# Psychometric properties of the Brazilian version of the Difficulties in Emotion Regulation Scale (DERS)

## Propriedades psicométricas da versão Brasileira da Difficulties in Emotion Regulation Scale (DERS)

Ana Carolina Maciel Cancian, ⓘ Lucas André Schuster de Souza, Victória Helena Pesenti e Silva, Wagner de Lara Machado, Margareth da Silva Oliveira

**Abstract**

**Introduction:** Emotion regulation can be defined as the process by which individuals manage their emotional experience. It has been demonstrated that deficits in this ability are associated with various psychiatric disorders. In this direction, the Difficulties in Emotion Regulation Scale (DERS) was developed to measure difficulties in emotion regulation.

**Objective:** To examine the psychometric properties of the Brazilian Portuguese version of the DERS.

**Method:** A total of 377 individuals from the general population, selected by convenience, completed a sociodemographic form, the adapted Brazilian Portuguese DERS and the Depression Anxiety Stress Scale (DASS-21). Factor structure, reliability, and concurrent validity of the adapted version of the instrument were investigated.

**Results:** The confirmatory factor analysis replicated the six-factor structure originally proposed for the instrument and confirmed the acceptability of a hierarchical model where all DERS subscales loaded on a general emotion dysregulation factor. Internal consistency indicators had adequate values for the general factor and subscales. The positive association between DERS and DASS-21 scores supports the instrument's concurrent validity.

**Conclusion:** These results suggest that the Brazilian version of the DERS is reliable both as a general measure of difficulties in emotion regulation and as a measure of the constituents of this construct. Future research should investigate the psychometric properties of the scale in clinical and nonclinical populations, with equal gender proportions and diverse backgrounds, and preferably employing longitudinal designs.

**Keywords:** Emotions, psychometrics, symptom assessment.

**Resumo**

**Introdução:** Regulação emocional pode ser definida como o processo pelo qual os indivíduos regulam sua experiência emocional. Tem sido demonstrado que déficits na regulação emocional podem estar associados a vários transtornos psiquiátricos. Nesta linha, a Difficulties in Emotion Regulation Scale (DERS) é um instrumento que foi desenvolvido para acessar dificuldades na regulação emocional.

**Objetivo:** Examinar as propriedades psicométricas de uma versão da DERS adaptada ao português brasileiro.

**Método:** Um total de 377 indivíduos da população geral foram selecionados por conveniência para completar um questionário sociodemográfico, a versão adaptada ao português brasileiro da DERS e a Depression Anxiety Stress Scale (DASS-21). Foram investigadas a estrutura fatorial, confiabilidade e validade concorrente da versão adaptada da DERS.

**Resultados:** A análise fatorial confirmatória replicou a estrutura de seis fatores originalmente proposta para o instrumento e confirmou a aceitabilidade de um modelo hierárquico em que todas as subescalas são carregadas em um fator de desregulação emocional geral. Os indicadores de consistência interna apresentaram valores adequados para o fator geral e subescalas. A associação positiva entre os escores obtidos na DERS e na DASS-21 dá suporte à validade concorrente do instrumento.

**Conclusão:** Esses resultados sugerem que a versão brasileira da DERS é confiável como medida geral de dificuldades na regulação emocional e como medida dos constituintes desta construção. Pesquisas futuras devem investigar as propriedades psicométricas da escala em populações clínicas e não clínicas, com igual proporção de gênero e diversas origens e, de preferência, empregando desenhos longitudinais.

**Descritores:** Emoções, psicometria, avaliação de sintomas.

## Introduction

Emotion regulation can be defined as the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions.[1-3] Emotion regulation may decrease, increase, or simply maintain emotional response, depending on an individual's goals. Since deficits in this ability are associated with various psychiatric disorders, it can be considered to be a transdiagnostic process.[4] Difficulties in emotion regulation are present in several forms of psychopathology such as eating disorders, substance abuse, anxiety, mood, and personality disorders.[1,4-8]

Therefore, successful emotion regulation seems to be a prerequisite for adaptive functioning.[3] The emotion regulatory process of an individual may be automatic or controlled, conscious or unconscious and involve extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions.[3,9] This process is also described as one of the several forms of affect regulation, which means an attempt to alter some aspect of the interaction between the individual and the environment.[3]

In 2004, Gratz & Roemer,[10] having knowledge of the clinical significance of emotion regulation, reviewed the extant literature to conceptualize emotional regulation with the objective of developing and validating a measure to assess difficulties in this ability. After this review, the authors concluded that emotional regulation involves a) awareness and understanding of emotions, b) acceptance of emotional responses, c) ability to control impulsive or inappropriate behaviors and behave in accordance with desired goals when experiencing negative emotions, and d) ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands. Therefore, an absence of any or all of these categories would indicate the presence of difficulties in emotion regulation, or emotion dysregulation.

