Emotion

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A Replication and Development of the Short Cognitive Mediation Beliefs Questionnaire (CMBQ-S)

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The Cognitive Mediation Beliefs Questionnaire is a 15-item tool that assesses individuals' emotion beliefs about the cognitive mediation of emotions. It measures two emotion beliefs: stimulus–response generation beliefs and cognitive mediation change beliefs. This study aimed to reduce the number of items and test the validity of a briefer version of the Cognitive Mediation Beliefs Questionnaire. We combined data from 13 unpublished data sets collected between 2019 and 2023 and reached a final sample of 2,872 participants. While this data set is relatively large and diverse (e.g., participants from 53 nationalities), most were from developed countries, and the data were not fully representative across demographic characteristics, such as age and ethnicity. The data were randomly split by 50%/25%/25% (60%/40% female/male) to conduct one exploratory factor analysis and two confirmatory factor analyses. Using an iterative process in the exploratory factor analysis, seven items were deleted for failing to meet item retention criteria, resulting in an eight-item solution across two factors. Across two confirmatory factor analyses with independent samples, the eight-item and the 15-item solutions were tested. The eight-item model was superior in terms of model fit in both samples. These results were in line with our hypothesis in that an eight-item Short Cognitive Mediation Beliefs Questionnaire confirmed the validity of the two-factor structure. The present study offers a valid and efficient measure of emotion beliefs that can be used to make a rapid assessment of beliefs about emotions and to support clinical interventions, particularly cognitive behavioral therapy approaches, where cognitive change is fundamental.

Keywords: emotion belief, cognitive behavioral therapy, validation, psychometrics, questionnaire

Emotion regulation concerns the ability to control when and how we experience and express our emotions, and effective emotion regulation is a critical aspect of well-being (Karnaze & Levine, 2020; Salovey et al., 2010; Sapolsky, 2007). Across several prominent theories of emotion (e.g., process model of emotion regulation, Gross, 2014; cognitive appraisal theory, Lazarus, 1999) and psychotherapy (cognitive therapy, Beck, 1993; rational emotive behavior therapy, Ellis, 1957), at the core of effective emotion regulation lies cognitive mediation, often referred to as cognitive appraisal. In brief, and in lay terms, in the face of an adverse event (i.e., stimulus), our thoughts about the event (i.e., cognition) largely determine our emotional reactions to it (i.e., response). As such, one of the ways in which we can regulate our emotional reactions to adverse events is to alter our appraisal of the event. This process has

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been coined as cognitive reappraisal, which involves modifying one's appraisal of a situation to alter its emotional impact (Gross, 2015), which plays a pivotal cognitive role in shaping emotional responses (McRae et al., 2010), and this paramount for individuals undergoing cognitive behavior therapy (CBT; e.g., rational emotive behavior therapy; Ellis & Dryden, 2007). Recent research has indicated the potential importance of what people believe about emotions and emotion regulation, known as emotion beliefs (Ford & Gross, 2018; Kisley et al., 2024) for emotional responding. Investigating emotion beliefs, particularly through the lens of cognitive mediation, is imperative for understanding individual differences in emotion regulation strategies because emotion beliefs have implications for both how emotions are generated and then how they can be modified.

The Cognitive Mediation Beliefs Questionnaire (CMBQ; M. J. Turner et al., 2021) was developed as a tool for assessing individuals' emotion beliefs about the cognitive mediation of emotions. In its original conceptualization, the CMBQ comprised four emotion beliefs (M. J. Turner et al., 2021):

1. Stimulus–response (S-R) generation beliefs (emotions are caused by events)
2. Stimulus–response (S-R) change beliefs (changes in the situation lead to emotion change)
3. Cognitive mediation (C-M) generation beliefs (emotions are cognitively mediated)
4. Cognitive mediation (C-M) change beliefs (changes in cognition lead to emotion change)

These four superordinate and dispositional emotion beliefs reflect ideas that are central to cognitive behavioral therapies such as rational emotive behavior therapy (M. Turner, 2022), whereby S-R beliefs reflect adversity–consequences thinking while C-M beliefs reflect beliefs–consequences thinking. To expand, S-R beliefs reflect the idea that emotion generation and change is determined by situational events *alone*, while C-M beliefs reflect the idea that emotion generation and change is determined by one's cognitions about situational events. But although four separate emotion beliefs were proposed by M. J. Turner et al. (2021), in validation studies only S-R generation beliefs and C-M change beliefs formed reliable factors in factor analyses; C-M generation beliefs and S-R change beliefs did not. Thus, the original CMBQ that is at the focus of the current article comprises two factors, namely S-R generation beliefs (e.g., "My emotions are caused entirely by the things that happen to me") and C-M change beliefs. (e.g., "I can change my emotions by changing how I think about the situation").

