Mindfulness

Confirmation and Validation of the Equanimity Scale-16 (ES-16)

--Manuscript Draft--

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Abstract:	Objectives Equanimity is an accepting and non-reactive mental state that has gained increased recognition as a key mechanism of mindfulness-based interventions (MBIs). The recently developed Equanimity Scale-16 (ES-16) provides a measure of equanimity that can be used to assess such interventions, however, to date evidence of its factor structure and temporal stability are lacking. The present study aimed to provide the first confirmatory factor analysis of the ES-16, and to further examine the validity and test-retest reliability of the measure. Methods The Qualtrics online platform was used to administer the ES-16 and other questionnaires in order to assess validity and collected demographic information in 395 adults from the general community (76.2% females and 23.8% males). Questionnaires were then re-administered four weeks later to assess test-retest reliability. Results Confirmatory factor analysis indicated that one- or two-factor (i.e., Experiential Acceptance, Non-reactivity) models provided adequate model fit with the addition of covariances between semantically similar items. However, adequate model fit was also obtained with a bi-factor model, suggesting that there is an underlying unidimensionality as all items tap into the latent equanimity construct. The ES-16 showed good internal consistency ($\omega = .90$); test-retest reliability ($n = 161$; $r = .81$, $p < .001$) over four weeks; and convergent validity, illustrated by significant correlations in the expected directions with the Two-Factor Equanimity Scale (EQUA-S), Depression Anxiety Stress Scales, and Difficulties in Emotion Regulation Scale-Short Form. Conclusion The present results support previous research showing that the ES-16 is a valid and reliable self-report measure to assess overall trait equanimity. Given the central role of equanimity in MBIs, the ES-16 may also assist in further understanding mechanisms of change in MBIs.

Response to Reviewers:	All the remaining mandatory editorial requirements have been attended to and the final corrected manuscript abstract and supplementary figures have been uploaded including the title page. Best wishes Alice Shires

Confirmation and Validation of the Equanimity Scale-16 (ES-16)

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Abstract

Objectives

Equanimity is an accepting and non-reactive mental state that has gained increased recognition as a key mechanism of mindfulness-based interventions (MBIs). The recently developed Equanimity Scale-16 (ES-16) provides a measure of equanimity that can be used to assess such interventions, however, to date evidence of its factor structure and temporal stability are lacking. The present study aimed to provide the first confirmatory factor analysis of the ES-16, and to further examine the validity and test-retest reliability of the measure.

Methods

The Qualtrics online platform was used to administer the ES-16 and other questionnaires in order to assess validity and collected demographic information in 395 adults from the general community (76.2% females and 23.8% males). Questionnaires were then re-administered four weeks later to assess test-retest reliability.

Results

Confirmatory factor analysis indicated that one- or two-factor (i.e., Experiential Acceptance, Non-reactivity) models provided adequate model fit with the addition of covariances between semantically similar items. However, adequate model fit was also obtained with a bi-factor model, suggesting that there is an underlying unidimensionality as all items tap into the latent equanimity construct. The ES-16 showed good internal consistency ($\omega = .90$); test-retest reliability ($n = 161$; $r = .81$, $p < .001$) over four weeks; and convergent validity, illustrated by significant correlations in the expected directions with the Two-Factor Equanimity Scale (EQUA-S), Depression Anxiety Stress Scales, and Difficulties in Emotion Regulation Scale-Short Form.

Conclusion

The present results support previous research showing that the ES-16 is a valid and reliable self-report measure to assess overall trait equanimity. Given the central role of equanimity in MBIs, the ES-16 may also assist in further understanding mechanisms of change in MBIs.

Mindfulness has been characterized in a range of ways, including "close, clear-minded attention to, or awareness of, what is perceived in the present" (Quaglia et al., 2015, p. 4), and "the quality of mind that notices what is present without judgement, without interference" (Goldstein, 2002, p. 89). However, mindfulness has most commonly been defined as "paying attention in a particular way: on purpose in the present moment, and non-judgmentally" (Kabat-Zinn, 1994, p. 4). Although the definition of mindfulness remains debatable, mindfulness practices have been conceptualized as a psychological skillset, involving attention to experiences perceived in the environment, physical body and mind with a non-judgmental and non-reactive attitude (Cayoun & Shires, 2020). Research suggests that mindfulness skills can be learned and practiced with the aim of reducing psychological distress and increasing well-being (Hofmann et al., 2010).

There is evidence that Mindfulness-Based Interventions (MBIs) may reduce symptoms across a variety of disorders including anxiety and depression (Goldberg et al., 2019), and pain (Chiesa & Serretti, 2011), and there have been increasing interest in the mechanisms of change in MBIs (Cayoun & Shires, 2020; Chiesa et al. 2014; Gu et al., 2015; Hölzel et al., 2011). This is especially since several MBIs specify and emphasize different practices. For instance, Mindfulness-integrated Cognitive Behavior Therapy integrates mindfulness meditation practice in the Burmese *vipassana* tradition with principles of cognitive behavior therapy for transdiagnostic applications (Cayoun, 2011); Mindfulness-Based Stress Reduction, initially developed to manage pain and reduced stress, is predominately based on mindfulness meditation and hatha yoga, (Kabat-Zinn, 1990); Mindfulness-Based Cognitive Therapy places emphasis on the content of thoughts and integrates aspects of cognitive therapy for depression (Segal et al., 2004; Beck et al., 1979); Mindfulness-Based Symptom Management emphasizes traditional ethics in mindfulness meditation (Monteiro & Musten, 2013); and there are mindfulness-based programs for disordered eating (e.g., Godsey, 2013),

some designed for children with disruptive behaviors (e.g., Singh et al., 2013), and many more.

As summarized in the Buddhist Psychological Model (BPM; Grabovac et al., 2011), the well-documented process of information processing in Buddhist psychology, known as *dependent origination* (see *paticca samuppada vibhanga sutta* in Saṃyutta Nikāya 12.2; Bodhi, 2000) theorizes that awareness of an object takes place either when a stimulus enters one's perceptual field and contacts a sense organ, or when an object of cognition (i.e., thoughts, emotions, memories) occurs in one's mind. With this awareness, there is an accompanied feeling tone; either pleasant, unpleasant, or neutral. Habitual responses to sensations are to crave pleasant and to avoid unpleasant feeling tones (attachment and aversion). The model states that "attachment and aversion arise in reaction to the feeling state itself rather than to the object" (Grabovac et al., 2011, p. 155). Unless one is mindful and adopts an equanimous attitude toward the experience, these responses catalyze a downward cascade of thoughts and emotions, otherwise known as *mental proliferation*, which leads to suffering (Grabovac et al., 2011). Whilst unpleasant experiences are inherent in life, the model proposes that the way one relates to experiences, either through craving, attachment or aversion, increases suffering (Grabovac et al., 2011; Teasdale & Chaskalson, 2011). As such, equanimity is traditionally understood as being an important skill in the practice of mindfulness and its reducing effects on suffering.

