Development and Validation of the Multidimensional Cognitive Attentional Syndrome Scale (MCASS)

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Abstract

The cognitive attentional syndrome (CAS), a multidimensional construct that consists of maladaptive forms of self-regulation, is central to the metacognitive model. Despite the CAS’s central importance to the metacognitive model, as well as evidence that components of the CAS are risk factors for the development of emotional disorders, a psychometrically sound self-report measure that accounts for the multidimensional nature of the CAS has yet to be developed. The present set of studies details the development and initial validation of the Multidimensional Cognitive Attentional Syndrome Scale (MCASS). In study 1, a pool of 69 items, assessing the seven self-regulation strategies of the CAS, was administered to U.S. adults recruited through a crowd-sourcing website (N = 323). Structural analyses supported the proposed 7-factor solution and three items with the highest loadings on each factor, without salient cross-loadings, were retained. In Study 2, adult participants (N = 389) completed a battery of self-report measures, including the retained 21 MCASS items. The reduced item pool was examined using both first- and second-order measurement models. The 7-factor first-order measurement model and the second-order measurement model, with each of the first-order factors loading on a higher-order construct (i.e., CAS), provided adequate model fit. Each of the seven, first-order factors exhibited significant loadings on the second-order construct. Convergent, discriminant, and concurrent validity analyses further supported the construct validity of the MCASS scale scores. The MCASS may be particularly useful for examining the theoretical underpinnings of the metacognitive model, as well as for more comprehensive clinical monitoring of the CAS.

Keywords: cognitive attentional syndrome, psychometrics, factor structure, metacognition, self-report
Public Significance Statement

We developed the first comprehensive multidimensional self-report measure of the cognitive attentional syndrome (i.e., Multidimensional Cognitive Attentional Syndrome [MCASS]), a construct that evidence suggests is involved in the development of a wide variety of emotional disorders. The MCASS may be particularly useful for better understanding the etiology of emotional disorders and may result in increased use of clinical interventions that are tailored to the specific needs of each patient.
Development and Validation of the Multidimensional Cognitive Attentional Syndrome Scale (MCASS)

The self-regulatory executive function model (S-REF; Wells & Matthews, 1996) has expanded our understanding of the role of metacognition in the etiology and maintenance of emotional disorders (see Wells, 2019, for a recent review). The cognitive attentional syndrome (CAS), a set of maladaptive forms of self-regulation initiated and maintained by beliefs about thinking (i.e., metacognitive beliefs), is central to the S-REF model. A review of written descriptions of the CAS (Wells, 2009) suggest the CAS is marked by seven core self-regulatory strategies: (a) worry, (b) rumination, (c) internal threat monitoring, (d) external threat monitoring, (e) thought suppression, (f) physical avoidance behavior, and (g) substance use. The S-REF model holds that the habitual use of these strategies prolongs and exacerbates emotional distress, thereby serving as a causal and maintaining factor for emotional disorders. Consistent with the S-REF model, many of the strategies that mark the CAS are well-established risk factors for various forms of psychopathology and other maladaptive outcomes (e.g., anxiety and depression; Young & Dietrich, 2015; Nolen-Hoeksema, 2000; stress; Roussis & Wells, 2008; posttraumatic stress disorder; Spinhoven et al., 2015; Bardeen, Fergus, & Wu, 2013).

To our knowledge, one measure has been developed to assess the CAS. The Cognitive Attentional Syndrome Questionnaire (CAS-1) is a 16-item self-report measure that was developed primarily for clinical use (Wells, 2009). The first eight items assess self-regulatory strategies that are rated on a 0-8 scale. The second set of eight items assess positive (benefits of thinking style) and negative (danger and uncontrollability of thinking style) metacognitive beliefs that are rated on a 0-100 scale. The item scores of the CAS-1 were originally summed for use as a total score. Modifications had to be made to the rating of the second set of eight items to
ensure they fell on the same 0-8 scale as the first set of eight items (Fergus, Bardeen, & Orcutt, 2012; Fergus, Valentiner, McGrath, Gier-Lonsoy, & Jencius, 2013). The CAS-1 has evidenced adequate-to-good internal consistency (Cronbach’s αs = .78 and .86), large correlations with a measure assessing a related construct of maladaptive responses to unwanted inner experiences (r = .63), theoretically expected concurrent relations with anxiety and depressive symptom severity (rs ranging from .30-.58), and incremental validity in accounting for unique variance in symptom severity when controlling for the variance attributed to a measure of the convergent construct (Fergus et al., 2012; Fergus et al., 2013). These studies provided initial support for the psychometric properties of the CAS-1.

The items of the CAS-1 have been summed for use as a total score in subsequent studies (e.g., Kowalski, Wypych, Marchewka, & Dragan, 2019). Additionally, three subscales have been used in previous research based on the rationally-derived domains of CAS self-regulatory strategies, positive metacognitive beliefs, and negative metacognitive beliefs (e.g., Fergus & Scullin, 2017). Given the differing way in which the CAS-1 item scores have been operationalized, the factor structure of the item scores was examined in two studies. Kowalski and Dragan (2019) found the most support for a 2-factor solution (self-regulatory strategies, metacognitive beliefs), whereas Nordahl and Wells (2019) found support for a 3-factor solution that paralleled how Fergus and Scullin (2017) operationalized subscale scores. However, it is important to note that the 3-factor solution examined by Nordahl and Wells (2019) exhibited poor model fit based upon conventional goodness-of-fit benchmarks (i.e., CFI = .87, TLI = .84, RMSEA = .10). It was not until three error terms were allowed to correlate based on modification indices that model fit was acceptable. As such, Nordahl and Wells (2019) suggested that the measure might be improved by removing items with redundant content. Kowalski and
Dragan (2019) interpreted their findings to suggest the need for newly developed measures of the CAS with refined item content.

