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A German version of the State Difficulties in Emotion Regulation Scale (S-DERS): Translation, Validation and Extended Factor Models --Manuscript Draft--

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Abstract:	<p>Difficulties in emotion regulation are an essential transdiagnostic phenomenon of mental health. While there is extensive literature focusing on emotion regulation difficulties as trait-like constructs, it is inherently a dynamic process that unfolds over time. This raises the need for state-like measures to capture these temporal dynamics in both laboratory and real-world settings, such as the State Difficulties in Emotion Regulation Scale (S-DERS). Here, we present a reliable and valid German version of the S-DERS on 214 participants following a mood induction and compare different competing structural models. Extending previous research, we find that an exploratory structural equation modeling approach with extensive cross-loadings is necessary to reach good model fit. Moreover, a model with four correlated factors outperformed a bi-factor and high-order model. This indicates there is no single latent construct of emotion regulation difficulties, but rather four distinct but related constructs for (a) Non-acceptance of Current Emotions, (b) Limited Ability to Modulate Current Emotional and Behavioral Responses, (c) Lack of Awareness of Current Emotions, and (d) Lack of Clarity about Current Emotions. These associations may imply a complex causal interplay between these factors, which we explore with cross-sectional network models.</p>
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Dear Prof. Iliescu, dear editorial team,

we are excited to submit the attached manuscript *A German version of the State Difficulties in Emotion Regulation Scale (S-DERS): Translation, Validation and Extended Factor Models* for consideration as an original research article in the European Journal of Psychological Assessment.

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There is an increasing shift towards researching emotion regulation as a dynamic process. In 2017, the original S-DERS was published, providing a measure to study emotion regulation difficulties on a basis of states, rather than retrospectively self-evaluated traits. Such measures can provide essential insights for processes related to well-being and psychopathology.

In our preregistered study, we not only present and validate a German version of the S-DERS following an experimental mood induction, but also take a more comprehensive look at different structural equation models which can account for relations between different subfactors of emotion regulation difficulties. These include the most relevant models in this domain, i.e., simple structure, exploratory structural equation models, higher-order, bi-factor, and network models, which are systematically compared.

Our results provide important insights into the intrinsic structure of state-based emotion regulation difficulties, which to date do not exist, and further elucidate their relation to dimensions of mental well-being. To support future research, we provide open data and code as resources for replication and further study by the research community.

Thank you for your time and consideration. We look forward to the opportunity to share our findings with your readers.

Sincerely,

Dr. Maurizio Sicorello

A German version of the State Difficulties in Emotion Regulation Scale (S-DERS): Translation, Validation and Extended Factor Models

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The study was approved by the Ethical Board II of Heidelberg University, Germany (2021-519). All participant provided written consent.

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All authors declare that they have no conflict of interest.

Preregistration, Data, and Code can be found on <https://osf.io/ebj6u/> and https://github.com/MaurizioSicorello/SDERSvalid_Analysis

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A German version of the State Difficulties in Emotion Regulation Scale (S-DERS): Translation, Validation and Extended Factor Models

Abstract

Difficulties in emotion regulation are an essential transdiagnostic phenomenon of mental health. While there is extensive literature focusing on emotion regulation difficulties as trait-like constructs, it is inherently a dynamic process that unfolds over time. This raises the need for state-like measures to capture these temporal dynamics in both laboratory and real-world settings, such as the State Difficulties in Emotion Regulation Scale (S-DERS). Here, we present a reliable and valid German version of the S-DERS on 214 participants following a mood induction and compare different competing structural models. Extending previous research, we find that an exploratory structural equation modeling approach with extensive cross-loadings is necessary to reach good model fit. Moreover, a model with four correlated factors outperformed a bi-factor and high-order model. This indicates there is no single latent construct of emotion regulation difficulties, but rather four distinct but related constructs for (a) Non-acceptance of Current Emotions, (b) Limited Ability to Modulate Current Emotional and Behavioral Responses, (c) Lack of Awareness of Current Emotions, and (d) Lack of Clarity about Current Emotions. These associations may imply a complex causal interplay between these factors, which we explore with cross-sectional network models.

