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ORIGINAL ARTICLE

The Development and Validation of the Ontological Addiction Scale

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Abstract
Ontological Addiction Theory is a metaphysical theory of mental illness which conceptualises psychological suffering in terms of excessive ego-centeredness. This study aimed to develop and validate the Ontological Addiction Scale (OAS) and compare OAS scores with mental health measures. A 31-item prototype scale was developed based on traditional Buddhist theory and contemporary models of addiction. An ego-centeredness form of the Five-Factor Narcissism Inventory (FFNI) was the main criterion measure. For mental health measures, the Patient Health Questionnaire (PHQ-9), Generalised Anxiety Disorder Scale (GAD-7) and Rosenberg Self-Esteem Scale (RSES) were used. The prototype OAS and two shorter versions showed excellent internal consistency and test–retest reliability. Construct validity was evidenced by medium to large correlations with criterion measures. OAS scores showed strong correlations with PHQ-9, GAD-7 and RSES, suggesting a clear relationship between OAS and mental health. The OAS appears to be a valid and reliable instrument suitable for assessing OA.

Keywords Ontological addiction · Ontological Addiction Scale · Mental illness · Buddhism · Psychometrics

Introduction

The biopsychosocial model of mental illness has advanced earlier conceptualisations by offering a more encompassing view of the determinants of psychopathology. Earlier perspectives, such as the "medical model", have been criticised for being overly reductionist, and the recognition that biological, psychological and social factors all play a role in the aetiology of mental illness offers a richer and more rounded perspective (Ghaemi, 2009). However,

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one important factor that the biopsychosocial model overlooks is the way individuals conceptualise themselves in relation to how they fundamentally exist. Ontological Addiction Theory (OAT) is a new metaphysical theory which asserts that individuals have a tendency to form faulty ontological beliefs, and that such beliefs can become addictive resulting in functional impairment and mental health problems (Shonin et al., 2013, 2016; Van Gordon, et al., 2018a, b). More specifically, ontological addiction has been defined as "the unwillingness to relinquish an erroneous and deep-rooted belief in an inherently existing 'self' or 'I' as well as the impaired functionality that arises from such a belief" (Shonin et al., 2013, p. 64).

OAT asserts that due to harbouring faulty ontological beliefs, individuals reinforce their sense of selfhood to such a point that they become overly absorbed in narrow and egotistical cognitive behavioural response modes (Shonin et al., 2016). In simplistic terms, this means that an individual who is suffering from ontological addition becomes "self-addicted", believing that they exist at the centre of the world, separate from everyone and everything around them.

OAT is based on Buddhist teachings relating to the nature of existence. Central to these teachings is the premise that the world is subject to constant change or impermanence (Sanskrit: "aniccā") (Shonin et al., 2014). Given that phenomena never assume an existence that is completely fixed in space and time (i.e. phenomena are permanently in a state of transience), Buddhist teachings assert that they are devoid of a self that inherently manifests (Shonin et al., 2014). Consequently, all phenomena, including humans, are of the nature of non-self (Sanskrit: "anattā") and are inherently "empty" due to existing only in a relative sense (Nagarjuna, 2005). This view appears to be echoed by emerging insights from the field of quantum physics regarding the nature of the physical world (Van Gordon et al., 2017a, b).

Given that ontological addiction results from an erroneous perspective in terms of the ultimate manner in which reality functions, the condition can affect people who might not otherwise be defined as mentally ill according to accepted Western criteria. However, OAT contends that the mistaken belief in an inherently existent self is also a primary cause of many forms of mental illness. More specifically, the theory asserts that by reifying selfhood based on this flawed belief, humans are prone to the pathological pursuit of self-interest, devoting disproportionate amounts of energy to furthering the interests of the self or protecting it from perceived threats (Van Gordon et al., 2016). Furthermore, the rewards and punishments associated with self-centred behaviour can exacerbate fixation on the self to the extent that it meets the criteria of an addiction, including established addiction models such as Griffiths' (2005) components model of addiction (Shonin et al., 2016).

According to OAT, well-being emerges via deconstruction of the ego and resulting processes of attachment (Ducasse et al., 2019). Without a fixed belief in an independently and inherently existing "me" or "I" entity, there is a less pronounced locus of self about which conceptual and emotional dysfunctions can accumulate (Van Gordon et al., 2019). Therefore, OAT posits that treatment strategies for OA should seek to undermine self-attachment and associated addictive beliefs. This is consistent with studies showing that lower self-attachment is associated with better physical and psychological health (Pande & Naidu, 1992), enhanced well-being (Sahdra et al., 2010), and reduced chronic pain and psychological distress (Van Gordon, et al., 2017a, b).

Furthermore, studies of advanced meditators have shown that inducing a state of emptiness-of-self can be (i) more effective than mindfulness for improving non-attachment to self, mystical experiences, compassion and positive and negative effect (Van Gordon et al., 2019), and (ii) an important basis for the cultivation of profound spiritual experiences, such as insight into death and the relativity of time (Van Gordon, et al., 2018a, b). Qualitative studies have also shown that understanding and accepting that the self is empty of inherent existence can

foster personal, professional and spiritual development (Shonin & Van Gordon, 2015; Van Gordon et al., 2019).

The Present Study

Despite growing interest in the construct of ontological addiction (OA), to date there is no validated scale to assess it. Such a scale would be of significant value to OAT research by facilitating the examination of OA and its relationship to mental illness. Therefore, the primary purpose of the present study was to validate the Ontological Addiction Scale (OAS) against several criterion measures, and to refine the scale content accordingly. The criterion measures used were (i) an adapted version of the 60-item short-form of the Five-Factor Narcissism Inventory (FFNI-60; Krizan & Herlache, 2017; Sherman et al., 2015), (ii) the Non-Attachment Scale (NAS; Sahdra et al., 2010) and (iii) the Non-Attachment to Self Scale (NTS; Whitehead et al., 2018). The FFNI-60 was chosen because it contained items relating to many different domains of dysfunctional ego-centeredness, which is deemed to be a central feature of ontological addiction as a construct. Non-attachment is an important concept in Buddhist philosophy and practise (Barrows et al., 2022), as attachment to impermanent states is viewed as the means by which psychological pain manifests and reinforces itself. The cultivation of non-attachment is a primary means by which attachments—including addictions—can be undermined and transcended. In the context of OA, "non-attachment" and "non-attachment to self" are thereby of central importance in that they are almost a defining characteristic of a non-ontologically addicted state.

The secondary purpose of the study was to examine the relationship between OA and mental illness using three well-validated screening measures for depression, anxiety and self-esteem: (i) the nine-item Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001); (ii) the seven-item Generalised Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006); and (iii) the Rosenberg Self-Esteem scale (RSES; Rosenberg, 1965). Although the PHQ-9 and GAD-7 scales directly address key features of mental health illness, the RSES was also used because self-esteem is particularly relevant to OA as a construct and has been found to be significantly associated with depression (Brumfitt & Sheeran, 1999).

Regarding the expected results, given the aforementioned significance of ego-centredness as a central feature of OA, and the roles of non-attachment and non-attachment to self in undermining or ameliorating OA, it was expected that there would be a strong and significant association between OAS prototype scores and scores on the short form of the FFNI-60, and a strong and significant negative association between OAS prototype scores and scores on the NAS and NTS. Given the aforementioned findings concerning the role of OA in the manifestation of mental health symptoms, it was also expected that scores on the OAS prototype would be strongly and significantly associated with PHQ-9 and GAD-7 scores, and negatively associated with RSES scores.

