

The conviction of delusional beliefs scale: Reliability and validity

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Received 7 February 2006; received in revised form 9 June 2006; accepted 14 June 2006

Available online 1 August 2006

Abstract

This study reports on the development of a new measure of delusional belief conviction, the Conviction of Delusional Beliefs Scale (CDBS). Most of the current scales in use assess belief conviction with a single item and primarily reflect the cognitive aspects of conviction. The CDBS represents an improvement over existing scales in that it contains a larger number of test items that can be subjected to psychometric examination. In addition, the CDBS also broadens the concept of belief conviction by incorporating cognitive, emotional, and behavioral items. In the present study, fifty participants with delusions completed the CDBS along with measures of delusional ideation, psychiatric symptomatology, insight, and reading ability. The CDBS showed very good levels of internal consistency and test–retest stability over a six-week period. All of the CDBS items loaded highly on a unitary factor of belief conviction. The CDBS positively correlated with four measures of belief conviction thereby reflecting the convergent validity of the scale. The CDBS was unrelated to other dimensions of delusional ideation, psychiatric symptomatology, insight, and reading ability, which supported the discriminant validity of the scale. The CDBS appears to be a reliable and valid measure of delusional belief conviction that could be used in clinical and research settings.

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Keywords: Delusions; Conviction; Assessment; Beliefs

1. Introduction

According to the DSM-IV-TR, a delusion is defined as a “false belief based on incorrect inference about external reality that is firmly sustained despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary” (American Psychiatric Association [APA], 2000, pg. 821). Early conceptualizations of delusions

viewed these beliefs as dichotomous constructs that were either present or absent (Jaspers, 1968; see Garety and Hemsley, 1987; Mullen, 2003). However, categorizing delusions in this manner is not empirically supported as many persons maintain “partial” delusions, which are beliefs with lower levels of conviction, and beliefs of this nature can even be found in normal individuals without psychiatric conditions (Peters et al., 2004; Strauss, 1969; van Os et al., 2000; Verdoux and van Os, 2002). In addition, research has suggested that delusions are multidimensional constructs that are comprised of between 5 and 11 dimensions (Appelbaum et al., 1999, 2004; Garety and Hemsley, 1987; Kendler et al., 1983).

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Commonly reported dimensions include how strongly a belief is held (conviction), how often the person focuses/thinks about their belief (preoccupation), how widespread and influential the belief is (pervasiveness), whether the belief is linked to negative emotional states, such as anger, depression, or anxiety (negative emotionality), and whether the belief is linked to behaviors (action–inaction).

Of all the dimensions, conviction is most central to the definition of a delusion. Conviction is defined as the degree of certainty that a delusional belief is true (APA, 2000; Appelbaum et al., 2004; Kendler et al., 1983). Previous views of delusional conviction proposed that these beliefs were absolute and resistant to modification (Leeser and O'Donohue, 1999), but it has been demonstrated that conviction levels do change over time and conviction may be best viewed as existing on a continuum (Sharp et al., 1996). In addition, researchers frequently use conviction levels as the main outcome variable in treatment studies since reducing belief conviction not only weakens the delusion, but leads to improved emotional and behavioral functioning as well (Bouchard et al., 1996; Chadwick and Lowe, 1990; Haddock et al., 1998; Sharp et al., 1996; Kingdon and Turkington, 2005; for an exception see Freeman et al., 1998).

Due to the importance of conviction in both the definition and treatment of delusions, research that attempts to improve its measurement would indeed be valuable (Bouchard et al., 1996). Currently, there are a number of rating scales that measure delusional belief conviction. Clinician-rated instruments such as the Brown Assessment of Beliefs Scale (Eisen et al., 1998) and the Maudsley Assessment of Delusions Schedule (Taylor et al., 1992) use a single Likert scale item to measure belief conviction. Other scales, such as the Psychotic Rating Scale (PSYRATS; Haddock et al., 1999), utilize percentage rating scales (0–100%; Chadwick and Lowe, 1990; Hole et al., 1979) or use single items that are tailored to the individual's specific belief (e.g., Personal Questionnaire; Brett-Jones et al., 1987). Common to all of these scales is the measurement of belief conviction with a single item.