In the extant research, the CMBQ demonstrates robust psychometric properties (M. J. Turner et al., 2021, 2022, 2024). Greater S-R generation beliefs and lower C-M change beliefs correlate to lower positive mental health (M. J. Turner et al., 2024), greater (worse) affective and emotion reactivity outcomes (M. J. Turner et al., 2022), and a lesser tendency to use adaptive emotion regulation techniques (M. J. Turner et al., 2022; Young & Turner, 2023). The 15-items in the CMBQ are scored on a five-point Likert-scale (see https://osf.io/r872e). However, 15-items may not be parsimonious considering its assessment of just two subscales. Thus, the CMBQ could be shortened to make it more applicable in applied settings. Indeed, one of the chief purposes of the CMBQ was for it to be used in assessment for psychotherapy, so a shorter measure would render it more usable, particularly alongside other scales. Longer scales can increase respondent burden, and the likelihood of respondent fatigue, dropout, and decreasing response rates and data quality (Rolstad et al., 2011). Moreover, shorter scales are often more focused, capturing essential information while minimizing redundancy and irrelevant items. This can lead to clearer and more interpretable results, thus facilitating researchers' ability to draw meaningful conclusions from data (Tennant & Conaghan, 2007).

Therefore, a shorter version of the CMBQ would enhance its utility across diverse settings (Groves et al., 2004; Rolstad et al., 2011). Research evidence supports the efficacy of shorter scales like the CMBQ in various contexts. For example, studies have found that shorter versions of similar questionnaires demonstrate comparable reliability and validity to their longer counterparts (Groves et al., 2004). Additionally, longer scales may bias participants' cognitive and emotional responses (Tourangeau et al., 2000). In the case of the CMBQ, a concise version should yield reliable and valid results while minimizing respondent burden and maximizing response rates. A briefer version of the questionnaire would not only facilitate quicker administration but also reduce participant burden, making it more accessible for researchers, practitioners, and individuals undergoing training in CBT (Dryden et al., 2017). Such a tool would further enable efficient data collection in large-scale studies and clinical assessments, thereby enhancing the feasibility and practicality of incorporating cognitive mediation beliefs into research and practice.

In the current article, we present the validity testing of a briefer version of the CMBQ. Our goal was to significantly reduce the number of items to minimize participation time while preserving as much information as possible from the original scale, ultimately creating a short CMBQ (CMBQ-S) with robust psychometric properties. The refined scale will include only the most psychometrically optimal items to provide a user-friendly and efficient instrument for assessing cognitive mediation beliefs (Groves et al., 2004). We also wanted to ensure that multiple factor analyses were undertaken to ameliorate cohort effects and to add surety to the major changes that we were making to the CMBQ. Therefore, we undertook exploratory factor analysis (EFA) and two confirmatory factor analyses (CFA), each with separate data. We used EFA to identify items for removal from the CMBQ and to assess the underlying factor structure of the CMBQ (Cabrera-Nguyen, 2010; Costello & Osborne, 2005). We then used two CFAs to ensure that the factor structure that arrived via EFA held in separate samples, with the second CFA acting as a replication of the first one. It is important to use separate CFA samples from the EFA sample (e.g., Cabrera-Nguyen, 2010) to test the EFA-informed factor structure and associated psychometric properties (e.g., Costello & Osborne, 2005). Our approach was to "measure twice and cut once" because it is only necessary to shorten the CMBQ on one occasion and to avoid championing a model that has an artificially good model fit on the basis of a single data set (Knekta et al., 2019). It is hypothesized that the two-factor model structure (S-R generation and C-M change) proposed and validated in the original CMBQ would be replicated in the CMBQ-S.

Method

Participants

A total of 2,897 respondents completed the CMBQ (see Table 1 for demographic information). There were 54 missing data points (0.12%) from $n = 23$ participants, who were removed from the data set. Two participants recorded an age that was below what was acceptable in our ethical applications, so they were removed. Our final sample was $n = 2,872$, which was randomly split by 50%/25%/25% (60%/40% female/male) to conduct EFA and multiple CFAs. Guidelines for EFA indicate that a gold standard (excellent) sample size is one that is >1,000 (Comrey & Lee, 1973), with the general rule being that larger is better (Osborne & Costello, 2004). Thus, the sample for EFA was $n = 1,522$, yielding 562 males (36.92%), 903 females (59.33%), and 57 who did not disclose their sex (3.75%). Researchers suggest a CFA sample size of $n = 500$ to be very good (Williams et al., 2010), so for the two CFAs, the sample was $n = 675$ for each (i.e., two separate samples of 675 participants). For the first CFA, the sample comprised 239 males (35.41%), 406 females (60.15%), and 30 who did not disclose their sex (4.44%). For the second CFA, the sample comprised 254 males (37.63%), 401 females (59.41%), and 20 who did not disclose their sex (2.96%).