Methods

Development of the OAS

The scale was developed by the present authors, three of whom are experts in Buddhist philosophy and practice. The development of the scale utilised the components model of addiction

(Griffiths, 2005), which is applicable to all forms of addiction. The components model of addiction asserts that an addiction must meet six core criteria: *salience*, *mood modification*, *tolerance*, *withdrawal*, *conflict* and *relapse*. However, for the purposes of the present study, the *mood modification* and *conflict* components were substituted with *euphoria* and *dysphoria*, as these better captured their intended roles as polar opposites relating to affective valence, and appeared to fit better with the notion of ego-addiction. For the content of these six addiction component categories, a component breakdown of the Buddhist *eight mundane concerns* was used (Nagarjuna, 2005). The eight mundane concerns are as follows:

1. Feeling pleased or delighted due to having money and/or material possessions
2. Feeling disappointed, upset or angry due to losing possessions or not acquiring them
3. Feeling pleased when praised or approved of by others
4. Feeling upset or dejected when criticised or subjected to disapproval
5. Feeling pleased due to having a good reputation
6. Feeling dejected or upset due to having a bad reputation
7. Feeling delighted when experiencing sense pleasures
8. Feeling dejected and upset by unpleasant sensory experiences

These eight concerns embody the positive and negative aspects of four underlying components (Table 1); material wealth or possessions; sensations; reputation amongst kin and social circles; and wider reputation. Each component has two polarities: gain and loss. It should be stressed here that both the Griffiths' components model of addiction and the eight mundane concerns of Buddhism were employed purely to ensure a suitable range of items covering the various facets of ontological addiction. Consequently, they were not intended as distinct, empirical components or dimensions of responses on the scale.

By creating four corresponding items for each of the six addiction components, a prototype scale was formulated using the resulting 24 question-categories as a guide. In order to enable the OAS to be refined according to initial findings, an additional seven candidate items were included as alternatives for some of these items or as additional items deemed worthy of examining. This was to enable weaker items to be identified and rejected according to the results. The prototype scale items are shown in Table 2.

Design

The present investigation was a cross-sectional cohort study employing a correlational design.

Participants

Sample size calculations were performed using G*Power3 (Faul et al., 2007). A figure of 200 participants was determined based on a power of 0.95, a significance threshold of 0.05 and a small to medium effect size ($r = 0.25$) for a correlational design employing two-tailed tests. Sample size requirements for an exploratory factor analysis (EFA) are notoriously difficult to assess because they depend not only the number of extracted factors, but on the anticipated factor loadings. However, guidance suggests that for an anticipated single-factor solution, this is also an acceptable figure for an EFA of the variables under examination (Goldberg & Velicer, 2006). A total of 210 participants (125 males and 85 females) were recruited via the *Prolific* online recruitment system and therefore comprised a self-selected convenience sample. Each participant received a payment of £2.50 following participation in the

Table 1 Four-factor breakdown of the *eight mundane concerns* of Buddhism

Component	Positive	Negative
1. Material wealth/possessions	Delight about gain	Distress about loss or non- acquisition
2. Sensations	Delight at pleasurable sensations	Distress from painful or unpleasant sensations
3. Others' perception of us (friends, colleagues, family)	Delighted with praise	Distress from disapproval or criticism
4. Others' perception of us (general reputation)	Delighted with good reputation	Distress from bad reputation

Table 2 Prototype Ontological Addiction Scale (OAS-31): six subscales based on Griffith's (2005) component model of addiction

Salience (i.e. ego-centred activities are the most important in the person's life, and dominate their thinking, feelings and behaviours)	S1. Felt you needed to receive more attention or affection from a person you care about?
	S2. Thought about how others see you?
	S3. Thought about increasing or protecting your wealth or material possessions?
	S4. Thought about how you could avoid experiencing discomfort?
	S5. Felt the need for more attention or recognition?
	S6. Thought about what someone you care about thinks of you?
	S7. Thought about seeking pleasurable experiences?
Euphoria (i.e.: ego-centred occurrences impact mood in a positive way)	E1. Felt uplifted when you were praised?
	E2. Felt superior to others?
	E3. Felt uplifted when you experienced financial or material gain?
	E4. Felt good when you experienced fewer challenges?
	E5. Felt elated when things were going well?
Tolerance (i.e. one needs to constantly increase ego-centred behaviour to feel well)	T1. Felt you needed to try harder in order to receive praise or avoid criticism?
	T2. Felt you needed to do better in order to avoid shame or humiliation?
	T3. Felt you needed more money or material possessions?
	T4. Felt an increasing need to occupy yourself to avoid being on your own?
	T5. Felt an increasing need to do things that normally bring you pleasure (/comfort)?
Withdrawal (i.e. unpleasant feeling occur when ego-centred behaviour is reduced)	W1. Found it hard to accept your mistakes and shortcomings?
	W2. Found it hard to overcome rejection?
	W3. Found it hard to give something away?
	W4. Found it hard to live more simply?
Dysphoria (i.e. interpersonal or intrapsychic conflicts resulting from ego-centred behaviour)	D1. Felt low when you were criticised?
	D2. Felt inferior to others?
	D3. Felt low when you encountered financial or material loss?
	D4. Felt low when you encountered difficult circumstances?
Relapse (i.e. the tendency for repeated reversions to ego-centredness following a period of being less self-centred)	R1. Stopped being kind to somebody you care about because they offended you?
	R2. Felt worried about not being recognised after having acted in others' interests?
	R3. Felt regret after having given a gift?
	R4. Stopped helping others because it was causing discomfort or inconvenience?
	R5. Felt regret about giving something away?
	R6. Felt regret about doing something good for somebody?

survey (mean duration 20 min 25 s; SD = 10.8 min). The mean age for males was 25.1 years (SD = 7.33; range = 18–48 years) and the mean age for females was 29.9 years (SD = 10.80; range = 18–65 years). Of these participants, 187 reported their ethnicity as "White" (89.1%), two as "Black" (0.95%), five as "Asian" (2.38%), three as "mixed" (1.43%) and ten as "other ethnic group" (4.76%). Three participants responded "not stated" (1.43%). Of the 188 participants for whom location data was available, 45 were based in Poland (23%), 39 in Portugal (20.7%), 23 in the UK (12.2%), 11 in Italy (5.9%), nine in the USA (4.8%), eight in Greece (4.3%), six in Canada (3.2%), six in Hungary (3.2%) and six in Mexico (3.2%). The remaining 35 participants (18.6%) were located in France, Ireland, Spain, Latvia, Germany, South Africa, Belgium, Chile, Germany, Israel, Netherlands, Czech Republic, Denmark, Estonia and Sweden. Inclusion criteria for the survey were that participants should be English-speakers aged over 18 years, who did not have psychotic symptoms, neurological conditions, alcohol use disorders and/or drug use disorders. These conditions were excluded in line with standard practice for scale validation studies using general population samples (Boateng et al, 2018).

Measures

In terms of assessing convergent and divergent validity for OA, *ego-centeredness*, *non-attachment* and *non-attachment to self* were deemed to be the most applicable constructs. Therefore, the following criterion measures were selected.