Introduction

Emotion regulation is a key concept for mental and physical well-being, comprising all implicit and explicit strategies affecting the occurrence, intensity, or duration of emotional experiences (Gross & Thompson, 2007). There are many stages at which these processes can fail, starting from the identification of emotions, over the selection of a strategy, its implementation, and the monitoring of success (Fernandez et al., 2016). One particularly influential clinical model outlined six categories of emotion regulation difficulties, which can negatively affect a person's well-being (Gratz & Roemer, 2004): A *Lack of Awareness* as the diminished tendency to attend and acknowledge one's emotions, a *Lack of Clarity* as the extent to which people understand their emotional experiences, the *Non-Acceptance* of primary emotions in the form of secondary meta-emotional responses (e.g., shame or anger for feeling a certain way), a limited access to helpful *Strategies*, difficulties engaging in *Goal-Directed Behavior* as well as *Impulsive Behavior* when confronted with negative emotions. This model gave rise to the six factor Difficulties in Emotion Regulation Scale (DERS), which has been used in thousands of empirical studies, repeatedly demonstrating the relevance of these dimensions for the etiology and maintenance of psychopathology across diagnostic boundaries (Clamor et al., 2024; Daros & Williams, 2019; Miola et al., 2022; Stellern et al., 2023).

Originally, most emotion regulation studies focused on trait-like constructs assessed with cross-sectional questionnaires—including the DERS—at a single time point, primarily measuring a person's general concept of their own emotional processes. Still, emotions and their regulation typically unfold over brief time periods (Gross, 2015). Studies in the laboratory or daily life can address this state-like dynamic nature of emotion regulation difficulties as they emerge, which is the fundamental building block of trait-like difficulties (Fernandez et al., 2016). Therefore, Lavender and colleagues (2017) used original items of the 36-item DERS to construct the 21-item State Difficulties in Emotion Regulation Scale (S-DERS) for momentary assessments. Based on an experimental induction of negative mood and exploratory factor analysis, they determined that state difficulties are best captured by a smaller item set comprising four factors instead of the original six DERS factors. This solution merged the factors for strategies, goal-directed behavior, and impulsiveness into a single factor reflecting the limited ability to *Modulate* current emotional and behavioral responses. It has been applied to a large range of clinical topics such as eating disorders, alcohol use, sleep disruption, and daily affective experiences (Emery & Simons, 2020; Forester et al., 2023; Pavlacic et al., 2022; Reid et al., 2022).

1 In the present study, we present a translation, preregistered validation, and factor
2 modeling extension for a German version of the S-DERS. At the core, we aimed to perform a
3 conceptual replication of the original S-DERS construction study, which included an
4 experimental induction of negative mood to provide an appropriate affective context for
5 emotion regulation difficulties to occur. We preregistered hypotheses that (H1) our mood
6 induction increased negative affect based on the valence dimension, (H2) we replicate the
7 original four-factor structure, (H3) internal consistency reliability will be satisfactory ($>.80$)
8 for all scales except for the Clarity scale, which had limited internal consistency in the original
9 study ($>.60$), (H4) there is convergent validity between the S-DERS and the trait-DERS scales,
10 and (H5) concurrent criterion validity for other relevant constructs from the clinical and
11 personality domain. Specifically, we expected positive associations of the global S-DERS score
12 with psychopathology, neuroticism, and affective reactivity to the mood induction. Concerning
13 S-DERS subscales, we expected positive associations between Non-Acceptance and
14 experiential avoidance, Modulate and impulsivity, Awareness and mindfulness, as well as
15 Clarity and mindfulness.
16

17 The basis of the original four-factor solution of the S-DERS was an exploratory factor
18 analysis (EFA) with parallel analysis and main loadings above .40. We preregistered the same
19 procedure as a criterion for successful structural validation, but also planned stricter models in
20 terms of assumptions and decision criteria. These included a confirmatory factor analysis
21 (CFA) without cross-loadings (simple structure), as the strictest possible model. Still, even for
22 the trait-DERS models without cross-loadings fit measures are often insufficient (Gutzweiler
23 & In-Albon, 2018). Exploratory structural equation modeling (ESEM) provides a framework
24 to fit a model with cross-loadings for all items and has provided improved model fit for the
25 DERS in the past as well as a reduction in factor correlations (Gutzweiler & In-Albon, 2018;
26 Marsh et al., 2014; Sousa et al., 2023). Therefore, we also conducted an ESEM-based analysis
27 with fit measures as the success criterion, which in terms of strictness is between inference
28 based on CFA simple structures and EFA loading sizes.
29

