

Development and Validation of the Brief Unhelpful Thoughts Scale (BUTs)

Simon Robert Knowles^{1,2,3,*}, Pragalathan Apputhurai¹ and Glen Bates¹

¹*Faculty of Health, Arts and Design, Swinburne University of Technology, Melbourne, Australia*

²*Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Melbourne, Australia*

³*Colorectal Medicine and Genetics, The Royal Melbourne Hospital, Melbourne, Australia*

Abstract: A key component of cognitive behaviour therapy (CBT) is to identify and challenge unhelpful thinking patterns (also known as cognitive distortions, thinking errors, or distorted automatic negative thoughts) in interventions that foster more reality-oriented thinking. This paper describes the development and validation of the Brief Unhelpful Thinking Scale (BUTs). Four studies were conducted of which three included mixed undergraduate and community samples (Studies 1-3) and one was a clinical sample of individuals diagnosed with Social Anxiety Disorder (SAD). An 11-item two-factor model of unhelpful thinking emerged in Study 1(N=223), which was confirmed in Study 2(N=203). The first factor focused on negative self-bias (e.g., generalized, negative, emotional), and the second factor focused on expectations of others (e.g., expectations others will act fairly, change, follow rules). Study 3 (N=23) established test-retest reliability for the BUTs and the final study (N=9) examined BUTs in a group-based CBT intervention for SAD. This study showed the BUTs to be sensitive to changes in unhelpful thinking after a CBT intervention.

Conclusion: In conclusion, the BUTs is a brief psychometrically valid measure of unhelpful thinking that can be utilized by both clinicians and researchers who wish to measure individual unhelpful thinking patterns and relate them to changes in psychological distress in CBT-based interventions.

Keywords: Unhelpful thoughts, cognitive distortions, cognitive behaviour therapy, scale development.

1. INTRODUCTION

Cognitive behaviour therapy (CBT) often involves a focus on monitoring unhelpful thinking patterns (also known as cognitive distortions, thinking errors, or distorted automatic negative thoughts) and fostering more reality-oriented thinking [1, 2]. In psychological practice involving CBT interventions, helping clients to identify and address unhelpful thinking patterns is seen as a key feature of the success of the intervention [e.g., 3, 4]. Unhelpful thinking patterns reflect a maladaptive pattern of thinking that maintains symptoms of anxiety and/or depression if not corrected [5-7]. A main aim of CBT is to help the client become aware of unhelpful thoughts, and to construct more reflective and realistic alternative explanations that contain less threat meaning [7, 8]. A large number of unhelpful thinking patterns have been identified in the literature [1, 9-11], the 15 most commonly reported are described by McKay, Davis, and Fanning [11], see Table 1.

The link between unhelpful thoughts and psychopathology is an ongoing topic of research. Cognitive-mediation of psychological symptoms is generally supported [12, 13]. Evidence indicates negative automatic thoughts mediate the relationship

between self-esteem/self-compassion and both anxiety and depression [14], as well as the relationship between self-criticism and negative affect [15]. Ross, Gottfredson, Christensen, and Weaver [16] found unhelpful thoughts correlated with depression, and other studies have shown unhelpful thoughts to be related to, or associated with changes in, anxiety or depression [12, 17].

Several scales have been developed to measure unhelpful thoughts, including the automatic thoughts questionnaire [ATQ; 18], the cognitive bias questionnaire [CBQ; 19], the cognitive distortions questionnaire [CD-Quest; 20], the cognitive distortions scale [CDS; 21], and the cognitive errors questionnaire [CEQ; 22]. The most cited to date is Hollon and Kendall's [18] 30-item ATQ designed to assess the frequency of cognitions related to depression. Later, researchers included a second believability scale [23, 24]. Research on the ATQ has confirmed its validity [25, 26]. The ATQ can discriminate between normal, non-depressed and depressed adolescents [27], and shows comparable validity when shortened to 15- and 8-item versions [26]. However, more recently, De Oliveira *et al.* [20] CD-Quest was developed to assess automatic thoughts more closely related to CBT treatments. The CD-Quest contains 15-items measured on a grid (3-point frequency by 3-point intensity rating scales, with zero representing absence of distortion). Two studies have validated the scale [28, 29].

*Address correspondence to this author at the Swinburne University of Technology, PO Box 218, Hawthorn 3122 Melbourne, Australia;
Tel: +61 3 9214 8206; Fax: 61 3 98190574; E-mail: sknowles@swin.edu.au

Table 1: List of Unhelpful Thinking Patterns Commonly Assessed in Psychological Interventions