Equanimity has become increasingly recognized as a fundamental component in mindfulness (Eberth et al., 2019). The term equanimity has been described in the Buddhist literature as "a balanced reaction to joy and misery, which protects one from emotional agitation" (Bodhi, 2005, p.154). In Western psychology equanimity has been defined as "an even-minded mental state or dispositional tendency toward all experiences or objects, regardless of their affective valence (pleasant, unpleasant, or neutral) or source" (Desbordes

et al., 2015, p.357). For the purposes of the development of an equanimity scale, we use the latter definition, as it relates to the use of mindfulness-based interventions.

Behaviorally, equanimity has been suggested to be the fundamental mechanism of change in mindfulness-based practice, since without it, stillness and non-self-referential processing of experience would be undermined by learned reactivity (Cayoun & Shires, 2020). While mindfulness-based practices foster the development of equanimity, the development of mindfulness matures as a function of the cultivation of equanimity (Analayo, 2022; Rogers et al., 2021). In this way, equanimity is the non-reactive attitude that inhibits desire and avoidance (traditionally termed *craving* and *aversion*) when one is faced with an internal or external trigger (Cayoun, 2011; Cayoun & Shires, 2020; Rogers et al., 2021). The non-reactive attitude that defines equanimity encourages even-minded and thus more objective perceptions of experiences (Desbordes et al., 2015).

The Decoupling Model of Equanimity (Hadash et al., 2016) posits that equanimity is the decoupling of desire (i.e., wanting and not wanting) from the hedonic tone of current or anticipated experiences (i.e., the pleasantness or unpleasantness of an experience). Anālayo (2021) also refers to equanimity as a key aspect of mindfulness training as being the breaking or *decoupling* of link between hedonic tone and craving. Thus, equanimity is manifested through "an intentional attitude of acceptance toward experience regardless of hedonic tone and reduced automatic reactivity to the hedonic tone of experience" (Hadash et al., 2016, p.2). In an equanimous state, an individual's desire is based on their values, long-term goals, and prosocial purposes rather than the hedonic tone of an experience (Shoham et al., 2018). While in a state of equanimity, there is a readiness to endure and engage with a variety of experiences without narrowing one's attention to their pleasant or unpleasant hedonic tone (Shoham et al., 2018). This model of equanimity is in line with the BPM's conceptualization of increased suffering from craving and aversion (Grabovac et al., 2011).

Mindfulness-based practices foster the progressive development of equanimity, which enables the cultivation of a new perspective on one's emotions and in turn allows for better emotion regulation (Juneau et al., 2020). Emotion regulation refers to "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998, p. 275). Equanimity has been proposed to be a crucial part of emotion regulation through its ability to limit the automatic response of one's initial evaluative reactions (Farb et al., 2012). It has been posited to work by decreasing one's automatic fusion with their experiences whilst simultaneously increasing one's decentering abilities – the process of stepping outside of one's own mind to an objective and non-judgmental stance towards the self (Grabovac et al. 2011; Juneau et al., 2020). This results in a decoupling between appraisal of emotional stimuli and the subsequent affective response to it, thus altering the intensity, strength, and duration of emotional states (Juneau et al., 2020). There is evidence that mindfulness practices used in an eight-week MBI improved emotion regulation in clinical and non-clinical anxious populations (Goldin & Gross, 2010).

Equanimity as an individual mechanism has not been heavily researched thus far within the scope of mindfulness in Western psychology (Desbordes et al., 2015). Existing measures of equanimity have primarily defined equanimity in the context of resilience through effective stress-management strategies, making it difficult to undertake empirical studies in this area (Desbordes et al., 2014). This gap has made it difficult to link outcomes of MBIs with the theoretical underpinnings of equanimity (Juneau et al., 2020). Defining equanimity as this central mechanism of change in MBIs may contribute to our understanding of how MBIs create change (Cayoun & Shires, 2020).

Moreover, existing measures of equanimity lack a theoretical framework and are based on differing definitions of equanimity (Desbordes et al., 2014; Juneau et al., 2020). Weber (2020) argues that using descriptors such as "non-judgement" and "acceptance" to define

mindfulness acts as a distorted description of a concept that may be more accurately operationalized as equanimity. Recognizing equanimity as an individual mental state and skill may help to disentangle the mechanisms involved in mindfulness practices including decentering, non-judgement, and non-reactivity, which will both improve the understanding of how a state of mindfulness develops and provide knowledge on the most crucial mechanisms in MBIs (Juneau et al., 2020). Mindfulness skills are proposed to develop as a function of equanimity (Rogers et al 2021) such that, "the cultivation of mindfulness and equanimity could be visualized as involving a dynamic interrelationship, where each of these two constructs supports and enhances the other." (Analayo, 2021, p. 2636).

Recently, Juneau et al. (2020) also developed a dedicated scale of equanimity, the Two-Factor Equanimity Scale (EQUA-S). The scale consists of two dimensions of equanimity, even-minded state of mind (E-MSM) and a hedonic independence (HI) (Juneau et al., 2020). In this context, E-MSM refers to an individual's ability to stay calm despite the emotional evaluation of the event or stimuli (Juneau et al., 2020). HI refers to absence of reactions related to the hedonic tone triggered by an event or stimulus (Juneau et al., 2020). Since development, the EQUA-S has been used in a correlational study (Juneau et al., 2021), but it has not undergone further validation.

The current paper focuses on the Equanimity-Scale-16 (ES-16; Rogers et al., 2021), a self-report measure of equanimity, comprised of 16 items extracted from 20 pre-existing measures that are theoretically aligned with equanimity. On the basis of exploratory factor analysis alone, Rogers et al. (2021) reported the ES-16 to include two factors, Experiential Acceptance (EA) and Non-reactivity (NR). EA refers to acceptance of all internal experiences (negative thoughts, feelings, and sensations) may be understood as the opposite of experiential avoidance, which has been linked with poor well-being outcomes (Hayes et al., 1996; Rogers et al., 2021). NR was described as one's ability to inhibit a previously

learned response to these experiences (Rogers et al., 2021). The two factors are connected, as increased acceptance has been demonstrated to reduce reactivity (Lindsay & Creswell, 2017; Lindsay et al., 2018; Rogers et al., 2021).