Based on this multidimensional conceptualization of emotion regulation, the Difficulties in Emotion Regulation Scale (DERS) was developed. It comprises 36 items with responses ranging on a 5-point Likert-type scale.[10] The authors of the scale conducted an exploratory factor analysis to examine its factor structure and results showed that emotion regulation was better described including six dimensions instead of four. These six factors were described as: difficulty accepting emotional responses (nonacceptance, 6 items), lack of emotional awareness (awareness, 5 items), limited access to emotion regulation strategies (strategies, 8 items), difficulties engaging in goal-directed behavior when emotionally aroused (goals, 5 items), difficulties with impulse control (impulse, 6 items), and lack of emotional clarity (clarity, 5 items). Furthermore, in its original study, the DERS demonstrated high internal consistency (α = 0.93), good test-retest reliability (0.88 on a period ranging from 4 to 8 weeks), and adequate construct and predictive validity, providing empirical support for a multidimensional conceptualization of emotion regulation.

A Brazilian version was developed by Miguel et al.,[11] who found evidence supporting the six-factor structure originally proposed by the creators of the instrument. In that study, the scale showed good internal consistency (α = 0.94). Moreover, the Brazilian DERS showed adequate convergent validity, being positively correlated with alexithymia, affective empathy and maladaptive personality traits and negatively correlated with cognitive empathy. The authors also investigated divergent validity, showing that the DERS is not correlated with cognitive abilities. The study performed in the Brazilian sample suggests that the DERS could be applied in clinical and nonclinical populations, especially when associated with related symptoms, e.g., anxiety and depression.[11] Until now, no study was found to have tested whether scores on the Brazilian DERS correlate with measures of depression, anxiety and stress.

In the end of their preliminary study, Gratz & Roemer[10] presented limitations that they suggested should be addressed in future research. The authors also claimed that it was necessary to examine the psychometric properties and factor structure of the DERS in clinical and nonclinical samples, as well as how it relates to other measures of general distress or psychopathology, like anxiety and depression. Consistently with Gratz & Roemer's[10] recommendations, Ritschel et al.[12] utilized the Depression, Anxiety, and Stress Scale (DASS)[13] to examine if distress symptomatology was associated with DERS scores. The authors concluded that DERS and DASS were significantly positively correlated.

The DERS scale was adapted and had its psychometric properties investigated in several countries, e.g., Italy,[14] Portugal,[15] Turkey,[16] Greece,[17] Chile,[18] Argentina,[19] and Brazil.[11] Generally, these adaptations have confirmed the six-factor structure proposed by the original authors. Nonetheless, Bardeen et al.[20] advocated for testing a hierarchical factor structure, which would provide more consistent evidence for using total DERS scores as a measure of general difficulties in emotion regulation. In this case, higher-order confirmatory factor analysis (CFA) would address the hypothesis that a general factor accounts for the correlations among lower-order factors of the scale. Testing a hierarchical factor also

allows one to determine the relative importance of each subscale to the general factor. Such an approach has not yet been applied to the study of the factor structure of the Brazilian DERS.

To date, the issues presented have not been addressed focusing on the Brazilian version of the DERS. Therefore, this study was designed to examine additional psychometric characteristics of the Brazilian Portuguese DERS. The aim was to investigate the adequacy of both a simple intercorrelated factor structure and a hierarchical factorial structure, as well as its internal consistency and the association between scores obtained on the Brazilian version of the DERS and distress measures assessed by the DASS-21 in a nonclinical sample.

## Method

### Translated instrument

The authors sought to develop an adaptation of the DERS to Brazilian Portuguese in line with the guidelines of the International Test Committee for adapting psychometric tests.[21] Various procedures were adopted to investigate whether the concepts could be transposed to the new context and culture in which it was intended to be used.[22] Before beginning the scale adaptation, the original author (Dr. Kim Gratz) was contacted and provided authorization and materials of the original DERS.