Type of Unhelpful Thought	History / Lineage of Unhelpful Thought
1. Filtering: You take the negative details and magnify them while filtering out all positive aspects of a situation.	Negative concerns are dwelled upon [9, 10] and considered the most important [1]. Positive information is also disqualified [9]. Filtering captures full focus like tunnel vision [11].
2. Polarized Thinking: Things are black or white, good or bad. You have to be perfect or you're a failure. There is no middle ground.	Polarised thinking [11] has also been known as dichotomous [1] and black-and-white thinking [9].
3. Overgeneralization: You come to a general conclusion based on a single incident or piece of evidence. If something bad happens once you expect it to happen over and over again.	Expecting all similar events to be the same as one negative one has been consistent across authors [1, 9, 11].
4. Mind Reading: Without their saying so, you know what people are feeling and why they act the way they do. In particular, you are able to divine how people are feeling toward you.	Mind reading involves projecting one's own feelings on to others without adequately observing how they feel [11]. This also been conceptualized as a form of jumping to negative conclusions in which a negative interpretation is made without sufficient evidence to support the conclusion [9].
5. Catastrophizing: You expect disaster. You notice or hear about a problem and start "what if's:" What if tragedy strikes? What if it happens to you?"	Catastrophising involves emotional distress at situations not being as desired, instead of accepting and disliking reality, and attempting to change the situation [10]. This involves expecting the worst outcome [1], and also imagining multiple bad outcomes as 'what if' scenarios [11].
6. Personalization: Thinking that everything people do or say is some kind of reaction to you. You also compare yourself to others, trying to determine who's smarter, better looking, etc.	Personalization is seen as a process of comparison to establish self-worth [11]. It has also has been seen as the assumption of personal causality [1, 9] despite not being responsible for the event [9].
7. Control Fallacies: If you feel externally controlled, you see yourself as helpless, a victim of fate. The fallacy of internal control has you responsible for the pain and happiness of everyone around you.	Control fallacies involve a distortion of sense of power to be externally influenced or responsible for events [11]. It has also been seen to involve the belief that unhappiness is externally caused without recognizing the role of internal cognitive processes that contribute [10].
8. Fallacy of Fairness: You feel resentful because you think you know what's fair but other people won't agree with you.	Fallacy of fairness involves placing your values of fairness on others, despite the likelihood of disagreement on what is considered fair [11]. This may also involve dwelling over the problems of others or assuming a sense of power over the behaviour of others [10].
9. Blaming: You hold other people responsible for your pain, or take the other tack and blame yourself for every problem or reversal.	Blaming involves overestimating others and underestimating your own responsibility for a situation, or <i>vice versa</i> [11]. Similarly, people who are blamed are seen as entirely bad, and willfully acting badly entirely out of free will without considering other influences compelling the person [10].
10. Shoulds: You have a list of ironclad rules about how you and other people should act. People who break the rules anger you and you feel guilty if you violate the rules.	Shoulds involve conditional self-worth as a motivation whereby if one does not meet the expected standard they feel self-resentment and guilt [9, 10]. This has also been described as involving a list of inflexible rules [11].
11. Emotional Reasoning: You believe that what you feel must be true—automatically. If you <i>feel</i> stupid and boring, then you must <i>be</i> stupid and boring.	Emotional reasoning involves using emotions as evidence of truth [9]. This distortion is erroneous as it is a product of thoughts rather than a valid indicator of reality [11].
12. Fallacy of Change: You expect that other people will change to suit you if you just pressure or cajole them enough. You need to change people because your hopes for happiness seem to depend entirely on them.	The fallacy of change involves believing your happiness is dependent on others instead of your own life decisions, and can result in the other person feeling pushed away without changing [11].
13. Global Labeling: You generalize one or two qualities into a negative global judgment.	Global labelling involves mislabelling oneself as a whole, based upon your errors, instead of collection of complex and contrary information [9, 11].
14. Being Right: You are continually on trial to prove that your opinions and actions are correct. Being wrong is unthinkable and you will go to any length to demonstrate your rightness.	A strong need to be right can make one unable to see other views or information that is inconsistent with being right [11]. This also has been seen as there being only one right solution where there may be none or many [10].
15. Heaven's Reward Fallacy: You expect all your sacrifice and self-denial to pay off, as if there were someone keeping score. You feel bitter when the reward doesn't come.	Heaven's reward involves the belief that only what is 'right' is rewarded. As such, other opportunities for reward are lost and a reward for what is 'right' may not come [11].

Note: Unhelpful thinking patterns taken from McKay, et al, [11], page 26.

Additionally, in all cognitive distortions except personalization (item 10), CD-Quest scores have been shown to discriminate non-clinical from probably clinically anxious and depressed patients [30].

In relation to current measures of unhelpful thinking patterns, the items in the ATQ are not necessarily consistent with the cognitive distortions commonly targeted in CBT treatment (e.g., "I can't get started").

This limits the applicability of the ATQ in evaluating cognitive-mediation. The CD-Quest overcomes some limitations of the ATQ as it is aligned to commonly cited cognitive distortions (e.g., should statements). However, the use of a grid scoring system, although capturing both frequency and intensity, may be less sensitive than a 6-point rating scale as it is based upon 3-point rating scales [31]. Furthermore, the CDS and CBQ are limited by being based around interpretations of a story while the CEQ only covers four unhelpful thinking patterns.

The present study aimed to develop a short unhelpful thinking scale derived from the most common sources of cited unhelpful thinking patterns. A second aim was to address the limitations of previous scales by developing and assessing the psychometric properties of the Brief Unhelpful Thinking Scale (BUTs), which measures unhelpful thoughts in a concise format that are commonly identified and challenged in CBT-based interventions. A series of four separate studies was conducted with independent samples to explore and confirm the factor structure and test-retest reliability of the BUTs, and test its ability to assess sensitivity of changes in a clinical sample.

2. STUDY 1: DEVELOPMENT OF THE BRIEF UNHELPFUL THINKING SCALE (BUTS)

2.1. Method

The aim of Study 1 was to explore the factor structure of unhelpful thoughts. It was hypothesized that a stable scale would be derived from the BUTs items.

2.2. Participants

Two hundred and twenty-three individuals completed an online survey. The mean age of the sample was 32.74 years ($SD=10.56$) and most participants were women (84.8%), single (32.7%), worked either casually (12.1%), part time (15.7%) or work full-time (32.7%), were Australian (77%) and 23.3 percent identified themselves as students.