Further validation of the factor structure of the ES-16 is necessary to confirm the underlying two factors. This is especially needed given that the sample in the initial study of the ES-16 (Rogers et al., 2021) was limited to 223 adults, which is small by some standards (Nunnally, 1978). In addition, as all items on the EA are positively worded and all NR items are negatively worded, there is the possibility that the emergence of two factors in the prior exploratory factor analysis by Rogers et al. (2021) is a statistical artefact of the difference in which people interpret and respond to items of positive or negative valence (e.g., van Sonderen et al., 2013). Such a finding has been displayed in analyses on the UCLA-Loneliness Scale, which includes 10 positively worded items and 10 negatively worded items (Russell, 1996). Specifically, despite the proposed unidimensional structure of the loneliness construct, two factors reflecting the positively- and negatively-worded items emerge, with a one-factor model obtaining adequate fit when a number of items are removed (Russell, 1996; see also Elphinstone, 2018). However, due to the underlying intent of all items to assess loneliness, a bi-factor model in which all items load on a general loneliness factor and also respective specific positive- or negative-worded item factors provides adequate model fit (Russell, 1996). On the basis of a similar rationale, it was decided to assess one-, two-, and bi-factor models of the ES-16. The assessment of one- and bi-factor models is further justified by the intent to use a singular overall score (i.e., with higher scores reflecting higher levels of equanimity), to thus establish the essential unidimensionality of the measure (see Skogan et al., 2019 for an example).

In addition to further investigating the structure of the ES-16, the current study also examined the temporal stability of the measure, as the previous investigation of this was limited as the

time gap between assessments to examine test-retest reliability varied from two to six weeks (Rogers et al., 2021). Finally, the ES-16 would benefit from further validation through administration with other theoretically related constructs such as emotion regulation, as suggested by (Rogers et al., 2021). The principal aim of the present study was to determine whether the validity and correlated two-factor structure of the ES-16 can be confirmed in a sample form the general population before it can be used for accurate interpretation in future MBIs. We first hypothesized, in accordance with the results of Rogers et al. (2021), that the underlying two-factor structure of the ES-16 will be confirmed as comprising Experiential Acceptance and Non-reactivity dimensions. We also hypothesized that the ES-16 would have good internal consistency, construct validity and test-retest reliability over a four-week period. Regarding convergent validity, it was hypothesized that the ES-16 would show a significant positive correlation with the EQUA-S and significant negative correlations with the Depression Anxiety Stress Scales-21 (DASS-21) and the Difficulties in Emotion Regulation Scale (DERS) as mindfulness and MBIs are linked with decreased psychological suffering (Baer, 2003; Hofmann et al, 2010; Rogers et al., 2021). We also sought to investigate relationships between the ES-16 and demographic variables of gender and age. Previous research on nonattachment (Sahdra et al., 2010), which is conceptually similar to equanimity (Desbordes et al., 2015), has indicated that there are no gender differences in nonattachment, but that nonattachment appears to increase with age. We expect similar findings with the ES-16.

Method

Participants

The sample consisted of 395 adults from the general population. Participants were recruited from advertising on social media and through peer referral. Participant demographics are presented in Table 1. Participants had a wide range of ages, were generally

engaged in full-time work, the majority were married or in de-facto relationships and indicated a postgraduate level education, most identified as White, and females were the majority. From the initial sample, 159 participants also completed the ES-16 a second time to assess test-retest reliability.

INSERT TABLE 1 ABOUT HERE

Table 1

Participant demographic information

Characteristic	*n*	*%*
Age (years)		
18-25	66	16.7
26-40	61	15.4
41-60	151	38.2
60+	117	29.6
Gender		
Female	301	76.2
Male	94	23.8
Employment		
Part time	64	16.2
Casual	37	9.4
Full time	114	28.9
Student	46	11.6
Self-employed	71	18
Unemployed	63	15.9
Relationship status		
Single	76	19.2
In a relationship	85	21.5
Married/De-facto	200	50.6
Separated/divorced	29	7.3
Widowed	5	1.3
Education		
High school	23	5.8
Trade/apprenticeship	4	1
Diploma	32	8.1
Undergraduate degree	119	30.1
Postgraduate degree	217	54.9
Ethnicity		
Asian	26	6.6
White	328	83
Hispanic	5	1.3
South Asian	10	2.5
Other	26	6.6

Measures

Demographics. The demographics questionnaire collected information about age, gender, work status, relationship status, education, and ethnicity (see Table 1).

Equanimity. The Equanimity Scale-16 (ES-16; Rogers et al., 2021) is a 16-item self-report questionnaire measuring equanimity. Items are rated on a 5-point Likert scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Scores range from 16 to 80, with higher scores representing higher levels of equanimity. The ES-16 has been shown to have good internal consistency (α = .88), good test-retest reliability (r = .87, p < .001) and good convergent validity (Rogers et al., 2021).

The Two-Factor Equanimity Scale (EQUA-S; Juneau et al., 2020) is a 14-item self-report questionnaire measuring equanimity. Items are rated on a 5-point Likert scale from 1 (*Never or very rarely true*) to 5 (*Very often or always true*). Scores range from 14 to 70, with higher scores representing higher levels of equanimity. The EQUA-S was shown to have satisfactory internal consistency (α = .81 and .74) by Juneau et al. (2020).

Negative Affect and Emotional Reactivity. The DASS-21 (Lovibond & Lovibond, 1995) is a 21-item self-report tool that measures three subscales of depression, anxiety, and stress symptoms over a two-week period. Items are rated on a 4-point Likert scale ranging from 0 (*Not at all*) to 3 (*Very much or most of the time*). Each of the three subscales have a possible score between 0 to 21, with higher scores indicating higher distress in respective categories. The subscales of the DASS-21 have shown good to excellent internal consistency (α = .87 to .94) and concurrent validity in clinical and non-clinical samples (Antony et al., 1998).

Emotion Regulation. The Difficulties in Emotion Regulation Scale-Short Form (DERS-SF; Kaufman et al., 2016) is an 18-item self-report measure that is used to identify

and measure emotional regulation issues. The measure consists of six subscales: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Items are rates on a 5-point Likert scale ranging from 0-10% (*Almost Never*) to 91-100% (*Almost Always*), with higher scores representing increased difficulties in emotion regulation. The DERS-SF has demonstrated strong internal consistency (α = .93) and good concurrent validity (Skutch et al., 2019).