The use of single item scales to measure belief conviction is problematic for several reasons. First, these items do not allow an examination of traditional psychometric properties used in test construction such as internal consistency (Devillis, 1991; Kendler et al., 1983; Nunnally and Bernstein, 1994). Second, single item scales are limited in that they may lack the range of measurement provided by multi-item scales, which reduces their sensitivity to change. Third, many single item scales (e.g., Personal Questionnaire and percentage

conviction rating scale) were developed for use in single-subject design studies and have not been validated for group-based treatment studies, which are used in most treatment studies today (Bouchard et al., 1996). Fourth, the content of the single item scales usually reflect the cognitive aspects of conviction (e.g., how certain am I that the belief is true), but research suggests that conviction may have emotional (e.g., attachment, meaning, comfort) and behavioral components (e.g., talking to others about beliefs) as well (Kendler et al., 1983; Leeser and O'Donohue, 1999; Sharp et al., 1996). Thus, scales that allow for a richer conceptualization of conviction may possess a greater degree of construct validity and it is possible that conviction may be a unitary construct with cognitive, emotional, and behavioral aspects. Finally, percentage rating scales, while time efficient, are difficult to complete in that participants may not be able to determine where to place their belief along the scale due to the lack of anchors/descriptors on the scale. Thus, a participant may be unable to discriminate between a 90% conviction rating and a 75% rating (Sharp et al., 1996). Therefore, it appears that the measurement of belief conviction can be improved.

This study reports on the reliability and validity of a new measure of belief conviction, the Conviction of Delusional Beliefs Scale (CDBS). The CDBS contains multiple test items that can be subjected to psychometric examination to establish the scale's reliability and broadens the concept of belief conviction by incorporating cognitive, emotional, and behavioral items. In this study, we will first present data on the internal consistency and test–retest reliability of the CDBS over a six-week period. Second, the construct validity of the scale will be examined by presenting data on the factor loadings for the CDBS items in order to establish that belief conviction is a unitary construct. Third, the convergent validity of the scale will be examined by computing correlations between the CDBS and four other measures of delusional belief conviction. Finally, the discriminant validity of the scale will be examined by computing correlations between the CDBS and other dimensions of delusional ideation and measures of psychiatric symptomatology, depression, and insight.

2. Methods

2.1. Participants

Fifty participants with delusional beliefs completed the study (Table 1). All participants were recruited from two inpatient psychiatric facilities in Oklahoma and had DSM-IV-TR diagnoses of schizophrenia, schizoaffective

Table 1
Summary of participant demographics and clinical characteristics

Variable	Mean (SD)
<i>N</i>	50
Age (years)	36.4 (11.8)
Educational level (years)	12.2 (2.7)
WRAT-III reading ^a	91.4 (13.7)
SCID diagnosis	–
Schizophrenia (<i>n</i>)	39
Schizoaffective (<i>n</i>)	7
Delusional disorder (<i>n</i>)	4
BPRS total score	54.4 (10.8)
Thought disorder	16.1 (4.4)
Affect	10.9 (4.3)
Anergia	7.5 (3.1)
Disorganization	5.4 (2.0)
Length of illness (years)	11.9 (10.6)
% Persecutory delusions	50%
Number of prior hospitalizations	5.0 (4.0)
% Taking atypical antipsychotics	72%
Medication dosage (CPZ)	591.6 (487.3)

Note. WRAT-III = Wide Range Achievement Test-III; BPRS = Brief Psychiatric Rating Scale; GAF = Global Assessment of Functioning score; CPZ = chlorpromazine equivalent dosages (Woods, 2003).

^a WRAT-III reading subtest scores reported as standard scores ($M=100$, $SD=10$).

disorder, or delusional disorder based on the Structured Clinical Interview for DSM-IV-Patient Edition (SCID-P; First et al., 2001). The presence of delusional beliefs was assessed with the Expanded Brief Psychiatric Rating Scale (BPRS) using recommended cut-off scores (e.g., BPRS scores 5+ for suspiciousness/grandiosity and/or 4+ for unusual thought content; Martin and Penn, 2002; Lukoff et al., 1986). Since delusional beliefs have varied conviction levels, the sample was further divided into individuals with full ($n=30$) and partial delusions ($n=20$), as determined by the scoring criteria of the BPRS. We felt that using a variety of participants with varying degrees of conviction promoted greater variability in our sample. To be eligible for the study, the delusional belief had to be present for at least one month prior to the study, which was verified by a review of psychiatric case notes and staff observations. If a participant held more than one delusional belief, they were instructed to select the most important one (see Appelbaum et al., 1999; Eisen et al., 1998 for a similar procedure). Each delusion was classified by thematic content according to guidelines from the DSM-IV-TR by 2 independent raters ($kappa=.90$; see Appelbaum et al., 1999). Twenty-five delusions were persecutory, 15 grandiose, and 10 were delusions of reference. The sample contained a greater number of males ($n=33$; $\chi^2=5.1$, $p=.02$) than females ($n=17$), and there were more White participants ($n=32$; $\chi^2=44.5$, $p=.001$) than African American ($n=6$), Native