We pooled CMBQ data from 13 data sets (unpublished) collected between 2019 and 2023. These data sets were developed using a variety of methodologies owing to the research aims underpinning the separate studies for which data were collected. In total, 49.03% of these data were collected via Prolific.ac, the online research participant recruitment platform that has been successfully used in past research (e.g., Palan & Schitter, 2018), including articles pertaining to the validity of the CMBQ (M. J. Turner et al., 2021, 2022). To be clear, across 13 separate studies, we included the CMBQ as part of data collection, and as such, we were able to build as large a data set as possible from various sources. This approach has some advantages. First, it ensures that findings emanating from data analysis are less subject to cohort effects, and data represent a diversity of participants, not just workers and students as is the case in previous CMBQ studies (e.g., M. J. Turner et al., 2021, 2022, 2024). Second, because each of the 13 studies had its own methodological features, the larger data set captures a diversity in how the CMBQ was implemented and somewhat accounts for method effects (Lewis et al., 2015). Third, because the 13 studies were led by a range of different researchers, data were collected at different times; thus, the time-of-measurement effect is better accounted for (Waltz et al., 2019). However, there are, of course, some disadvantages to this approach to data collection. First, the separate data sets do not contain the same demographic information because recruitment methods varied as per the aims of the different studies, so there are gaps in these data. Second, when collating data from different sources, error can emerge in data transfer. For example, in some data sets, CMBQ items had been reordered for

Table 1
Means (and Standard Deviations) for C-M Change and S-R Generation Across Demographic Characteristics for the 15-Item and Eight-Item CMBQ(S) in the Full n = 2,897 Sample

	15-item CMBQ		Eight-item CMBQ	
	C-M change	S-R generation	C-M change	S-R generation
Demographic characteristic	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Age				
18–29	3.71 (0.64)	2.96 (0.79)	3.67 (0.72)	3.06 (0.86)
30–39	3.68 (0.62)	2.91 (0.76)	3.66 (0.71)	3.02 (0.85)
40–49	3.80 (0.61)	2.84 (0.84)	3.82 (0.70)	2.94 (0.92)
50+	3.73 (0.65)	2.89 (0.86)	3.76 (0.71)	3.01 (0.93)
Sex				
Female	3.77 (0.63)	2.94 (0.82)	3.74 (0.72)	3.05 (0.89)
Male	3.68 (0.63)	2.85 (0.80)	3.70 (0.70)	2.95 (0.88)
PNTS	3.75 (0.28)	2.17 (0.47)	3.84 (0.27)	2.25 (0.60)
Education				
Primary	4.08 (0.64)	3.77 (1.03)	4.02 (0.70)	3.86 (1.20)
Secondary	3.69 (0.65)	3.20 (0.86)	3.65 (0.74)	3.27 (0.89)
Further	3.72 (0.61)	2.96 (0.78)	3.72 (0.70)	3.08 (0.85)
Higher	3.74 (0.64)	2.88 (0.79)	3.73 (0.73)	3.00 (0.88)
Postgraduate	3.72 (0.64)	2.83 (0.82)	3.72 (0.71)	2.95 (0.90)
Ethnicity				
Asian	3.55 (0.66)	2.93 (0.70)	3.54 (0.78)	3.05 (0.75)
Black	3.67 (0.65)	2.72 (0.80)	3.72 (0.66)	2.84 (0.82)
Mixed	3.62 (0.60)	2.97 (0.74)	3.64 (0.75)	3.16 (0.75)
White	3.69 (0.61)	2.83 (0.76)	3.69 (0.69)	2.95 (0.84)
Other	3.70 (0.62)	3.29 (0.61)	3.67 (0.70)	3.40 (0.65)
Employment				
Part-time	3.84 (0.56)	3.17 (0.72)	3.85 (0.67)	3.23 (0.82)
Full-time	3.65 (0.65)	2.95 (0.76)	3.63 (0.73)	3.07 (0.85)
Student	3.82 (0.69)	2.93 (0.83)	3.82 (0.75)	3.01 (0.87)
Self-employed	3.92 (0.74)	2.87 (1.02)	3.94 (0.75)	2.94 (1.06)

Note. C-M = cognitive mediation; S-R = stimulus–response; CMBQ = Cognitive Mediation Beliefs Questionnaire; PNTS = prefer not to say.

ease of scoring. Therefore, extra attention and checking by different individuals were required from the current research team to ensure accuracy of data to enable a larger data set to be created.

