Measuring Emotional Awareness from a Cognitive-Developmental Perspective: Portuguese Adaptation Studies of the Levels of Emotional Awareness Scale

Avaliação da Consciência Emocional numa Perspectiva Cognitivo--Desenvolvimentista: Estudos da Adaptação Portuguesa da Escala de Níveis de Consciência Emocional

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ABSTRACT

Introduction: The Levels of Emotional Awareness Scale (LEAS) was developed to assess the emotional awareness construct, based on a cognitive-developmental perspective and influenced by the Piaget and Werner theories. It is composed of 20 emotion-evoking scenes and has been used in multiple researches related to emotion regulation, alexithymia and psychiatric disorders. It is a well-documented, valid and reliable measure. Due to the extent of LEAS, some investigators have been using one of the parallel forms (LEAS-A), which is a part of the complete version, nevertheless there is a gap of studies concerning LEAS-A psychometric qualities. In the absence of measures for assessing the organization of the emotional experience in Portuguese samples, we developed the Portuguese version of LEAS, characterizing reliability and validity indicators and the same for LEAS-A.

Materials and Methods: Three different studies were carried out with these versions, two with university students and another with a sample from the general population.

Results: The Portuguese version showed high levels of reliability, superior to those found in other adaptation procedures. LEAS-A showed good reliability and indicators of discriminant and concurrent validities. The LEAS-A scores were independent from negative affect and related to the externally-oriented thinking involved in alexithymia.

Conclusions: The Portuguese LEAS and LEAS-A show very adequate qualities, which allow for their scientific use. Implications for clinical and research contexts are discussed.

Keywords: Emotional awareness; Emotional development; Personality assessment; Alexithymia; Psychometrics.

RESUMO

Introdução: A Escala de Níveis de Consciência Emocional (LEAS) foi desenvolvida para avaliar o constructo consciência emocional, numa perspectiva cognitivo-desenvolvimentista e influenciada pelas Teorias de Piaget e Werner. É composta por 20 situações ou cenários que evocam emoções e tem sido usada em múltiplas investigações nos domínios da regulação emocional, alexitimia e perturbações psiquiátricas. Trata-se de uma medida bem documentada, validada e precisa. Em virtude da sua extensão, alguns investigadores têm vindo a utilizar uma das formas paralelas que compõe a versão completa, a LEAS-A, sendo contudo notória a vacuidade de estudos que descrevam as qualidades psicométricas desta versão. Face à inexistência de uma medida de caracterização da organização da experiência emocional para a população portuguesa, desenvolveu-se a versão portuguesa da LEAS, caracterizaram-se diversos indicadores de precisão e validade, assim como para a versão reduzida LEAS-A.

Materiais e Métodos: Foram desenvolvidos três estudos com estas versões, dois deles com recurso a estudantes universitários e um outro com uma amostra da população em geral.

Resultados: A versão portuguesa demonstrou níveis elevados de precisão, mais robustos do que os encontrados em estudos de adaptação da escala noutros países. A LEAS-A apresentou bons níveis de precisão e indicadores de validade discriminante e concorrente. As pontuações obtidas na LEAS-A mostraram-se independentes da presença de afecto negativo e associaram-se significativamente a um estilo cognitivo externalizado, próprio do funcionamento alexitímico.

Conclusões: As versões portuguesas da LEAS e da LEAS-A apresentam qualidades psicométricas muito adequadas, o que permite o seu uso científico. São discutidas as implicações da sua utilização nos contextos clínico e de investigação.

Palavras-chave: Consciência Emocional; Desenvolvimento Emocional; Avaliação da Personalidade; Alexitimia; Psicometria.

INTRODUCTION

The assessment of emotional processing and emotional experience has been focused throughout many decades on instruments that measure the intensity or frequency of certain emotional states or moods using categorical or ordinal scales. Despite the value and utility for clinical and research purposes of those instruments, they do not take into account variability in terms of individual skills for monitoring inner states or emotional experience structures. On the other hand, the self-report scales and structured interviews could have significant limitations, as some authors have already pointed out.[1,2]

The study of individual differences on the ability of being aware of emotions triggered by certain stimuli (hardly measured by clinical mood scales) inspired Lane and collaborators[3,4] to design a theoretical model – the model of levels of emotional awareness (LEA) – to better understand