Procedure

Participants accessed the survey online, hosted on the Qualtrics platform, and were required to read the participant information sheet and indicate whether they were over 18 years old before agreeing to participate. Informed consent was obtained from all participants. The demographics questionnaire, ES-16, EQUA-S, DASS-21, and DERS-SF were then administered. Participants also had the option of leaving their email address to be contacted for the second administration of the survey to collect test-retest reliability data, which took place four weeks later.

Data Analysis

Analyses were completed in R with Lavaan (Rosseel, 2012). The underlying factor structure of the ES-16 was analyzed using confirmatory factor analysis (CFA) using the Weighted Least Squares with Mean and Variance adjusted (WLSMV) estimator. The ES-16 includes five response options (i.e., 1 = *Strongly Disagree*, 5 = *Strongly Agree*), which may arguably be best treated as ordinal rather than continuous data (Shi & Maydeu-Olivares, 2019). Inappropriately considering ordinal data to be continuous, which leads to using estimation methods such as Maximum Likelihood, may lead to poorer model fit than is actually the case. This may subsequently lead to the unnecessary rejection or modification of models (Li, 2016; Sellbom & Tellegen, 2019).

The overall fit of each model was assessed using the absolute and incremental fit indices (i.e., the comparative fit [CFI] and Tucker-Lewis indices [TLI]), and the root mean square error of approximation (RMSEA) residual-based index, and the standardized root mean squared residual (SRMR) (Berle et al., 2018; Hu & Bentler, 2009). In line with established criteria, values of at least 0.95 for CFI and TLI, values below 0.06 for RMSEA, and below .08 for SRMR were considered acceptable (Hu & Bentler, 2009). However, as WLSMV estimation can lead to inflated values for CFI and TLI, and reduced RMSEA values, in comparison to Maximum Likelihood estimation (Xia & Yang, 2019), SRMR which is robust to estimation methods (Shi & Maydeu-Olivares, 2019) was prioritized.

Internal consistency was measured using model-based coefficient omega in accordance with the recommendations of Flora (2020). Pearson's correlation coefficients were used to explore convergent validity. Participant responses between time points were matched and Pearson's correlation coefficients was used to assess test-retest reliability.

Results

Confirmatory factor analysis

CFA was conducted on one-, two-, and bi-factor models (see Table 2; all models are shown in the online supplementary materials and standardized factor loadings in Table 3). The initial results for the one-factor model indicated poor model fit. However, a revised model, inclusive of the addition of three covariances between NR items was close to attaining adequate fit. The largest modification index (MI = 115.807) recommended the addition of a covariance between two items; "When I feel physical discomfort, I can't relax because I am never sure it will pass" and "If I notice an unpleasant body sensation, I tend to worry about it". As these were the only two items referring to bodily sensations, allowing the items to covary was deemed appropriate. Two further modification indices suggested that model fit

would be improved with the addition of covariances between two items pertaining to how one reacts to others ("I am impatient and can't stop my reactivity when faced with other people's emotions and actions"; "I am not able to prevent my reaction when someone is unpleasant"; MI = 41.835), and another two items asking about immediate reactivity ("When I notice my feelings, I have to act on them immediately"; "I notice that I react to whatever pops into my head"; MI = 37.872).

Table 2

CFA results for each model shown to three decimal places

	χ^2	CFI	TLI	SRMR	RMSEA (90% Confidence Interval)
Initial one-factor	(104) = 688.686*	.906	.892	.071	.119 (.111 - .128)
Revised one-factor	(101) = 412.473*	.950	.941	.058	.088 (.080 - .097)
Two-factor	(103) = 426.925*	.948	.940	.054	.089 (.081 - .098)
Revised two-factor	(102) = 314.147*	.966	.960	.048	.073 (.064 - .082)
Bi-factor	(88) = 270.247*	.971	.960	.041	.073 (.063 - .082)

Note: * $p < .001$

As also shown in Table 2, the initial two-factor model was close to good model fit, and improved to an acceptable level when revised to include a covariance between the two aforementioned items pertaining to bodily sensations (MI = 79.16). The EA and NR factors were correlated very strongly (.81, $p < .001$) in this model.

The bi-factor model was a good fit with the data without any modifications. However, on the basis of the standardised factor loadings shown in Table 3, while all items loaded strongly on the general factor, four NR items did not load significantly on their specific factor. The EA items all loaded significantly on their specific factor. This was in particular

contrast to the two-factor model where all items loaded strongly and significantly on their respective factor.

Table 3

Standardized factor loadings for the one-, two-, and bi-factor models.

	One-factor	Two-factor		Bi-factor		
		EA	NR	General	EA	NR
EA1	.65*	.67*		.50*	.49*	
EA2	.65*	.67*		.48*	.51*	
EA3	.76*	.78*		.55*	.63*	
EA4	.67*	.70*		.56*	.42*	
EA5	.78*	.81*		.70*	.37*	
EA6	.68*	.70*		.56*	.40*	
EA7	.77*	.80*		.67*	.38*	
EA8	.58*	.60*		.53*	.23*	
NR1	.56*		.64*	.64*		-.05
NR2	.59*		.63*	.66*		.50*
NR3	.60*		.64*	.68*		.49*
NR4	.67*		.73*	.73*		-.04
NR5	.69*		.73*	.72*		-.02
NR6	.64*		.71*	.72*		-.25*
NR7	.72*		.76*	.75*		-.01
NR8	.53*		.60*	.61*		-.19**

Note: ** $p < .01$, * $p < .001$. EA = Experiential Avoidance, NR = Non-reactivity.

Reliability

Using the guidelines provided by Flora (2020), the model-based categorical omega for the one-factor 16-item measure was ω = .89. When each factor was assessed independently, reliability was also high for the EA (ω = 87) and NR (ω = .86) factors. When assessing the bifactor model, a categorical form of omega hierarchical, which reflects variance accounted for by the general equanimity factor, also indicated a high level of reliability, ω_h = .83. However, the reliability of the specific EA and NR factors, after accounting for the variance explained by the general factor, were .49 and .03 respectively. In conjunction with the CFA results, this appears to support the view that the ES-16 displays essential unidimensionality. That is, while a two-factor model is statistically feasible, there is common shared variance amongst all of the items reflecting that they are all assessing a singular equanimity construct. Therefore, the use of an overall score, whereby higher scores indicate higher levels of equanimity, is appropriate.