2.3. Measures

Brief Unhelpful Thinking Scale (BUTs), preliminary version. Initially many sources were explored to attain the greatest range of unhelpful thoughts possible. These sources included internet-based professional self-help sites, which identified between 10-12

unhelpful thinking patterns (e.g., www.cci.health.wa.gov.au, www.getselfhelp.co.uk, psychologytools.com, thiswayup.org.au, www.livingwell.org.au, www.moodcafe.co.uk, www.toiletanxiety.org) and published literature [1, 9-11]. It was clear that the majority of highly cited unhelpful thinking patterns and their derivatives were based upon the work by McKay *et al*, [11]. Consequently, to facilitate compatibility with current interventions, we choose to utilize the 15 originally reported by McKay *et al*, [11]. This represented both the best breadth (i.e., highest number of clearly delineated unhelpful thoughts) and depth (i.e., most commonly cited or derived from). Further, we concluded that utilizing this single source would also be beneficial given that current CBT-based interventions are likely to either utilize McKay *et al*, unhelpful thinking patterns, or at the very least use ones similar to or derived from them. Participants were advised, "Below are statements that describe how some people think about events in their life. Please answer 'how strongly you agree or disagree' with each of these statements, as they relate to you. Answer all of the statements as honestly and thoughtfully as you can" at the beginning of BUTs. Items were assessed using a 6-point rating scale ("Strongly agree", "Moderately agree", "Mildly agree", "Mildly disagree", "Moderately disagree", and "Strongly disagree", scored 5-0 respectively). Total higher summed scores indicated greater tendency toward unhelpful thinking.

2.4. Procedure

Invitations to participate in an online survey investigating thinking patterns and mental health were posted on a university participant website and the first author's (SK) own websites. Participants were informed that their participation in this study was voluntary and they were free to withdraw at any time. Completion of the survey was taken as informed consent. All four studies reported in this paper conform to the Australian national health ethical research standards and were approved by a university ethics committee.

2.5. Data Analysis

Data were analyzed using SPSS Version 24 and AMOS Version 24. Data were screened for univariate outliers prior to analysis. An exploratory factor analysis (EFA) was then conducted using principle-axis factor extraction with an oblimin rotation to determine which of the 15-BUTs items should be retained.

2.6. Results and Discussion

2.6.1. Development of the BUTs

Screening of the initial 15 BUTs items for sampling adequacy (Kaiser–Meyer–Olkin=0.89) and sphericity (Bartlett's test of sphericity: $\chi^2(105)=1053.47$, $p<0.001$) indicated the data were appropriate for factor analysis. Eigenvalues from the factor analysis identified three factors. The first factor explained 36% of the variance, the second factor 10% of the variance, and the third factor 7% of the variance. However, the pattern matrix and the Screen plot for the initial eigenvalues suggested only two factors were appropriate. As recommended by Kaufman and Dunlap [32], Horn's Monte Carlo simulation method with 1000 iterations confirmed this decision. Four items were removed because their communalities fell below 2 or because they cross-loaded (*Blaming*: "You hold other people responsible for your pain, or take the other tack and blame yourself for every problem", *Global labelling*: "You generalize one or two qualities into a negative global judgment", *Mind reading*: "Without their saying so, you know what people are feeling and why they act the way they do is" and *Control fallacies*: "If you feel

externally controlled, you see yourself as helpless, a victim of fate"). The exploratory factor analysis was rerun. The second analyses explained 52% of the variation in the responses to the remaining 11 items, and there was a correlation of -0.57 between the two factors. The pattern matrix is shown in Table 2.

Following the EFAs, Cronbach's alphas for the BUTs scales were calculated respectively to assess internal consistency. Cronbach's alphas for the two scales were $\alpha = 0.79$ and $\alpha = 0.77$, indicating that both had good internal consistency. The Spearman's rank correlation coefficient between the two subscales was 0.52 ($p < 0.001$)

The results provide support for the Study 1 hypothesis that a stable scale would be derived from the BUTs items. The EFA identified a two-factor solution for the 11-item version of the BUTs. Six-item and five-item subscales were found to demonstrate high internal consistency and face-validity. On the basis of the item content, the first factor was taken to represent negative bias toward oneself while the second factor represents expectations of others.

Table 2: Factor Loadings Based on a Principal Axis Factor with Oblimin Rotation for Study 1.

Item	Negative Self-Bias	Expectations of Others
BUTs1: <i>Filtering</i> : You take the negative details and magnify them while filtering out all positive aspects of a situation.	0.59	
BUTs2: <i>Polarised thinking</i> : Things are either black or white, good or bad. You have to be perfect or you're a failure.	0.54	
BUTs3: <i>Overgeneralisation</i> : You come to a general conclusion based on a single incident or piece of evidence.	0.57	
BUTs5: <i>Catastrophising</i> : You expect disaster. You notice or hear about a problem and start "what if's" - What if tragedy strikes?	0.68	
BUTs6: <i>Personalisation</i> : Thinking that everything people do or say is some kind of reaction to you. You also compare yourself to others, trying to determine who's smarter, better looking, etc.	0.59	
BUTs11: <i>Emotional reasoning</i> : You believe that what you feel must be true- automatically. If you feel stupid and boring, then you must be stupid and boring.	0.60	
BUTs8: <i>Fallacy of fairness</i> : You feel resentful because you think you know what's fair but other people don't agree with you.		-0.51
BUTs10: <i>Shoulds</i> : You have a list of ironclad rules about how you and other people should act.		-0.54
BUTs12: <i>Fallacy of change</i> : You expect other people will change to suit you if you just pressure or cajole them enough.		-0.61
BUTs14: <i>Being right</i> : You are continually on trial to prove that your opinions and actions are correct.		-0.87
BUTs15: <i>Heaven's reward</i> : You expect all your sacrifice and self-denial to pay off, as if there were someone keeping score.		-0.59

Note: Factor loadings < 0.2 are suppressed.