We have complied with APA ethical standards in the treatment of the sample. Ethical approval was granted from the university ethics committees of all authors (University of Derby, Manchester Metropolitan University, Midwestern University) given the data collection strategy undertaken, and informed consent was gained from participants. Participants were provided with an information sheet before agreeing to take part, and after giving consent, participants could complete the CMBQ using their smartphones, tablets, laptops, or desktop computers.

Transparency and Openness

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study, and the study follows Journal Article Reporting Standards (Appelbaum et al., 2018). All data, analysis code (syntax), and research materials are available on the Open Science Framework at M. J. Turner (2024). Data were analyzed using SPSS Version 27 (EFA) and Jeffreys's Amazing Statistics Program (JASP Team, 2024; CFA). This study's design and its analysis were not preregistered.

Analytic Strategy

In line with study aims, we completed EFA followed by CFA. For EFA, Kaiser–Meyer–Olkin measure (KMO = .90) and Bartlett's test of sphericity, $\chi^2(105) = 10654.22$, $p < .001$, indicated the suitability of the data set for factor analysis. An EFA using maximum likelihood was carried out (Groarke & Hogan, 2018) using SPSS Version 27 (Table 2). In line with previous studies (e.g., Rauthmann, 2013), we did not have a predetermined expectation for the final number of items in the shortened scale. Based on the original CMBQ, we expected C-M and S-R beliefs to be negatively correlated, so we used oblique rotation using direct oblimin with Kaiser normalization. We used parallel analysis, the Kaiser criterion, visual inspection of the scree plot, and the proportion of variance, alongside theoretical considerations to inform factor retention (Cabrera-Nguyen, 2010). We were stringent on item retention to meet our objective of reducing the item number, so in determining which items to retain we used a .7/.3 rule whereby an item was retained if it had a primary loading above .70, secondary loading (cross-loading) of below .30, which is stricter than suggested in guidelines (Matsunaga, 2010), and a communality of over .40 (Worthington & Whittaker, 2006). In addition, we inspected interitem correlations that exceeded .60, and for correlated pairs of items, we removed the item that had greater interitem correlations with other items. Factor analysis and

Table 2
First EFA Iteration Including All 15-Item Numbers and Text, Factor Loadings, and Cross-Loadings

		Factor			
Item	Item text	1	2	Eigen values	% Variance explained
13	My emotions are caused entirely by the things that happen to me.	**.802**	.010	4.850	32.336
12	What happens to me entirely dictates how I feel.	**.759**	.028		
5	My emotions are completely dictated by what happens to me.	**.753**	.002		
10	My emotions are caused entirely by others' actions toward me.	**.737**	.004		
6	My feelings are completely controlled by the situation I am in.	**.730**	.027		
8	My feelings are entirely determined by peoples' actions toward me.	**.725**	−.018		
4	My emotions are entirely caused by what people do around me.	**.714**	.009		
1	How I feel is completely dictated by the things that happen to me in my life.	**.649**	−.053		
15	I can change my emotions by changing how I think about the situation.	−.097	**.762**	3.721	24.808
9	To change how I feel, I can change my thoughts about the situation.	−.129	**.759**		
7	Thinking differently about the situation will change how I feel.	−.003	**.722**		
11	Because I can choose to think differently, I can choose to feel differently about the situation.	−.135	**.681**		
3	To change how I feel, I need to change what I think about things around me.	.088	**.603**		
2	To control my emotions, I need to change the way I think.	.130	**.587**		
14	To change how I feel, my thoughts about the situation need to change.	.088	**.584**		

Note. Bold values indicate factor loadings. Total variance explained = 57.144%, model fit: $\chi^2 = 936.458$, $df = 76$, $p < .001$, Cronbach's $\alpha = .83$, McDonald's $\omega = .76$. EFA = exploratory factor analysis; *df* = degrees of freedom.

associated item deletion was conducted iteratively, removing items one at a time, and repeating the EFA (Costello & Osborne, 2005; Schönrock-Adema et al., 2009).