American ($n=11$), or Hispanic participants ($n=1$). In terms of sampling efforts, ten additional participants were approached for participation in the study, but refused. The most common reason for non-participation was an unwillingness to discuss their beliefs with the researchers. Exclusion criteria consisted of a chart history of brain injury or neurological disease other than schizophrenia, delusional belief present for less than one month based on chart records, or if they met DSM-IV-TR diagnostic criteria for substance dependence within the last three months based on the SCID-P. After a complete description of the study to the participants, informed consent was obtained. The study received IRB approval from the University of Tulsa and the Oklahoma Department of Mental Health and Substance Abuse Services.

2.2. Measures

2.2.1. Demographic and clinical measures

A demographic questionnaire was used to obtain information on participants' background and psychiatric history (e.g., length of illness, number of previous inpatient hospitalizations, and medication type and dosage). The SCID-P was used to derive a psychiatric diagnosis based on the DSM-IV-TR (First et al., 2001). The final DSM-IV diagnosis was made based on all available information by one of the researchers (DC). The BPRS was used to 1) identify delusional beliefs and 2) to assess the participant's current level of psychiatric symptomatology over the previous two-week period of time (Lukoff et al., 1986). The BPRS contains 24 items (rated on a scale of 1 [*Not present*] to 7 [*Extremely severe*]), which cover a wide range of psychiatric symptoms. The BPRS comprises four factor scores: Anergia (range 4–28, midpoint 16), Affect (range 5–35, midpoint 20), Thought Disorder (range 4–28, midpoint 16), and Disorganization (range 3–21, midpoint 12; see Mueser et al., 1997). In this study, we were primarily interested in the BPRS Thought Disorder factor score, which is comprised of ratings for suspiciousness, grandiosity, hallucinations, and unusual thought content and reflects the presence of delusional ideation. The research assistants were trained to acceptable levels of reliability with a criterion-trained rater on the BPRS (Intra-Class Correlation (ICC)=.80+; Ventura et al., 1993) and SCID-P ($kappa=.91$; First et al., 2001).

2.2.2. Insight Scale

The Insight Scale (IS) was used to measure participants' level of insight into their psychiatric disorder (Birchwood et al., 1994). The IS contains 8 items (rated "agree", "not agree", or "don't know") and scores range

from 0 to 16 with higher scores indicative of greater levels of insight. The items comprising the IS have good content validity (as reviewed in Amador and David, 2004). In previous research, the internal consistency of the IS was good ($\alpha=.75$), and the scale demonstrated excellent one week test–retest reliability ($r=.90$; Birchwood et al.). The IS showed good levels of agreement with the clinician-rated insight item from the Present State Examination and IS scores were found to differ between participants with acute and remitted psychosis (Birchwood et al., 1994). In this study, the IS total score was used to reflect overall level of insight. In the present sample, the internal consistency of the IS was good ($\alpha=.70$).

2.2.3. Zung Self-rating Depression Scale

The Zung Self-Rating Depression Scale was developed to measure the cognitive, emotional, and physical symptoms associated with depression (Zung, 1965). The scale contains 20 items, which are rated on a Likert scale ranging from 0 (*a little of the time*) to 4 (*most of the time*). Higher scores indicate greater levels of depressive symptomatology. The Zung scale has an extensive history of use in psychological research and is considered a reliable and valid measure of depression. In previous research, the Zung correlated highly with the Beck Depression Inventory and was a good predictor of depressive symptoms (Groth-Marnat, 1997; Thurber et al., 2002). In the present study, the internal consistency of the Zung was good ($\alpha=.77$).

2.2.4. Wide Range Achievement Test-III reading subtest

The WRAT-III reading subtest was used to measure participant reading level (Wilkinson, 1993). The WRAT-III presents words of increasing difficulty that the person must read aloud. The total number of words read correctly is used to compute a standardized reading score ($M=100$, $SD=15$).