3. STUDY 2: CONFIRMATION OF THE BUTS

The aim of Study 2 was to confirm the factor structure of BUTs in an independent sample. A further aim of Study 2 was to assess the construct (convergent and divergent) and criterion validity of the BUTs in the new sample. It was hypothesized the two-factor 11-item BUTs solution derived in Study 1 would be confirmed. It was also hypothesized that the BUTs would demonstrate convergent validity with the *Automatic Thoughts Questionnaire* [ATQ; 18], *Cognitive Distortions-Questionnaire* [CD-Quest; 20], *Depression Anxiety Stress Scale* [DASS-21; 33], *Dysfunctional Attitudes Scale-Short Form* [DAS-SF; 34, 35] and *EUROHIS Quality of life* [EUROHIS-QOL-8; 36], while divergent validity with gender. To demonstrate criterion validity, it was hypothesized that participants who had never seen a mental health professional or were not currently seeing a mental health professional, would score lower on the BUTs than those who had or were currently seeing a mental health professional.

3.1. Participants

Two hundred and three adults from the public completed an online survey. The mean age of the sample was 33.90 years ($SD=11.12$ years) with more than half of the sample being women (79.3%). Participants in the public sample were predominantly Australian (70.9%) and tended to be married (43.3%). Almost half (43.3%) were working, either casually (14.3%), part-time (17.7%) or work full-time (27.1%), Australian, and 23.6% identified themselves as students.

3.2. Measures

Brief Unhelpful Thinking Scale (BUTs). The 11-item scale developed in the first study was included in the online questionnaire. Each item was scored on a 6-point scale consistent with Study 1. Higher summed scores represent greater unhelpful thinking.

Automatic Thoughts Questionnaire [ATQ; 18] measures automatic thoughts related to depression. Conventionally the ATQ is measured with two subscales [23, 24] on a 5-point rating scale, including frequency (1='not at all' to 5='all the time') and believability (1='not at all' to 5='totally'). The ATQ is scored with the sum of frequency (ATQ-F), sum of believability (ATQ-B), and also combination (ATQ; frequency*belief/2). Higher scores indicate greater automatic thoughts.

Cognitive Distortions-Questionnaire [CD-Quest; 20] assesses CBT-related cognitive distortions. The CD-Quest is a 15-item scale measured on a grid [37] consisting of 3-point *frequency* (1="Occasional" to 3="Almost all of the time", with 0 representing absence of cognition) and *intensity* (1="A little" to 3="Very much"), that leads to a 6-point rating scale output ((frequency+intensity)-1, with 0 frequency=0 score). Higher scores represent a greater distortion in thought.

Depression Anxiety Stress Scale [DASS-21; 33] is a 21-item scale comprising of three 7-item subscales of depression (e.g., "I felt that life was meaningless"), anxiety (e.g., "I felt scared without any good reason"), and stress (e.g., "I found myself getting agitated"). Items are scored on a 4-point rating scale (0="Did not apply to me at all" to 3="Applied to me very much, or most of the time"). Higher summed scores (multiplied by two for comparison with full-scale) on each subscale indicate greater depression, anxiety, or stress, respectively.

Dysfunctional Attitudes Scale-Short Form [DAS-SF; 34, 35]. The DAS-SF is an 18-item measure of dysfunctional attitudes (e.g., "If I fail at my work, then I am a failure as a person"), which is divided into two 9-item scales (DAS-SF1 and DAS-SF2). Each item is measured on a 4-point rating scale (1="Totally agree" to 4="Totally disagree") with higher summed scores indicating greater dysfunctional attitudes.

EUROHIS Quality of life [EUROHIS-QOL-8; 36]. EUROHIS-QOL-8 consists of eight items that assess quality of life (e.g., "How would you rate your quality of life?"). Items are scored on a 5-point rating scale (1="Very poor", "Very dissatisfied" or "Not at all" to 5="Very Good", "Very satisfied" or "Completely"). Higher summed scores indicate greater quality of life.

3.3. Procedure

Invitations to participate in an online survey investigating thinking patterns and mental health were posted on a university participant website and the first author's (SK) own websites.

3.4. Data Analysis

The two-factor model derived based in Study 1 was tested with a CFA using the Study 2 data. Screening of the 11 items for sampling adequacy (Kaiser-Meyer-Olkin=0.86) and sphericity (Bartlett's test of sphericity: $\chi^2(55) = 668.41$, $p < 0.001$) indicated the data were appropriate for factor analysis. Model fit was evaluated

according to criteria recommended by Byrne [38]: Root Mean Square Error of Approximation (RMSEA)<0.08, Tucker Lewis Index (TLI)>0.90 and Comparative Fit Index (CFI)>0.90. The criterion for Standardized Root Mean square Residual (SRMR) was <0.08, as recommended by Hu and Bentler [39]. Construct (convergent and divergent) validity was assessed using correlations, and criterion validity was evaluated using independent-samples *t*-tests.

3.5. Results and Discussion

The results supported Study 2’s first hypothesis that the two-factor 11-item BUTs solution derived in Study 1

would be confirmed in an independent sample. The CFA indicated a good fit for the two-factor 11-item solution ($\chi^2(43) = 1.80, p = 0.001, SRMR = 0.05, RMSEA = 0.06, TLI = 0.93$ and $CFI = 0.95$). The final loadings for the two factors are shown in Figure 1, with the first factor measuring negative bias toward oneself and the second factor measuring expectations of others. The moderate correlation of 0.65 between these two factors suggests that a single BUTs scale is acceptable, with a Cronbach alpha of 0.84 indicating a good internal consistency.