30 For the trait-DERS, it is still unclear whether subscales capture a common trait of
31 emotion regulation difficulties. This question is relevant to decide whether the total score or
32 subscale scores should be preferred in a given research application, but previous studies are
33 inconsistent (Bardeen et al., 2016; Sousa et al., 2023; Weathers et al., 2013). Therefore, we
34 also computed a higher-order model to test for a superordinate factor which influences the
35 subscales. Conceptually, such a model implies that a general latent construct of emotion
36 regulation difficulties causally influences the four subscales, which in turn causally influence
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the participant responses to the items. In post-hoc exploratory analyses, we contrasted this model with a bifactor model, which implies a direct effect of global difficulties on indicators, which is distinct from the specific constructs underlying the subscale factors. All tested structural equation models are illustrated in Figure 1. Further, we provide an exploratory network analysis as a hypothesis-generating tool to support future research on the causal structure of emotion regulation difficulties (Borsboom et al., 2021).

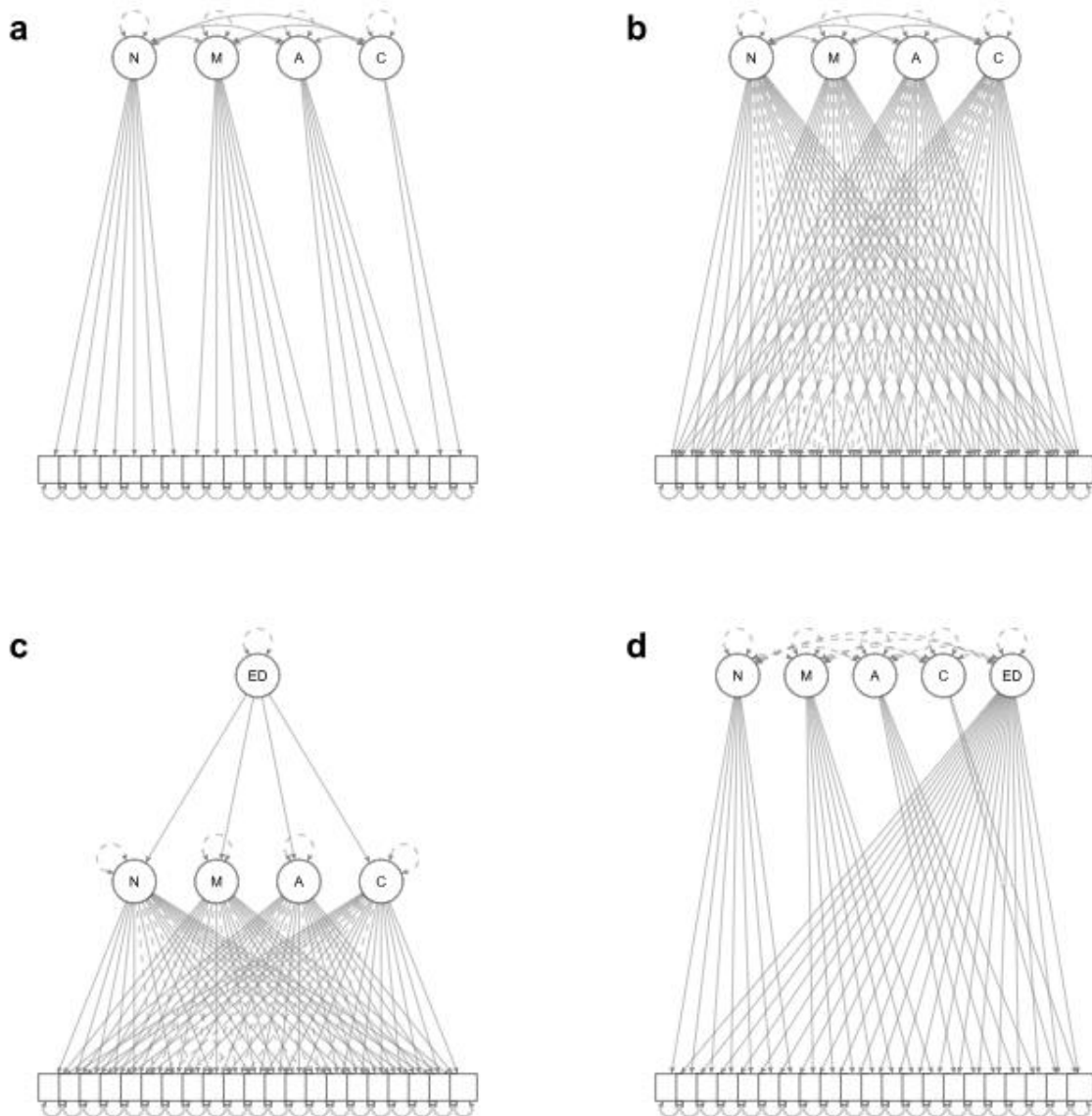


Figure 1. Factor models tested for the S-DERS. (a) CFA simple structure without cross-loadings. (b) ESEM with cross-loadings. (c) Model with a higher-order factor. (d) Bi-factor model. ED = Emotion regulation difficulties. N = Non-Acceptance. M = Modulate. A = Awareness. C = Clarity.

Methods

Participants and Procedures

The sample comprised 214 participants of ages 18-61, which were predominantly young (mean age = 22.5, $SD = 6.5$) female (89%, 10% male, one person gender-diverse) university students (93%). This composition is overall similar to the original S-DERS validation study, which only included young adult women between the age of 18-25. In our sample, 51 participants (24%) reported a diagnosis for a mental disorder in the past, with 26 (12%) having received treatment.

Following the literature on power simulations for confirmatory factor analysis, we aimed to recruit at least 200 participants (Wolf et al., 2013). An a priori stopping rule was set if recruiting plateaus after 200 participants (< 8 participants per week for 4 weeks in a row) or reaches a maximal sample size of 250. According to power calculations with G*Power (v3.1) for one-tailed zero-order correlations, a sample size of 200 allows a statistical power of 90% to detect a population correlation of .20 or higher. This can be viewed as sufficient, given the moderate-to-high correlations needed to attest validity.