2.3. Delusional assessment measures

2.3.1. Brown Assessment of Beliefs Scale

The Brown Assessment of Beliefs Scale (BABS) was used as a clinician-rated measure of delusional beliefs (Eisen et al., 1998). The BABS comprises seven items: Conviction, perception of others' views, explanation of others' views, fixity of the belief, attempts to disprove the belief, level of insight, and the presence of delusions of reference (optional item). The items are rated on a five point Likert scale that ranges from 0 (*non-delusional; non-pathological*) to 4 (*delusional; most pathological*) and higher scores reflect more severe levels of delusional symptomatology. In previous research, the BABS

demonstrated very good levels of inter-rater agreement (ICC's ranged from .82 to .96; Eisen et al., 1998). The BABS conviction item correlated positively with three other measures of belief conviction and was not correlated with symptoms of depression or obsessive-compulsive disorder (Eisen et al., 1998). In the present sample, the research assistants demonstrated good levels of inter-rater agreement on the BABS with a criterion-trained rater (ICC's = .80–.90).

2.3.2. Characteristics of Delusions Scale

The Characteristics of Delusions Scale (CDS) was developed as a self-report measure of delusional ideation (Garety and Hemsley, 1987). The CDS items reflect 11 different delusional dimensions. For this study, we report data for only the CDS conviction item as the other 10 dimensions overlap with the BABS. The CDS conviction item uses a visual analogue scale (single 10 cm line with no marks or divisions) and participants indicate where on the line their level of conviction falls. The end points are “*believe absolutely*” and “*believe not at all*” and responses are scored on a scale of 1–10. Higher scores are indicative of greater belief conviction. In previous research, the CDS conviction item correlated with the conviction item from the BABS (Eisen et al., 1998), and minimally correlated with the other 10 dimensions from the CDS (Garety and Hemsley, 1987).

2.3.3. Percentage conviction rating scale

The percentage conviction rating scale is a one item scale that asks the person to rate how “strongly they believe their specific belief is true” using a percentile ranking scale that ranges from 0% to 100% (Chadwick and Lowe, 1990; Hole et al., 1979). The participant indicates where on this scale their conviction level falls. In previous research, the scale was found to be sensitive to change during treatment studies (Chadwick and Lowe, 1990; Bouchard et al., 1996; Sharp et al., 1996).

2.3.4. The Conviction of Delusional Beliefs Scale

The Conviction of Delusional Beliefs Scale (CDBS) was developed to provide a self-report measure of belief conviction that could be used in a variety of clinical and research settings. The CDBS contains 9 items, which are rated on a Likert scale that ranges from 1 (*not at all/never*) to 5 (*all the time/always*). The Likert scale format was chosen based on our structured interviews with persons with delusions who tended to rate strength of conviction based on how frequently the events in the items occurred in their daily lives. The nine CDBS items are summed to obtain a total score (CDBS scores can range from 9 to 45) and higher CDBS scores reflect greater belief conviction.

The CDBS items and instructions are written at a 5th grade reading level (Flesch–Kincade Grade level=5.4), which is important as psychiatric participants may have reading difficulties that can impact their ability to complete assessment measures.

The initial pool of 38 items for the CDBS was generated from a review of the literature and current measures of delusional ideation, clinical experience (20+ years for the authors), structured interviews with individuals about their beliefs, and discussions with experts in delusions. We did not adapt or modify items from existing scales for the CDBS. For the CDBS, conviction was conceptualized as a unitary construct with cognitive (e.g., belief certainty), emotional (e.g., attachment to belief; belief is important and has meaning), and behavioral aspects (e.g., talking to others; Sharp et al., 1996). The items were then sent to four clinical researchers with expertise in psychosis who reviewed the items for content appropriateness, importance, readability, and bias. Reviewers provided written comments on the items and suggested revisions/additions to the scale (8 items were deleted and 4 items were added for a total of 34 items in the preliminary version of the scale). To be included in the scale, the items had to be rated as acceptable by 75% or greater of the expert reviewers. The 9 items in the final version of the scale represent the best items in terms of psychometric properties (internal consistency, factor loadings) based on administration of the scale to two pilot samples of 25 and 30 persons with delusions (Combs et al., 2002, 2005). The CDBS along with instructions on its proper use and scoring can be obtained from the first author.