3.6. Convergent and Divergent Validity of the BUTs

As shown in Table 3, the data also supported the second hypothesis. In terms of convergent validity, BUTs scores had a significant positive association with mean ATQ belief, frequency and combined, CD-Quest frequency, intensity and combined, DASS and DAS. Consistent with the ATQ and CD-quest, BUTs scores also had no association with gender, indicating divergent validity. The third hypothesis of criterion validity was also supported based on BUTs scores across mental health support history. An independent-samples *t*-test identified that individuals who had never seen a mental health professional had a significantly lower BUTs score than those who had seen a mental health professional ($M=16.83, SD=8.65, N=72, M=21.43, SD=8.71, N=131$ respectively; $t(201)=3.61, p<0.001$). Similarly, individuals who were not currently

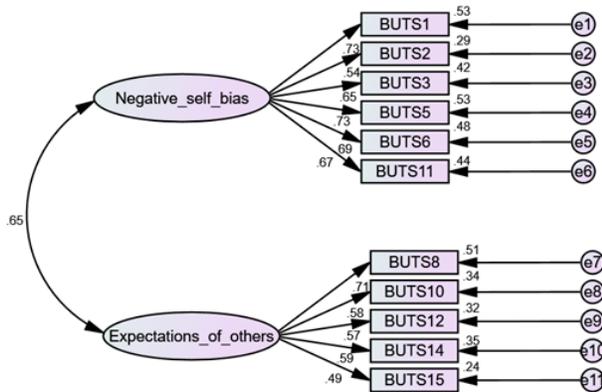


Figure 1: The final CFA model for the BUTs scale.

Table 3: Correlation between BUTs, Mean ATQ Belief Score, Mean ATQ Frequency Score, ATQ Combined, Mean CD-Quest Frequency Score, Mean CDQ Intensity Score, CD-Quest Combined, Total DASS Score, Total DAS Score, Total QoL Score and Gender

ITEM Items	1	2	3	4	5	6	7	8	9	10
1. BUTs										
2. Mean ATQ belief score	0.51**									
3. Mean ATQ frequency score	0.51**	0.85**								
4. ATQ combined	0.48**	0.95**	0.93**							
5. Mean CD-Quest frequency score	0.67**	0.52**	0.52**	0.49**						
6. Mean CD-Quest intensity score	0.53**	0.43**	0.48**	0.45**	0.67**					
7. CD-Quest combined	0.63**	0.52**	0.53**	0.51**	0.91**	0.89**				
8. Total DASS score	0.59**	0.65**	0.65**	0.62**	0.61**	0.49**	0.60**			
9. Total DAS score	0.56**	0.55**	0.51**	0.53**	0.56**	0.44**	0.54**	0.50**		
10. QoL score	-0.43**	-0.51**	-0.47**	-0.47**	-0.45**	-0.30**	-0.41**	-0.55**	-0.39**	
11. Gender	-0.12	-0.07	-0.07	-0.07	-0.11	-0.05	-0.10	-0.06	-0.02	0.02

Note:

* = $p < 0.05$;

** = $p < 0.01, N=203$.

seeing a mental health professional reported a significantly lower BUTs score than those who reported currently seeing a mental health professional ($M=18.76$, $SD=8.71$, $N=166$, $M=24.49$, $SD=8.60$, $N=37$ respectively; $t(201)=3.63$, $p<0.001$).

4. STUDY 3: TEST-RE-TEST ASSESSMENT OF THE BUTS

The aim of Study 3 was to establish test-retest reliability for the BUTs. It was hypothesized that there would be significant positive correlation of BUTs scores over a two-week period.

4.1. Participants

Twenty-three university post-graduate students participated in this study. The mean age of the participants was 27.30 years ($SD=12.00$ years), with 56.5% being female.

4.2. Measures

Brief Unhelpful Thinking Scale (BUTs). Consistent with Study 2, the 11-item BUTs was measured on a 6-point rating scale (0="Strongly agree" to 5="Strongly disagree"). Higher scores indicate greater unhelpful thinking patterns.

4.3. Procedure

A non-clinical sample of university students was invited while in class to completed a pen and paper survey twice over a period of 2 weeks. All participants were informed that their participation in this study was voluntary and they were free to withdraw at any time. Completion of the survey was taken as informed consent.

4.4. Results and Discussion

As hypothesized the BUTs showed good test-retest reliability. The test-retest reliability coefficient for the BUTs was 0.79 ($p < 0.001$). The finding that the BUTs is reliable over time, and the evidence of convergent and criterion validity from Study 2, suggest that the BUTs is a psychometrically strong measure.

5. STUDY 4: CHANGES IN BUTS SCORE ASSOCIATED WITH CBT-BASED INTERVENTION

The aim of Study 4 was to test whether the BUTs was sensitive to changes in unhelpful thinking associated with a CBT intervention. It was hypothesised; BUTs scores would be significantly lower after participation in an eight-week CBT program compared to pre-intervention scores.

5.1. Participants

This study was completed on a small clinical sample ($n=9$), who were formally assessed and diagnosed with Social Anxiety Disorder (SAD). The mean age of the participants was 35.78 years ($SD=10.57$ years) and most participants were women (55.6%), worked part time (22.2%) or work full-time (55.6%), and all participants were Australian.

5.2. Measures

Brief Unhelpful Thinking Scale (BUTs). Consistent with Study 2, BUTs is an 11-item scale to assess unhelpful thinking. Each item is measured with a 6-point rating scale (0="Strongly agree" to 5="Strongly disagree"). Higher summed scores represent greater engagement in unhelpful thinking patterns.

Social Phobia Scale [SPS; 40] is a 20-item measure of social anxiety symptoms related to fear of social scrutiny. Each item is measured on a 5-point rating scale (0="Not at all" to 4="Extremely"). Higher summed scores represent greater fear of social scrutiny.

5.3. Procedure

Participants completed the BUTs and SPS as part of battery of self-report measures administered before and after the eight-week CBT program for SAD at a university psychology clinic. Participants accessed the measures *Via* a URL where they were informed that their participation in the research was voluntary and that they were free to withdraw at any time. Completion of the survey was taken as informed consent. Diagnosis was also confirmed by diagnostic interview with all participants meeting DSM-IV-TR [41] criteria for SAD. The treatment program included components of cognitive-behaviour therapy psychoeducation, group based exposure task and homework assignments.