It is worth highlighting that half of the items of the CAS-1 pertain to metacognitive beliefs. The inclusion of metacognitive beliefs is potentially problematic for a measure of the CAS because metacognitive beliefs are considered distinct from the CAS self-regulatory strategies within the S-REF model (Wells & Matthews, 1996). More precisely, metacognitive beliefs putatively evoke and maintain the CAS. As such, from a conceptual standpoint, a measure of the CAS should be comprised of items that adequately represent the components of the CAS as described above while excluding items that are metacognitive beliefs. Moreover, there is likely insufficient content devoted to the different self-regulatory strategies in the CAS-1. For example, rumination and worry are assessed by one item in the CAS-1, meaning that there is no differentiation between these two related but distinct constructs (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Internal and external threat monitoring are similarly combined into a single item, despite being distinct as well (Wells & Matthews, 1996). The remaining three strategies (thought suppression, physical avoidance behavior, and substance use) are assessed by 1 to 2 CAS-1 items (e.g., physical avoidance assessed via “avoided situations” and “asked for reassurance”). Having only 1 to 2 items per domain does not allow for each specific strategy to be isolated from the other domains to understand their unique contributions to constructs of interest (e.g., deriving subscale scores; Bandalos, 2018).

Results from previous research (e.g., Kowalski & Dragan, 2019) and concerns regarding the item content of the CAS-1 suggest a need for the development of new measure of the CAS. As reviewed, a new measure of the CAS is best suited to exclusively focus on self-regulatory strategies and to allow for each strategy to be specifically examined via its own subscale score.
Without such a measure, we cannot assess the adequacy of the larger theoretical model and determine the degree to which the CAS is important in understanding the etiology of emotional disorders. As such, the primary aim of the present investigation was to develop a comprehensive multidimensional self-report measure of the CAS titled the Multidimensional Cognitive Attentional Syndrome Scale (MCASS). Two studies were conducted to meet this goal. The first study involved item development, as well as examining the tenability of the proposed factor solution to inform item retention. The second study involved submitting the final item pool to confirmatory factor analysis to ensure that the data fit the proposed seven-factor model. Additionally, internal consistency, convergent, discriminant, and concurrent validity of the MCASS item scores were examined in Study 2.

**Study 1 Method**

**Participants**

Participants were 323 adults who were recruited through Amazon’s Mechanical Turk (MTurk), an online labor market in which community adults can complete questionnaires in exchange for compensation. MTurk participants have been found to produce high-quality data and to be more demographically diverse than undergraduate and other Internet samples (Chandler & Shapiro, 2016). As a quality control measure, only participants with at least a 95% approval rating from requesters in MTurk and who had completed at least 50 past human intelligence tasks were allowed to participate in this study. Previous research suggests that such quality control measures improve the quality of data (Peer, Vosgerau, & Acquisti, 2014). The average age of Sample 1 was 36.6 years ($SD = 10.2$), and the sample was 47.7% female. Regarding race, 81.4% of participants self-identified as White, 10.8% as Black, 4.3% as Asian,
0.3% as American Indian or Alaska Native, 0.6% as Native Hawaiian or other Pacific Islander, and 2.5% as “other.” Additionally, 11.5% of the sample identified their ethnicity as Hispanic.

Preliminary Item Pool

As noted, seven core self-regulatory strategies are described in a review of written descriptions of the CAS (Wells, 2009). These strategies are: (a) worry, (b) rumination, (c) internal threat monitoring, (d) external threat monitoring, (e) thought suppression, (f) physical avoidance behavior, and (g) substance use. A pool of items assessing these seven strategies was developed using a combination of existing items from published measures and by creating new items. The item pool included three items from the Brief Measure of Worry Severity (Gladstone et al., 2005), one item from the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990), two items from the Cognitive Fusion Questionnaire (Gillanders et al., 2014), one item from the COPE (Carver, 1997), one item from the Student Alcohol Survey (McCarty, 1979), two items from the Drinking Context Scale (O’Hare, 1997), three items from the Drinking Motives Questionnaire (Cooper, 1994), two items from the Response Style Questionnaire (Nolen-Hoeksema, 1991), nine items from the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999), three items from the White Bear Suppression Inventory (Wegner & Zanakos, 1994), five items from the Distraction & Suppression subscale and eight items from the Behavioral Avoidance subscale of the Multidimensional Experiential Avoidance Questionnaire (Gámez, Chmielewski, Kotov, Ruggero, & Watson, 2011), one item from the Cognitive-Behavioral Avoidance Subscale (Ottenbreit & Dobson, 2004), one item from the Body Vigilance Scale (Schmidt, Lerew, & Trakowski, 1997), one item from the Obsessive Beliefs Questionnaire (Obsessive Compulsive Cognitions Working Group, 2001), four items from the Attention to Emotions Scale (Haung, Berenbaum, & Chow, 2013), five items from the Brief Hypervigilance
Items that appeared to assess metacognitive beliefs, which are distinct from the CAS, and items assessing clinical outcomes (e.g., anxiety, depression) were excluded. Potential problems with previously existing items were addressed by revising double-barreled items and forward-coding items that were previously reverse-coded (Devellis, 2017). The item pool was preceded by a set of general instructions: “Please read each statement and indicate how much you generally agree with it by choosing the appropriate option. Please respond to all of the items. There are no right or wrong answers”. Each item was rated on a six-point rating scale (1 = “strongly disagree” to 6 = “strongly agree”).

Procedure

All study procedures were approved by the local institutional review board. Informed consent and self-report measures could be completed from any computer with Internet access. Participants provided demographic information and then completed the 69 items that were developed for the study. Data were collected using Qualtrics, a secure online survey program. Participants were debriefed and paid $0.75 upon study completion, an amount consistent with MTurk studies of similar length (Buhrmester, Kwang, & Gosling, 2011).

Data Analytic Strategy

The analyses for Study 1 were conducted using Mplus 7.4 with robust maximum likelihood (MLR) estimation (Muthen & Muthen, 2015). The 69 items were submitted to exploratory factor analysis (EFA) with oblique rotation. Parallel analysis, which is considered the most accurate method of determining factor structure, was conducted (Fabrigar, Wegener, MacCallum, & Strahan, 1999; O’Connor, 2000; Zwick & Velicer, 1986). Goodness-of-fit for the
exploratory factor model identified via parallel analysis was examined using three of the most commonly recommended fit indices: the Tucker–Lewis fit index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The following guidelines were used to evaluate model fit. For the CFI and TLI, values > .90 indicate adequate fit (Bentler 1990; Meyers et al. 2006). For the RMSEA index, values < .05 indicate excellent fit, values from .05 to .08 indicate adequate fit (Browne & Cudeck 1993), and values from .08 to .1 indicate mediocre/acceptable fit, whereas values > .10 indicate inadequate fit (Meyers et al. 2006).