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the cognitive-developmental organization of emotional experience. The authors considered emotional development an analogous process to what Piaget[5] formulated about cognitive development, in which affective maturity obeys a complex and sequential process of integration and differentiation of the cognitive schemes involved in emotional processing, progressively revised through processes of assimilation and accommodation. Based on Piagetian assumptions, cognitive development consists of a progressive transformation of implicit forms of knowledge (sensory-motor and operative) to explicit forms (conscious thoughts) through language and other means of representation. LEA also takes into account Werner & Kaplan considerations[6] on symbolic abilities to represent reality as a marked contribution to emotional development. In the 1960's the authors emphasized that internal and external objects only become known if the observer is capable of symbolically representing them through language or other forms of expression. With this in mind, affective experiences can only be incorporated as explicit knowledge if the subject symbolizes them in a way that they become conscious thoughts about feelings and not only implicit forms of knowledge (e.g. action tendencies or sensorial procedures). A main principle of this model is that the individual differences in emotional awareness reflect variations in terms of differentiation and integration of the schemes used in emotional information processing through introspection, whether it be external or internal. The development of cognitive schemata used to process emotional information is guided by words or other means of representation used to describe emotional experience. These contributions are the core of LEA, which offers a matrix for understanding emotional development and introduces new ways of assessing individual variability in terms of emotion regulation competencies such as emotional experience and expression, but also the empathetic skills. As we will describe later with regard to the levels of emotional awareness scale, this model considers empathy as a corollary of a well-differentiated structure of emotional experience, in the way that only individuals able to experience high differentiation and blends of emotions when faced with a certain stimulus will probably be competent enough to recognize the same skill in others and accept that they can experience that same stimulus with a totally different emotional valence. This is compatible with the consideration that those who are more able to experience and be aware of high differentiation and a mixture of emotions were simultaneously capable of forming a 'theory of mind' and to develop self-reflective abilities.[7,8]

LEA includes five levels of emotional awareness, gradually more differentiated and essentially sharing the structural characteristics of the Piagetian framework for cognitive development. In an ascending order of differentiation and integration, five levels involving the transformation of knowledge about the internal and external world are considered: 1. physical / bodily sensations; 2. action tendencies; 3. single/discrete emotions; 4. blends of emotions and 5. blend of blends of emotions, related to the ability to appreciate the complexity of self emotional experiences and those of others (Table 1).

Lane et al developed The Levels of Emotional Awareness Scale (LEAS) to assess the organization and complexity of emotional experience based on LEA. LEAS is a performance measure for characterizing the individual ability to symbolically represent emotions through words. It is a semi-projective scale composed of twenty items/situations, each one of them includes three or four sentences describing hypothetical scenarios, always involving two people. Scenes were designed in order to evoke four types of basic emotions (anger, fear, happiness or sadness) at five different levels, the complexity of which increases along the scale. LEAS is composed of two parallel forms that can be considered two short-versions, A and B. Each version has ten equivalent items which were chosen taking into account the complexity of the hypothetical scenarios. In a small number of papers regarding research with psychiatric samples,[9] the LEAS short versions have been used as measures of emotional awareness and to assess the construct of this awareness in studies with a pre and post treatment design. However, no normative data or specific psychometric qualities have been established on the short versions to date.

Application time of the complete version is about 30/40 minutes. In the protocol, one scenario (e.g. '*You are walking through the desert with a guide. You ran out of water hours ago. The nearest well is two miles away according to the guide's map.*') is presented per page, at the top followed by two questions: *How would you feel?* and *How would the other person feel?* Subjects write their answers on the correspondent page and are instructed to give answers as long or short as they want. The twenty scenarios are scored in three dimensions or subscales, referred to as "self", "other" and "total". The scoring system evaluates the structure of emotional experience and not the adequacy of the contents in each situation. The self and other dimensions are scored from '0' to '4' which, according to specific criteria, correspond overall to the following characteristics:

0 – answers that do not include emotional descriptions or in which the verb "feel" is used to describe contents related to thoughts and not to feelings;

1 – answers that reflect emotional awareness as physical sensations (e.g. "I would feel tired");

2 – answers that reflect undifferentiated emotions (e.g. "I would feel bad") or action tendencies (e.g. "I would feel like punching the wall");

3 – answers that use words describing differentiated but single emotions (e.g. "I would feel happy");

4 – answers with more words or expressions typified as level 3, which reflect a greater emotional differentiation (e.g. "I would feel very happy but at the same time sad and guilty").