For the primary criterion measure of *ego-centeredness*, an adapted version of the 60-item short-form of the Five-Factor Narcissism Inventory (FFNI-60; Krizan & Herlache, 2017; Sherman et al., 2015) was used. The FFNI-60 comprises items relating to vulnerable and grandiose narcissism. It contains items such as "I deserve special treatment" and "It really makes me angry when I don't get what I deserve". Respondents rate their agreement on a five-point Likert scale ("disagree strongly", "disagree a little", "neither agree nor disagree", "agree a little", "agree strongly") and scores range from 60 to 300, with higher scores indicating higher levels of narcissistic traits. For the purposes of the present study, items from the *Acclaim-Seeking*, *Arrogance*, *Entitlement*, *Exhibitionism*, *Grandiose Fantasies*, *Need for Admiration*, *Shame* and *Reactive Anger* subscales were selected to reflect dysfunctional ego-centeredness. The resulting shorter form (FFNI-32), with scores in the range of 32 to 160, was used as a measure of ego-centeredness that is believed to reflect processes central to OA. The Cronbach's alpha in the present study was 0.88.

To assess *non-attachment*, the 30-item Non-Attachment Scale (NAS) was used. This assesses "release from mental fixations" (Sahdra et al., 2010) and employs a six-point Likert scale from 1 ("strongly disagree") to 6 ("strongly agree"). For the present study, the eight-item, short form of the NAS (NAS-SF) was used (Chio et al., 2018). The scale contains items such as "I find I can be calm and/or happy even if things are not going my way" and "I can accept the flow of events in my life without hanging onto them or pushing them away". The NAS has total scores ranging from 8 to 48, with higher scores indicating higher levels of non-attachment. The Cronbach's alpha in the present study was 0.80.

Non-attachment to self was assessed using the Non-Attachment to Self Scale (NTS; Whitehead et al., 2018). The NTS uses a seven-point Likert scale with questions such as "I can let go of unhelpful thoughts about myself". The total score ranges from 7 to 49, with higher scores indicating higher non-attachment to self. The Cronbach's alpha in the present study was 0.77.

To examine the relationship between OAS scores and mental health, three well-validated measures of depression, anxiety and self-esteem were used. The nine-item Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) provides a brief assessment of

depressive symptoms. Respondents are asked if they have experienced symptoms such as "little interest or pleasure in doing things" and "feeling down, depressed or hopeless". Responses are rated on a four-point Likert scale (not at all, several days, more than half the days, nearly every day). The scale has a Cronbach's alpha of 0.81 and total scores are in the range of 0 to 27, with higher scores indicating higher levels of depressive symptomatology. The Cronbach's alpha in the present study was 0.86.

The seven-item Generalised Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) provides a brief assessment of general anxiety. It has seven items including "feeling nervous, anxious or on edge" and "trouble relaxing", which are scored on the same, 4-point Likert scale. The scale has a Cronbach's alpha of 0.83 with total scores in the range of 0 to 21, with higher scores representing greater general anxiety. The Cronbach's alpha in the present study was 0.87.

The Rosenberg Self-Esteem scale (RSES; Rosenberg, 1965) is a 10-item scale that assesses self-esteem (e.g., "On the whole, I am satisfied with myself" and "At times, I think I am no good at all"). Participants rate items on a four-point Likert scale (strongly agree, agree, disagree and strongly disagree). The scale has a Cronbach's alpha of 0.77 and scores range from 0 to 30, with higher scores indicating higher levels of self-esteem. The Cronbach's alpha in the present study was 0.91.

The OAS-31 prototype scale is detailed in Table 2. It comprises 31 items across six domains—*salience*, *euphoria*, *tolerance*, *withdrawal*, *dysphoria* and *relapse*. Items are rated on a five-point Likert scale (never, rarely, sometimes, often and always), with scores in the range of 0 to 124. The Cronbach's alpha in the present study was 0.902 for run 1 and 0.920 for run 2 (see the "Procedure" section).

Procedure

Participants were directed, via an online hyperlink, to a *Qualtrics* online survey. The survey began with an information sheet explaining the purpose of the study and how it was to be conducted, the requirements for participation and policy concerning data protection, informed consent and withdrawal. If the participant chose to continue, they were then directed to a form in which they ticked a box to consent to the study, with the option to provide a unique code which would enable them to withdraw their data from the study should they elect to do so. After consent was given, a form was presented that requested demographic information, including age, sex and ethnicity; following which, participants were invited to complete the prototype Ontological Addiction Scale (OAS), followed by the RSES, FFNI-32, NAS-SF, NTS, PHQ-9 and GAD-7. The OAS was then presented again so that reliability could be examined. Participants were free to complete the survey at their own pace. Ethical approval for the study was provided by the Research Ethics Committee of the University of Derby, UK.

Data Analysis

Data for the test and retest conditions of the OAS item responses and totals, as well as the RSES, FFNI-32, NAS-SF, NTS, PHQ-9 and GAD-7, were analysed using SPSS Version 25 (SPSS Inc., Chicago, IL, USA). Scale scores for the FFNI-32, NAS-SF and NTS were normalised such that the lowest score was always zero, and thereby consistent with negative endpoint descriptors such as "not at all", "nothing" or "never" in the

scales employed. Relationships between these variables were examined using a correlation matrix. If a variable showed no significant skew or kurtosis, and no significant departure from normal distribution, then Pearson tests were used; otherwise, Spearman tests were employed. The data for the OAS items were also subjected to an exploratory factor analysis to examine the scale's factor structure.

Results

Descriptive Statistics

Descriptive statistics for all measures taken are shown in Table 3. Age, PHQ-9 scores and GAD-7 scores showed significant skewness, and Kolmogorov–Smirnov and Shapiro-Wilkes tests showed significant departure from normal distribution. No other variables showed significant skewness or kurtosis, and Kolmogorov–Smirnov and Shapiro-Wilkes tests showed no significant departure from normal distribution for any of the other measures. Correlations of PHQ-9 and GAD-7 scores therefore employed Spearman's tests, while other scale measures used Pearson tests.

Exploratory Factor Analysis

Participants completed the OAS-31 prototype once at the beginning of the test battery, and once at the end. Therefore, in order to examine the factor structure, an exploratory factor analysis was performed on each of these datasets. The factor structure and variance is detailed in Table 4. In order to establish the most appropriate number of factors to retain, a scree plot of factor loadings is usually examined, using the "Kaiser criterion" of retaining factors with Eigenvalues of greater than 1. However, Velicer et al. (2000) argue that this criterion is not appropriate and is prone to result in over-extraction of factors. Horn's method of parallel analysis (Horn, 1965) offers a more appropriate method by including a baseline from random data generated based on the relevant number of variables and observations. An online parallel analysis engine (Patil et al., 2007) was therefore used to

Table 3 Descriptive Statistics (*n = 210; 125 male, 85 female*)

Measure	Mean	SD	95% confidence interval for mean		Skewness		Kurtosis	
			Lower bound	Upper bound	Statistic	Std error	Statistic	Std error
Age	27.27	9.58	25.96	28.57	1.49*	0.168	1.97*	0.334
OAS Run 1	64.17	15.37	62.08	66.26	0.087	0.168	0.218	0.334
OAS Run 2	60.90	17.18	58.56	63.23	0.119	0.168	0.035	0.334
FFNI-32	62.25	18.18	59.77	64.72	0.129	0.168	−0.403	0.334
NAS-SF	16.71	5.69	15.94	17.48	−0.003	0.168	0.139	0.334
NTS	8.51	6.05	7.69	9.34	−0.023	0.168	0.288	0.334
PHQ-9	9.31	5.95	8.51	10.12	0.556*	0.168	−0.254	0.334
GAD-7	7.64	4.88	6.97	8.30	0.552*	0.168	−0.355	0.334
RSES	16.51	6.05	15.69	17.34	−0.023	0.168	−0.288	0.334

Table 4 Exploratory factor analysis: factor structure of OAS-31 Prototype based on initial extraction of items with eigenvalue > 1

Factor	Run 1			Run 2		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	8.16	26.31	26.31	9.39	30.30	30.30
2	3.01	9.71	36.02	3.43	11.06	41.36
3	2.08	6.72	42.74	2.60	8.38	49.74
4	1.55	5.00	47.73	1.51	4.86	54.60
5	1.30	4.18	51.91	1.37	4.42	59.02
6	1.27	4.110	56.02	1.14	3.66	62.68
7	1.12	3.622	59.64	1.10	3.54	66.22
8	1.05	3.400	63.04	-	-	-

compute optimal eigenvalue cut-offs for each factor, and these were included in the scree plots for this analysis.