5.4. Results and Discussion

Two repeated sample *t*-tests were conducted to determine whether there were significant mean differences in primary symptom score (SPS) and BUT spre- and post-intervention. Pre-intervention scores were significantly higher on social anxiety symptom scores than after the intervention (Pre: $M = 28.33$, $SD = 17.00$, Post: $M = 17.22$, $SD = 14.90$; $t(8) = 4.12$, $p = 0.003$). The eta-squared statistic (1.37) indicated a large effect size. Supporting the Study 4 hypothesis was the finding that the BUTs scores also showed a significant reduction post-intervention (Pre: $M = 31.89$, $SD = 14.38$; Post: $M = 24.11$, $SD = 10.01$, $t(9) = 2.33$,

$p = 0.048$). Review of the individual change (post-pre) scores indicated that while one participant had no change in BUTs scores, the remaining eight participants had reduced BUTs scores. Correlation of differences scores (i.e., post-SPS – pre-SPS; post-BUTs – pre-BUTs) indicated a strong positive linear relationship ($r = 0.90$, $p < 0.001$) suggesting that changes in reduction in social anxiety symptom scores were strongly associated reductions in unhelpful thinking pattern scores and the eta squared statistic (0.16) indicated a large effect size. Study 4 results therefore suggest that the BUTs is able to measure changes in unhelpful thinking after CBT interventions.

5.5. General Discussion

The aim of this research was to develop and psychometrically validate BUTs, a brief CBT-focused unhelpful thinking patterns measure. In Study 1, based on an initial 15 items derived from the most commonly assessed unhelpful beliefs, an EFA identified an 11-item two-factor solution. Negative self-bias had six items, while and Expectations of others included five items. Study 2, involving a primarily a community cohort, further validated BUTs by confirming the factor structure and strong psychometric properties in an independent sample. BUTs was also significantly correlated to CD-Quest and ATQ but not gender indicating convergent and divergent validity respectively. Study 3 confirmed the stability of the measure by demonstrating test-retest reliability over a two-week period. Study 4 tested BUTs in a small-scale CBT intervention for SAD and provided evidence that reductions in social anxiety symptom scores were strongly associated with reductions in unhelpful thinking pattern scores. Collectively, the four studies in this research demonstrate that BUTs is valid, has strong psychometric properties, and performs well in both an online setting and in a CBT intervention.

Regarding the relationship between BUTs and the CBT literature, the BUTs is grounded in the structure and accepted unhelpful thinking patterns identified by McKay *et al.*, [11]. Although blaming, global labelling, mind reading and control fallacies were removed, two distinct underlying latent structures of a general negative bias toward oneself and expectations of others emerged. Individuals with unhelpful thinking patterns tend to distort how they relate to themselves and others. When processing cognitive information about themselves, the thoughts tend to be generalised, emotionally-laden, filtered down to negative, exclusively bad, and relate to a perception that a

catastrophe is coming for which they are responsible. Similarly, when processing information about others, there is a need to avoid being wrong, make many sacrifices for others, have everyone live by a common set of rules, and an expectation that others will act fairly and should change to suit them. The negative relationship between the two constructs suggests some individuals lean more towards distortions regarding themselves and other individuals lean more towards distorted expectations of others. This empirical organization of the unhelpful thinking patterns by BUTs offers the potential to identify which theme of cognitive distortion might be a priority to focus on with a client or also develop interventions that more specifically target one theme.

Although the sample size was small, Study 4 showed that BUTs has the potential to contribute knowledge about the relationship between unhelpful thinking and psychopathology. Not only is BUTs directly based upon cognitive distortions targeted in CBT but, in nine individuals with SAD, there was a significant reduction in both unhelpful thinking patterns and social anxiety symptoms as a function of a CBT intervention. This finding is consistent with other research showing anxiety and depressive disorders reduce when unhelpful thinking reduces [12, 17]. Furthermore, this finding is consistent with a meta-analysis that found CBT to be an effective intervention in reducing SAD symptoms [42]. BUTs was developed on an online platform for ease of use in online questionnaires. As these validation studies were undertaken using an online platform, BUTs shows potential for use in the contemporary setting of Health CBT interventions.

Several limitations are acknowledged. First, the initial 15 unhelpful thinking patterns used in this study was confined to one source [11]. However, this represented both the best breadth and depth of unhelpful thinking patterns reported in the published literature and websites created by known professional psychology organizations (e.g., www.cci.health.wa.gov.au). Second, the majority of participants primarily used to validate the BUTs were non-clinical. A follow-up validation of BUTs in a larger clinical sample of anxiety or depressive disorders is recommended. While data from the Study 4 SAD group with diagnosed participants was consistent with the general data, this sample size was small. Small sample size was also a limitation of Study 3. Moreover, the final intervention-based study only included two time-points; consequently more time-points would be needed to confirm causation between changes in distress and unhelpful thinking patterns.

Future research is needed to further understand the relationship between unhelpful thinking and psychopathology. The status of cognitive-mediation in CBT is currently unclear and requires further investigation. As such, BUTs offers a psychometrically strong tool that can be utilised to further explore mediation. In the literature, cognitive distortions have been related to levels of anxiety and depression [12, 17]. The BUTs may provide a helpful tool to explore stability of unhelpful thinking across time providing evidence for it as either a trait or state-based cognitive process. Finally, further research is required to assess the potential for development of clinical cut-offs for the BUTs and to identify how changes in unhelpful thinking patterns may differ across various psychopathologies and psychosocial factors including personality.

CONCLUSION

In conclusion, BUTs is a brief psychometrically valid scale based upon widely accepted cognitive distortions related to CBT. This new scale will be valuable for both clinicians and researchers who wish to measure individual unhelpful thinking patterns and relate them to changes in psychological distress in CBT-based interventions.