The total score in each item corresponds to the highest score obtained between self and other. A possible score of "5", only attributable to the total score, is given when self and other dimensions of the same scenario are scored as "4" and simultaneously correspond to different emotional

Table 1 - Levels of knowledge transformation and organization of emotional experience

Levels of structure transformation / emotional awareness	External World	Internal World	Subjective quality of emotional experience	Emotional differentiation	Ability to describe emotions	Type of Knowledge
5. Formal Operational schemata	Abstract thinking using hypothetic-deductive reasoning	Diverse nuances experienced, in which experience does not limit the emotional awareness of others (empathy)	High differentiation and mixture	Richer differentiation in terms of intensity and quality	Description of more differentiated and complex states	Explicit representations (conscious thoughts)
4. Concrete Operational schemata	Several features of an object integrated into unified concepts, based on immediate experience	Multifaceted emotional experience includes experiencing opposite feelings and mixed emotions in a single reaction	Differentiated Emotions	Mixture of emotions, concurrence of opposing emotions	Description of differentiated emotions	
3. Preoperational schemata	Individual features of objects are used to represent the whole	Diffuse and one-dimensional emotional reactions	Simple Emotions	Experience of emotional extremes, with a limited repertoire	Description of single dimensional and stereotyped emotions	
2.Sensorimotor enactive schemata	Learning through physical perception of the objects	Induction changes in undifferentiated emotional state through actions on the environment	Action Tendencies	Tendency for action or global hedonic state	Description of action tendency or global hedonic states	Implicit representations (procedural, sensorimotor)
1. Sensorimotor reflexive schemata	Reflexive and involuntary responses	Involuntary responses in an automatic level and at interface with environment	Bodily Sensations	Global undifferentiation of the emotional arousal	Description of physical sensations or with no description	

experiences.

These levels describe the organization of emotional experience in affective traits, although they may also describe emotional states. The levels are hierarchically associated, considering that the functioning at a certain level adds and modifies the previous levels of functioning, but without removing them. For example, emotional experiences scored at level 4 may incorporate somatic sensations, typically from level 1, more differentiated than the ones presented in experiences typically from level 2.

Through the 1990´s the authors of the original scale developed validity and reliability studies, emphasizing instrument's good psychometric qualities[4]. Later, further studies on larger samples[10] also showed very good psychometric properties of the scale (high levels of inter-rater reliability for self, other and total scores and high intra-test homogeneity).

Studies analysing the discriminant validity of LEAS have highlighted non-significant correlations with measures that assess the frequency or intensity of emotional states, such as the Affect Intensity Measure, the Beck Depression Inventory or the Taylor Manifest Anxiety Scale.[11] These results support that LEAS assesses the emotional experience organization and its complexity instead of the intensity of emotional states.

Some authors have suggested the LEAS could be considered as a measure of alexithymia (a personality trait characterized by a difficulty in identifying and expressing feelings, a poor fantasy life and an external-oriented cognitive style, that influences several physical and psychiatric conditions). Although it measures a related construct, at least theoretically, LEAS was not developed with the specific aim of assess alexithymia but rather emotional awareness skills.[12] The correlations found in some papers between emotional awareness measured by LEAS and alexithymia measured by a self-report scale such as the Toronto Alexithymia Scale-20 items (TAS-20) seem to be relatively weak,[1,13] pointing to the need to develop more research in this field.

OBJECTIVES

Recognizing the value of this performance measure of the affective experience organization and its differentiation in a developmental perspective, the main objective of this study was to carry out a Portuguese version of LEAS with adequate psychometric qualities, as similar as possible to the original version. In addition, it was also a key aim to study the properties of the LEAS-A short version in a Portuguese sample, to guarantee a reliable and valid shortened measure for characterizing the emotional experience structure and awareness deficits, which may be especially relevant for evaluating medical samples or other groups of patients who are more resistant to psychological assessment or approaches.