Participants were recruited over mailing lists, social media, and internal advertisements at [REDACTED] and [REDACTED] University. As a participation incentive, 25 online coupons á 40€ were provided after study completion to randomly drawn participants. The only inclusion criterion was age between 18-65. The study was performed contactless on participants' smartphones using the SEMA3 platform (O'Brien et al., 2024). This included a demographic section, followed by a section with psychological questionnaires, a mood induction, and the translated S-DERS. This procedure took on average 31.4 minutes ($SD = 20.6$). Psychology students could participate for course credit, which was taken by 88% of participants. The study was approved by the Ethical Board II of [REDACTED].

Translation

The S-DERS (21 items) was separately translated into German by M.S., M.E., and D.K. without reference to the German DERS version. Then, translations were compared for consistency and discussed, followed by a comparison to the German DERS version to resolve conflicts, settling on a consensual translation. The final German items were retranslated to English by two independent psychologists with no significant differences between the back-translation and the original English S-DERS items.

The translated items can be found in Table S1 (ordered by factor) and Table S2 (administration order with English items for comparison). Item responses ranged from 1 ("Not

at all”/“Überhaupt nicht”) to 5 (“Completely”/“Völlig”). The items of the Awareness scale were reversed and then sum scores for the total scale and the subscales calculated. Notably, while this scoring is consistent with the previous procedure, it differently weighs the four subscales, as they consist of a different number of items. We present exploratory analyses on the differences between this and an unweighted procedure.

Further Psychological Measures

Other psychological measures used for validation included the trait-DERS (36 items, Gutzweiler & In-Albon, 2018), the Neuroticism scale of the NEO Five Factor Inventory (12 items, Borkenau & Ostendorf, 2007), the Depression, Anxiety, and Stress Scale (DASS-21, 21 items, Nilges & Essau, 2021), the Barrett Impulsivity Scale (BIS-15, 15 items, Meule et al., 2011), the Acceptance and Action Questionnaire II (AAQ-II, 7 items, Hoyer & Gloster, 2013), and Awareness and Describe Subscales of the Five Facet Mindfulness Questionnaire Short (FFMQ, 16 items, Michalak et al., 2016). Lastly, the Interpersonal Emotion Regulation Questionnaire (20 items; Pruessner et al., 2020) and the Childhood Trauma Questionnaire (Klinitzke et al., 2012) were administered for a different research project and are therefore not reported in the present study.