In the first step towards adapting the scale, two Brazilian Portuguese versions of the instrument were elaborated, one by a bilingual psychologist who was familiar with the concept of emotion regulation (T1), and the other by a professional translator with a major in English (T2). A synthesis of both versions, done by one of the authors (AC), led to a third version (T3). This third version was then back-translated into English by another independent translator (R1).

The back-translated version (R1) was sent to the author of the original scale (Dr. Kim Gratz) to verify its semantic equivalence. Notes and suggestions were proposed for the instructions and items 3, 6, 13, 15, 17, 20, 34 and 36. Adjustments related to the content were added and this set of translated items approved by Dr. Gratz composed a preliminary version of the scale.

The preliminary version was presented to a group of 10 psychologists with both clinical and research experience. They were asked to rate how well they could understand each item of the scale, using an online survey platform. For comprehension ratings, an ordinal scale was used, comprising the following options: 0 - I did not understand anything; 1 - I understood only a little; 2 - I understood somewhat; 3 - I understood almost

everything, but I had some doubts; 4 - I understood almost everything; 5 - I understood perfectly and I have no doubts. Open text fields were also made available for professionals to justify their answers or to suggest changes. Scores obtained with the numerical scale were used to compute a modified version of the content validity index (CVI),[23] which was obtained by determining the proportion of judges who rated 4 or 5 on scale comprehension. After this procedure, a final version of the 36-item scale was retained for testing. The final items in the Brazilian Portuguese version of the DERS and their CVIs are available as online-only supplementary material (Appendix 1).

### Participants

The sample comprised 377 individuals from the general population who anonymously completed self-report questionnaires and a sociodemographic form. Participants' age ranged from 18 to 66 years, with a mean age of 33.9 (standard deviation = 10.4). Seventy percent (n = 267) of these participants were female and the majority of the sample had at least some college education (n = 328, 87%).

### Ethical considerations

This research was approved by the research ethics committee of Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS; protocol no. 50096515.0.0000.5336). Individuals invited to participate were chosen by convenience, via email and social media sites (Facebook and WhatsApp). Data were collected online using the Qualtrics platform during the year of 2016. All participants agreed to the consent form that was available on the first page of the questionnaire. Participants did not receive any financial compensation for participation.

### Measures
*Difficulties in Emotion Regulation Scale (DERS)*

The DERS is a 36-item self-report scale measuring difficulties in emotion regulation. Individuals indicate how often items occur using a 5-point Likert scale ranging from almost never to almost always. The scale has six factors: difficulty accepting emotional responses (nonacceptance, 6 items), lack of emotional awareness (awareness, 5 items), limited access to emotion regulation strategies (strategies, 8 items), difficulties engaging in goal-directed behavior when emotionally aroused (goals, 5 items), impulse control difficulties (impulse, 6 items), and lack of emotional clarity (clarity, 5 items). The original version showed high internal consistency (α = 0.93) and good test-retest reliability.[10]

*Depression Anxiety Stress Scales (DASS)*

The DASS is a self-report scale that assesses the severity of depression, anxiety and stress symptoms in the past week. In this study, we utilized the 21-item version (DASS-21). Items are rated on a 4-point Likert-type scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). The DASS-21 was adapted and validated to Brazilian Portuguese and the results indicated good internal consistency for each subscale: 0.92 for depression, 0.90 for stress, and 0.86 for anxiety.[13,24,25] Alphas on this study's sample were 0.89 for depression, 0.83 for stress, and 0.87 for anxiety.

**Data analysis**

*Factor structure*

A CFA was conducted to assess how well the six-factor structure originally proposed by Gratz & Roemer[10] fitted the data obtained with the Brazilian version of the DERS. A shorter version of the DERS with 16 items has been tested in another study with a Brazilian sample,[11] with results suggesting good reliability. It has been argued that a shorter version is superior in terms of ease of use, as it takes less time to complete. Nevertheless, the removal of nonredundant items from the instrument reduces the range of the latent construct that is encompassed by the items, and thus negatively affects the instrument's construct validity.[26] In addition to that, one of the factors on the 16-item model was represented by only 2 items. While this does not preclude factor analysis, it does make the model more susceptible to under-identification and should be avoided if possible.[27] Therefore, we consider that using the original 36-item would be a more theoretically and methodologically consistent choice, despite the 16-item model having shown adequate statistical results.[10] Since the distribution of item responses in the sample violated the assumption of normality, the diagonally weighted least squares estimator with robust standard errors (DWLS) was used, because it has been shown to perform better than other estimators under nonnormality.[28] The Tucker-Lewis index (TLI), comparative fit index (CFI) and root mean squared error of approximation (RMSEA) were used to assess each model's fit to the data. The adopted cutoff criteria for accepting a model were values larger than 0.90 on both CFI and TLI, and RMSEA values smaller than 0.08.[27,29]