MATERIALS AND METHODS

Considering the proposed objectives, this research project was developed in three major steps. The development of the Portuguese version of LEAS and its short-version obeyed a set of recommendations proposed by Moreira:[14] 1) request for the author's permission to use the instrument and the respective scoring manual; 2) elaboration of a Portuguese translation of the scale based on the contributions from three mental health professionals (three translations were prepared and a final version was obtained after consensus between the three professionals); 3) the back translation from the consensual version was sent to the author of the original scale, who reviewed it and proposed a few adjustments. After a pre-test with the final version on a small sample (n = 10), in which no questions or recommendations were made by subjects for improving the scale contents, three studies were developed involving analyses of the psy-

Table 2 - Socio-demographic characteristics (n = 176)

Socio-demographic characteristics	Sample (n = 176) Male (n = 33)	Female (n = 143)	χ^2 (Sig-2 sided)
Age			
18 - 20	4	49	
21 - 30	21	67	
31 - 40	3	18	2.49 (0.646)
41 - 50	2	4	
51 - 60	3	4	
≥ 61	0	1	
Marital Status			
Single	28	125	
Married	3	11	
Civil union	0	2	9.89 (0.078)
Divorced	2	3	
Widow	0	2	
Completed level of education			
High-school	24	117	
Graduate	7	25	5.00 (0.082)
Master	2	1	

chometric properties of the Portuguese versions of LEAS (complete and short).

Research was developed in public and private university institutions in Lisbon with students who consented, in an informed way, to participate in this investigation. The first study included students who were completing degrees in Medicine, Psychology, Nursing, Education and Electric Engineering (n = 176). The men and women who made up the sample had similar ages, marital status and educational level. Table 2 describes their socio-demographic characteristics. The sample (n = 176) was mainly composed of female (81.3%), with ages between 21 and 30 years old (50%), single individuals (86.9%) and students in their first year of the university (80.1%).

The second study was specifically developed for characterizing the test-retest reliability of LEAS. A sample of students was evaluated in two sequential moments from one of the faculties that have already participated in the first study, chosen due to convenience. The sample was also assessed with the Portuguese version of the TAS-20.[15] The students were told that the main objective of the first moment of assessment was to study a Portuguese version of a psychological instrument, but no clues were given about the second moment of assessment. The test-retest study was done with four weeks of interval between both moments of assessment. A set of 25 complete protocols (n = 50) was collected including LEAS and TAS-20. Subjects assessed in this study were mainly young women (96%) aged between 18 and 20 years old (52%).

Finally, in the third study the psychometric properties of the LEAS-A were tested. The emotional awareness was assessed in a sample of healthy individuals with no complaints or medical conditions, randomly selected from a public bank of blood donors, in Lisbon. This assessment was part of a larger clinical evaluation, also including socio-demographic and clinical data, and self-report measures of alexithymia and negative affect (the TAS-20 and the Portuguese version of Hospital Anxiety and Depression Scale,[16] HADS, respectively). All protocols were collected before donation and after the clinical screening of their health condition. Subjects gave their informed consent to participate. They were mainly female (63.3%), single (60%) and aged between 18 and 30 years old (53.4%).

SPSS Statistics (ver. 19.0) was used for all statistical analysis. Statistical significance was set at $p < 0.05$, two-tailed.

RESULTS

Study 1

Table 3 presents the mean results of the three dimensions scored on LEAS: self, other and total. The mean results ± 1 SD point to a higher awareness for self's emotions (57.16 ± 10.59) and less for other's emotions (51.31 ± 10.88). It also shows the mode and mean values of scores, in each scene/item, for each one of the three dimensions scored in LEAS. It emphasizes, in three dimensions, the relevance of answers scored at the 3rd level, showing explicit representations of emotional experiences as single but differentiated emotions. The internal consistency analyses of the LEAS showed high intra-test homogeneity.