Validity

Table 4 includes descriptive statistics and omega reliability coefficients for each measure, and correlations between the ES-16 and each validating measure. The DASS-21 and DERS-18 were highly reliable. The EQUA-S was of adequate reliability. The correlational results indicated that the ES-16 was moderate-to-strongly associated with higher levels of equanimity as measured by the EQUA-S; reduced symptoms of depression, anxiety, and stress; and reduced difficulties in emotion regulation.

INSERT TABLE 4 ABOUT HERE

Table 4

Descriptive statistics, reliability coefficients, and correlational results for the ES-16 and each validating measure.

	Coefficient ω	M(SD)	Min	Max	ES-16 overall *r*
ES-16 overall	.89	57.50 (11.33)	26	80	-
EQUA-S	.65	41.98(5.71)	26	60	.63*
Depression	.90	3.84(3.71)	0	19	-.44*
Anxiety	.82	2.78(2.99)	0	15	-.37*
Stress	.85	5.77(3.33)	0	19	-.53*
Emotional Regulation (DERS-18)	.92	33.13(10.59)	18	74	-.60*

Note: * $p < .001$

Gender and age effects. Results of an independent samples *t*-test revealed no significant difference between male and female responses on total ES-16 ($t(393) = .98$, $p = .33$). In line with the findings of Rogers et al. (2021), results indicated a significant positive correlation between age and total ES-16 ($r = .16$, $p < .001$), showing that older age was associated with higher levels of equanimity.

Test-retest reliability

Results showed a significant correlation between participant responses between the four-week period for the total ES-16 ($r = .81$, $p < .001$).

Discussion

The present study aimed to provide the first CFA of the ES-16 developed by Rogers et al. (2021), and further explore the reliability and validity of the measure in a general population sample. Overall, the current findings indicate that the ES-16 is a valid and reliable self-report measure of equanimity.

Confirmation of the ES-16 factor structure

In line with the initial exploratory study of the ES-16 by Rogers et al. (2021), the current CFA results provided some support for the conceptualization of the ES-16 as a two-factor model reflecting EA and NR. However, the results of the one-factor and bi-factor models suggests that there is an essential unidimensional structure to the ES-16. This makes sense as all items are measuring equanimity, with the existence of two factors potentially partly caused by the positive wording of all EA items and negative wording of all NR items. If the ES-16 is considered to be best conceptualized as a bi-factor model, it manages to align with the theoretical structure of the decoupling model of equanimity (Hadash et al., 2016), which proposes that equanimity comprises acceptance regardless of hedonic tone and a reduction in reactivity. This operationalization is also consistent with established theoretical models of equanimity including the BPM (Grabovac et al., 2011) and the *process of mindfulness meditation leading to insight and equanimity* (PROMISE) model (Eberth et al., 2019). The model also fits with clinical MBIs, such as mindfulness-integrated cognitive behavior therapy (Cayoun, 2011), which posits that acceptance and non-reactivity to experiences decreases habitual craving and aversion that are connected to psychological distress. Accordingly, the ES-16 appears to have utility in assessing changes in equanimity through the applications of these types of interventions.

Reliability and validity of the ES-16

Consistent with hypotheses, the ES-16 was highly reliable when assessed as either a one-factor model or when examining the general equanimity factor in the bi-factor model, exclusive of the variance also contributed by the specific EA and NR. The EA and NR factors were also highly reliable when assessed independently, but displayed poor reliability in the bi-factor model when the general factor was accounted for. Thus, with a focus on the overall ES-16 score, the measure showed good test-retest reliability, suggesting that equanimity is a relatively stable construct over four weeks. This finding expanded on the initial study by

Roger et al. (2021) which found that equanimity was relatively stable over two to six weeks. This contributes to emerging views of equanimity being understood as a trait that is stable over time, rather than a changing state (Rogers et al., 2021).

In accord with the hypotheses, the ES-16 overall, demonstrated significant correlations in the predicted directions with the other measures, showing good convergent validity. Those who reported higher levels of equanimity in the ES-16, were also found to report higher levels of equanimity with the EQUA-S developed by Juneau et al. (2020). Moreover, supporting hypotheses, the ES-16 total score showed a strong significant correlation with the DERS-SF and its subscale scores in the hypothesized directions. This supports the theoretical understanding that higher levels of equanimity are associated with better emotion regulation skills. With more accepting and non-reactive responses to emotions, situations, and objects (whether pleasant or unpleasant), more balanced and calm mental states are produced, which appears to increase emotional awareness and reduce both the acute intensity of the emotion and the likelihood of long-term emotion dysregulation (Juneau et al., 2020).

Replicating the findings of Roger et al. (2021), the present results also show that responding with higher levels of acceptance and non-reactivity was associated with lower levels of depression, anxiety, and stress symptoms, as shown by the significant negative correlations between the ES-16 and DASS-21 subscales. This association accords with existing evidence that equanimity plays an active role in the reduction of psychological symptoms during MBIs (Cayoun & Shires 2020; Eberth et al., 2019).

This psychometric study did not include a manipulation protocol, and future MBIs using the ES-16 as part of their intervention will clarify its predictive validity. This could be done by assigning an incremental practice dosage (frequency and/or duration) to equivalently distressed participants, with the hypothesis that equanimity should increase as a function of increased dosage over a given period. Alternatively, the type of mindfulness methods could

be manipulated in such a way that groups would practice methods that vary in their focus on equanimity. For example, equanimity scores would be expected to be lower when using mindfulness of breath, which is predominantly a concentrative technique, than when using the body-scanning techniques taught in vipassana traditions known to help cultivate equanimity (e.g., Cayoun, 2011; Hart, 1987).

Consistent with previous research on nonattachment (e.g., Sahdra et al., 2010), there appeared to be no gender difference in equanimity. However, this finding could be expanded on in future studies. By obtaining a larger sample with a more even gender distribution, measurement invariance could be investigated across male and female respondents. Also consistent with previous research, participants rated higher on equanimity with age, although these correlations were low. This seems to support the ecological validity of the construct as being less reactive is expected as one matures (Rogers et al., 2021). However, it is possible that a few items of the ES-16 could have been associated with indifference instead of equanimity by some participants, especially since it has been shown that apathy tends to increase in older adults (Brodaty et al., 2010). Future studies will need to control for this variable.