*Reliability*

Internal consistency for the whole scale and subscales was assessed by determining point estimates and 95% confidence intervals for Cronbach's alpha coefficient, composite reliability and average variance extracted.

*Concurrent validity*

In order to assess the instrument's validity based on external criterion variables, associations among DERS and DASS-21 subscales were tested. Given that initial data exploration showed that the distribution of DERS and DASS-21 scores was highly right-skewed on some subscales, thus violating normality assumptions, nonparametric correlation analysis (Spearman's rho) was used to test these associations. Statistical analysis was conducted using JASP v0.8.2.

## Results

**Sample characteristics**

The majority of the sample was female, with post-secondary education or higher and with high income (Table 1).

**Factor structure**

A single-factor baseline model was generated to serve as comparison for the other theoretical models. This first single-factor model had a poor fit, as hypothesized (CFI = 0.890, TLI = 0.884, RMSEA = 0.100). The second model to be tested was based on the original intercorrelated six dimensions proposed by Gratz & Roemer.[10] Fit indices

**Table 1 -** Sociodemographic characteristics of the sample

| Variables | n | Mean (SD) or % |
|---|---|---|
| Age | 377 | 33.99 (10.47) |
| Gender | | |
| Male | 110 | 29.2 |
| Female | 267 | 70.8 |
| Education | | |
| Less than secondary education | 14 | 3.7 |
| Secondary education | 35 | 9.3 |
| Post-secondary education | 197 | 52.2 |
| Graduate education or higher | 125 | 33.2 |
| Other | 6 | 1.6 |
| Monthly income in Brazilian minimum wage | | |
| 1-2 | 93 | 24.7 |
| 3-4 | 76 | 20.2 |
| 5-6 | 92 | 24.4 |
| 7-8 | 46 | 12.2 |
| 9-10 | 21 | 5.6 |
| >10 | 49 | 13.0 |

SD = standard deviation.

for the second model met the specified criteria for good model fit (CFI = 0.972, TLI = 0.969, RMSEA = 0.051). Model 3 comprised a hierarchical structure in which a second-order factor accounted for the covariance among all DERS subscales as specified in the original validation study. This third model also fitted the data adequately, yet not showing as good fit indices as the second one (CFI = 0.953, TLI = 0.950, RMSEA = 0.066). Table 2 shows fit measures for all tested models. Path diagrams with standardized loadings and error variances for both models are available as online-only supplementary material (Appendices 2 and 3).

The correlations among all six subscales in the first-order model are shown in Table 3. In accordance with what has been found in other studies investigating DERS' factor structure,[20] the awareness scale showed the smallest correlation coefficients in the first-order model and exhibited a low factor loading on the general factor (0.30) in the second-order model, while all other subscales had high loadings on the general emotion dysregulation factor.

**Reliability**

The results indicated that the instrument has a very high internal consistency, with an alpha of 0.94 for the overall scale, ranging from 0.79 to 0.88 on subscales. Additionally, composite reliability and average variance extracted by factor were computed in order to determine the reliability of each subscale while accounting for different item loadings and error estimates provided by the CFA.[30] Table 4 presents reliability measures for all subscales and for the total scale.

**Table 2 -** Fit statistics for all models

|  | df | $\chi^2$ | $\chi/df^2$ | p | CFI | TLI | RMSEA |
|---|---|---|---|---|---|---|---|
| Model 1 | 594 | 2.814.785 | 4.739 | < 0.001 | 0.890 | 0.884 | 0.100 |
| Model 2 | 579 | 1.148.743 | 1.984 | < 0.001 | 0.972 | 0.969 | 0.051 |
| Model 3 | 588 | 1.536.700 | 2.613 | < 0.001 | 0.953 | 0.950 | 0.066 |

Model 1 = single-factor model; Model 2 = original correlated six-factor model; Model 3 = six-factor model with second-order general factor.
CFI = comparative fit index; df = degrees of freedom; RMSEA = root mean squared error of approximation; TLI = Tucker-Lewis index.