2.4. Procedure

Two doctoral students in the clinical psychology program at the University of Tulsa administered the study protocol under the supervision of the first author (DC). All of the research assistants underwent extensive training on the administration of the study measures prior to working with participants. Participants with delusions were referred to the study by treatment staff familiar with their case history and presenting problems. The demographic questionnaire, SCID-P, BPRS, WRAT-III, Zung Depression Scale, and Insight Scale were administered first. This was followed by completion of the delusional belief measures, which were randomized prior to administration to minimize order effects. For the CDBS, CDS, and Percentage Conviction Rating scale, the delusional belief was written at the top of each form with instructions to rate that specific belief on each scale for the current week. After completion of the self-report

measures, a research assistant blinded to the self-report data administered the BABS. Time to complete the study averaged about 2 h, and participants were paid a stipend for their time. After the initial testing session, participants completed a new CDBS at week 1, 2, 4, and 6. All participants reported the same delusional belief (some variation in wording was expected, but the content remained the same) at each time period based on the BPRS. This step in the study was important to ensure that participants were rating the same belief each time the scale was completed. Participants did not have access to prior CDBS responses during the follow-up periods. The researchers did not have control over when participants were discharged during the follow-up period. The CDBS was completed by 92% ($N=46$) of participants at week 1, 64% at week 2 ($N=32$), 46% at week 4 ($N=23$), and 40% at week 6 ($N=20$).

3. Results

The CDBS showed a very good level of internal consistency based on data from the initial testing session (alpha = .80; $N=50$). Individual item means and

Table 2
Psychometric properties for the CDBS

CDBS item stem ^a	Mean (SD)	Corrected item–total correlation ^b	Alpha if item deleted	Factor loading
1. Questioned truth of belief (cog.) ^a	3.5 (1.3)	.599*	.766	.721
2. Thought my belief was not true (cog.) ^a	4.0 (1.2)	.587*	.770	.723
3. Be okay if belief were not true (emot.) ^a	3.1 (1.6)	.671*	.753	.779
4. Find few things to support (cog.) ^a	2.7 (1.4)	.350*	.799	.466
5. Others told me my belief was not true (beh.) ^a	2.8 (1.4)	.386*	.795	.511
6. Like to talk about belief (beh.)	2.6 (1.3)	.468*	.783	.605
7. Feel anxious about the truth of my belief (emot.) ^a	2.8 (1.5)	.455*	.786	.586
8. Belief is logical/well-supported (cog.)	3.9 (1.3)	.508*	.779	.626
9. Others can change my belief (cog.) ^a	4.1 (1.2)	.432*	.788	.571

Note. CDBS items rated on a scale ranging from 1 (*not at all/never*) to 5 (*all of the time/always*).

^aReverse scored item.

^bCorrelation between the item score and the total score minus the score for that item.

* $p < .01$.

psychometric properties are presented in Table 2. All of the CDBS items were scored in the positive direction (7 items are reverse scored) so that higher CDBS scores indicated greater belief conviction. Test–retest stability of the CDBS was excellent at week 1 ($r = .81, p = .0001$), week 2 ($r = .83, p = .0001$), week 4 ($r = .77, p = .0001$), and week 6 ($r = .70, p = .0001$). Thus, the CDBS appears to possess good internal and test–retest stability.

The mean score on CDBS was 29.7 ($SD = 7.8$) and the distribution of CDBS scores was normal (one-sample Komogorov–Smirnov test = 1.05, ns). The CDBS had good variability among the participants (sample range 9–44 out of a possible 9–45). There was no difference in CDBS total score by gender ($t(49) = 0.2, ns$) or ethnicity ($F(3, 49) = .45, ns$). There was no difference in CDBS score by delusion type (e.g., persecutory, grandiose, or reference), $F(2, 49) = 2.5, ns$. The CDBS was not significantly correlated with age, educational level, chronicity of illness, number of previous hospitalizations, or medication type (atypical vs. typical) or chlorpromazine dosage level (all r 's < .20, ns).