The development and validation of the ES-16 makes significant theoretical and empirical contributions to the growing literature of mindfulness practices and clinical research. Despite being comprised of subcomponents, equanimity has been used for over 25 centuries as a single attitude and practice (see Bodhi, 2005, for traditional description). Although the present results support the two-factor model of the ES-16, we also believe that it is theoretically more meaningful to interpret equanimity as an overall construct and to evaluate equanimity levels through the ES-16 total score.

The ES-16 has expanded on previous clinical representations of equanimity by interconnecting the two theoretical components of experiential acceptance and non-reactivity

which have been posited to be key in the cultivation of equanimity. Whilst previous clinical measures that have included items relating to equanimity have included acceptance, they have lacked the non-reactivity aspect. Non-reactivity is crucial in the behavior change that occurs within MBIs (Rogers et al., 2021). Through non-reactivity, one engages in the process of habituation and desensitization to the experience that the individual is in the process of accepting (Desbordes et al., 2015).

The ES-16 may also assist in investigating the role of equanimity in established models of mindfulness, such as the BPM (Grabovac et al., 2011), the PROMISE model (Eberth et al., 2019) and the co-emergence model of reinforcement (Cayoun & Shires, 2020). The present study also strengthened the exploratory study of the ES-16 by Rogers et al. (2021) by confirming the temporal stability of equanimity. This finding will aid in clinical interventions where the ES-16 can reliably be used to measure change in equanimity following MBIs. Given that equanimity has been proposed to be the most significant mechanism of change during mindfulness practice, the ability to measure the construct reliably and accurately will be fundamental in clinical work and future research. With its use in clinical interventions, the ES-16 may assist in further understanding mechanisms of change in MBIs, such as the differential effects of metacognitive awareness and interoceptive acceptance.

Limitations and Future Directions

The present study contains some limitations that must be acknowledged. Whilst the current sample size did improve on the exploratory study from Roger et al. (2021), participant demographics were similar, with the majority being female, identifying as White, and having postgraduate qualifications. Additionally, meditation experience was not controlled for in this study and there may have been a selection bias with participants having an existing interest in mindfulness. Shoham et al. (2018) found that the amount and degree of an individual's mindfulness training was linked to increased cultivation of equanimity and

willingness to tolerate emotions. Future research would benefit from using more balanced samples and more comprehensively distinguishing between levels of meditation experience.

To help assess divergent validity, future studies of the ES-16 would benefit from assessing equanimity's diametrically opposed constructs of craving and aversion, which have been traditionally termed "far-enemies" of equanimity (Nyanamoli, 2011). It is also well-documented (e.g., Kornfield, 2012) that equanimity can be easily confused with indifference, which is traditionally conceptualized as a "near-enemy" of equanimity, because both mental states involve a form of detachment. However, detachment in indifference may be based on avoidance, carelessness, or disinterest, which has been shown to increase with age (Brodaty et al., 2010), whereas detachment in equanimity preserves interest, care, and engagement, and includes a profound understanding that emotional reactivity makes no sense given that all phenomena arise and pass away continually. Accordingly, it will be important for future studies to examine divergent validity by also including a measure of indifference.

Additionally, participants were a general population sample who were not assessed for psychological disorders. Future research would benefit from examining the factor structure of the ES-16 across a range of psychological disorders. More generally, inherent limitations of self-report measures should be acknowledged. According to literature, self-reporting one's own level of mindfulness is often inaccurate (Grossman & van Dam, 2011). Mindfulness training is designed to increase awareness of internal experiences, such as inattentiveness and reactivity (Cayoun & Shires, 2020). With additional insight someone may rate themselves as less mindful or less equanimous and more reactive following an MBI (Sauer et al., 2013) and individuals may over-estimate their mindfulness or equanimity skills pre-intervention, leading to inaccurate assessment (Sauer et al., 2013). Future research would benefit from either controlling for these factors or exploring them as a mechanism against the development of experiential acceptance within equanimity (Rogers et al., 2021). There is

potential to investigate this within clinical samples, where if insight and more objective rating increases as a function of increased equanimity, it should be measured in future mindfulness training (Rogers et al., 2021).

In summary, the ES-16 was supported as an essentially unidimensional measure comprising items reflecting the experiential acceptance and non-reactivity considered typical of being equanimous. The measures of internal consistency, test-retest reliability and convergent validity all supported further use of the ES-16. The results of this study are consistent with the theoretical framework of equanimity and suggest that the ES-16 will provide meaningful insight when administered during MBIs in clinical and general populations.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest. J. Cheevers completed this study under supervision of A. Shires and B. A. Cayoun. B. Elphinstone assisted with the statistical analyses. All authors contributed to writing and editing the article.

Informed Consent The study gained approval from the UTS Human Research Ethics Low Risk Research Committee (approval number 2018002456-25). All participants were fully informed of the procedure and aims of the study and gave their informed consent.

References

Anālayo, B. (2021). Relating equanimity to mindfulness. *Mindfulness 12*(11)**,** 2635–2644. https://doi.org/10.1007/s12671-021-01671-z

Anālayo, B. (2021). Monitoring and acceptance: Key dimensions in establishing mindfulness. *Mindfulness, 13*(8), 1901–1906. https://doi.org/10.1007/s12671-021-01770-x

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176–181. https://doi.org/10.1037/1040-3590.10.2.176

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(2), 125–143. https://doi.org/10.1093/clipsy.bpg015

Beck, A. T. (Ed.). (1979). *Cognitive therapy of depression*. Guilford press.

Berle, D., Starcevic, V., Viswasam, K., Milicevic, D., Hannan, A., Brakoulias, V., & Steel, Z. (2018). Confirmatory factor analysis of the Nepean Dysphoria Scale in a clinical

sample. *Psychiatric Quarterly*, *89*(3), 621-629. https://doi.org/10.1007/s11126-018-9564-9

Bodhi, B. (2005). *In the Buddha's words: an anthology of discourses from the Pali Canon*. Wisdom Publications.

Bodhi, B. (2000). *The connected discourses of the Buddha: Translated from the Pali by Bhikkhu Bodhi*. Wisdom Publications.

Brodaty, H., Altendorf, A., Withall, A., Sachdev, P. (2010). Do people become more apathetic as they grow older? A longitudinal study in healthy individuals. *International Psychogeriatrics*, *22*(3), 426-36. https://doi.org/10.1017/S1041610209991335

Canivez, G. L. (2016). Bifactor modeling in construct validation of multifactored tests: Implications for understanding multidimensional constructs and test interpretation. *Principles and methods of test construction: Standards and recent advancements. Gottingen, Germany: Hogrefe Publishers*.