Examination of these plots (Figs. 1 and 2) reveals a three-factor solution based on the point at which the EFA scree plot lines meet those of the baseline. Loadings of these factors are presented in Table 5. Item-total correlations were also computed and Cronbach's alpha was calculated for each run.

Through examining the factor loadings, it appeared clear that a single interpretable factor predominated, with generally high, positive loadings for both runs. The mean factor loadings for this were 0.49 for run 1 and 0.53 for run 2, and suggests that the sample size was adequate for this analysis (Goldberg & Velicer, 2006). This factor, accounting for 26.3% and 30.3% of the variance respectively, was deemed to represent the central construct of *ontological addiction.* Factor 2 appeared for the most part to reflect the affective valence of the items. For example, in run 1, high positive loadings were evidenced on E1 ("Felt uplifted when you were praised?") and E5 ("Felt elated when things were going well?"), while high negative loadings appeared to be associated with strong negative affect, particularly items on the *relapse* subgroup, such as R3 ("Felt regret after having given a gift?") and R6 ("Felt regret about doing something good for somebody?"). Notably, they did not appear to load very heavily on the *dysphoria* subgroup. A similar pattern was evidenced for run 2, only in this instance the signs for factor 2 were reversed, with positive loadings indicating strong negative affect, and vice versa. *Euphoria* subgroup items tended to have higher loadings, as did items from the *relapse* subgroup, though, again, the *dysphoria* subgroup items did not feature strongly. This factor accounted for 9.7% and 11.1% of the variance for the respective runs.

The final, third factor accounted for 6.7% and 8.4% of the variance, respectively. For run 1, this factor was less clear, but appeared to load more heavily on items related to self-esteem. High positive loadings were noted in *euphoria* subgroup items E2 ("Felt superior to others?") and E5 ("Felt elated when things were going well?"), while high negative loadings were observed on D1 ("Felt low when you were criticised?") and D2 ("Felt inferior to others?"). For run 2, this pattern was repeated.

The Cronbach's alpha figures for run 1 ($\alpha = 0.902$) and run 2 ($\alpha = 0.920$) of the OAS prototype showed excellent internal consistency and reflected the predominance of a single factor. Therefore, the use of item-total correlations was deemed acceptable to refine the scale by identifying and removing weaker items.

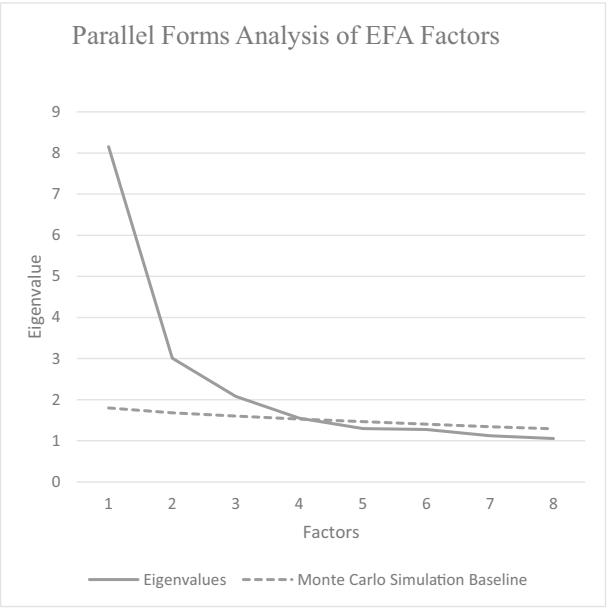

Fig. 1 Run 1: Parallel forms analysis of factors extracted from OAS-31 prototype responses

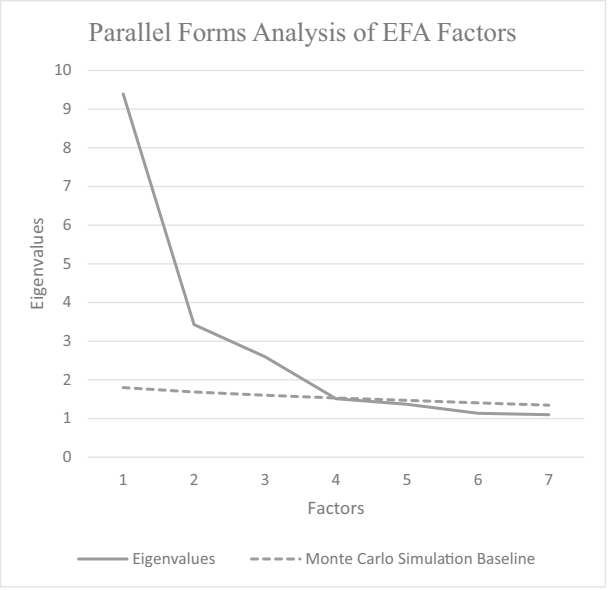

Fig. 2 Run 2: Parallel forms analysis of factors extracted from OAS-31 prototype responses

Table 5 Factor loadings and corrected item-total correlations (CITC) of the *Salience* (S1-7), *Ego Euphoria* (EE1-5), *Tolerance* (T1-5), *Dysphoria* (D1-4), *Withdrawal* (W1-4) and *Relapse* (R1-6) Group Scores for Run 1 and Run 2 of the OAS Prototype