The CDBS items all loaded strongly on a general factor of belief conviction based on a Principal Components Analysis of the CDBS items, which reflected the unitary nature of the scale (all loadings .32+; Tabachnick and Fidell, 1996). We then computed a series of correlations to examine the convergent and discriminant validity of the CDBS. Due to the number of correlations, a Bonferroni-corrected probability level

was set at .0035 (.05/14 comparisons), and correlations falling above that level were considered to be non-significant. We expected that the CDBS would positively correlate with four measures of belief conviction to support the convergent validity of the scale. The CDBS showed significant correlations with the BABS conviction item, the CDS conviction item, the Percentage Conviction Rating Scale, and the BPRS thought disorder factor score (Table 3). To examine the discriminant validity of the CDBS, we computed correlations between the CDBS total score and the remaining BABS items other than belief conviction, the BPRS factor scores of Anergia, Affect, and Disorganization, the Zung Depression Scale, and the Insight Scale. As expected, there was no relationship between the CDBS and these measures at corrected probability levels (Table 3). Based on this data, the CDBS appears to have good construct validity.

4. Discussion

This study reports data on a new self-report measure of delusional belief conviction, the Conviction of Delusional Beliefs Scale (CDBS). Overall, the CDBS appears to be a reliable and valid measure of belief conviction and is appropriate for use in the assessment of delusions related to psychosis. The CDBS has several properties that may make it attractive to clinical researchers. First, compared to existing scales, the CDBS contains a larger number of items, which allows for a greater range of measurement and better sensitivity in treatment outcome studies. In addition, the CDBS items possess very good internal consistency and temporal stability, and these psychometric properties may increase the usefulness of the CDBS in research. Second, the CDBS contains items that reflect the cognitive, emotional and behavioral aspects of conviction. We do not assume that emotional or behavioral aspects are more important than cognitive, but we believe that these represent different ways that conviction can be expressed. Behaviorally, conviction appears to be primarily reflected in talking to others about the belief (i.e., trying to convince others about the truth of the belief) and social interactions in which others challenge the belief's veracity. Items that reflected other actions or behaviors (e.g., locking your door to prevent attack) were not assessed in the CDBS as we felt that behaviors associated with delusions were too idiosyncratic and diverse to effectively measure (Sharp et al., 1996).

Emotionally, the data from this study suggests that greater conviction was manifested in an increased sense of importance/meaning of the belief, which was found

Table 3
Correlations between the CDBS, measures of delusional conviction, symptom severity, and clinical functioning

Measure	CDBS total score correlation coefficient (r)
Convergent measures	–
BABS conviction item	.731 *
CDS conviction item	.518 *
% Conviction rating scale	.706 *
BPRS thought disorder score	.421 *
Discriminant measures	–
BABS perception of others views	.281
BABS explain differing views	.243
BABS fixity of ideas	.086
BABS attempt to disprove	.305
BABS insight	.193
BPRS anergia	.050
BPRS affect	–.153
BPRS disorganization	–.058
Insight scale	–.065
Zung Depression Scale	–.123

Note. BABS = Brown Assessment of Beliefs Scale; CDS = Characteristics of Delusions Scale; BPRS = Brief Psychiatric Rating Scale; factor scores were adapted from Mueser et al. (1997).

* $p < .0035$ (Bonferroni-corrected p value; .05/14).

across all delusion types — even persecutory delusions (personal communication, Peter Kinderman, May 2001; see Kendler et al., 1983; Leiser and O'Donohue, 1999). This may appear paradoxical, but we speculate that although a belief may be persecutory in content, it may still be perceived as true and important by the participants (Roberts, 1991). Our results are consistent with research suggesting that persecutory delusions are important and serve as purpose to the individual in that they may defend against negative events by reducing self-discrepancies between the actual and ideal self (Bentall and Kaney, 1996; Kinderman and Bentall, 1996, 1997; McKay et al., in press; Mortiz et al., in press). In terms of anxiety, our results suggest that as conviction levels increase (i.e., more certainty) participants report less anxiety about their beliefs. For example, most of realize that the sun will come up each morning and as a result do not worry about the truth of that belief. Why would a person worry about the truth of their belief if they had no doubts about its truthfulness? However, it appears that our findings are at odds with research reporting a positive correlation between anxiety/worry and delusional conviction (Freeman and Garety, 1999; Garety et al., 2005). It is believed that anxiety and other emotional processes can impact the formation and maintenance of delusional beliefs by increasing attention to threatening stimuli and preventing disconfirmation of beliefs via social avoidance (Freeman et al., 2002, 2004). However, we argue that the CDBS specifically measures anxiety about the truth of the belief, and other studies measure anxiety in the presence of expected harm. In the presence of harm, it would be reasonable to report increased physiological arousal (e.g., greater heart rate, sweating, and worry). These relationships are indeed complicated and delusional distress is most likely related to a combination of conviction and the imminence and pervasiveness of the threat (Freeman et al., 2001). Finally, the CDBS is written at the 5th grade level, which increases its utility with persons reporting delusional beliefs who may have compromised reading and cognitive abilities. In fact, many assessment measures such as the Minnesota Multiphasic Personality Inventory 2 (MMPI-2) and Personality Assessment Inventory (PAI) were written at lower reading levels to enhance their use with psychiatric populations.