Following the identification of the factor structure of the pool of items, factor loadings were interpreted. After factor identification, items with loadings < .40 (Gratz & Roemer, 2004; Judah, Grant, Mills, & Lechner, 2014) and/or items that cross-loaded on another factor (Matsunaga, 2010) were removed from consideration for retention.

**Study 1 Results**

Parallel analysis indicated that seven factors should be extracted. These seven factors accounted for the following variance: factor 1 = 40.08%, factor 2 = 8.86%, factor 3 = 7.01%, factor 4 = 3.41%, factor 5 = 2.18%, factor 6 = 2.55%, factor 7 = 2.22%, and factor 8 = 1.66%. The seven-factor model provided adequate fit to the data, $\chi^2 = 3053.160$ (1884, $p < .001$), CFI = .927, TLI = .909, RMSEA = .044 (90% CI = .041 - .047). Factors 1 through 7 had item loadings that clearly distinguished these factors from one another in a manner that was consistent with the proposed 7-factor model. Based on the specified criteria for potential item retention (i.e., factor loadings > .4 that did not cross-load), 10 items remained on Factor 1 (rumination), 10 items remained on Factor 2 (substance use), seven items remained on Factor 3 (external threat monitoring), six items remained on Factor 4 (thought suppression), eight items remained on Factor 5 (behavioral avoidance), nine items remained on Factor 6 (internal threat monitoring),
and four items remained on Factor 7 (worry; see Table 1). Inter-factor correlations appear in Table 2.

As noted above, we sought to retain three items for each lower-order construct to ensure that each lower-order construct could be identified as a latent construct (Brown, 2015) while also ensuring that the measure was not prohibitively long. As such, we retained the three highest loading items with acceptable readability scores (Flesch, 1979; Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991) for each of the seven factors. These 21 items and their factor loadings appear in Table 1. In total, nine items were created by the authors, while 12 items came from previously validated scales. Specifically, three items came from the Rumination Reflection Questionnaire (Trapnell & Campbell, 1999), one item came from the COPE (Carver, 1997), one item came from the Brief Hypervigilance Scale (Bernstein et al., 2015), six items came from the Distraction & Suppression and Behavioral Avoidance subscales of the Multidimensional Experiential Avoidance Questionnaire (Gámez et al., 2011), two items came from the Attention to Emotions Scale (Haung et al., 2013), and one item came from the Brief Measure of Worry Severity Scale (Gladstone et al., 2005).

**Study 1 Summary**

In Study 1, a preliminary pool of 69 items was developed to assess the CAS. These items were then administered to adult participants and the results from an EFA supported a 7-factor solution that was consistent with the conceptualization of the CAS outlined by Wells (2009). Following EFA, the three items with the highest loadings on each factor, without salient cross-loadings, and with acceptable readability were retained for further examination.

**Study 2**

The purpose of Study 2 was twofold. First, we examined the factor structure of the seven-
factor model identified in Study 1 and the interrelations among the latent factors. Examination of latent factor interrelations, rather than intercorrelations among subscales, provides a clearer estimate of relations among constructs because measurement error is taken into account (e.g., scale unreliability; Brown, 2015). We predicted that the factors would strongly relate with one another and exhibit loadings on a higher-order construct. Such findings would support the use of a total scale score.

The second goal of Study 2 was to examine the reliability and validity of item scores of the MCASS. Internal consistency of the total scale score and subscale scores was examined. Convergent validity was examined by investigating associations between scores on the MCASS and CAS-1 (Wells, 2009). The association between scores on the MCASS and a measure of social desirability was examined as a test of discriminant validity. Additionally, to broaden the range of discriminant associations, relations between scores on the MCASS and a measure of music listening behaviors were examined. Some evidence suggests that those who engage in music listening behaviors more frequently, do so, at least in part, as an avoidant coping strategy to regulate physiological arousal and negative affective states (Chamorro-Premuzic, Swami, Furnham, & Maakip, 2009; Hanser, ter Bogt, Van den Tol, Mark, & Vingerhoets, 2016; Liu, Lee, Yu, & Chen, 2016; Lee et al., 2012; McCaffrey, 2008; Schäfer, Sedlmeier, Städtler, & Huron, 2013). Based on this previous research we hypothesized that correlations between the MCASS and music listening behaviors would be small to medium in size, while those between the MCASS and social desirability would be small and nonsignificant. Finally, concurrent validity was examined by investigating associations between scores on the MCASS and constructs theoretically relevant to the CAS (Wells, 2009). We expected that the MCASS would
share medium to large correlations with these criterion variables (i.e., Depression, Anxiety, Stress).

**Study 2 Method**

**Participants**

Participants were 389 adults who were recruited through MTurk. Consistent with Study 1, as a quality control measure, only participants with at least a 95% approval rating from requesters in MTurk and who had completed at least 50 past human intelligence tasks were allowed to participate in the study (Peer et al., 2014). Participants from Study 1 were not allowed to participate in Study 2. The average age of Sample 2 was 36.6 years ($SD = 10.2$), and the sample was 48.3% female. Regarding race, 65.6% of the sample self-identified as White, 27.2% as Black, 4.4% as Asian, 1.3% as American Indian or Alaska Native, and 1.5% as “other.” Additionally, 23.1% of the sample identified their ethnicity as Hispanic. In addition to the MCASS, participants completed the following measures.

**Measures**

*Cognitive Attentional Syndrome-1 (CAS-1)*

As already introduced, the CAS-1 is a 16-item measure developed by Wells (2009) to assess the CAS in clinical settings. The first two items assess the degree to which individuals have been dwelling on or worrying about problems and focusing attention on threats, respectively. The next six items assess the frequency of which individuals have used strategies to cope with negative feelings or thoughts (e.g., “tried not to think about things”). Responses to these initial eight items are given on a 0-8 rating scale. The final eight items assess individuals’ positive and negative metacognitive beliefs about the CAS (e.g., “worrying helps me cope”) and were rated on a modified 0-8 rating scale following existing research (Fergus et al., 2012; Fergus
et al., 2013). Higher CAS-1 scores are meant to represent greater CAS engagement. In the present study, the CAS-1 demonstrated adequate internal consistency ($\alpha = .94$).