Item	Run 1 (α = .902)				Run 2 (α = .920)			
	Factor 1	Factor 2	Factor 3	CITC	Factor 1	Factor 2	Factor 3	CITC
S1. Felt you needed to receive more attention or affection from a person you care about?	0.587	−0.025	−0.159	.518	0.679	−0.122	−0.125	.614
S2. Thought about how others see you?	0.502	0.134	−0.092	.472	0.584	−0.247	−0.301	.542
S3. Thought about increasing or protecting your wealth or material possessions?	0.383	0.023	0.196	.378	0.399	−0.015	0.324	.396
S4. Thought about how you could avoid experiencing discomfort?	0.587	0.001	−0.167	.509	0.678	−0.058	−0.118	.613
S5. Felt the need for more attention or recognition	0.502	0.049	0.006	.482	0.464	−0.035	−0.018	.448
S6. Thought about what someone you care about thinks of you?	0.484	0.319	−0.120	.449	0.580	−0.213	−0.282	.529
S7. Thought about seeking pleasurable experiences	0.391	0.315	0.131	.376	0.349	−0.181	0.266	.343
E1. Felt uplifted when you were praised?	0.376	0.450	0.204	.367	0.487	−0.417	0.254	.459
E2. Felt superior to others?	0.305	−0.018	0.439	.306	0.311	0.216	0.431	.317
E3. Felt uplifted when you experienced financial or material gain?	0.388	0.328	0.275	.369	0.458	−0.289	0.463	.438
E4. Felt good when you experienced fewer challenges?	0.427	0.180	0.120	.413	0.474	−0.233	0.148	.453
E5. Felt elated when things were going well?	0.275	0.559	0.409	.265	0.413	−0.487	0.533	.388
T1. Felt you needed to try harder in order to receive praise or avoid criticism?	0.654	0.078	−0.254	.456	0.615	−0.342	−0.306	.423
T2. Felt you needed to do better in order to avoid shame or humiliation?	0.530	−0.028	−0.369	.539	0.653	−0.230	−0.368	.578
T3. Felt you needed more money or material possessions?	0.531	−0.062	−0.020	.326	0.373	−0.508	0.472	.648
T4. Felt an increasing need to occupy yourself to avoid being on your own?	0.659	0.054	−0.145	.459	0.401	0.130	0.081	.442
T5. Felt an increasing need to do things that normally bring you pleasure (/comfort)?	0.511	0.305	−0.354	.455	0.447	−0.109	0.197	.354
W1. Found it hard to accept your mistakes and shortcomings?	0.587	0.162	−0.306	.555	0.622	−0.060	−0.324	.604
W2. Found it hard to overcome rejection?	0.350	0.549	0.481	.606	0.683	−0.021	−0.210	.482
W3. Found it hard to give something away?	0.477	−0.042	0.028	.375	0.456	0.527	0.134	.618
W4. Found it hard to live more simply?	0.473	0.204	0.035	.251	0.361	0.275	−0.045	.647
D1. Felt low when you were criticised?	0.595	−0.056	−0.231	.602	0.667	−0.144	−0.341	.556
D2. Felt inferior to others?	0.656	0.006	−0.264	.470	0.530	0.025	−0.350	.599

Table 5 (continued)

Item	Run 1 (α = .902)				Run 2 (α = .920)			
	Factor 1	Factor 2	Factor 3	CITC	Factor 1	Factor 2	Factor 3	CITC
D3. Felt low when you encountered financial or material loss?	0.396	−0.257	0.080	.499	0.648	−0.003	0.116	.341
D4. Felt low when you encountered difficult circumstances?	0.263	−0.227	0.087	.615	0.685	−0.087	−0.107	.396
R1. Stopped being kind to somebody you care about because they offended you?	0.545	−0.285	0.164	.514	0.586	0.377	0.221	.565
R2. Felt worried about not being recognised after having acted in others' interests?	0.666	−0.197	0.089	.633	0.731	0.177	0.125	.717
R3. Felt regret after having given a gift?	0.518	−0.517	0.243	.472	0.475	0.605	0.051	.456
R4. Stopped helping others because it was causing discomfort or inconvenience?	0.446	−0.458	0.155	.418	0.528	0.472	0.120	.513
R5. Felt regret about giving something away?	0.557	−0.481	0.253	.526	0.516	0.591	0.111	.502
R6. Felt regret about doing something good for somebody?	0.432	−0.525	0.206	.394	0.450	0.594	0.014	.425

Item Analysis

For each of the OAS-31 runs, a reliability analysis was performed in which Cronbach's alpha figures were calculated for the scale with each item omitted alongside item-total correlations. Figures for Cronbach's alpha become higher when weaker items are omitted, and lower when stronger items are left out. The aim of this part of the analysis was to arrive at a version of the OAS which contained four items per subgroup, retaining stronger items while dispensing poorer performing items. The *dysphoria* and *withdrawal* OAS subgroups did not contain alternative items, and so item-total correlations and adjusted Cronbach's alpha figures were examined to ensure that they were satisfactory (see Table 6).

For the item-total correlations, all items showed satisfactory figures overall. Items D3 ("Felt low when you encountered financial or material loss?") and D4 ("Felt low when you encountered difficult circumstances?") showed somewhat weaker correlations in run 2 than in run 1. Items W3 ("Found it hard to give something away?") and W4 ("Found it hard to live more simply?") had poor correlations for run 1, but notably improved in run 2.

Figures for all subgroups are shown in Table 6. The *salience*, *euphoria*, *tolerance* and *relapse* subgroups included alternative items that were also evaluated in order to allow the omission of weaker items. Although the four-factor structure described in Table 1 was used as a guide to the content of items within each subgroup, not all questions applied to a specific factor. Some items, such as S2 ("Thought about how others see you"), spanned two components, while others, such as E4 ("felt good when you experienced fewer challenges"), were general enough to apply to all four components.

For the *salience* subgroup, Item S7 ("Thought about seeking out pleasurable experiences") had the lowest item-total correlations for both runs. Therefore, this was flagged for removal from the final scale. Item S3 ("Thought about increasing or protecting your wealth or material possessions?") also scored consistently low in this respect and was likewise flagged for removal. Furthermore, Items S5 ("Felt the need for more attention or recognition") and S6 ("Thought about what someone you care about thinks of you") also scored somewhat poorly, although scores improved in subsequent runs. However, S6 was included as a possible variation of S1 ("Felt you needed to receive more attention or affection from a person you care about"), covering the theme of reputation amongst close kin; since S1 performed better, S6 was flagged for removal, leaving the remaining four items.

For the *euphoria* subgroup, items E2 ("Felt superior to others") and E5 ("Felt elated when things were going well") both scored worst in one run or the other. E5 was flagged for removal partly because it scored particularly poorly in run 1, but primarily because it was an alternative formulation of E4 ("Felt good when you experienced fewer challenges") and could therefore be eliminated because the latter formulation clearly performed better on both runs.

A similar pattern was evident in the *tolerance* subgroup. Item T3 ("Felt you needed more money or material possessions?") performed worst for the first run, but best for the second, while item T5 ("Felt an increasing need to do things that normally bring you pleasure (/comfort)?") performed worst on the second run but somewhat better on the first. The mean of the item-total correlations for these items across both runs favoured the former item, as did the construct composition overall. It was also deemed important that items specifically addressing wealth or material possessions should be adequately represented, and so this latter item was flagged for removal.

Finally, for the *regret* subgroup, item R6 ("Felt regret about doing something good for somebody") performed most poorly in both runs and so this was flagged for removal. Items R3

Table 6 Item analysis of the *Dysphoria* (D1-4), *Withdrawal* (W1-4), *Salience* (S1-7), *Ego Euphoria* (EE1-5), *Tolerance* (T1-5), and *Relapse* (R1-6) Subscale Scores for Run 1 and Run 2 of the OAS Prototype