Table 3 - LEAS means results and mode and mean values for each item of the scale (n = 176)

LEAS subscales/ dimensions	Mean results (SD)	Mode values for each item																				Mean scores in each dimension
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
self	57.16 (10.59)	3	3	4	3	3	4	4	2	4	4	4	3	3	3	3	3	3	3	3	4	2.86
other	51.31 (10.88)	3	3	3	3	2	4	4	3	4	3	3	3	3	0	3	3	3	3	3	4	2.58
total	64.26 (10.87)	3	3	4	3	3	3	4	3	3	4	4	4	3	3	3	3	3	3	3	4	3.20

Table 4 - Inter-rater reliability (Correlations)

Raters / r values	Rater A			Rater B			Rater C		
	self	other	total	self	other	total	self	other	total
Rater A	1	1	1	0.998**	0.998**	0.999**	0.993**	0.993**	0.995**
Rater B	0.998**	0.998**	0.999**	1	1	1	0.994**	0.993**	0.995**
Rater C	0.993**	0.993**	0.995**	0.994**	0.993**	0.995**	1	1	1

** $p < 0.01$

Table 5 - Mean results on LEAS-A and TAS-20 (*n* = 41)

	Mean	SD
LEAS - Self	24.59	5.85
LEAS - Other	21.39	5.34
LEAS Total	28.76	5.33
TAS-20 DIF	15.98	6.28
TAS-20 DDF	12.80	4.80
TAS-20 EOT	19.44	4.12
TAS-20 Total *Score*	48.22	12.54

The *Cronbach Alpha* Coefficient was calculated based on the scores of self, other and total, showing α-values of 0.85, 0.82 and 0.88, respectively (*n* = 176).

Protocols were scored in an independent way by three raters, all of them clinical psychologists. The psychometric analyses highlighted quite adequate levels of reliability of this LEAS version. The correlation coefficients among the assigned scores by the 3 raters (Table 4) to self, other and total for each of the 20 items have highlighted a very good inter-rater reliability (r = 0.998, 0.998, 0.999, $p < 0.01$).

Similarly to other studies, total scores with Portuguese version of LEAS showed different mean scores ± 1 SD between men and women, with men showing decreased levels of emotional awareness than women (52.70 ± 13.39, 58.20 ± 9.60 for self in men and women, respectively; 47.94 ± 15.33, 52.08 ± 9.47 for other; 60.24 ± 14.75, 65.18 ± 9.59 for total scores). The exploratory analysis based on the *Levene Statistic* revealed that the assumptions of the homogeneity of variance were not met. The *Mann Whitney U Test* showed that women seem to be significantly more aware of their emotions than men, although men and women did not differ significantly in other and total scores (U = 2926.5, p = 0.031; U = 2659.0, p = 0.256; U = 2812.0, p = 0.086 for self, other and total, respectively).

The sets of items that compose the two short versions LEAS-A and LEAS-B, (which make up the complete version, as mentioned before) were also studied. The correlation between total scores of versions A and B is positive and highly significant (r = 0.771, $p < 0.01$). LEAS-A and LEAS-B also correlate significantly with the complete version of LEAS (r = 0.943, $p < 0.01$; r = 0.929, $p < 0.01$, respectively). The results show the similarity of the two short versions and emphasize the potential of using one of the versions or, in longitudinal studies, using one in a first moment and the other in a later moment for assessing changes in emotional awareness.

Study 2

Test-retest suggested very good reliability for the Portuguese version of LEAS (ρ = 0.795, $p < 0.001$), showing a good stability of the measure across time. Similar results were found for TAS-20 (ρ = 0.776, $p < 0.001$). Correlations on TAS-20 and LEAS total scores did not correlate significantly, suggesting that alexithymia and emotional awareness measured by these two instruments are well differentiated constructs and not directly related.

Study 3

Tables 5 and 6 show, respectively, mean results in LEAS-A and TAS-20 among a sample of healthy individuals, and correlations between TAS-20 and LEAS-A factors/scores. Internal consistency measured by *Cronbach Alpha* shows good intra-test homogeneity level in LEAS-A (α = 0.79) Total scores of alexithymia and emotional awareness scales are negatively related but they did not reach a significant correlation. However, Pearson correlations showed an inverse and significant association between the emotional awareness level (total score) and externally-oriented thinking style (r = -0.318, $p < 0.05$).

LEAS-A scores (self, other and total) did not relate to anxiety (r = 0.101, p = 0.530; r = -0.074, p = 0.646; r = -0.018, p = 0.911; respectively) or to depression symptoms (r = 0.019, p = 0.907; r = -0.211, p = 0.185; r = -0.146, p = 0.362; respectively) or even with HADS total scores (r = 0.068, p = 0.674; r = -0.152, p = 0.341; r = -0.087, p = 0.590; respectively), reinforcing that LEAS is a measure of the emotional experience organization and not of the frequency or the valence of the emotional states and, as much, is independent from negative affect. The TAS-20 *scores* did not also relate to negative affect measured on HADS.