**Metacognitive Questionnaire (MCQ-30)**

The MCQ-30 (Wells & Cartwright-Hatton, 2004) assesses five types of maladaptive metacognitive beliefs: (a) positive beliefs about worry (e.g., “worrying helps me to avoid problems in the future”); (b) negative beliefs about uncontrollability and danger of worry (e.g., “my worrying is dangerous for me”); (c) cognitive confidence (e.g., “I have little confidence in my memory for words and names”); (d) need for control (e.g., “If I did not control a worrying thought, and then it happened, it would be my fault”); and (e) cognitive self-consciousness (e.g., “I think a lot about my thoughts”). MCQ-30 items are rated on a 4-point rating scale ranging from 1 (“do not agree”) to 4 (“agree very much”) to indicate how characteristic each belief is of the participant. Higher scores indicate greater endorsement of maladaptive metacognitive beliefs. The MCQ-30 has exhibited adequate psychometric properties in previous research, including internal consistency, convergent validity, and concurrent validity (Wells & Cartwright-Hatton, 2004). Additionally, results from factor analysis support the use of a total score and subscale scores (Fergus & Bardeen, 2019). Internal consistency of the MCQ-30 total score ($\alpha = 0.96$) and subscale scores ($\alpha$s from .84 to .93) was adequate in the present study.

**Depression, Anxiety, and Stress Scale (DASS-21)**

The DASS-21 (Lovibond & Lovibond, 1995) is a 21-item self-report measure that assesses depression, anxiety, and stress symptoms. DASS-21 items are rated on a 4-point scale ranging from 0 (“did not apply to me at all”) to 3 (“applied to me very much, or most of the time”) to describe how each statement pertained to the participant in the past week. A 3-factor structure of the DASS-21 has been supported and the DASS-21 scales have shown adequate
psychometric properties in prior studies, including internal consistency and convergent validity (e.g., Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005; Lovibond & Lovibond, 1995). In this study, the DASS-21 was used to determine criterion-related validity, as the CAS should theoretically be associated with the constructs represented by this measure (Wells, 2009). Internal consistency of the Depression, Anxiety, and Stress scales of the DASS-21 was adequate in the present study ($\alpha = .95, .93, \text{ and } .93$, respectively).

**Social Desirability Scale (SDS-17)**

The SDS-17 (Stöber, 2001) is a 17-item self-report measure, adapted as a shorter and more contemporary version of the Marlowe-Crowne Scale (Crowne & Marlowe, 1960), which asks participants whether socially undesirable but common behaviors describe them (e.g., “I take out my bad moods on others now and then”). Response options to SDS-17 items are dichotomous (*True* or *False*). The SDS-17 is used frequently in research studies to control for individual differences in the tendency to respond in a socially desirable way. The SDS-17 has exhibited adequate psychometric properties in previous research, including internal consistency and convergent and discriminant validity (Stöber, 2001). In the present study, the SDS-17 demonstrated adequate internal consistency ($\alpha = .72$).

**Music Listening Scale**

The Music Listening Scale is an 8-item self-report measure from the Oregon Avocational Interest Scale (Goldberg, 2009) that asks about the frequency of one’s music listening behaviors (e.g., traded music with a friend). Items are rated on a 5-point rating scale ranging from 0 (“never in my life”) to 4 (“more than ten times in the past year”). The MLS was used in this study to establish discriminant validity, as the new MCASS should not theoretically have meaningful
correlations with an assessment of music listening habits. The MLS demonstrated adequate internal consistency in the present study (α = .74).

**Procedure**

All study procedures were approved by the local institutional review board. Informed consent and self-report measures could be completed from any computer with Internet access. Participants provided demographic information, completed the MCASS, and then completed a battery of other questionnaires in a random order. Data were collected using a secure online survey program. Participants were debriefed and paid $1.50 upon study completion.

**Data Analytic Approach**

The factor structure of the MCASS was examined using a CFA approach. First-order CFA measurement models were examined first to test the adequacy of a more parsimonious one-factor lower-order model and a correlated 7-factor lower-order model supported in Study 1, as well as to examine latent correlations among the seven lower-order factors (Brown, 2015). Next, lower-order factor correlations were removed from the lower-order 7-factor model and direct effects from the higher-order factor (i.e., CAS) to each of the seven lower-order factors were added. This CFA was used to determine whether the higher-order factor (i.e., CAS) accounted for the latent correlations among the seven lower-order constructs.¹

The chi-square difference test (using the DIFFTEST function in Mplus; Muthen & Muthen, 2015) was used to examine whether there was a significant difference in the fit of the lower-order, and higher-order models (Brown, 2015). However, the chi square difference test is highly influenced by sample size; chi-square difference tests may indicate a significant difference when the magnitude of differences are actually trivial (Cheung & Rensvold, 2002). To address this issue, RMSEA 90% confidence intervals were also compared (CIs; Brown, 2015;
Kline, 2016). If models have overlapping 90% RMSEA CIs, differences in model fit are considered negligible (Wang & Russell, 2005).

Models were tested using Mplus 7.4 (Muthen & Muthen, 2015). Robust maximum likelihood (MLR) estimation was used to test all models because it is robust to violations of the assumption of normality (Brown, 2015). The three fit indices used in Study 1 (RMSEA, TLI, CFI) were used in Study 2 to evaluate each model. Internal consistency estimates of the MCASS scales were examined using coefficient omega. Bivariate correlations were calculated to examine the convergent, discriminant, and concurrent validity of the MCASS scores.

**Study 2 Results**

**Confirmatory Factor Analyses**

The one-factor lower-order model did not provide an adequate fit to the data, \( \chi^2 = 1943.677 \) (189, \( p < .001 \)), CFI = .571, TLI = .525, RMSEA = .154 (90% CI = .148 - .161). The correlated 7-factor model provided adequate fit to the data, \( \chi^2 = 246.633 \) (168, \( p < .001 \)), CFI = .981, TLI = .976, RMSEA = .035 (90% CI = .025 - .044). All factor loadings were significant (\( ps < .001 \)). All of the subscales were significantly correlated; latent correlations among the seven subscales ranged from .24 to .88, \( ps < .001 \) (see Table 2). Finally, the 7-factor higher-order CFA provided adequate fit to the data, \( \chi^2 = 348.405 \) (182, \( p < .001 \)), CFI = .959, TLI = .953, RMSEA = .048 (90% CI = .041 - .056). All of the items loaded on their respective lower-order factors (\( ps < .001 \)). Additionally, factor loadings on the higher-order factor were all significant (\( p < .001 \)) and medium to large in magnitude: worry = .95, rumination = .91, substance use = .65, internal threat monitoring = .65, behavioral avoidance = .60, external threat monitoring = .54, and thought suppression = .39. The chi-square difference test, \( \Delta \chi^2 = 92.66 \) (\( df = 14 \), \( p < .001 \)),
indicated that the 7-factor lower-order model provided better fit to the data than the higher-order model, but overlapping RMSEA 90% CIs suggested that the difference in models was negligible.

