % of the total variance, suggesting that there are probably other important core processes that need to be identified.

Labelling of the theoretical construct identified in the current study remains tentative. Nevertheless, a variety of theoretical explanations may explain the core process that has been identified, including repetitive negative thinking (Ehring and Watkins 2008), self-attacking (Gilbert 2005), experiential avoidance (Hayes et al. 1999; Hayes et al. 2004) and meta-cognitive beliefs (Wells 2009). Yet a key challenge for any of these accounts is the diversity of the 12 processes identified as closely related. An explanation that evokes a higher order, abstract, construct may therefore be more suitable. Perceptual control theory (PCT; Powers 1973) is a psychological framework that has recently informed developments in transdiagnostic CBT (Higginson et al. 2011; Mansell 2005; Mansell et al. 2012). These accounts have proposed that the wide range of maintenance processes identified are all examples of what is termed 'arbitrary control'. Any process that is carried out without regard to the important personal goals that a person holds has the potential to conflict with them. Thus, it is the extent to which processes such as self-attacking, risk seeking, avoidance, worry and rumination are utilised without regard to the impact there are having on important personal goals (e.g. to feel worthwhile; to achieve success; to be close to other people) that is problematic. It is likely, that the more frequent, pervasive and enduring these cognitive and behavioural processes are engaged, the greater goal conflict they cause. In turn, therapy based on PCT involves questions directed at shifting and sustaining awareness on problematic goal conflict to help patients resolve the conflict and regain overall control of their lives (Carey 2006; Mansell et al. 2012). It remains to be tested whether the core process identified in this study can be regarded as arbitrary control.

The studies were both relatively preliminary and had several limitations. Most importantly there were key decisions made about the design of the questionnaire and the nature of the samples that could be challenged.

First, a self-report scale eliciting process-based information needs to be interpreted with caution, as researchers have suggested that individuals may not always be consciously aware or able to monitor these cognitive or behavioural processes, leading to potential problems with validity (Gibbs and Rude 2004; Wells and Matthews 1994). Some argue that individuals may be better at self-reporting information related to thought content rather than thought process (Ehring and Watkins 2008). However two other process scales, the Appearance Anxiety Inventory (Veale et al. 2014) and the Specific Phobia of Vomiting Inventory (Veale et al. 2013) were able to identify two distinct factors labelled threat monitoring and avoidance of threat. This may be because the content of the items were relevant to the individual with Body Dysmoprhic Disorder or a specific phobia of vomiting respectively.

Second, one of the difficulties of using the semantic differential technique was that participants were forced into choosing a response along a spectrum of contrasting positions that they may not experience. For example the question 'how much have you focused on your internal experiences when feeling bad, rather than focusing on what is happening in your surroundings' implies that these are the only two responses that a person may experience. Future versions of the questionnaire could insert a 'do not apply' option or adopt the use of a unipolar scale, which would involve measuring one construct that differs in degree (Barker et al. 2002). In this case, it would involve singularly measuring each aspect of the different constructs. However, this would result in a lengthy scale.

Regarding establishing diagnoses, these were either reliant on self-report or obtained from the participant's clinician. The design of the study could have been improved by using a diagnostic tool such as the SCID I (First et al. 1995), which is most commonly used in clinical research studies. However, due to restrictions on time, the study was designed to increase the likelihood of participation, which meant that the use of the SCID I was not feasible (e.g. online participation).

Sample size may have also been an issue. Despite the sample size of the clinical and student groups being well over a minimum of 75, ideally a good sample size for a PCA would constitute approximately 300 participants (Comrey and Lee 1992; Tabachnick and Fidell 2007). Nevertheless, other researchers argue that a factor that has more than four loadings greater than .6 can be considered a reliable factor solution regardless of the size of the sample (Guadagnoli and Velicer 1988). Positively, both the clinical and student sample had more than four loadings greater

than .6. Notably, we could not conduct a factor analysis in the community sample owing to its small size ($n = 57$). This is a clear limitation, limits generalisability and is a target for future research. The student sample was also biased in terms of its preponderance of female participants. Nevertheless, the factor structure was replicated in a clinical sample with a 2:1 ratio of female to male participants, which is more representative of the ratio within mental health services.

Future studies could assess the validity of the CBP-Q by means of larger sample sizes, with stricter diagnosis criteria (e.g. SCID) and across a range of diagnostic groups to establish whether the processes measured are truly transdiagnostic or specific to particular diagnostic categories. Individual items from the questionnaire could be analysed against symptom-based scales, to assess whether specific items are stronger than others at predicting increases in symptomatology. In future versions of the CBP-Q, it would be useful to generate additional items for processes that were not fully covered in the current scale (e.g. a wider range of safety-seeking behaviours) and for further thought to be given to the type of scaling method that would be most appropriate for this kind of questionnaire. Finally, the order of the different measures in the study could be randomised or counterbalanced to reduce any potential after effects of completing each scale.

Clinically the CBP-Q would be a useful tool to assess the processes that need to be addressed during therapy. It could be argued that the CBP-Q may potentially be clinically more useful in providing information about the individual needs of clients than diagnostic labels. Within transdiagnostic CBT, basic theory is used to build a formulation and guide intervention without the need for a diagnostic assessment, thereby making therapy more efficient and reducing unnecessary delays as individuals are allocated to different services, or individuals trained in different models, based on their diagnosis (Mansell et al., 2009). Following further research and validation, it has the potential of being a useful tool to monitor progress during therapy and as an outcome measure. More specifically, we expect that the specific items (e.g. hypervigilance, worry) that are elevated in an individual client can be discussed early on in therapy, to inform the formulation and guide behavioural experiments, thereby making therapy more efficient.

In conclusion, the findings from the study lend support to the growing literature of studying cognitive and behavioural processes across psychological disorders versus disorder-specific phenomena (e.g. content and process). The study demonstrated the CBP-Q to be a reliable self-report scale, measuring one construct, hypothesised here as attempts of arbitrary control. Convergent and divergent validity were satisfactory.

However, systematic research studies will be required to replicate and extend the findings from the current study, with particular focus on the theory best able to account for the identified core process.

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Conflict of Interest Trishna Patel, Warren Mansell and David Veale declare that they have no conflict of interest.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (national and institutional). Informed consent was obtained from all individual subjects participating in the study. If any identifying information is contained in the paper the following statement is also necessary—Additional informed consent was obtained from any subjects for whom identifying information appears in this paper.

Animal Rights No animal studies were carried out by the authors for this article.

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