Cayoun, B. A. (2011). *Mindfulness-integrated CBT: principles and practice.* Chichester, UK: Wiley.

Cayoun, B. A., Elphinstone, B., Kasselis, N., Bilsborrow, G., & Skilbeck, C. (2022). Validation and factor structure of the Mindfulness-based Self Efficacy Scale-Revised. *Mindfulness, 13*(3)*,* 751-765. https://doi.org/10.1007/s12671-022-01834-6

Cayoun, B. A., & Shires, A. G. (2020). Co-emergence Reinforcement and Its Relevance to Interoceptive Desensitization in Mindfulness and Therapies Aiming at Transdiagnostic Efficacy. *Frontiers in Psychology*, *11*, 545945. https://doi.org/10.3389/fpsyg.2020.545945

Chen, F. F., Hayes, A., Carver, C. S., Laurenceau, J. P., & Zhang, Z. (2012). Modeling general and specific variance in multifaceted constructs: A comparison of the bifactor

model to other approaches. *Journal of Personality*, *80*(1), 219-251. https:L//doi.org/10.1111/j.1467-6494.2011.00739.x

Chiesa, A., Anselmi, R., & Serretti, A. (2014). Psychological mechanisms of mindfulness-based interventions: what do we know? *Holistic Nursing Practice*, *28*(2), 124-148. https://doi.org/10.1097/HNP.0000000000000017

Chiesa, A., & Serretti, A. (2011). Mindfulness-based interventions for chronic pain: a systematic review of the evidence. *The Journal of Alternative and Complementary Medicine, 17*(1), 83-93. https://doi.org/10.1089/acm.2009.0546

Desbordes, G., Gard, T., Hoge, E. A., Hölzel, B. K., Kerr, C., Lazar, S. W., Olendzki, A., & Vago, D. R. (2015). Moving beyond Mindfulness: Defining Equanimity as an Outcome Measure in Meditation and Contemplative Research. *Mindfulness*, *6*(2), 356–372. https://doi.org/10.1007/s12671-013-0269-8

Eberth, J., Sedlmeier, P., & Schafer, T. (2019). PROMISE: A model of insight and equanimity as the key effects of mindfulness meditation. *Frontiers in Psychology, 10,* 2389. https://doi.org/10.3389/fpsyg.2019.02389

Elphinstone, B. (2018). Identification of a Suitable Short- form of the UCLA- Loneliness Scale. *Australian Psychologist*, *53*(2), 107-115. https://doi.org/10.1111/ap.12285

Farb, N. A., Anderson, A. K., & Segal, Z. V. (2012). The mindful brain and emotion regulation in mood disorders. *The Canadian Journal of Psychiatry*, *57*(2), 70-77. https://doi.org/10.1177/070674371205700203

Feldman, C., & Kuyken, W. (2019). *Mindfulness: Ancient wisdom meets modern psychology*. Guilford Publications.

Godsey, J. (2013). The role of mindfulness-based interventions in the treatment of obesity and eating disorders: an integrative review. *Complementary Therapies in Medicine*, *21*(4), 430-439.

Goldberg, S. B., Tucker, R. P., Greene, P. A., Davidson, R. J., Kearney, D. J., & Simpson, T. L. (2019). Mindfulness-based cognitive therapy for the treatment of current depressive symptoms: a meta-analysis. *Cognitive Behavior Therapy*, *48*(6), 445-462. https://doi.org/10.1080/16506073.2018.1556330

Goldstein, J. (2002). *One dharma: The emerging western Buddhism*. Rider.

Grabovac, A. D., Lau, M. A., & Willett, B. R. (2011). Mechanisms of Mindfulness: A Buddhist Psychological Model. *Mindfulness, 2*(3), 154–166. https://doi.org/10.1007/s12671-011-0054-5

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*(3), 271-299. https://doi.org/1089-2680/98/$3.00

Grossman, P., & van Dam, N. T. (2011). Mindfulness, by any other name…: trials and tribulations of *sati* in western psychology and science. *Contemporary Buddhism, 12*(1), 219-239. https://doi.org/10.1080/14639947.2011.564841

Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, *37*, 1-12. https://doi.org/10.1016/j.cpr.2015.01.006

Hadash, Y., Segev, N., Tanay, G., Goldstein, P., & Bernstein, A. (2016). The Decoupling Model of Equanimity: Theory, Measurement, and Test in a Mindfulness Intervention. *Mindfulness*, *7*(5), 1214-1226. https://doi.org/10.1007/s12671-016-0564-2

Hart, W. (1987). *The art of living: Vipassana meditation as taught by S. N. Goenka.* Harper & Row.

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, *78*(2), 169-183. https://doi.org/10.1037/a0018555

Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, *6*(6), 537-559. https://doi.org/10.1177/1745691611419671

Howell, J., Anderson, R., Egan, S., & McEvoy, P. (2020). One factor? Two factor? Bi-factor? A psychometric evaluation of the Frost Multidimensional Scale and the Clinical Perfectionism Questionnaire. *Cognitive Behavior Therapy*, *49*(6), 518-530. https://doi.org/10.1080/16506073.2020.1790645

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: A multidisciplinary journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Juneau, C., Pellerin, N., Trives, E., Ricard, M., Shankland, R., & Dambrun, M. (2020). Reliability and validity of an equanimity questionnaire: The two-factor equanimity scale (EQUA-S). *PeerJ*, *8*, e9405.

Juneau, C., Shankland, R., & Dambrun, M. (2020). Trait and state equanimity: The effect of mindfulness-based meditation practice. *Mindfulness*, *11*(7), 1802-1812. https://doi.org/10.1007/s12671-020-01397-4

Juneau, C., Shankland, R., Knäuper, B., & Dambrun, M. (2021). Mindfulness and equanimity moderate approach/avoidance motor responses. *Cognition and Emotion*, *35*(6), 1085-1098. https://doi.org/10.1080/02699931.2021.1927674

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, *4*(1), 33-47.

Kabat-Zinn, J. (1990). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness.* Delacorte Press.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life.* Hyperion.

Kaufman, E. A., Xia, M., Fosco, G., Yaptangco, M., Skidmore, C. R., & Crowell, S. E. (2016). The Difficulties in Emotion Regulation Scale Short Form (DERS-SF): Validation and replication in adolescent and adult samples. *Journal of Psychopathology and Behavioral Assessment*, *38*(3), 443-455. https://doi.org/10.1007/s10862-015-9529-3.