**Construct Validity**

Bivariate correlations are presented in Table 3. The MCASS total scale score shared the largest correlation with the CAS-1, closely followed by a large magnitude correlation with the MCQ-30 total scale score. Large magnitude correlations were observed between the MCASS total scale score and anxiety, depression, and stress. While the correlation between the MCASS total scale score and the SDS-17 total scale score was significant in this large sample, the magnitude of the correlation was small ($r = -.17$). Moreover, the SDS-17 total scale score was not significantly associated with four of the seven MCASS subscale scores ($r$s from .05 to -.03). The correlation between the MCASS total scale score and MLS was significant and medium in size ($r = .37$), and the correlations between the MCASS subscale scores and the MLS were all significant and small to medium in size ($r$s from .16 to .36).

**Study 2 Summary**

In Study 2, we sought to examine the factor structure of the MCASS items that were identified in Study 1. The one-factor model was the only model that did not provide adequate fit to the data. For the lower-order 7-factor model, the interrelations among the seven lower-order factors were medium to large. Additionally, for the higher-order model, all of the lower-order factors evidenced loadings on the higher-order CAS construct that were medium to large in magnitude.

Additionally, results from Study 2 provide support for the MCASS item scores as a reliable and valid measure of the CAS. The total scale and subscales showed adequate internal consistency, converged with the only known measure of the CAS, and shared strong correlations
with constructs theoretically relevant to the CAS (i.e., anxiety, depression, stress, and metacognitive beliefs). In support of discriminant validity, the magnitude of the correlation between the MCASS total score and SDS was small and only three of the seven MCASS subscales exhibited small magnitude significant correlations with the SDS. The magnitude of the correlations between the MLS and MCASS total and subscale scores were small to medium in size.

**General Discussion**

The CAS and its components are of central importance to the S-REF model (Wells & Matthews, 1996) and are essential to understanding a wide range of psychopathology. However, the only existing measure of the CAS has several significant limitations, including poor content validity, rating scales with different metrics, and items assessing metacognitive beliefs used in the total score to represent the CAS. The purpose of the present set of studies was to address these problems by developing a pool of items that adequately covered the content of the CAS, confirming the factor structure of the theoretically informed multidimensional measure, and finally, confirming that the MCASS item scores exhibit adequate reliability and validity.

A large pool of items was administered to an adult sample and a 7-factor solution was identified in Study 1. A theoretically supported hierarchical model, consisting of a general CAS construct with seven lower-order domains (i.e., rumination, worry, external threat monitoring, internal threat monitoring, thought suppression, behavioral avoidance, and substance use), was supported by the results from CFA in the second study. Each of the seven constructs showed moderate to strong correlations with one another and all of the lower-order factors evidenced loadings on the higher-order CAS construct that were medium to large in magnitude. Results
from the structural analyses conducted in Study 2 support the use of the MCASS total scale score and domain-specific subscale scores.

Additionally, the MCASS item scores exhibited good reliability and correlated with theoretically related constructs in the expected manner. Discriminant validity was measured by comparing the MCASS with the SDS and MLS, as social desirability was expected to exhibit small magnitude correlations with the CAS and music habits were expected to exhibit small to medium magnitude correlations with the CAS. As predicted, a medium-sized negative correlation was observed between the MCASS and the MLS, and three MCASS subscales exhibited negative correlations with the MLS that were small in magnitude. While these correlations were significantly smaller than those that suggest convergent and criterion-related validity, they are consistent with evidence that suggests that those who engage in music listening behaviors more frequently, do so, at least in part, as an avoidant coping strategy (Chamorro-Premuzic et al., 2009; Hanser et al., 2016; Liu et al., 2016; Lee et al., 2012; McCaffrey, 2008; Schäfer et al., 2013). It may be that listening to music reduces emotional distress in the short-term, but when used chronically and rigidly as one’s primary emotion regulation strategy, music listening may maintain or exacerbate emotional distress (i.e., a rigidly applied avoidance strategy).

The MCASS has anticipated utility in a number of therapeutic settings. Its consistent scaling and brief nature allows it to be administered quickly and accurately by clinicians, even in busy settings. Furthermore, the seven subscales of the measure allow clinicians to determine which maladaptive coping strategies are used most frequently by each client and to adjust case conceptualizations and treatment plans accordingly. For example, if a client scored high on the rumination and internal threat monitoring subscales, the clinician could choose to use the
attention training technique (ATT) to reduce the client’s self-focused attention (Fergus & Bardeen, 2016; Papageorgiou & Wells, 2000). Although all seven of the aforementioned behaviors putatively contribute to the CAS, each client copes with emotional distress in a unique way, and thus, may require a customized and focused approach. The wide range of emotional disorders that the components of the CAS contribute to suggests that the MCASS has the potential for frequent use in a variety of clinical settings and presentations (Young & Dietrich, 2015; Nolen-Hoeksema, 2000; Roussis & Wells, 2008).

This study had a number of strengths and limitations. Strengths include the use of two large samples of adult participants and comparisons of MCASS data with several existing, psychometrically sound measures. One limitation is the use of an online, unselected sample. The factor structure of the CAS should ideally be replicated in a clinical sample with a variety of psychological disorders that have shown to be related to the CAS. Additionally, only self-report measures were used to assess the range of constructs in the present set of studies. To expand upon this, the MCASS should also be compared to objective measures of related constructs (e.g., performance-based measures of external attention fixation).