Following EFA, we used CFAs to test the two-factor solution (S-R generation and C-M change) that was arrived at in the EFA. We also report the results of the two CFAs with all 15 original CMBQ items as a point of comparison to the shortened CMBQ. Thus, in total we conducted four CFAs, two for each of the separate $n = 675$ samples. Data were subjected to CFA using Jeffreys's Amazing Statistics Program (JASP Team, 2024) in which a two-factor model was tested using a correlated-factor model. A number of descriptive fit indices were used to determine model fit (Schermelleh-Engel et al., 2003). These included root-mean-square error of approximation (RMSEA; <.06 considered acceptable; Brown, 2015), standardized root-mean-square residual (SRMR; <.08 considered acceptable, Hu & Bentler, 1999), comparative fit index (CFI: >.95; Hu & Bentler, 1999), normed fit index (NFI; >.90, Kaplan, 2000), goodness of fit index (GFI), Tucker–Lewis index (TLI; >.90, Hu & Bentler, 1999), and the expected cross-validation index (ECVI: lowest value indicates highest potential of replicability; Browne & Cudeck, 1992).

Results

EFA

In the EFA analysis, seven items were deleted iteratively for failing to meet item retention criteria, and eight items across two factors were extracted, accounting for 69.13% of the variance (Table 3). The EFA revealed two factors of S-R generation (four items; 13, 5, 12, 6) and C-M change (four items; 15, 9, 11, 7). Therefore, EFA analyses was consistent with the two-factor solution as captured in the original CMBQ.

CFA

Sample 1

The 15-item two-factor correlated model was a somewhat acceptable fit, $\chi^2 = 4968.909$, $df = 105$, $p < .001$, RMSEA = .09 (90% confidence interval, CI, [.078, .092]), SRMR = .06, CFI = .91, NFI = .90, TLI = .90, GFI = .98, ECVI = .92. Factor loadings were between .63 and .79 for S-R generation and between .61 and .76 for C-M change (Table 4). Cronbach's α was .91 for S-R generation and .87 for C-M change. McDonald's omega was .91 for S-R generation and .86 for C-M change.

The eight-item two-factor correlated model was an excellent fit, $\chi^2 = 2383.587$, $df = 28$, $p < .001$, RMSEA = .05 (90% CI [.028, .062]), SRMR = .03, CFI = .99, NFI = .98, TLI = .98, GFI = .99, ECVI = .14. Factor loadings were between .73 and .83 for S-R generation and between .75 and .78 for C-M change (Table 4). Cronbach's α was .87 for S-R generation and .85 for C-M change. McDonald's omega was .87 for S-R generation and .85 for C-M change.

Sample 2

The 15-item two-factor correlated model was a somewhat acceptable fit, $\chi^2 = 5480.876$, $df = 105$, $p < .001$, RMSEA = .09 (90% CI [.084, .098]), SRMR = .06, CFI = .91, NFI = .89, TLI = .89, GFI = .98, ECVI = 1.01. Factor loadings were between .72 and .84 for S-R generation and between .54 and .79 for C-M change (Table 4). Cronbach's α was .93 for S-R generation and .85 for C-M change. McDonald's omega was .93 for S-R generation and .84 for C-M change.

The eight-item two-factor correlated model was an excellent fit, $\chi^2 = 2571.740$, $df = 28$, $p < .001$, RMSEA = .05 (90% CI [.031, .065]), SRMR = .02, CFI = .99, NFI = .98, TLI = .98, GFI = .99, ECVI = .15. Factor loadings were between .76 and .85 for S-R generation and between .75 and .78 for C-M change (Table 4). Cronbach's α was .89 for S-R generation and .84 for C-M change. McDonald's omega was .89 for S-R generation and .84 for C-M change.

The eight-item model was superior in terms of model fit in both samples. See Figures 1 and 2 for graphical representations of the CMBQ-S factors structure and loadings for the two CFA samples.

Discussion

The chief aim of the present study was to reduce the numbers of items comprising the CMBQ, to yield a shorter version (the CMBQ-S) that demonstrates as robust structural validity as the original CMBQ. A secondary aim was to replicate the structural validation of the original CMBQ with new data. It was hypothesized that the two-factor model structure (S-R generation and C-M change) proposed and validated in the original 15-item CMBQ would be replicated in the new eight-item CMBQ-S, thus creating a shorter and equally valid

Table 3
EFA Outcomes for the Two-Factor Model, With Factor Loadings, Cross-Loadings, and Communalities

Items	Loading	Cross-loading	Communality	% Variance	Loading range	Loading mean	α(ω)	Eigen value	*M* (*SD*)
Factor 1: S-R generation				37.151	.74–.84	.70	.87 (.87)	2.972	3.01 (0.86)
13	.835	−.002	.698						
5	.782	−.019	.615						
12	.780	.010	.607						
6	.743	.009	.551						
Factor 2: C-M change				31.978	.69–.80	.70	.83 (.83)	2.558	3.70 (0.71)
15	.797	.000	.635						
9	.783	−.037	.618						
11	.718	−.040	.521						
7	.692	.068	.476						

Note. Total variance explained = 69.130%; $\chi^2 = 38.104$, $df = 13$, $p < .001$. EFA = exploratory factor analysis; S-R = stimulus–response; C-M = cognitive mediation; *df* = degrees of freedom.