Mood Induction

Before the assessment of the S-DERS, all participants underwent a negative mood induction, as negative emotions are likely a prerequisite for the meaningful assessment of momentary emotion regulation difficulties (Lavender et al., 2017). The mood induction consisted of a combination of sad music and autobiographical recall (Werthmann et al., 2014). Participants listened to 6 minutes of the ‘Adagio for Strings’ by Samuel Barber while writing about a recent negative experience. This negative experience was instructed to be a 5-6 on a scale from 0 (not a negative experience) to 10 (extremely negative experience). Immediately before and after the mood induction, participants indicated their momentary affective state based on a two-dimensional affective grid with the dimensions *valence* (from 0 = unpleasant emotion to 10 = pleasant emotion) and *arousal* (from 0 = low energy to 10 = high energy; Tiede, 2020). Lastly, as another manipulation check, participants were asked how well they could immerse themselves in the recalled negative experience (from 1 = not at all to 5 = very well).

Data Analysis

The success of the mood induction was tested as the difference between affective valence before versus after the manipulation using a paired t-test. An exploratory test on the affective arousal dimension is also reported without previously specified expectations.

All factor models tested for the S-DERS are shown in Figure 1. First, we conducted a confirmatory factor analysis for four factors without cross-loadings (i.e., simple structure; Figure 1a) using maximum likelihood estimation with the R package Lavaan (Rosseel, 2012). We preregistered that if model fit measures did not meet the criteria of $RMSEA \leq 0.06$; $CFI \geq 0.95$; $TLI \geq 0.95$; $SRMR \leq 0.08$ (Hu & Bentler, 1999), we test an ESEM model with cross-loadings for all items (Figure 1b) using the esem package (Prokofieva et al., 2023). In this procedure, first, an EFA was fit with the psych package using principal axis factoring and promax rotation, which was also used in the original S-DERS validation. Referent items were identified using the automated procedure of the esem package. Then, this model was refit as a CFA in Lavaan with the loadings of the referent items fixed to their EFA loadings, while the remaining EFA loadings were used as starting values. If this model also did not meet the fit measure criteria above, we preregistered to perform EFA with the number of factors based on parallel analysis at the 99% quantile, with loadings $>.40$ considered as substantial loadings on the main factors and loadings $>.30$ considered as substantial cross-loadings. This EFA procedure is identical to that used in the original validation study. Internal consistency (composite reliability) was calculated as McDonald's ω from the final model (Flora, 2020). Additionally, the higher-order (Figure 1c) and bifactor models (Figure 1d) were tested against the winning model using the Vuong test (Vuong, 1989). Lastly, we conducted an exploratory network analysis on the partial correlation matrix (Figure 2). Pruning of edges was performed based on the Extended Bayesian Information Criterion with $\lambda = 0.5$ and graphical lasso using the bootNet package (Epskamp et al., 2018).

For associations between the S-DERS and other variables, bivariate correlations were computed with a preregistered one-tailed $\alpha = .05$. All analyses were performed in R (v4.3.2).

Open Science Practices

We report how we determined our sample size, all data exclusions (if any), all data inclusion/exclusion criteria, whether inclusion/exclusion criteria were established prior to data analysis, all measures in the study, and all analyses including all tested models. Preregistration, data, and analysis code can be found at: [REDACTED]. For reproducibility or other reuse of data and code, we recommend directly accessing the github

repository, which also includes a documentation of files, version control, and steps to reproduce analyses: [REDACTED]. A print version of the questionnaire can be found in both repositories as well as the supplements.

There were two notable changes to the preregistration. First, we originally preregistered to conduct EFA with Geomin rotation and maximum likelihood estimation. This is in contrast to the analyses performed by Lavender et al. (2017) and was considered as the esem package did not exist at the time of preregistration and the only validated procedure was performed with this estimation procedure. Using the same procedure as Lavender et al. (2017) is an improvement not only due to consistency, but also because principal axis factoring is better suited to identify factors with few items, such as the Clarity scale which only consists of two items. Secondly, we preregistered likelihood ratio tests for model comparisons, but the net procedure indicated models resulting from CFA and ESEM were not nested. Possibly, this was due to the selective fixing of values in ESEM, thus making the Vuong test for non-nested models the safer option (Vuong, 1989). Both procedures led to the same inferential decision.