**Table 3 -** Spearman's nonparametric correlations among DERS subscales (first-order model)

|  | Nonacceptance | Goals | Impulses | Awareness | Strategies | Clarity | Total |
|---|---|---|---|---|---|---|---|
| Nonacceptance | - | 0.579* | 0.515* | 0.130† | 0.683* | 0.408* | 0.727* |
| Goals |  | - | 0.637* | 0.193* | 0.752* | 0.495* | 0.819* |
| Impulses |  |  | - | 0.264* | 0.683* | 0.543* | 0.782* |
| Awareness |  |  |  | - | 0.251* | 0.572* | 0.508* |
| Strategies |  |  |  |  | - | 0.543* | 0.887* |
| Clarity |  |  |  |  |  | - | 0.747* |
| Total |  |  |  |  |  |  | - |

DERS = Difficulties in Emotion Regulation Scale.
* p < 0.001, † p < 0.05.

**Table 4 -** Reliability indicators for the six subscales and total scores on the Brazilian Portuguese DERS

| Scale/subscale | Cronbach's α | Cronbach's α 95%CI | | Average variance extracted | Composite reliability |
|---|---|---|---|---|---|
|  |  | Lower | Upper |  |  |
| Goals | 0.849 | 0.824 | 0.872 | 0.547 | 0.856 |
| Nonacceptance | 0.889 | 0.871 | 0.905 | 0.560 | 0.883 |
| Impulse | 0.845 | 0.820 | 0.868 | 0.488 | 0.849 |
| Awareness | 0.831 | 0.803 | 0.856 | 0.463 | 0.835 |
| Strategies | 0.888 | 0.870 | 0.904 | 0.502 | 0.889 |
| Clarity | 0.790 | 0.754 | 0.822 | 0.441 | 0.791 |
| Total DERS | 0.940 | 0.930 | 0.948 | 0.585 | 0.887 |

95%CI = 95% confidence interval; DERS = Difficulties in Emotion Regulation Scale.
Model 3 was used to compute reliability estimates.

### Concurrent validity

The DASS-21 scale was used in this study to assess concurrent validity due to its hypothesized relationship with emotion regulation. Correlations among DERS and DASS-21 subscales were statistically significant and moderate to high in magnitude. Nonparametric correlation coefficients are shown in Table 5.

As shown in Table 5, all the DERS subscales were significantly correlated with DASS-21 subscales, with nonparametric correlation coefficients ranging from medium to large in magnitude, except for the awareness subscale in DERS, which presented lower correlations with the other subscales.

Scores on the DASS-21 subscales can be categorized based on severity level, over a total of 5 severity levels which range from normal to very severe. Thus, checking whether DERS scores substantially differ along these

levels might improve its clinical utility. In order to verify that, mean scores and standard errors for the mean were calculated for DERS subscales on each of the five DASS-21 severity levels. Table 6 shows means and standard errors for DERS total scores on each DASS-21 subscale along the five severity levels. These data show a clear trend where emotion dysregulation scores follow symptom severity with very little overlap between each severity level.

## Discussion

The aim of the present study was to further investigate the factorial structure, internal consistency, and concurrent validity of a Brazilian version of the DERS. The original scale was translated and

**Table 5 -** Spearman's nonparametric correlations between DERS subscales and DASS-21 subscales (n = 377)

| DASS-21 subscales | DERS subscales | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Nonacceptance** | **Goals** | **Impulses** | **Awareness** | **Strategies** | **Clarity** | **Total** |
| Depression | 0.492 | 0.557 | 0.496 | 0.301 | 0.642 | 0.508 | 0.667 |
| Anxiety | 0.416 | 0.434 | 0.497 | 0.295 | 0.519 | 0.477 | 0.575 |
| Stress | 0.468 | 0.507 | 0.559 | 0.246 | 0.598 | 0.513 | 0.631 |
| Total | 0.528 | 0.575 | 0.592 | 0.320 | 0.678 | 0.569 | 0.719 |

DASS-21 = Depression Anxiety Stress Scales; DERS = Difficulties in Emotion Regulation Scale.
p < 0.001.