Table 4

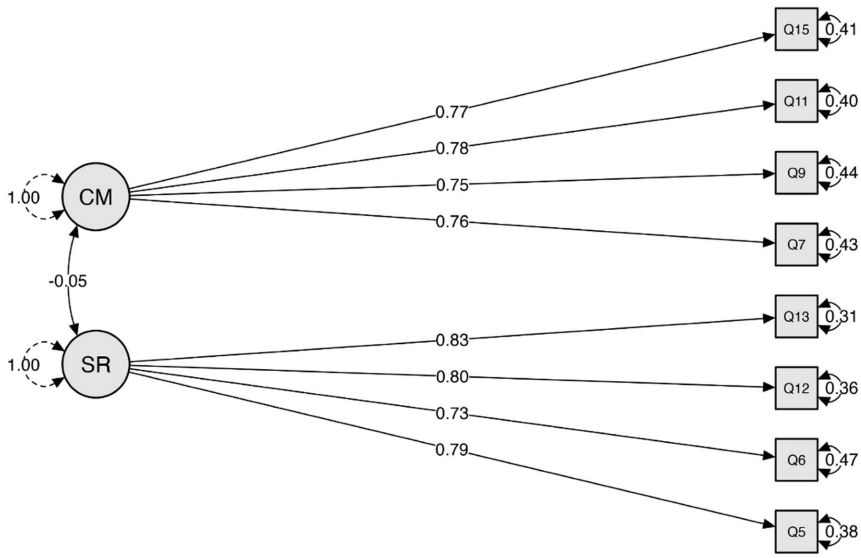
Factor Loadings, Means (and Standard Deviations), Skewness (Kurtosis) From CFA for the Eight-Item and 15-Item CMBQ for the Two Samples

		Sample 1				Sample 2			
Item number	Item	15-item factor loading	Eight-item factor loading	*M* (*SD*)	Skewness (kurtosis)	15-item factor loading	Eight-item factor loading	*M* (*SD*)	Skewness (kurtosis)
C-M change									
2	To control my emotions, I need to change the way I think.	.62		3.74 (0.91)	−.76 (.41)	.59		3.78 (0.84)	−.69 (.31)
3	To change how I feel, I need to change what I think about things around me.	.62		3.68 (0.89)	−.72 (.40)	.55		3.74 (0.87)	−.72 (.37)
7	Thinking differently about the situation will change how I feel.	.76	.76	3.79 (0.82)	−.74 (.73)	.79	.78	3.81 (0.82)	−.79 (.72)
9	To change how I feel, I can change my thoughts about the situation.	.75	.75	3.65 (0.88)	−.67 (.26)	.75	.75	3.74 (0.82)	−.65 (.44)
11	Because I can choose to think differently, I can choose to feel differently about the situation.	.74	.78	3.65 (1.00)	−.69 (.09)	.71	.75	3.68 (0.89)	−.67 (.09)
14	To change how I feel, my thoughts about the situation need to change.	.61		3.71 (0.89)	−.77 (.49)	.54		3.82 (0.83)	−.78 (.72)
15	I can change my emotions by changing how I think about the situation.	.73	.77	3.72 (0.88)	−.83 (.62)	.73	.75	3.79 (0.81)	−.73 (.66)
S-R generation									
1	How I feel is completely dictated by the things that happen to me in my life.	.63		3.24 (1.04)	−.28 (−.75)	.72		3.26 (1.08)	−.28 (−.76)
4	My emotions are entirely caused by what people do around me.	.71		2.59 (1.00)	.38 (−.60)	.78		2.68 (1.05)	.44 (−.57)
5	My emotions are completely dictated by what happens to me.	.77	.79	2.99 (1.04)	−.02 (.90)	.78	.80	3.03 (1.08)	−.08 (−.92)
6	My feelings are completely controlled by the situation I am in.	.74	.73	3.03 (1.05)	−.10 (−.84)	.75	.76	3.05 (1.05)	−.10 (−.84)
8	My feelings are entirely determined by peoples' actions toward me.	.76		2.68 (1.01)	.33 (−.64)	.77		2.78 (1.08)	.30 (−.75)
10	My emotions are caused entirely by others' actions toward me.	.73		2.54 (1.01)	.47 (−.44)	.79		2.69 (1.07)	.30 (−.74)
12	What happens to me entirely dictates how I feel.	.77	.80	3.02 (1.05)	−.11 (−.96)	.82	.85	3.06 (1.08)	−.10 (−.77)
13	My emotions are caused entirely by the things that happen to me.	.79	.83	2.99 (1.04)	−.01 (−.82)	.84	.84	2.98 (1.09)	−.01(−.97)