As described, we sought to develop a multidimensional measure that would be feasible to use in real world settings and in large research studies. As such, we may have traded broad content coverage of some of the lower-order constructs for brevity. While some of the lower-order constructs may be sufficiently narrow to be well covered by three items, others may not. It may be beneficial to develop a longer version of the MCASS to ensure sufficient content coverage of each of the lower-order domains. In a similar vein, some have suggested that worry and rumination may be well represented as part of the construct of repetitive negative thinking (McEvoy, Mahoney, & Moulds, 2010) and large magnitude correlations are often observed.
between scores on measures of these constructs, as was the case in the present set of studies. However, there are considerable differences in the operational definitions of these constructs that suggest that they should be considered distinct from one another. Whereas worry is future-oriented and focuses on threats that have not occurred, rumination is a past- or present-oriented pattern of thinking for which the distinguishing theme tends to be loss and failure (see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, for further discussion of this topic). Importantly, consistent with the results of the present set of studies, these constructs have been shown to be statically distinguishable in several studies (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Hong, 2007; Muris, Roelofs, Meesters, & Boomsma, 2004; Segerstrom, Tsao, Alden, & Craske, 2000; Watkins, Moulds, & Mackintosh, 2005).

Because the disadvantages of including reverse-coded items in self-report measures has been well documented (Devellis, 2017; Hughes, 2009; Weems & Onwuegbuzie, 2001), we forward coded any items that were reverse-coded prior to conducting Study 1. Using reverse-coded items may reduce scale validity by increasing the likelihood of systematic error. In fact, the psychometric properties of self-report measures often improve when reverse-coded items are removed (e.g., Rodebaugh, Woods, & Heimberg, 2007; Weeks et al., 2005). Additionally, evidence from EFA, CFA, and multitrait-multimethod research has demonstrated the tendency of reverse-coded items to load onto their own separate factor, thus introducing a method effect that could result in the development of an arbitrary subscale or scale score (Dalal & Carter, 2015). However, some researchers have pointed out that using reverse-coded items make it easier to identify inattentive participants and those with an acquiescence bias (i.e., the tendency to endorse a positive response option more frequently; Ferrando, & Lorenzo-Seva, 2010; Primi, Hauck-Filho, Valentini, & Santos, 2020). Despite such advantages, researchers note that acquiescence
bias is generally a minor residual factor and, on average, would not be expected to substantively impact scale scores (Ferrando, & Lorenzo-Seva, 2010). Moreover, evidence suggests that the systematic error produced by the use of reverse-coded items has a greater impact on scale scores than error that may result from inattentive responding and acquiescence bias (Dalal & Carter, 2015). In any case, the latter source of error is still worth accounting for when possible.

Fortunately, there are several methods that can be used to identify inattentive and acquiescence responding that do not require the use of reverse-coded items (see Dalal & Carter, 2015). Such methods may be used in tandem with the MCASS in future studies.

There are several future directions for this line of research. First, test-retest reliability of the MCASS should be assessed by administering it to the same group of participants at two or more time points. Secondly, the MCASS should be administered to participants with a variety of DSM-diagnosed disorders in order to assess the validity of the CAS in such populations and to understand the contributions of the CAS to emotional disorders. Thirdly, the MCASS should be administered longitudinally and in concordance with therapy in a clinical sample to understand the effectiveness of metacognitive therapies (Wells, 2009) in lessening the symptoms of the CAS and enhancing psychological wellbeing. In addition, it would be beneficial to further investigate the discriminant validity with a wider variety of measures.

In summary, the MCASS is the first psychometrically sound self-report measure of the CAS and its lower-order factors. Support was found for a 7-factor structure of the CAS, and the newly created MCASS measure has demonstrated a strong theoretical basis and psychometric properties. Future work is necessary to test the properties of the MCASS and its scope in regard to psychopathology. Overall, the MCASS has demonstrated the potential to aid in both future research on this topic and in the clinical assessment and treatment of psychological suffering.
References


Footnotes

1At the request of an anonymous reviewer, we used confirmatory factor analysis to examine a bifactor model of the MCASS to determine whether the domain-specific factors are meaningfully distinct from the general factor to warrant the use of subscale scores. For the bifactor model, all 21 items were allowed to load onto the CAS general factor, as well as their respective lower-order factors, and the correlations between all factors were fixed to zero (see Supplemental Figure S4 for a depiction of this model). The bifactor CFA provided adequate fit to the data, χ² = 317.60 (168, p < .001), CFI = .964, TLI = .954, RMSEA = .048 (90% CI = .040 -.056). Additional indices derived from the bifactor model are presented in Supplemental Table S1. Indices derived from the bifactor model suggest that the MCASS is a multidimensional measure, consisting of domain-specific factors that are sufficiently distinct from the general factor to calculate both total and subscale scores.
Table 1
Factor Loadings for the final 21 items of the MCASS

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Often I'm playing back over in my mind how I acted in a past situation.</td>
<td>.86 .01 .01 .01 .01 .01 .05</td>
</tr>
<tr>
<td>2. I spend a lot of time rethinking things that are over and done with.</td>
<td>.83 .01 .04 .03 .00 .00 .07</td>
</tr>
<tr>
<td>3. I tend to &quot;ruminate&quot; or dwell over things that happen to me for a really long time afterward.</td>
<td>.78 .03 .04 .04 .02 .02 .08</td>
</tr>
<tr>
<td>4. Alcohol or drugs help me cope with problems in my life.</td>
<td>.05 .91 .03 .01 .02 .01 .03</td>
</tr>
<tr>
<td>5. I drink alcohol or take drugs to make myself feel better.</td>
<td>.00 .90 .05 .01 .03 .04 .02</td>
</tr>
<tr>
<td>6. I drink alcohol or take drugs to relieve stress.</td>
<td>.04 .88 .02 .01 .02 .04 .02</td>
</tr>
<tr>
<td>7. I stay alert or watchful at all times.</td>
<td>.01 .06 .77 .01 .07 .04 .02</td>
</tr>
<tr>
<td>8. I keep track of entrances and exits when in public so that I can escape if necessary.</td>
<td>.04 .02 .76 .03 .05 .11 .03</td>
</tr>
<tr>
<td>9. When I am in a public place, I position myself so that I can keep an eye on my surroundings.</td>
<td>.05 .06 .76 .02 .04 .05 .02</td>
</tr>
<tr>
<td>10. When negative thoughts come up, I try to fill my head with something else.</td>
<td>.07 .01 .00 .86 .04 .02 .13</td>
</tr>
<tr>
<td>11. When unpleasant memories come to me, I try to put them out of my mind.</td>
<td>.07 .06 .04 .85 .03 .01 .03</td>
</tr>
<tr>
<td>12. When upsetting memories come up, I try to focus on other things.</td>
<td>.03 .10 .00 .77 .05 .07 .01</td>
</tr>
<tr>
<td>Question</td>
<td>Factor Loadings</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>13. If I am in a slightly uncomfortable situation, I try to leave right away.</td>
<td>.03 .01 .02 .07 .75 .19 .01</td>
</tr>
<tr>
<td>14. I go out of my way to avoid uncomfortable situations.</td>
<td>.10 .01 .00 .01 .74 .07 .01</td>
</tr>
<tr>
<td>15. I'm quick to leave any situation that makes me feel uneasy.</td>
<td>.08 .03 .03 .00 .71 .15 .07</td>
</tr>
<tr>
<td>16. I pay attention to my thoughts and feelings more than other people.</td>
<td>.07 .07 .11 .01 .04 .66 .07</td>
</tr>
<tr>
<td>17. I tend to pay attention to my emotions even when I don't want to.</td>
<td>.11 .05 .04 .01 .10 .66 .08</td>
</tr>
<tr>
<td>18. It would be difficult for me to not pay attention to my emotions, even if I tried.</td>
<td>.08 .01 .05 .06 .11 .65 .12</td>
</tr>
<tr>
<td>19. I constantly think about bad things happening.</td>
<td>.06 .03 .07 .00 .04 .07 .75</td>
</tr>
<tr>
<td>20. I often worry about not being able to stop myself from worrying.</td>
<td>.08 .03 .08 .00 .03 .08 .71</td>
</tr>
<tr>
<td>21. I often have thoughts that something bad is going to happen.</td>
<td>.11 .08 .05 .04 .06 .09 .70</td>
</tr>
</tbody>
</table>