ACKNOWLEDGMENTS

The authors wish to thank Ms Sarina Cook for her editorial assistance, Dr De Oliveira for his kind permission to use the CD-Quest in this study and Ms Iris l'Anson who supervised the group-based CBT SAD intervention.

DISCLOSURE STATEMENT

The authors have declared that no conflict of interests exists. No funding was attained for the conducted research.

KEYPOINTS

1. Helping clients to identify and address unhelpful thinking patterns is a key component of cognitive behavioural interventions.
2. This paper outlines a series of studies directed at developing and validating the Brief Unhelpful Thoughts Scale (BUTs).
3. The BUTs is a brief and easy to complete psychometrically valid measure that can be utilised in clinical practice to monitor changes in unhelpful thinking associated with psychological interventions.

REFERENCES

- [1] Beck AT, Rush AJ, Shaw BF and Emery G. Cognitive therapy of depression. New York, NY: The Guilford Press 1979.
- [2] Hetrick SE, Bailey A, Rice SM, Magenta BS, Joanne EM, *et al.* A qualitative analysis of the descriptions of Cognitive Behavioural Therapy (CBT) tested in clinical trials of depressed young people. *Journal of Depression and Anxiety* 2015; 2167-1044: 1000172.
- [3] Feldman G. Cognitive and Behavioral Therapies for Depression: Overview, New Directions, and Practical Recommendations for Dissemination. *Psychiatric Clinics of North America* 2007; 30(1): 39-50. <https://doi.org/10.1016/j.psc.2006.12.001>
- [4] Rohde P, Feeny NC and Robins M. Characteristics and components of the TADS CBT approach. *Cognitive and Behavioral Practice* 2005; 12(2): 186-97. [https://doi.org/10.1016/S1077-7229\(05\)80024-0](https://doi.org/10.1016/S1077-7229(05)80024-0)
- [5] Bowler JO, Mackintosh B, Dunn BD, Mathews A, Dalgleish T, *et al.* A comparison of cognitive bias modification for interpretation and computerized cognitive behavior therapy: Effects on anxiety, depression, attentional control, and interpretive bias. *Journal of consulting and clinical psychology* 2012; 80(6): 1021. <https://doi.org/10.1037/a0029932>
- [6] DeRubeis RJ, Siegle GJ and Hollon SD. Cognitive therapy versus medication for depression: treatment outcomes and neural mechanisms. *Nature Reviews Neuroscience* 2008; 9(10): 788-96. <https://doi.org/10.1038/nrn2345>
- [7] Beck AT and Clark DA. An information processing model of anxiety: Automatic and strategic processes. *Behaviour research and therapy* 1997; 35(1): 49-58. [https://doi.org/10.1016/S0005-7967\(96\)00069-1](https://doi.org/10.1016/S0005-7967(96)00069-1)
- [8] Beck AT. Cognitive therapy: Nature and relation to behavior therapy. *Behavior Therapy* 1970; 1(2): 184-200. [https://doi.org/10.1016/S0005-7894\(70\)80030-2](https://doi.org/10.1016/S0005-7894(70)80030-2)
- [9] Burns DD. *Feeling good: The new mood therapy*. New York, NY: Harper Collins Publishers, Inc 1980.
- [10] Ellis A. *Reason and emotion in psychotherapy*. New York, NY: Lyle Stuart 1962.
- [11] McKay M, Davis M and Fanning P. *Thoughts and feelings: The art of cognitive stress intervention*. Oakland, CA: New Harbinger Publications 1981.
- [12] DeRubeis RJ, Evans MD, Hollon SD, Garvey MJ, Grove WM, *et al.* How does cognitive therapy work? Cognitive change and symptom change in cognitive therapy and pharmacotherapy for depression. *Journal of consulting and clinical psychology* 1990; 58(6): 862. <https://doi.org/10.1037/0022-006X.58.6.862>
- [13] Garratt G, Ingram RE, Rand KL and Sawalani G. Cognitive processes in cognitive therapy: Evaluation of the mechanisms of change in the treatment of depression. *Clinical Psychology: Science and Practice* 2007; 14(3): 224-39. <https://doi.org/10.1111/j.1468-2850.2007.00081.x>
- [14] Arimitsu K and Hofmann SG. Cognitions as mediators in the relationship between self-compassion and affect. *Personality and Individual Differences* 2015; 74: 41-8. <https://doi.org/10.1016/j.paid.2014.10.008>
- [15] Kopala-Sibley DC and Santor DA. The mediating role of automatic thoughts in the personality-event-affect relationship. *Cognitive Behaviour Therapy* 2009; 38(3): 153-61. <https://doi.org/10.1080/16506070802694644>
- [16] Ross SM, Gottfredson DK, Christensen P and Weaver R. Cognitive self-statements in depression: Findings across clinical populations. *Cognitive Therapy and Research* 1986; 10(2): 159-65. <https://doi.org/10.1007/BF01173722>