Item	Run 1 (α = .902)		Run 2 (α = .920)	
	Corrected item-total correlation	Cronbach's α If removed	Corrected item-total correlation	Cronbach's α If removed
D1. Felt low when you were criticised? (SF)	.602	.896	.556	.916
D2. Felt inferior to others? (SF)	.470	.899	.599	.916
D3. Felt low when you encountered financial or material loss?	.499	.899	.341	.919
D4. Felt low when you encountered difficult circumstances?	.615	.897	.396	.919
W1. Found it hard to accept your mistakes and shortcomings? (SF)	.555	.897	.604	.916
W2. Found it hard to overcome rejection? (SF)	.606	.896	.482	.918
W3. Found it hard to give something away?	.375	.901	.618	.916
W4. Found it hard to live more simply?	.251	.903	.647	.915
S1. Felt you needed to receive more attention or affection from a person you care about? (SF)	.518	.898	.614	.916
S2. Thought about how others see you?	.472	.899	.542	.917
S3. Thought about increasing or protecting your wealth or material possessions? (R)	.378^	.901	.396^	.919
S4. Thought about how you could avoid experiencing discomfort? (SF)	.509	.898	.613	.916
S5. Felt the need for more attention or recognition	.482	.899	.448^	.918
S6. Thought about what someone you care about thinks of you? (R)	.449^	.899	.529	.917
S7. Thought about seeking pleasurable experiences (R)	.376*	.901	.343*	.919
E1. Felt uplifted when you were praised? (SF)	.367	.901	.459	.918
E2. Felt superior to others?	.306	.902	.317*	.920
E3. Felt uplifted when you experienced financial or material gain?	.369	.901	.438	.918
E4. Felt good when you experienced fewer challenges? (SF)	.413	.900	.453	.918
E5. Felt elated when things were going well? (R)	.265*	.902	.388	.919
T1. Felt you needed to try harder in order to receive praise or avoid criticism?	.456	.899	.423	.918
T2. Felt you needed to do better in order to avoid shame or humiliation? (SF)	.539	.898	.578	.916

Table 6 (continued)

Item	Run 1 (α = .902)		Run 2 (α = .920)	
	Corrected item-total correlation	Cronbach's α If removed	Corrected item-total correlation	Cronbach's α If removed
T3. Felt you needed more money or material possessions?	.326*	.901	.648	.915
T4. Felt an increasing need to occupy yourself to avoid being on your own? (SF)	.459	.899	.442	.918
T5. Felt an increasing need to do things that normally bring you pleasure (/comfort)? (R)	.455	.899	.354*	.919
R1. Stopped being kind to somebody you care about because they offended you? (SF)	.514	.898	.565	.916
R2. Felt worried about not being recognised after having acted in others' interests? (SF)	.633	.896	.717	.914
R3. Felt regret after having given a gift? (R)	.472	.899	.456^	.918
R4. Stopped helping others because it was causing discomfort or inconvenience?	.418^	.900	.513	.917
R5. Felt regret about giving something away?	.526	.898	.502	.917
R6. Felt regret about doing something good for somebody? (R)	.394*	.900	.425*	.918

*Weakest corrected item correlation within question group

^Other weakest corrected item correlations surplus to the four-item-per-group requirement; (R) Flagged for removal; (SF) Selected for OAS-12 Short Form

("Felt regret about giving something away") and R4 ("Stopped helping others because it was causing discomfort or inconvenience") also performed poorly, but since R3 was an alternate formulation of the better-performing R5 ("Felt regret after having given a gift"), R3 was eliminated. A similar process was then used to select the strongest two items per subgroup. These items were then marked for inclusion in an OAS-12 Short Form version of the scale (Table 6).

Correlation Matrix: Key Measures

Correlations between measures are shown in Table 7. All correlations were significant to the $p < 0.001$ level.

Test–Retest Reliability

An important measure of validity is how well test and retest scores agree with one another across a particular time interval. Reliability of the OAS-31 was 0.89, which is considered very good. However, the mean test–retest interval was somewhat short at approximately 15 min.

Criterion and Construct Validity

The main criterion measure here was the FFNI-32, the adapted measure designed to assess *ego-centeredness*. Since OA is primarily concerned with ego-centeredness, it was unsurprising that a fairly strong positive correlation was observed between OA and FFNI-32 scores. Correlations between OAS-31 and FFNI-32 scores were $r = 0.61$ for the first run and $r = 0.69$ for the second.

OA scores were also predicted to correlate negatively with *non-attachment to self* and—to a lesser degree—*non-attachment* scores, with low OA being related to high NTS and NAS-SF scores, and vice versa. Consistent with this, correlations between OAS-31 and NTS scores were $r = 0.34$ for the first run and $r = 0.39$ for the second, while correlations between OAS-31 and NAS-SF scores were $r = 0.28$ for the first run and $r = 0.30$ for the second.

Depression, Anxiety and Self-Esteem Measures

Highly significant, positive correlations were also observed between OA and measures of depression ($\rho = 0.54$) and anxiety ($\rho = 0.57$), and a highly significant negative correlation was found between OA and self-esteem ($\rho = -0.43$). Notably, these correlations were near identical between the test and retest runs of the OAS prototype.

Comparison of Psychometric Properties of OAS-31, OAS-24 and OAS-12

Having examined correlations for the OAS-31 prototype, the next stage was to examine these correlations for the OAS-24 and OAS-12 Short Forms, to see how each of the scales performed by comparison. Figures for Cronbach's Alpha, test–retest reliability and correlations with all other measures were therefore computed for both runs of the OAS. Table 8

Table 7 Correlation matrix of measures taken using 31-item OAS prototype

Measure	OAS Run 1	OAS Run 2	FFNI-32	NTS	NAS-SF	PHQ-9	GAD-7	RSES
Ontological Addiction Scale (OAS-31) Run 1	1	.889	.606	−.342	−.275	.535^	.566^	−.425
Ontological Addiction Scale (OAS-31) Run 2	.889	1	.693	−.390	−.304	537^	565^	−.426
Five-Factor Narcissism Inventory (Ego-Centredness Form) (FFNI-32)	.606	.693	1	−.179	−.038	.286^	.325^	−.036
Nonattachment to Self Scale (NTS)	−.342	−.390	−.179	1	.589	−.379^	−.421^	.473
Nonattachment Scale Short Form (NAS-SF)	−.275	−.304	−.038	.589	1	−.285^	−.301^	.540
Patient Health Questionnaire (PHQ-9)	.535^	.537^	.286^	−.379^	−.285^	1	.802^	−.619^
Generalised Anxiety Disorder Scale (GAD-7)	.566^	.565^	.325^	−.421^	−.301^	.802^	1	−.565^
Rosenburg Self-Esteem Scale (RSES)	.425	.426	.036	.473	.540	−.619^	−.565^	1

Significance level of $p = .000$ for all values; Pearson tests (two-tailed) used for OAS Run1, OAS Run2, FFNI-32, NTS and NAS-SF scores; Spearman tests (two-tailed) used for PHQ-9 and GAD-7 scores

^Indicates Spearman test results

shows these figures for the prototype OAS-31, final-version OAS-24 and OAS-12 Short Form. The respective scale scores and correlations were calculated by including only the OAS scores for items included in the proposed OAS-24 and OAS-12 versions.

In terms of psychometric properties, Cronbach's alpha is particularly important, as an instrument must have a reasonably high internal consistency for it to have good construct validity. Ideally, a scale should have as few items as possible but with a high Cronbach's alpha. As shown in Table 8, for run 1, OAS-31 had an α of 0.90, while in the OAS-24, with the seven weaker items removed, this figure diminished only fractionally, to 0.89. However, in the OAS-12 Short Form, there was a slightly greater drop, to 0.84. Run 2 showed a similar pattern, with an OAS-31 α of 0.92, an OAS-24 α of 0.91 and an OAS-12 Short Form α of 0.87. This offered some support for the shorter OAS-24 being more suitable than the prototype because this version had near-identical internal consistency yet fewer items.