*Note: N = 323 (Study 1 sample). Bolded Factor Loadings significant at p < .001. Factor 1 = Rumination; Factor 2 = substance use; Factor 3 = external threat monitoring; Factor 4 = thought suppression; Factor 5 = behavioral avoidance; Factor 6 = internal threat monitoring; Factor 7 = worry.*
### Table 2

*Inter-factor Correlations*

<table>
<thead>
<tr>
<th>Factors</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rumination</td>
<td>--</td>
<td>.54</td>
<td>.46</td>
<td>.35</td>
<td>.52</td>
<td>.55</td>
<td>.88</td>
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<tr>
<td>2. Substance use</td>
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<td>--</td>
<td>.33</td>
<td>.24</td>
<td>.31</td>
<td>.40</td>
<td>.66</td>
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<tr>
<td>3. External Threat</td>
<td>.34</td>
<td>.25</td>
<td>--</td>
<td>.41</td>
<td>.58</td>
<td>.59</td>
<td>.45</td>
</tr>
<tr>
<td>4. Thought Suppression</td>
<td>.37</td>
<td>.22</td>
<td>.28</td>
<td>--</td>
<td>.46</td>
<td>.39</td>
<td>.31</td>
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<tr>
<td>5. Behavioral Avoidance</td>
<td>.36</td>
<td>.27</td>
<td>.37</td>
<td>.48</td>
<td>--</td>
<td>.51</td>
<td>.54</td>
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<tr>
<td>6. Internal Threat</td>
<td>.54</td>
<td>.29</td>
<td>.54</td>
<td>.34</td>
<td>.44</td>
<td>--</td>
<td>.59</td>
</tr>
<tr>
<td>7. Worry</td>
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<td>.25</td>
<td>.32</td>
<td>.28</td>
<td>.37</td>
<td>.46</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* Study 1 (*N* = 323) results appear below the diagonal. Study 2 (*N* = 389) results appear above the diagonal. All correlations are significant at *p* < .001.

Factor 1 = Rumination; Factor 2 = substance use; Factor 3 = external threat monitoring; Factor 4 = thought suppression; Factor 5 = behavioral avoidance; Factor 6 = internal threat monitoring; Factor 7 = worry.
Table 3

Bivariate Correlations

<table>
<thead>
<tr>
<th>Variables</th>
<th>CAS-1</th>
<th>MCQ-T</th>
<th>MCQ-P</th>
<th>MCQ-N</th>
<th>MCQ-CC</th>
<th>MCQ-NFC</th>
<th>MCQ-CSC</th>
<th>DASS-D</th>
<th>DASS-A</th>
<th>DASS-S</th>
<th>SDS</th>
<th>MLS</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.80***</td>
<td>.62***</td>
<td>.78***</td>
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<td>.68***</td>
<td>.69***</td>
<td>.73***</td>
<td>-.17**</td>
<td>.37***</td>
</tr>
<tr>
<td>2. MCASS-R</td>
<td>.66***</td>
<td>.65***</td>
<td>.52***</td>
<td>.70***</td>
<td>.52***</td>
<td>.47***</td>
<td>.44***</td>
<td>.58***</td>
<td>.56***</td>
<td>.63***</td>
<td>-.29***</td>
<td>.25***</td>
</tr>
<tr>
<td>3. MCASS-SU</td>
<td>.71***</td>
<td>.74***</td>
<td>.64***</td>
<td>.68***</td>
<td>.68***</td>
<td>.63***</td>
<td>.37***</td>
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<td>.72***</td>
<td>.73***</td>
<td>-.25***</td>
<td>.36***</td>
</tr>
<tr>
<td>4. MCASS-ETM</td>
<td>.47***</td>
<td>.44***</td>
<td>.31***</td>
<td>.39***</td>
<td>.25***</td>
<td>.43***</td>
<td>.47***</td>
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<td>.31***</td>
</tr>
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<td>5. MCASS-TS</td>
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<td>.29***</td>
<td>.22***</td>
<td>.22***</td>
<td>.19***</td>
<td>.27***</td>
<td>.29***</td>
<td>.16**</td>
<td>.16**</td>
<td>.19***</td>
<td>.05</td>
<td>.16**</td>
</tr>
<tr>
<td>6. MCASS-BA</td>
<td>.53***</td>
<td>.45***</td>
<td>.27***</td>
<td>.45***</td>
<td>.34***</td>
<td>.44***</td>
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<td>.41***</td>
<td>.01</td>
<td>.18***</td>
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<td>7. MCASS-ITM</td>
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<td>.52***</td>
<td>.39***</td>
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<td>.49***</td>
<td>.39***</td>
<td>.41***</td>
<td>.43***</td>
<td>-.03</td>
<td>.28***</td>
</tr>
<tr>
<td>8. MCASS-W</td>
<td>.75***</td>
<td>.76***</td>
<td>.61***</td>
<td>.84***</td>
<td>.66***</td>
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<td>.41***</td>
<td>.71***</td>
<td>.71***</td>
<td>.75***</td>
<td>-.26***</td>
<td>.28***</td>
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</tbody>
</table>