**Table 6 -** Means and standard errors for DERS scores on each severity level for DASS-21 subscales

| DASS-21 subscales/severity levels | n | DERS total score mean (standard error) |
|---|---|---|
| Depression | | |
| Normal | 185 | 70.95 (1.19) |
| Mild | 54 | 86.98 (2.55) |
| Moderate | 62 | 91.92 (2.66) |
| Severe | 37 | 107.1 (3.17) |
| Extreme | 39 | 111.9 (3.46) |
| | | |
| Anxiety | | |
| Normal | 217 | 74.95 (1.31) |
| Mild | 28 | 86.57 (3.43) |
| Moderate | 50 | 91.82 (3.2) |
| Severe | 23 | 97.52 (4.79) |
| Extreme | 59 | 107.3 (2.83) |
| | | |
| Stress | | |
| Normal | 183 | 71.98 (1.32) |
| Mild | 67 | 87.25 (2.42) |
| Moderate | 48 | 94.56 (3.46) |
| Severe | 53 | 104 (2.39) |
| Extreme | 26 | 107 (5.02) |

DASS-21 = Depression Anxiety Stress Scales; DERS = Difficulties in Emotion Regulation Scale.

back-translated for adjustment and adaptation of its instructions and items. Even though we used a different translation than the one employed in the other psychometric study about the Brazilian DERS,[11] it is possible to interpret evidence gathered here as supporting the multidimensional model proposed by Gratz & Roemer's, since semantic equivalence to the original measure was ascertained on both versions by means of rigorously applying procedures of cultural adaptation in different regions of Brazil.

Psychometric properties were investigated in a significant sample of individuals from the general population (N = 377). It was expected that the factorial structure obtained in the original English version would be confirmed, and it was hypothesized that a higher-order general factor would account for the covariance among the subscales.

By means of CFA, it was possible to replicate the six-factor structure originally proposed for the instrument, as well as to confirm the acceptability of a hierarchical model with all DERS subscales loaded on a general emotion dysregulation factor. While both models showed adequate fit to the data, fit measures for the hierarchical model were inferior than for the original with a single level. An inspection of the factor loadings showed that the awareness subscale had the lowest loading on the higher-order factor, which may explain the reduced model fit. This is in line with the hypothesis that the awareness subscale is not a manifestation of the same overall factor under which the other subscales lie, in line with the recent findings reported by Bardeen et al.[20] Considering these results, future studies that investigate different factor structures without the awareness scale loading on the general factor may be warranted.

Reliability was verified by checking internal consistency, both with a classical indicator (alpha) and with indicators based on factor loadings and residual variances (composite reliability and average variance extracted). All internal consistency indicators had adequate values for the general factor and subscales (ranged from 0.79 to 0.88). Reliability for the total DERS score was high ($\alpha$ = 0.94) and comparable with those reported by Gratz & Roemer.[10] These results suggest that the Brazilian version of the DERS is reliable both as a general measure of difficulties in emotion regulation and as a measure of the constituents of this construct, as proposed by Gratz & Roemer's multidimensional conceptualization.[10]

The present study found that the awareness subscale correlated with the other subscales with slightly higher values than the ones presented by Miguel et al.,[11] albeit mostly with weak correlations (ranging from 0.13 to 0.26). However, similarly to the study by Miguel et al.,[11] in the present investigation the awareness subscale showed moderate correlations only with the clarity subscale (0.57). These results give additional evidence that the awareness subscale does not fit the factor structure proposed by Gratz & Roemer.[10] One possible solution suggested would be using the 16-item DERS version, which does not include the awareness subscale.[11]

All DERS subscales showed significant correlations with stress, anxiety and depression measures obtained with the DASS-21. The magnitude of these associations ranged from moderate to high, except for the awareness subscale, which had a weak correlation with depression, anxiety and stress. Differences in mean scores along the severity levels of psychopathological symptoms provide evidence that the DERS can be useful to discriminate between clinical and nonclinical samples, which makes it a convenient measure for clinical and research purposes. There is substantial support in the literature for the relation between emotion regulation and symptoms such as those measured with the DASS-21, including studies that specifically investigated the association between scores on both measures.[12,20,31] The results shown here regarding the pattern of association between emotion regulation dimensions and psychopathological symptoms closely replicate what has been found in studies with the original DERS, as well as with its adaptations to other cultures.[15] This not only provides evidence for the equivalence of the Brazilian version, but also supports the instrument's suitability for clinical and research applications.