Note. All factor loadings were $p < .001$. CFA = confirmatory factor analyses; CMBQ = Cognitive Mediation Beliefs Questionnaire; C-M = cognitive mediation; S-R = stimulus–response.

Figure 1

Diagrammatic Representation of Factor Structure and Loadings for the CFA Conducted With Sample 1



Note. CFA = confirmatory factor analyses. CM = cognitive mediation; SR = stimulus–response; Q = question.

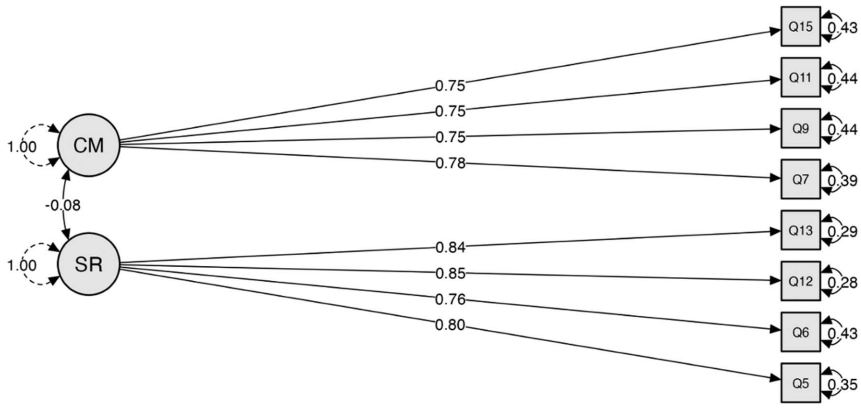
CMBQ for use in research and practice. The development of a short CMBQ is not a superficial or inconsequential endeavor; therefore, we wanted to ensure that item reduction was performed with a sufficient sample size. Using a large and diversely developed data set, we randomly split data to form three independent samples and completed three main analyses, namely, EFA and two CFAs. The purpose of the EFA was to reduce the items of the CMBQ and to assess the emergent factor structure. The purpose of the CFAs was to confirm the factor structure with the items that remained from the item reduction process.

The results were in line with our hypothesis in that an eight-item CMBQ-S confirmed the validity of the two-factor structure (S-R generation and C-M change) of the full CMBQ that was validated in previous research (M. J. Turner et al., 2021, 2022, 2024). Indeed, we arrived at a short CMBQ that appears to be more structurally valid than the 15-item original, as evidenced by stronger fit indices across the two CFAs. The apparent validity of the CMBQ-S is bolstered by the use of large data sets and repeated factor analyses that confirm the factor structure and item composition.

The development of the CMBQ-S has several advantages over and above the original CMBQ. First, the stronger fit indices for the CMBQ-S, compared to the original CMBQ, indicate that the eight items of the CMBQ-S offer a more accurate assessment of S-R

Figure 2

Diagrammatic Representation of Factor Structure and Loadings for the CFA Conducted With Sample 2



Note. CFA = confirmatory factor analyses. CM = cognitive mediation; SR = stimulus–response; Q = question.

generation and C-M change. At the very least, the CMBQ-S is no less valid than the original CMBQ. Second, because the CMBQ-S is shorter, it is quicker to complete for respondents; thus, it is less burdensome. The validated brief version of the CMBQ can support clinical interventions, particularly in CBT approaches where cognitive change is fundamental (Dryden & Neenan, 2004; Young & Turner, 2023). A brief scale can enable therapists to quickly focus on areas of concern and tailor interventions accordingly. Being able to reliably measure individuals' cognitive mediation and stimulus–response beliefs, clinicians can better target maladaptive beliefs and promote cognitive restructuring (Dryden et al., 2017), helping to address emotional dysfunction and psychopathology by targeting mistaken emotion beliefs (Linehan, 2015).