Note. N = 389 (Study 2 Sample). MCASS Total = new Multidimensional Cognitive Attentional Syndrome Scale; MCASS-R = Rumination subscale of the MCASS; MCASS-SU = Substance Use subscale of the MCASS; MCASS-ETM = External Threat Monitoring subscale of the MCASS; MCASS-TS = Thought Suppression subscale of the MCASS; MCASS-BA = Behavioral Avoidance subscale of the MCASS; MCASS-ITM = Internal Threat Monitoring subscale of the MCASS; MCASS-W = Worry subscale of the MCASS; CAS-1 = Cognitive Attentional Syndrome-1; MCQ-T = Metacognitive Questionnaire (MCQ-30); MCQ-P = Positive Beliefs about Worry subscale of the MCQ-30; MCQ-N = Negative Beliefs about Uncontrollability and Danger of Worry subscale of the MCQ-30; MCQ-CC = Cognitive Confidence subscale of the MCQ-30; MCQ-NFC = Need for Control subscale of the MCQ-30; MCQ-CSC = Cognitive Self-Consciousness subscale of the MCQ-30; DASS-D = Depression subscale of the Depression, Anxiety, and Stress Scale (DASS-21); DASS-A = Anxiety subscale of the DASS-21; DASS-S = Stress subscale of the DASS-21; SDS = Social Desirability Scale-17; MLS = Music Listening Scale.
Figure S1. Confirmatory factor analysis of the one factor model.

Note: Coefficients are standardized.
Figure S2. Confirmatory factor analysis of the correlated seven factor model.

Note: Coefficients are standardized. rm = Rumination; su = substance use; ef = external threat monitoring; ts = thought suppression; ea = behavioral avoidance; if = internal threat monitoring; wy = worry.
Figure S3. Confirmatory factor analysis of the higher-order model.

Note: Coefficients are standardized. cas = higher-order general factor; rm = Rumination; su = substance use; ef = external threat monitoring; ts = thought suppression; ea = behavioral avoidance; if = internal threat monitoring; wy = worry.
Figure S4. Confirmatory factor analysis of the bifactor model.

Note: Coefficients are standardized. cas = higher-order general factor; rm = Rumination; su = substance use; ef = external threat monitoring; ts = thought suppression; ea = behavioral avoidance; if = internal threat monitoring; wy = worry.
Table S1

**Bifactor Evaluation Indices and Standardized Factor Loadings**

<table>
<thead>
<tr>
<th></th>
<th>General Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>( \omega/\omega_S )</td>
<td></td>
<td>.96</td>
<td>.91</td>
<td>.95</td>
<td>.81</td>
<td>.88</td>
<td>.86</td>
<td>.75</td>
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<tr>
<td>( \omega_{H}/\omega_{HS} )</td>
<td></td>
<td>.83</td>
<td>18</td>
<td>.55</td>
<td>.61</td>
<td>.76</td>
<td>.56</td>
<td>.45</td>
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<tr>
<td>ECV_{H}/ECV_{S}</td>
<td></td>
<td>.49</td>
<td>.21</td>
<td>.58</td>
<td>.74</td>
<td>.86</td>
<td>.66</td>
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<table>
<thead>
<tr>
<th>Item Number</th>
<th>I-ECV Factor Loadings</th>
<th>Factor Loadings</th>
</tr>
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<tbody>
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<td>1</td>
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<td>21</td>
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</tbody>
</table>

*Note. N = 389 (Study 2 Sample). Items are ordered to be consistent with Table 1. Factor 1 = Rumination; Factor 2 = substance use; Factor 3 = external threat monitoring; Factor 4 = thought suppression; Factor 5 = behavioral avoidance; Factor 6 = internal threat.*
monitoring; Factor 7 = worry; ω = omega; ω_S = omega subscale; ω_H = omega hierarchical; ω_HS = omega hierarchical subscale; ECV = explained common variance; H = Hancock and Mueller (2001) replicability indicator; FD = factor determinancy; all factor loadings were significant at p < .001, except for those identified by ^; ^ indicates p > .05.
Multidimensional Cognitive Attentional Syndrome Scale

Please read each statement and indicate how much you generally agree with it by choosing the appropriate option. Please respond to all of the items. There are no right or wrong answers.

1 = strongly disagree
2 = moderately disagree
3 = slightly disagree
4 = slightly agree
5 = moderately agree
6 = strongly agree

1. Often I'm playing back over in my mind how I acted in a past situation.
2. I spend a lot of time rethinking things that are over and done with.
3. I tend to "ruminate" or dwell over things that happen to me for a really long time afterward.
4. Alcohol or drugs help me cope with problems in my life.
5. I drink alcohol or take drugs to make myself feel better.
6. I drink alcohol or take drugs to relieve stress.
7. I stay alert or watchful at all times.
8. I keep track of entrances and exits when in public so that I can escape if necessary.
9. When I am in a public place, I position myself so that I can keep an eye on my surroundings.
10. When negative thoughts come up, I try to fill my head with something else.
11. When unpleasant memories come to me, I try to put them out of my mind.
12. When upsetting memories come up, I try to focus on other things.
13. If I am in a slightly uncomfortable situation, I try to leave right away.
14. I go out of my way to avoid uncomfortable situations.
15. I'm quick to leave any situation that makes me feel uneasy.
16. I pay attention to my thoughts and feelings more than other people.
17. I tend to pay attention to my emotions even when I don't want to.
18. It would be difficult for me to not pay attention to my emotions, even if I tried.
19. I constantly think about bad things happening.
20. I often worry about not being able to stop myself from worrying.
21. I often have thoughts that something bad is going to happen.

Calculating subscale scores (sum all items within each subscale):

Rumination: 1-3
Substance Use: 4-6
External Fixation: 7-9
Thought Suppression: 10-12
Behavioral Avoidance: 13-15
Internal Fixation: 16-18
Worry: 19-21