While scores on most subscales showed a normal distribution, the distribution of DERS scores on the impulse, strategies and nonacceptance subscales, as well as the distribution of scores on the DASS-21 depression and anxiety subscales, were all right-skewed. This can be explained by the fact that the sample was a nonclinical one, where high depression and anxiety levels as well and high levels of emotional dysregulation are not to be expected. Nonetheless, the difference in distributions among those right-skewed and the other DERS subscales is an interesting finding that allows for questioning whether there might be differences in sensitivity among the subscales of the DERS. This could be further investigated with item response theory methods, in order to check how well calibrated the items and scales are to assess subjects who present a wide range of levels of the latent trait being measured.

Notwithstanding the contributions brought by this study regarding evidence of sound psychometric properties for the Brazilian DERS, this study has some limitations. The lack of a clinical sample defined based on widely accepted diagnostic procedures precludes more thorough inferences about the way this instrument

will work in populations diagnosed with some kind of mental health condition. Also, the cross-sectional design does not allow for testing the temporal stability of DERS scores, neither does it allow for assessing the predictive power of the DERS. Another limitation of this study is the gender imbalance found in the sample and the lack of identification of the participants' ethnic background, which could have some effect on results. Previous evidence investigated DERS measurement invariance between Indians and Americans, indicating that the difficulties in emotion regulation may function differently between diverse cultural groups.[32]

Future research should include longitudinal designs, thus allowing for the investigation of the temporal stability of the scores and of the relationship among DERS and psychopathological symptoms, as well as of the scale's predictive value regarding outcomes related to mental health and quality of life. In order to further investigate the gender disparities found in this study, future research should assess the scale's measure invariance across genders. Also, it would be useful to test the measure for its diagnostic validity, e.g. by assessing how well it discriminates between clinical and nonclinical samples defined using established diagnostic procedures, such as structured clinical interviews conducted by multiple raters.

## Conclusion

This study examined additional psychometric properties of the Brazilian Portuguese version of the DERS. Findings from this study provide additional support to the reliability and validity of the scale in the Brazilian context. However, this study has some limitations. The sample was comprised of a nonclinical population, mostly female (70%) and with a high mean level of education, therefore results may not be generalized. The authors suggest that further studies should examine the psychometric properties of the scale in clinical and nonclinical populations, with equal gender proportion and diverse backgrounds, and preferably employing longitudinal designs.

## Acknowledgements

The Brazilian Portuguese DERS produced and assessed in this study can be requested directly from the first author.

## Disclosure

No conflicts of interest declared concerning the publication of this article.

## References

1. Gross JJ. The emerging field of emotion regulation: an integrative review. Rev Gen Psychol. 1998;2:271-99.
2. Gross JJ, Muñoz RF. Emotion regulation and mental health. Clin Psychol (New York). 1995;2:151-64.
3. Gross JJ, Richards JM, John OP. Emotion regulation in everyday life. In: Snyder DK, Simpson JA, Hughes JN, editors. Emotion regulation in couples and families: pathways to dysfunction and health. Washington: American Psychological Association; 2006. p. 13-35.
4. Aldao A. Emotion regulation strategies as transdiagnostic processes: a closer look at the invariance of their form and function. Rev Psicopatol Psicol Clin. 2012;17:261-77.
5. Tull MT, Barrett HM, McMillan ES, Roemer L. A preliminary investigation of the relationship between emotion regulation difficulties and posttraumatic stress symptoms. Behav Ther. 2007;38:303-13.
6. Ehring T, Fischer S, Schnülle J, Bösterling A, Tuschen-Caffier B. Characteristics of emotion regulation in recovered depressed versus never depressed individuals. Pers Individ Dif. 2008;44:1574-84.
7. Gross JJ, Jazaieri H. Emotion, emotion regulation, and psychopathology: an affective science perspective. Clin Psychol Sci. 2014;2:387-401.
8. Cooper JL, O'Shea AE, Atkinson MJ, Wade TD. Examination of the Difficulties in Emotion Regulation Scale and its relation to disordered eating in a young female sample. Int J Eat Disord. 2014;47:630-9.
9. Thompson RA. Emotion regulation: a theme in search of definition. Monogr Soc Res Child Dev. 1994;59:25-52.
10. Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. J Psychopathol Behav Assess. 2004;26:41-54.
11. Miguel FK, Giromini L, Colombarolli MS, Zuanazzi AC, Zennaro A. A Brazilian investigation of the 36- and 16-item Difficulties in Emotion Regulation Scales. J Clin Psychol. 2017;73:1146-59.
12. Ritschel LA, Tone EB, Schoemann AM, Lim NE. Psychometric properties of the Difficulties in Emotion Regulation Scale across demographic groups. Psychol Assess. 2015;27:944-54.
13. Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behav Res Ther. 1995;33:335-43.
14. Sighinolfi C, Pala AN, Chiri LR, Marchetti I, Sica C. Traduzione e adattamento italiano del Difficulties in Emotion Regulation Strategies (DERS): una ricerca preliminare. Psicoter Cogn Comport. 2010;16:141-70.
15. Coutinho J, Ribeiro E, Ferreirinha R, Dias P. The Portuguese version of the Difficulties in Emotion Regulation Scale and its relationship with psychopathological symptoms. Rev Psiquiatr Clin. 2010;37:145-51.