If the therapeutic approach taken by the therapist involves continued monitoring of patient progress pertaining to target cognitions (such as emotion beliefs), then a briefer assessment can be used more readily as a repeated marker of S-R generation and C-M change without being too burdensome. Thus, it is a more attractive psychometric measure in practice, where patient or client assessment can be extensive, and in research where participant burden can influence engagement. Third, when used in research projects, a shorter scale may cost less if researchers are incentivizing or reimbursing participants for their time in completing a study. Thus, the CMBQ-S is more cost-effective than the original CMBQ.

Constraints on Generality

While the data set used for this study was large (relative to what is required for factor analysis) and diverse, it was not fully representative across demographic characteristics, such as age, ethnicity, and nationality. Thus, while the large sample size and the diversity of recruitment procedures adopted for data collection are a strength of the present study, findings cannot be accurately generalized to all ethnicities or cross-culturally. Future research should aim to collect more comprehensive demographic data to establish norms for various populations and to enhance the generalizability of findings. The authors of the current article hope that this endeavor is made more practically possible for researchers by the shortening of the CMBQ from 15 items to eight items.

One way that researchers could address the gap in our cross-cultural understanding of the CMBQ is to translate the CMBQ-S into various languages and test the validity of these translated versions. This will enable the inclusion of non-English speaking populations in research and clinical practice, which is particularly important with increasing globalization and migration, where diverse linguistic groups are present in many countries. Research instruments must be accessible to these groups to ensure that findings are representative and applicable to the broader population (Boynton et al., 2004). Furthermore, validated translations of the CMBQ-S will allow for international research collaborations and comparisons. This will enable researchers to aggregate data from multiple countries and cultures, enhancing the generalizability of findings and contributing to a more comprehensive understanding of S-R generation and C-M change beliefs across different cultural contexts (Efstathiou, 2019). In clinical practice, having a validated, translated version of the CMBQ-S ensures that practitioners can assess S-R generation and C-M change beliefs accurately among their diverse patient groups. This is vital for tailoring therapeutic interventions to be culturally effective (Bernal & Sáez-Santiago, 2006). Moreover, it helps in identifying specific cultural factors that may influence cognitive mediation, thereby improving the overall quality of mental health care (Griner & Smith, 2006).

Future Research

While the present study offers the CMBQ-S as a valid assessment of S-R generation and C-M change emotion beliefs, it does not indicate the extent to which scores on these constructs when measured briefly are indicative of adaptive emotion regulation tendencies. Nor do we know whether scores on the CMBQ-S relate to or predict emotion reactivity and mental health outcomes. Thus, replicating some extant research (e.g., M. J. Turner et al., 2022), the CMBQ-S needs to be evaluated in relation to constructs such as emotion regulation, emotional reactivity, and mental health. To expand, M. J. Turner et al. (2022) demonstrated that greater C-M change beliefs, and lower S-R generation beliefs, were related to more adaptive, and less maladaptive, emotion regulation tendencies (such as cognitive reappraisal), and better affective and emotion reactivity outcomes. In addition, S-R generation and C-M change beliefs reflect only two emotion beliefs, but other emotion beliefs have been conceptualized and validated, namely, goodness and controllability emotion beliefs (Ford & Gross, 2018). So, future research should also explore the relationships between S-R generation and C-M change beliefs and goodness and controllability beliefs to ascertain conceptual overlap and distinction. Research could also explore potentially complimentary constructs to emotion beliefs, such as emotional intelligence, perhaps using the Trait Emotional Intelligence Questionnaire to assess individuals' beliefs about their ability to recognize, understand, and manage emotions (Petrides & Furnham, 2003). It is perhaps possible to arrive at a set of psychometrics that assesses the important superordinate beliefs that predict emotion regulation tendencies, attempts, and effectiveness.

Conclusion

The current article successfully validated a shorter version of the CMBQ while retaining the robust structural validity of the original 15-item CMBQ. The findings confirmed that the eight-item CMBQ-S accurately captures the two-factor structure of S-R generation and C-M change beliefs, providing a more practical tool for both research and clinical practice. The CMBQ-S demonstrated superior fit indices, indicating its enhanced accuracy and reliability. Its brevity offers practical advantages, reducing respondent burden and increasing feasibility for repeated assessments, which is particularly beneficial in both therapeutic settings and large-scale research studies. Future research should aim to further validate the CMBQ-S across diverse demographic groups and explore its predictive utility regarding emotion regulation, emotional reactivity, and mental health outcomes. Additionally, translating and validating the CMBQ-S across various languages will enhance its global applicability and support cross-cultural research and practice.

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