Results

Manipulation check (H1)

Affective valence decreased after the mood induction, indicating a successful manipulation, albeit with a small-to-moderate effect size ($t(213) = 4.58, p < .001, d_c = .31; M_{pre} = 5.9, SD_{pre} = 1.9; M_{post} = 5.3, SD_{post} = 2.1$). Exploratory analyses indicated that affective arousal also decreased with a slightly larger effect size ($t(213) = 5.9, p < .001, d_c = .40; M_{pre} = 5.6, SD_{pre} = 1.9; M_{post} = 4.9, SD_{post} = 1.9$), further confirming the successful induction of sadness, which is generally classified as a low arousal emotion (Barrett & Russell, 1999). Overall, most participants stated they were successfully immersed in the experience ($M = 3.8, SD = 0.9$).

Factor structure (H2)

The correlations between items visually indicated a solution with four factors and considerable cross-loadings (Figure 2a). For the four-factor simple structure CFA without cross-loadings, none of the fit measures crossed the preregistered threshold (Table 1). The four-factor ESEM structure with cross-loadings improved model fit significantly, while only SRMR crossed the threshold. This model also outperformed the higher-order and bifactor models (Table 1) and no modification indices were statistically significant after Bonferroni-Holm correction. A parallel analysis also indicated a four-factor solution. Overall, the loading pattern

conformed to the original S-DERS validation except for two cross-loadings (Table 2): Item 17 of the Modulate scale (“My emotions feel out of control”) had a substantial cross-loading of .46 on the Clarity factor; item 7 of the Clarity scale had a substantial cross-loading of .37 on the Awareness factor (see discussion).

The four factors were moderately to highly correlated, with the lowest correlation between Modulate and Awareness ($r = .18$) and the largest between Modulate and Non-Acceptance ($r = .58$) the latter being visible as a large block in Figure 2a. Notably, this correlation was even higher in the validation of the original S-DERS. In-between were the correlations for Non-Acceptance and Awareness ($r = .30$), Non-Acceptance and Clarity ($r = .43$), Awareness and Clarity ($r = .35$), and Modulate and Clarity ($r = .41$). Overall, this pattern of factor correlations resembled those of the original S-DERS validation, except for larger correlations between the Awareness scale and the remaining three scales.

In contrast, the network model based on partial correlations emphasizes the proximity of the Awareness and Clarity scales (Figure 2b). Also, it indicates that items 5 (“I am feeling very bad about myself”) and 15 (“I believe that I am going to end up feeling very depressed”) might serve as connectors between the Non-Acceptance and the Modulate clusters (see discussion).