16. Ruganci RN, Gençöz T. Psychometric properties of a Turkish version of the Difficulties in Emotion Regulation Scale. J Clin Psychol. 2010;66:442-55.
17. Mitsopoulou E, Kafetsios K, Karademas E, Papastefanakis E, Simos PG. The Greek version of the Difficulties in Emotion Regulation Scale: testing the factor structure, reliability and validity in an adult community sample. J Psychopathol Behav Assess. 2013;35:123-31.
18. Guzmán-González M, Trabucco C, Urzúa A, Garrido L, Leiva J. Validez y confiabilidad de la versión adaptada al Español de la Escala de Dificultades de Regulación Emocional (DERS-E) en población Chilena. Ter Psicol. 2014;32:19-29.
19. Medrano LA, Trógolo M. Validación de la Escala de Dificultades en la Regulación Emocional en la población universitaria de Córdoba, Argentina. Univ Psychol. 2014;13:1345-56.
20. Bardeen JR, Fergus TA, Orcutt HK. An examination of the latent structure of the Difficulties in Emotion Regulation Scale. J Psychopathol Behav Assess. 2012;34:382-92.
21. International Test Commission. International guidelines on test adaptation [Internet]. 2005 [cited 2018 Aug 17]. https://www.intestcom.org/files/guideline_test_adaptation.pdf
22. Reichenheim ME, Moraes CL. Operationalizing the cross-cultural adaptation of epidemological measurement instruments. Rev Saude Publica. 2007;41:1-9.
23. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. Cien Saude Colet. 2011;16:3061-8.
24. Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. Psychol Assess. 1998;10:176-81.
25. Vignola RCB, Tucci AM. Adaptation and validation of the Depression, Anxiety and Stress Scale (DASS) to Brazilian Portuguese. J Affect Disord. 2014;155:104-9.
26. Pacico JC, Hutz CS. Validade. In: Hutz CS, Bandeira DR, Trentini CM, editors. Psicometria. Porto Alegre: Artmed; 2015. p. 71-83.
27. Brown TA. Confirmatory factor analysis for applied research. 2nd ed. New York: Guilford; 2015.
28. Li C-H. Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. Behav Res Methods. 2016;48:936-49.
29. Hu L, Bentler PM. Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification. Psychol Methods. 1998;3:424-53.
30. Valentini F, Damásio BF. Variância média extraída e confiabilidade composta: indicadores de precisão. Psicol Teor Pesqu. 2016;32:1-7.
31. Mazaheri M. Psychometric properties of the Persian version of the Difficulties in Emotion Regulation Scale (DERS-6 & DERS-5- Revised) in an Iranian clinical sample. Iran J Psychiatry. 2015;10:115-22.
32. Snow NL, Ward RM, Becker SP, Raval VV. Measurement invariance of the Difficulties in Emotion Regulation Scale in India and the United States. J Educ Develop Psychol. 2013;3:147-57.

**Correspondence:**
Ana Carolina Maciel Cancian
Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS)
Av. Ipiranga, 6681, Prédio 11, 9º andar, Sala 941, Partenon
90619-900 - Porto Alegre, RS - Brazil
Tel.: +55 (51) 33203500, ext. 7749
Fax: +55 (51) 33203633
E-mail: anacancian@gmail.com