Regarding its reliability, the CDBS demonstrated very good levels of internal consistency in the current sample, reflecting the homogeneity of item content (Devillis, 1991; Nunnally and Bernstein, 1994). Furthermore, CDBS scores were found to be highly stable over a six-week period. Even though participants rated the same belief at each session, they did not have access

to previous CDBS scores and the stability of the scale does not seem to be an artifact of the design (Chadwick and Lowe, 1990). The stability of conviction levels may seem surprising since all of the participants were undergoing inpatient psychiatric treatment during the study. However, it has been suggested that delusions may require more specialized forms of treatment such as Cognitive–Behavioral Therapy (Cather et al., 2004, 2005) or specific antipsychotic medications, such as pimozide, to improve (Manschreck, 1996). The participants in the current study were all receiving inpatient psychiatric treatment, which involved a combination of antipsychotic medication and group therapy (e.g., process groups, psycho-education, coping skills, recreational therapy).

The construct validity of the CDBS was supported by the factor loadings of the items and the convergent and discriminant properties. We feel that it is important to demonstrate the validity of a new scale when other scales are available for use. In terms of validity, all of the items loaded on a general factor of belief conviction, which supports the unitary nature of the CDBS. Furthermore, the CDBS positively correlated with four measures of belief conviction even though each scale measured conviction in a different way (i.e., clinician-rated, percentage rating scale, Likert scale item). Probably the most important evidence for the CDBS as a measure of belief conviction is the discriminant validity data for the scale. As expected, the CDBS was not correlated with other dimensions of delusional ideation and showed no relationships with other psychiatric symptoms, such as negative symptoms, anxiety/depression, insight, or disorganization. This is consistent with research suggesting that the dimensions of delusional beliefs, including conviction, are relatively independent constructs (Appelbaum et al., 1999; Stoll et al., 1987). Thus, based on the present data, it appears that the CDBS is *specifically* measuring belief conviction and not some other aspects of delusional ideation or general psychiatric symptomatology.

There are several limitations of the study. The sample size used in the study may be considered small by traditional psychometric standards (Devillis, 1991), but the number of participants is consistent with other studies that developed measures of delusional ideation (Eisen et al., 1998; Garety and Hemsley, 1987; see Bouchard et al., 1996 for a review). However, the difficulties associated with obtaining sizable numbers of persons with delusions should be considered in evaluating this limitation. Larger sample sizes often lead to more stable reliability estimates and would have increased the power to detect significant relationships, especially given our use of a Bonferroni-corrected probability level. In terms of sampling, it is

possible that participants with severe levels of paranoia may have refused to participate in the study and the results may reflect a narrow range of delusional participants who were willing to discuss their beliefs (see Section 2.1; Garety and Hemsley, 1987). Also, we selected the primary delusional belief and other more secondary delusions were not assessed, which prohibited a broader sampling of participant beliefs. Future research will need to examine the sensitivity of the CDBS to changes in conviction levels as a result of treatment (e.g., CBT for psychosis), and we welcome the inclusion of the CDBS as a treatment outcome measure (contact authors for a copy of the scale).

In closing, despite the importance of conviction in the study of delusions, little attention has been devoted to the development of psychometrically sound measures of delusional conviction. Improving our assessment measures is important since the demonstration of treatment efficacy is largely dependent on the quality of the measures used in the study. We hope that the CDBS will become a useful measure for clinical researchers that will enhance the study of delusional beliefs.

Acknowledgements

A copy of the CDBS can be obtained from the first author (dennis-combs@utulsa.edu) upon request. Support for this study was provided by a Faculty Summer Development Fellowship from the University of Tulsa to Dennis R. Combs, Ph.D. Special thanks to Dr. Peter Kinderman for his assistance during the item development phase of the study. The Oklahoma Department of Mental Health and Substance Abuse Services (ODMH-SAS) provided technical support and oversight for this project. We also thank all of the participants for their willingness to take part in this research project.

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