Table 6 - TAS-20 and LEAS-A correlations (*n* = 41)

TAS-20 factors		LEAS-A self	LEAS-A other	LEAS-A total
1st Factor (DIF)	Pearson	0.071	0.201	0.080
	Sig. (2-tailed)	0.658	0.207	0.617
2nd Factor (DDF)	Pearson	0.093	0.247	0.064
	Sig. (2-tailed)	0.562	0.120	0.693
3rd Factor (EOT)	Pearson	-0.244	-0.134	-0.318*
	Sig. (2-tailed)	0.124	0.404	0.043
Total Score	Pearson	-0.009	0.151	-0.040
	Sig. (2-tailed)	0.956	0.345	0.804

* $p < 0.05$

DISCUSSION

A preliminary analysis suggests that the Portuguese version LEAS is an adequate instrument for assessing emotional awareness construct and to characterize emotional experience structure. As far as we know, this is the first psychological measure with good psychometric properties that allow studying emotional awareness in a cognitive-developmental perspective, in Portugal. The sample of pre-graduate students assessed with LEAS, from such different degrees as medicine, engineering or psychology gave interesting results in terms of internal consistency and the highest values of *Cronbach Alpha*, when compared to other adaptation procedures of the scale developed in other countries like France[17] or Japan.[2] It should be noted that the scoring of the answers complied strictly with parameters suggested by the scoring manual of the original scale, using the glossary of words included in it.[18] In a similar way, a high inter-rater consistency was observed, which highlights the reliability qualities of the scoring procedures.

Parallel forms composing the original scale are positive and significantly correlated with the total score of LEAS complete version. These two reduced versions of the complete scale have been used in some studies with clinical samples[9,13] and this study supports that they have the potential to be used as adequate measures in longitudinal studies involving multiple moments of assessment of emotional awareness (e.g. in pre/post treatment studies, LEAS-A can be used in a first testing session and LEAS-B in the second one), without a plausible learning effect due to the continual presentation of the same items. In the last study, carried out with blood donors who were assessed with LEAS-A, the *Cronbach Alpha* value points to a good level of internal consistency. Nevertheless, it is relevant to develop other studies with healthy samples, assessed in two different moments with both short-versions in order to corroborate these psychometric findings.

With regard to the gender differences in emotional awareness, the results on the first study sustain some previous considerations,[19] which emphasized that women show higher emotional awareness levels, on average, than men. This study, however, only reached a significant difference in self's emotions between the genders and did not show a significant difference in other and total scores. For these results, the difference between the number of male and female participants that made up the sample may have been a contributing factor, pointing to the relevance in studying other samples with less variance in terms of the gender of the participants. Nonetheless, Barrett and collaborators have shown that even controlling verbal ability variables, women scored significantly higher than men on LEAS.

In terms of the temporal stability of LEAS, an indicator not very well characterized in previous studies, the results in the second study (test-retest reliability) showed a good stability throughout time. TAS-20 and LEAS did not correlate significantly, underlining differences between constructs measured by these two instruments and supporting indices of concurrent validity of the Portuguese LEAS.

In the last study, TAS-20 and LEAS-A correlated negatively although without statistical significance, which is in accordance with some literature. Studies[1,13] have indicated that different evaluation methods of emotional deficits may provide distinct results, in the way that self-evaluation of own ability to identify or express emotions (e.g. TAS-20) may reflect different characteristics of the alexithymic phenomenon, comparatively to the evaluation of those same skills through a performance measure, in which these abilities are mainly required (e.g. LEAS). Moreover, the fact that an individual does not report difficulties in his emotional experience does not exclude the presence of alexithymia, which highlights the differentiation of the constructs measured by these two scales and a possible explanation for the non-significant correlation of their total scores.