- [17] Wong SS. The relations of cognitive triad, dysfunctional attitudes, automatic thoughts, and irrational beliefs with test anxiety. *Current Psychology* 2008; 27(3): 177-91. <https://doi.org/10.1007/s12144-008-9033-y>
- [18] Hollon SD and Kendall PC. Cognitive self-statements in depression: Development of an automatic thoughts questionnaire. *Cognitive Therapy and Research* 1980; 4(4): 383-95. <https://doi.org/10.1007/BF01178214>
- [19] Krantz S and Hammen C. Assessment of cognitive bias in depression. *Journal of Abnormal Psychology* 1979; 88(6): 611-9. <https://doi.org/10.1037/0021-843X.88.6.611>
- [20] De Oliveira IR, Seixas C, Osório FL, Crippa JAS, De Abreu JN, et al. Evaluation of the psychometric properties of the cognitive distortions questionnaire (CD-Quest) in a sample of undergraduate students. *Innovations in Clinical Neuroscience* 2015; 12(7-8): 20-7.
- [21] Covin R, Dozois DJA, Ogniewicz A and Seeds PM. Measuring cognitive errors: Initial development of the cognitive distortions scale (CDS). *International Journal of Cognitive Therapy* 2011; 4(3): 297-322. <https://doi.org/10.1521/ijct.2011.4.3.297>
- [22] Lefebvre MF. Cognitive distortion and cognitive errors in depressed psychiatric and low back pain patients. *Journal of Consulting and Clinical Psychology* 1981; 49(4): 517-25. <https://doi.org/10.1037/0022-006X.49.4.517>
- [23] Zettle RD and Hayes SC. Dysfunctional control by client verbal behavior: The context of reason-giving. *The Analysis of Verbal Behavior* 1986; 4: 30. <https://doi.org/10.1007/BF03392813>
- [24] Zettle RD, Rains JC and Hayes SC. Processes of change in acceptance and commitment therapy and cognitive therapy for depression: A mediation reanalysis of Zettle and Rains. *Behavior Modification* 2011; 35(3): 265-83. <https://doi.org/10.1177/0145445511398344>
- [25] Harrell TH and Ryon NB. Cognitive-behavioral assessment of depression: Clinical validation of the automatic thoughts questionnaire. *Journal of Consulting and Clinical Psychology* 1983; 51(5): 721-5. <https://doi.org/10.1037/0022-006X.51.5.721>
- [26] Netemeyer RG, Williamson DA, Burton S, Biswas D, Jindal S, et al. Psychometric properties of shortened versions of the automatic thoughts questionnaire. *Educational and Psychological Measurement* 2002; 62(1): 111-29. <https://doi.org/10.1177/0013164402062001008>
- [27] Kauth MR and Zettle RD. Validation of depression measures in adolescent populations. *Journal of Clinical Psychology* 1990; 46(3): 291-5. [https://doi.org/10.1002/1097-4679\(199005\)46:3<291::AID-JCLP2270460307>3.0.CO;2-S](https://doi.org/10.1002/1097-4679(199005)46:3<291::AID-JCLP2270460307>3.0.CO;2-S)
- [28] Kostoglou SL and Pidgeon AM. The Cognitive Distortions Questionnaire: Psychometric validation for an Australian population. *Australian Journal of Psychology* 2016; 68(2): 123-9. <https://doi.org/10.1111/ajpy.12101>
- [29] Morrison AS, Potter CM, Carper MM, Kinner DG, Jensen D, et al. The Cognitive Distortions Questionnaire (CD-Quest): Psychometric properties and exploratory factor analysis. *International Journal of Cognitive Therapy* 2015; 8(4): 287-305. <https://doi.org/10.1521/ijct.2015.8.4.287>
- [30] Batmaz S, Kocbiyik S and Yuncu OA. Turkish Version of the Cognitive Distortions Questionnaire: Psychometric Properties. *Depression Research and Treatment* 2015.
- [31] Cicchetti DV, Shoinralter D and Tyrer PJ. The effect of number of rating scale categories on levels of interrater reliability: A Monte Carlo investigation. *Applied Psychological Measurement* 1985; 9(1): 31-6. <https://doi.org/10.1177/014662168500900103>
- [32] Kaufman JD and Dunlap WP. Determining the number of factors to retain: a Windows-based FORTRAN-IMSL program for parallel analysis. *Behav Res Methods Instrum Comput* 2000; 32(3): 389-95. <https://doi.org/10.3758/BF03200806>
- [33] Lovibond SH and Lovibond PF. *Manual for the Depression Anxiety Stress Scales*. 2nd ed. Sydney: Psychology Foundation 1995.
- [34] Beevers CG, Strong DR, Meyer B, Pilkonis PA and Miller IW. Efficiently Assessing Negative Cognition in Depression: An Item Response Theory Analysis of the Dysfunctional Attitude Scale. *Psychological Assessment* 2007; 19(2): 199-209. <https://doi.org/10.1037/1040-3590.19.2.199>
- [35] Weissman AN. *Assessing depressogenic attitudes: A validation study [Unpublished thesis]*: University of Pennsylvania 1979.
- [36] Schmidt S, Mühlan H and Power M. The EUROHIS-QOL 8-item index: Psychometric results of a cross-cultural field study. *European Journal of Public Health* 2006; 16(4): 420-8. <https://doi.org/10.1093/eurpub/cki155>
- [37] Williams JBW, Kobak KA, Bech P, Engelhardt N, Evans K, et al. The GRID-HAMD: Standardization of the Hamilton depression rating scale. *International Clinical Psychopharmacology* 2008; 23(3): 120-9. <https://doi.org/10.1097/YIC.0b013e3282f948f5>
- [38] Byrne BM. *Structural equation modeling with AMOS: basic concepts, applications, and programming*. Mahwah NJ: Lawrence Erlbaum Associates 2001; xiv: 338.
- [39] Hu LT and Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling* 1999; 6(1): 1-55. <https://doi.org/10.1080/10705519909540118>
- [40] Mattick RP and Clarke JC. Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy* 1998; 36(4): 455-70. [https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/10.1016/S0005-7967(97)10031-6)
- [41] American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th text. rev. ed. Washington, DC: Author 2000.
- [42] Rodebaugh TL, Holaway RM and Heimberg RG. The treatment of social anxiety disorder. *Clinical Psychology Review* 2004; 24(7): 883-908. <https://doi.org/10.1016/j.cpr.2004.07.007>

Received on 08-09-2017

Accepted on 20-10-2017

Published on 31-12-2017

DOI: <https://doi.org/10.12974/2313-1047.2017.04.02.1>

© 2017 Knowles, et al.; Licensee Savvy Science Publisher.

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.