Kornfield, J. (2012). *Bringing home the Dharma: Awakening right where you are*. Shambhala.

Li, C. H. (2016). The performance of ML, DWLS, and ULS estimation with robust corrections in structural equation models with ordinal variables. *Psychological Methods*, *21*(3), 369-387. https://doi.org/10.1037/met0000093

Lindsay, E. K., & Creswell, J. D. (2017). Mechanisms of mindfulness training: Monitor and Acceptance Theory (MAT). *Clinical Psychology Review*, *51*, 48-59. https://doi.org/10.1016/j.cpr.2016.10.011

Lindsay, E., Young, S., Smyth, J., Brown, K., & Creswell, D. (2018). Acceptance lowers stress reactivity: Dismantling mindfulness training in a randomized controlled trial. *Psychoneuroendocrinology*, *87*, 63-73. https://doi.org/10.1016/j.psyneuen.2017.09.015

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales* (2nd ed.*)*. Psychology Foundation, University of New South Wales.

Marlatt, G. A., & Kristeller, J. L. (1999). *Mindfulness and meditation.* In W. R. Miller (Ed.), *Integrating spirituality into treatment: Resources for practitioners* (p. 67–84). American Psychological Association. https://doi.org/10.1037/10327-004

Monteiro, L., & Musten, F. (2013). *Mindfulness starts here: An eight- week guide to skillful living*. Friesen Press.

Nunnally, J. O. (1978). *Psychometric Theory*. McGraw-Hill.

Nyanamoli, B. (trans.) (2011). *The path of purification, Visuddhimagga.* Buddhist Publication Society.

Quaglia, J. T., Brown, K. W., Lindsay, E. K., Creswell, J. D., & Goodman, R. J. (2015). From conceptualization to operationalization of mindfulness. In K. W. Brown, D. J. Creswell, & R. M. Ryan (Ed.), *Handbook of mindfulness: Theory, research, and practice* (pp. 151-170). The Guilford Press. https://pdfs.semanticscholar.org/234b/a4cf66586b4a8f0f4c6bb70b538711ff7f3c.pdf

Park, T., Reilly-Spong, M., & Gross, C. R. (2013). Mindfulness: A systematic review of instruments to measure an emergent patient-reported outcome (PRO). *Quality of Life Research*, *22*(10), 2639–2659. https://doi.org/10.1007/s11136-013-0395-8

Reise, S. P. (2012). The rediscovery of bifactor measurement models. *Multivariate Behavioral Research*, *47*(5), 667-696. https://doi.org/10.1080/00273171.2012.715555

Rogers, H. T., Shires, A. G., & Cayoun, B. A. (2021). Development and Validation of the Equanimity Scale-16. *Mindfulness*, *12*(1), 107-120. https://doi.org/10.1007/s12671-020-01503-6

Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software*, 48(2), 1-36.

Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, *66*(1), 20-40.

https://doi.org/10.1207/s15327752jpa6601_2

Sauer, S., Walach, H., Schmidt, S., Hinterberger, T., Lynch, S., Büssing, A., & Kohls, N. (2013). Assessment of mindfulness: Review on state of the art. *Mindfulness*, *4*(1), 3–17. https://doi.org/10.1007/s12671-012-0122-5

Segal, Z. V., Teasdale, J. D., & Williams, J. M. G. (2004). Mindfulness-Based Cognitive Therapy: Theoretical Rationale and Empirical Status. In S. C. Hayes, V. M. Follette, & M. M. Linehan (Eds.), *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition* (pp. 45–65). Guilford Press.

Sellbom, M., & Tellegen, A. (2019). Factor analysis in psychological assessment research: Common pitfalls and recommendations. *Psychological Assessment*, *31*(12), 1428-1441. https://doi.org/10.1037/pas0000623

Shi, D., & Maydeu-Olivares, A. (2020). The effect of estimation methods on SEM fit indices. *Educational and Psychological Measurement*, *80*(3), 421-445. https://doi.org/10.1177/0013164419885164

Shoham, A., Hadash, Y., & Bernstein, A. (2018). Examining the decoupling model of equanimity in mindfulness training: An intensive experience sampling study. *Clinical Psychological Science*, *6*(5), 704-720. https://doi.org/10.1177/2167702618770446

Singh, N. N., Lancioni, G. E., Karazsia, B. T., Winton, A. S., Myers, R. E., Singh, A. N., Singh, A. D., Singh, J. (2013). Mindfulness-based treatment of aggression in individuals with mild intellectual disabilities: A waiting list control study. *Mindfulness*, *4*(2), 158–167. https://doi.org/10.1007/s12671-012-0180-8

Skogen, J. C., Thørrisen, M. M., Olsen, E., Hesse, M., & Aas, R. W. (2019). Evidence for essential unidimensionality of AUDIT and measurement invariance across gender, age and education. Results from the WIRUS study. *Drug and Alcohol Dependence*, *202*, 87-92. https://doi.org/10.1016/j.drugalcdep.2019.06.002

Skutch, J. M., Wang, S. B., Buqo, T., Haynos, A. F., & Papa, A. (2019). Which brief is best? Clarifying the use of three brief versions of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 41*(3), 485-494. https://doi.org/10.1007/s10862-019-09736-z

Teasdale, J. D., & Chaskalson, M. (2011). How does mindfulness transform suffering? II: the transformation of dukkha. *Contemporary Buddhism, 12*(1), 103-124. https://doi.org/10.1080/14639947.2011.564826

Van Sonderen, E., Sanderman, R., & Coyne, J. C. (2013). Ineffectiveness of reverse wording of questionnaire items: Let's learn from cows in the rain. *PLOS ONE, 8*(9). https://doi.org/10.1371/journal.pone.0068967

Weber, J. (2017). Mindfulness is not enough: Why equanimity holds the key to compassion. *Mindfulness & Compassion, 2*(2), 149-158. https://doi.org/10.1016/j.mincom.2017.09.004

Weber, J. (2020). *The role of equanimity in facilitating positive mental states and mental wellbeing* (Doctoral dissertation, University of Bolton).

Williams, M. J., Dalgleish, T., Karl, A., & Kuyken, W. (2014). Examining the factor structures of the five-facet mindfulness questionnaire and the self-compassion scale. *Psychological Assessment, 26*(2), 407–418. https://doi.org/10.1037/a0035566

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement, 73*(6), 913-934. https://doi.org/10.1177/0013164413495237

Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation

methods. *Behavior Research Methods, 51*(1), 409-428. https://doi.org/10.3758/s13428-018-1055-2