This third study also gave some interesting results, strengthening the evidence of LEAS construct validity. A significant negative correlation found between emotional awareness (total score) and TAS-20 Factor 3 (externally-oriented thinking) is consistent with results found in a preceding study with the complete version of LEAS.[12] In data collected during this study, emotional awareness assessed by LEAS-A was inversely related to a concrete thinking style, less flexible or creative and focused on daily details, in agreement with a reduced emotional complexity and differentiation. This result may be supportive of the validity of this LEAS short-version as a psychological measure of emotional awareness from a developmental perspective, quite distinct from a measure of alexithymia such as TAS-20. Previous findings have already suggested that externally-oriented thinking seems to be more correlated with other indices of alexithymia than Factors 1 and 2, such as Perception Affect Task total score[1] or the number of emotion words used in response to pictures with some similarity to those included in the Thematic Apperception Test.[20] Factor 3 items are less of a self-evaluation and more an indicator of preferences or skills associated to externally-oriented thinking. Higher alexithymic individuals perhaps may be well competent in evaluating themselves on these preferences, but because of their plausible lack of emotional awareness it becomes particularly difficult to accurately rate themselves in items included on Factors 1 and 2. It may also be relevant to mention Lumley's considerations on Factor 3 of TAS-20. This researcher emphasizes that alexithymia generally predisposes to negative emotional conditions and, in that sense, it is quite reasonable that TAS-20, a measure specifically developed for alexithymia assessment, may correlate significantly with measures of negative affect,[21] although it did not take place in this study. Nonetheless, in an opposite way to Factors 1 and 2, Factor 3 (externally-oriented thinking) is frequently less or even not at all related to negative effect. Though Factor 3 items seem to characterize a specific cognitive feature of the alexithymic functioning relatively unrelated to negative affect, similarly to what was found in this study and in other studies with LEAS,[22] that was unrelated to symptoms of anxiety and depression. Although the sample of the third study was

relatively small, which implies more research to verify these associations, the results provide new evidence on the discriminant validity of LEAS-A, never reported before.

LEAS-A and TAS-20 appear to measure different aspects of the sensitivity to inner emotional states and provide independent contributions for assessment. Alexithymia and emotional awareness, measured by these psychological tools, seem to be unrelated constructs but in a certain way (inverse) linked by a cognitive style markedly concrete and poorly introspective. These considerations highlight that these measures may be complementary in assessment of self-emotional awareness and its severe impairments, but they do not appear to be interchangeable instruments.

CONCLUSIONS

In conclusion, this investigation highlights the good psychometric properties of the Portuguese version of LEAS, in terms of reliability and validity, supporting its scientific use in emotion-related research or in the study of individual emotion regulation characteristics in clinical settings. The short version LEAS-A assumed adequate psychometric properties as well. This is also the first paper, as far as we know, in which LEAS-A was studied in healthy samples in terms of its psychometric properties, which provided some data that can be used as reference for comparison with other groups. This study showed that LEAS short versions have good psychometric qualities, which is relevant for its use in the assessment context. It may be especially important for the evaluation of emotional awareness deficits in clinical samples or individuals hardly resistant or less tolerant to assessment approaches and for whom the complete version of LEAS would perhaps be considered too extensive, and consequently less appropriate to use in some clinical settings. In the future, we believe it will be relevant to extend the study of these versions to a set of other samples or groups, in order to support a more complete validation procedure. Although the data contribute to the psychometric properties of the Portuguese versions of LEAS, these studies had some limitations. In addition to the discrepancy observed in gender of the participants, samples were mainly composed of young adults, which may extensively limit the potential generalization of the results.

LEA and its assessment methodology seem to be undeniably relevant to research and clinical settings and we consider their use to have some implications on those contexts. In the research context, LEAS can be a very useful tool for qualifying clinical groups in terms of their competencies or deficits on labelling and expressing emotions, in a complementary way to the TAS-20 quantitative approach or even related to imagery or psychophysiological methods used in psychosomatic and emotion regulation research. Its use may also be relevant in research related to the treatment outcomes, for measuring clinical changes in emotional awareness in samples of individuals followed in different psychiatric / psychological treatment' approaches. From a clinical perspective, LEAS may definitely contributes towards a new paradigm of evaluation of changes processed in psychotherapy,[8] focused on the transformation of implicit forms of emotional representing into conscious feelings. Additionally, we consider that LEAS and its model can offer effective tools for a more adequate conceptualization of psychotherapeutic projects, centred on emotional strategies or clinical interventions further consonant with the levels of cognitive-developmental organization of the affective experience in which individuals mainly experience emotions.

CONFLICT OF INTERESTS

None stated.

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