Examination of the key criterion measures is also highly informative in showing how these scales compare. For run 1, correlations with the key criterion FFNI measure were $r = 0.60$ for OAS-31, $r = 0.59$ for OAS-24 and $r = 0.57$ for OAS-12. These showed a similar pattern to the run 2 FFNI correlations of $r = 0.69$ for OAS-31, $r = 0.67$ for OAS-24 and $r = 0.61$ for OAS-12. However, for NTS and NTS-SF measures, correlations for OAS-24 ($r = 0.47$ and $r = 0.32$, respectively) consistently improved upon correlations for OAS-31 ($r = 0.34$ and $r = 0.28$). However, results were inconsistent for OAS-12 figures, with correlations of OAS-24 with NTS/NTS-SF measures being lower for run 1 ($r = 0.44$ and $r = 0.29$), but higher for run 2 ($r = 0.52$ and $r = 0.37$).

The pattern of correlations overall suggests that the OAS-24 performs marginally better than the OAS-31, consistent with the omission of weaker items. However, although the OAS-12 performed comparably to the other scales, its internal consistency (M α = 0.85) was still somewhat lower than that of the OAS-24 (M α = 0.90), consistent with the substantially reduced number of items.

Discussion

The present scale validation study included a modest geographically diverse sample ($n = 210$) recruited from a trusted bank of participants (*Prolific*), and used well-validated and established measures to examine criterion validity against ego-centeredness

Table 8 Comparison of correlational measures for 31-item, 24-item and 12-item version of OAS

Measure		Cronbach's α	FFNI-32	NTS	NAS-SF	PHQ-9	GAD-7	RSES	Test–retest reliability
OAS-31 ***Prototype***	Run 1	.902	.606	−.342	−.275	.535^	.566^	−.425	.875
	Run 2	.920	.693	−.390	−.304	.537^	.565^	−.426	
OAS-24 ***Final***	Run 1	.887	.589	−.474	−.315	.560^	.580^	−.474	.886
	Run 2	.909	.669	−.466	−.341	.546^	.579^	−.466	
OAS-12 ***Short Form***	Run 1	.843	.571	−.444	−.292	.541^	.566^	−.444	.870
	Run 2	.866	.610	−.522	−.374	.557^	.567^	−.522	

Significance level of $p = .000$ for all values; Pearson tests (two-tailed) used for FFNI-32, NTS and NAS-SF scores; Spearman tests (two-tailed) used for PHQ-9 and GAD-7 scores

^Indicates Spearman test results

(Sherman et al., 2015), non-attachment (Sahdra et al., 2010) and non-attachment to self (Whitehead et al., 2018). It also used well-validated and widely used screening instruments for depression (Kroenke et al., 2001), anxiety (Spitzer et al., 2006) and self-esteem (Rosenberg, 1965). The incorporation of test and retest runs allowed the psychometric properties to be examined twice, with results for these separate runs providing a valuable source of convergent validity regarding the suitability of the items examined. The pattern of correlations between OA and other measures appeared to support the predictions of OAT (Shonin et al., 2014, 2016). This strongly suggests a relationship between excessive preoccupation with self-focussed thoughts and feelings and mental illness, with higher OA scores generally reflecting poorer mental health as assessed by the PHQ-7, GAD-7 and RSES.

More generally, the findings suggested that the OAS-31 prototype and the OAS-24/OAS-12 forms of the scales all showed very good-to-excellent validity, reliability and internal consistency. Both the high Cronbach's alpha figures and the findings of the EFA analyses suggest a predominately single-factor solution corresponding to the key construct of ontological addiction. Removing seven weaker items of the prototype had the desired outcome of creating a more condensed, 24-item version with comparable psychometric properties. However, the OAS-12 Short Form also performed well, with only slightly weaker psychometric properties than the OAS-24, despite having twelve fewer items.

The new OA measure reflects a development on other scales currently available for assessing constructs relating to Buddhist-derived non-attachment, such as the Non-Attachment Scale Short Form (Chio et al., 2018; Sahdra et al., 2010) and Non-Attachment to Self Scale (Whitehead et al., 2018). The latter of these scales was developed on the more general Buddhist concept of non-attachment to give an assessment of non-attachment to self, which is regarded to be of central importance to spiritual development within Buddhism. However, by framing psychological suffering as rooted in an *addiction to self*, the OAS not only embodies key constructs of non-attachment and non-attachment to self, but also domains more directly related to psychopathology and clinical addiction. In this context, an adaptation of Griffiths' (2005) components model of addiction (*salience*, *euphoria*, *tolerance*, *withdrawal*, *dysphoria* and *relapse*) was used as a framework for the new OA assessment instrument.

Wider Implications for Ontological Addiction Theory and Treatment

The OAS is grounded in the Buddhism-derived system of psychopathology, which is based on the view that what we think of as our individual self—and for that matter everything else—is psychologically constructed and has no inherent existence (Ducasse et al., 2019). Selfhood is seen as more akin to a mentally constructed narrative or story in which individuals are placed as agents surviving and managing life in a potentially dangerous and hostile environment. Due to its importance to physical and species survival, it is only natural that selfhood appears intensely real and that such basic concerns of survival and well-being take priority. However, the reification of self can lead to concerns and preoccupations becoming increasingly self-centred (Van Gordon et al., 2018a). It is this attachment to self that the OAS seeks to gauge, on the basis that it reflects the root of psychological suffering. This paradigm underlying the development of the OAS—as well as the corresponding findings from this validation study—suggests key mechanisms through which mental illness arises and reinforces itself. However, the

underlying OAT model also offers remedies through the use of Buddhist-based meditation practises designed to undermine the illusion of self (Goldberg et al., 2018).

OAT elucidates a three-phased approach to the treatment of OA based on first examining, and then transforming this imputed (i.e. "made up") self: "(i) becoming aware of the imputed self, (ii) deconstructing the imputed self and (iii) reconstructing a dynamic and dual approach" (Shonin et al., 2016, p. 665). The first stage involves simply becoming aware that there are no rational grounds for believing that the self inherently exists in the way that most individuals think it does. This may involve exercises in which the psychology of selfhood is logically examined and explored, using scientific argument to demonstrate principles of non-self or emptiness, but its main purpose is to cultivate proficiency in meditative awareness, particularly concentration-based meditation (Pāli: *samatha*). This enhances awareness, calmness and clarity, and allows the individual to experience the contents of their mind in a more equanimous and dispassionate way, consequently bringing about the conditions for confronting maladaptive, ego-centred beliefs.

In the second phase, the individual is taught to engage in a range of spiritual practises that run directly counter to self-interest, such as compassion, loving-kindness, patience, generosity and death awareness. Importantly, they then shift their focus to *vipassanā* (Pāli) or "insight meditation". Here, the conditions created by the concentration techniques employed in the first stage are now turned toward a deeper metaphysical examination of the causes, intrinsic properties and existence of phenomena. The goal of this is to cultivate the realisation that neither an individual nor anything else has an intrinsic self (Van Gordon et al., 2016), and that both form and emptiness are ultimately one.

In the third phase, having undermined the core beliefs underpinning ontological addiction, the individual may undergo a transformation of perspective from one which is ego-based, to one grounded in "non-self". Here, subject-object duality is transcended and a new, fluid and dynamic "true self" can arise which encompasses both the individual and the whole. This newly centred awareness still contains an emulated self in order to function in the world, but there is now recognition of its inherent nonexistence, and the inseparability and interdependence of all form, human and otherwise.

It is in this third phase that the Buddhist concept of emptiness (Sanskrit: *śūnyatā*) is of particular importance because it articulates an essential truth about the nature of the world. For practical purposes, emptiness can be considered equivalent to non-self and refers to the boundless, undifferentiated "ground" from which all distinctions, duality and manifest forms arise. It is only recently through developments such as OAT that the relevance of these insights—particularly emptiness theory (Van Gordon et al., 2019, 2017a, b)—to understanding and treating mental illness is becoming understood in Western society (Shonin et al., 2014, 2016; Van Gordon, et al., 2018a, b).

In particular, second-generation mindfulness interventions, such as mindfulness awareness training (MAT), have played an important role in recognising the importance of Buddhist principles such as emptiness, non-self and non-attachment, by facilitating deeper levels of metaphysical enquiry concerning selfhood through *vipassanā*, *śūnyatā* and other forms of meditation prescribed in the second and third phases of OAT-based treatment (e.g. compassion, loving-kindness, patience, generosity and death awareness) (Shonin et al., 2016; Van Gordon et al., 2015). *Śūnyatā* meditation, in particular, has invited growing interest because it involves cultivating a direct experience of conscious reality at its deepest level, where self and other dualities can be profoundly transcended. Indeed, evidence from studies of advanced meditators appears to confirm that *śūnyatā* meditation—in which a state of emptiness-of-self is sought—is more effective than mindfulness for cultivating

compassion and non-attachment to self, as well as deeper and more profound mystical or revelatory spiritual experiences that can further undermine self-attachment (Van Gordon et al., 2019, 2017a, b, 2018a, b). This aside, second-generation interventions generally are already proving effective not only for the treatment of mental illness (Ducasse et al., 2019) and for managing physical pain (Van Gordon et al., 2016, 2017a, b), but for more conventional addictions such as problem gambling (Shonin et al., 2013, 2016).

Further research is clearly needed to establish the clinical utility of OAT and the various Buddhist contemplative practices constructs to which it pertains. However, as interventions which seek to undermine the belief in an inherently existing self continue to gain traction in Western medicine, there is a growing need for tools which specifically assess OA. The OAS-24 and OAS-12 Short Form should therefore be a helpful addition to other Buddhism-derived non-attachment scales currently in use (Sahdra et al., 2010; Whitehead et al., 2018).

Limitations

A limitation of the present study is that the psychometric properties of OAS content were not always similar between test and retest runs, with some items showing marked differences from one run to the next, although variations due purely to chance are to be expected with such a large number of questions. However, this underlines the fact that many different possible selections of these questions would perform equally well and—were the study to be repeated on another independent sample—the findings might suggest a somewhat different selection of items for these scales. Nonetheless, the methodology employed herein served the crucial purpose of identifying weaker and stronger items that could guide the selection of items for the two shorter forms of the OAS.

The test–retest interval in this study was also somewhat short at around 15 min on average; a longer interval would have been desirable to give a better idea of how stable responses to the OAS are over time. However, the retest regimen did provide some crucial evidence of convergent validity of the scales' psychometric properties. Finally, it must be remembered that though this sample was suitable for the purposes of this study, this was a relatively small-scale study and the results should be treated with caution. Ideally the OAS should be independently tested in a clinical population with a larger retest interval.

Conclusion

OAT offers a comprehensive, Buddhist-based system of psychopathology, but until the present study, a screening instrument had not been validated to specifically assess addiction to self (OA). To remedy this, the prototype Ontological Addiction Scale (OAS) outlined here was developed and tested against a number of criterion measures amongst a sample of 210 participants. The three versions of the OAS examined in the present study all showed excellent internal consistency and test–retest reliability, and good construct and criterion validity. In terms of these psychometric properties, the OAS-24 appeared about equal to the OAS-31 prototype yet had the advantage of having seven fewer items. A shorter form, the OAS-12, also performed well, although with somewhat lower internal consistency. The present study findings suggest that these three versions of the OAS appear to be suitable for research purposes, though independent validation in a clinical population would be desirable.

Appendix

See Tables 9 and 10.

Table 9 Ontological Addiction Scale (OAS-24)

The following 24 questions will help you reflect on the extent to which ego governs your choices, thoughts and behaviours How often during the last year have you…?		Never	Rarely	Sometimes	Often	Always
1	Felt you needed to receive more attention or affection from a person you care about?	0	1	2	3	4
2	Thought about how others see you?	0	1	2	3	4
3	Thought about how you could avoid experiencing discomfort?	0	1	2	3	4
4	Felt the need for more attention or recognition?	0	1	2	3	4
5	Felt uplifted when you were praised?	0	1	2	3	4
6	Felt superior to others?	0	1	2	3	4
7	Felt uplifted when you experienced financial or material gain?	0	1	2	3	4
8	Felt good when you experienced fewer challenges?	0	1	2	3	4
9	Felt you needed to try harder in order to receive praise or avoid criticism?	0	1	2	3	4
10	Felt you needed to do better in order to avoid shame or humiliation?	0	1	2	3	4
11	Felt you needed more money or material possessions?	0	1	2	3	4
12	Felt an increasing need to occupy yourself to avoid being on your own?	0	1	2	3	4
13	Found it hard to accept your mistakes and shortcomings?	0	1	2	3	4
14	Found it hard to overcome rejection?	0	1	2	3	4
15	Found it hard to give something away?	0	1	2	3	4
16	Found it hard to live more simply?	0	1	2	3	4
17	Felt low when you were criticised?	0	1	2	3	4
18	Felt inferior to others?	0	1	2	3	4
19	Felt low when you encountered financial or material loss?	0	1	2	3	4
20	Felt low when you encountered difficult circumstances?	0	1	2	3	4

Table 9 (continued)

The following 24 questions will help you reflect on the extent to which ego governs your choices, thoughts and behaviours How often during the last year have you…?		Never	Rarely	Sometimes	Often	Always
21	Stopped being kind to somebody you care about because they offended you?	0	1	2	3	4
22	Felt worried about not being recognised after having acted in others' interests?	0	1	2	3	4
23	Stopped helping others because it was causing discomfort or inconvenience?	0	1	2	3	4
24	Felt regret about giving something away?	0	1	2	3	4
		OAS-24 Total			/ 96	

Table 10 Ontological Addiction Scale (OAS-12) Short Form

The following 12 questions will help you reflect on the extent to which ego governs your choices, thoughts and behaviours How often during the last year have you…?		Never	Rarely	Sometimes	Often	Always
1	Felt you needed to receive more attention or affection from a person you care about?	0	1	2	3	4
2	Thought about how you could avoid experiencing discomfort?	0	1	2	3	4
3	Felt uplifted when you were praised?	0	1	2	3	4
4	Felt good when you experienced fewer challenges?	0	1	2	3	4
5	Felt you needed to do better in order to avoid shame or humiliation?	0	1	2	3	4
6	Felt an increasing need to occupy yourself to avoid being on your own?	0	1	2	3	4
7	Found it hard to accept your mistakes and shortcomings?	0	1	2	3	4
8	Found it hard to overcome rejection?	0	1	2	3	4
9	Felt low when you were criticised?	0	1	2	3	4
10	Felt inferior to others?	0	1	2	3	4
11	Stopped being kind to somebody you care about because they offended you?	0	1	2	3	4
12	Felt worried about not being recognised after having acted in others' interests?	0	1	2	3	4
		OAS-12 total			/ 48	

Data Availability The dataset for the study is available from a public repository (*ResearchGate*).

Code Availability Not applicable.

Declarations

Ethics Approval Ethical approval for the study was provided by the Research Ethics Committee of the University of Derby, UK.

Consent to Participate Informed consent was given by all participants.

Consent to Publish Informed consent included consent for publication of reports using data from this study.

Conflict of Interest The authors declare no competing interests.

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