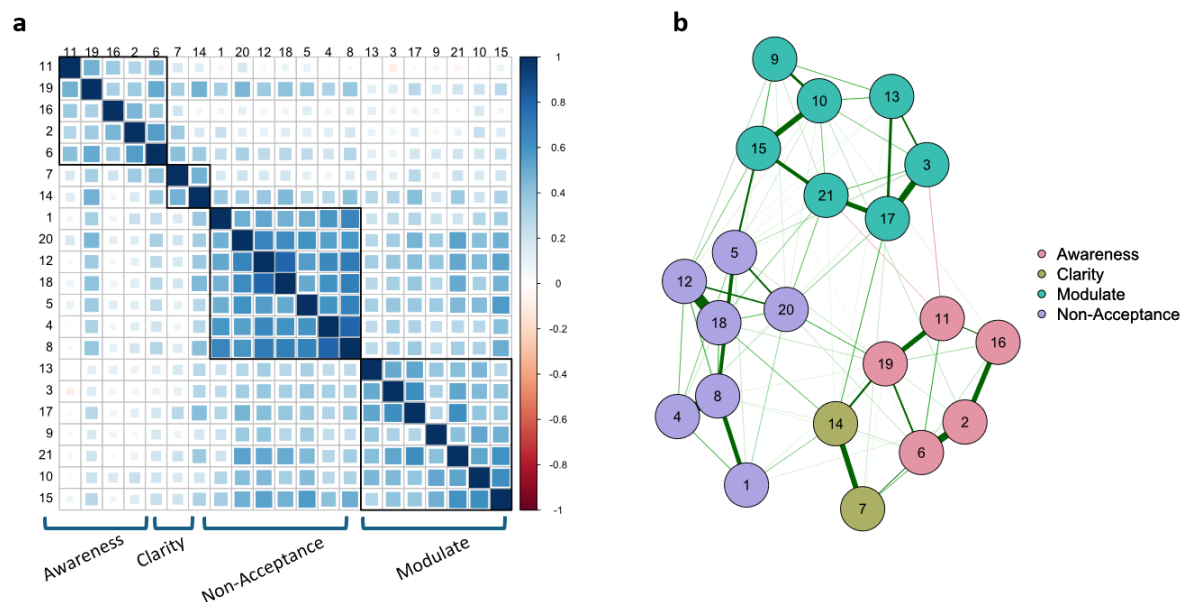


Figure 2. (a) Correlations between S-DERS items. Clusters were determined using hierarchical agglomerative clustering with complete linkage. (b) Network analysis based on the partial correlation matrix.

Table 1*Fit measures and inferential statistics for competing structural equation models*

	SRMR	RMSEA	CFI	TLI	AIC	BIC	χ^2	df	Model Comparison	p-Value
CFA Simple Structure	0.078	0.094	0.850	0.828	10,849	11,011	527.6	183		
ESEM Cross-loadings	0.039	0.078	0.923	0.881	10,729	11,049	313.3	136	Model 2 > Model 1	0
ESEM Higher-order	0.076	0.086	0.904	0.854	10,770	11,083	357.9	138	Model 2 > Model 3	0.001
Bi-factor	0.066	0.082	0.893	0.867	10,764	10,973	414.3	169	Model 2 > Model 4	0.008

Note. Based on $N = 214$ participants. SRMR = standardized root mean square residual, RMSEA = root mean square error of approximation, CFI = comparative fit index, TLI = Tucker–Lewis index, CFA = confirmatory factor analysis, ESEM = exploratory structural equation model, EFA = exploratory factor analysis, AIC = Akaike information criterion, BIC = Bayesian information criterion.

Table 2*Factor loadings and correlations*

Item	Factor			
	1	2	3	4
Factor 1: Non-acceptance of Current Emotions				
Item 8	0.97 (0.91)	-0.12 (0.48)	0.00 (0.29)	0.03 (0.38)
Item 4	0.91 (0.82)	-0.07 (0.43)	-0.06 (0.2)	-0.06 (0.28)
Item 12	0.71 (0.83)	0.19 (0.62)	-0.06 (0.23)	0.04 (0.41)
Item 18	0.69 (0.78)	0.05 (0.53)	-0.01 (0.26)	0.17 (0.47)
Item 1	0.68 (0.68)	-0.08 (0.37)	0.06 (0.27)	0.06 (0.33)
Item 5	0.59 (0.73)	0.29 (0.61)	0.06 (0.28)	-0.13 (0.26)
Item 20	0.53 (0.72)	0.24 (0.6)	0.09 (0.33)	0.05 (0.4)
Factor 2: Limited Ability to Modulate Current Emotional and Behavioral Responses				
Item 10	-0.06 (0.42)	0.87 (0.77)	0.14 (0.26)	-0.22 (0.16)
Item 21	-0.02 (0.47)	0.71 (0.77)	-0.09 (0.11)	0.21 (0.48)
Item 9	0.02 (0.35)	0.64 (0.59)	0.05 (0.16)	-0.15 (0.14)
Item 3	-0.03 (0.38)	0.62 (0.66)	-0.15 (0.03)	0.21 (0.43)
Item 13	-0.12 (0.31)	0.61 (0.6)	-0.03 (0.11)	0.17 (0.37)
Item 15	0.23 (0.58)	0.6 (0.72)	0.07 (0.25)	-0.1 (0.27)
Item 17	-0.08 (0.42)	0.54 (0.67)	-0.07 (0.14)	0.46 (0.64)
Factor 3: Lack of Awareness of Current Emotions				
Item 6 (r)	0.03 (0.32)	0.00 (0.24)	0.70 (0.75)	0.16 (0.35)
Item 2 (r)	-0.09 (0.17)	0.06 (0.16)	0.67 (0.66)	0.02 (0.18)
Item 11 (r)	-0.04 (0.09)	-0.09 (0.01)	0.62 (0.58)	-0.02 (0.08)
Item 16 (r)	-0.13 (0.09)	0.13 (0.13)	0.61 (0.56)	-0.11 (0.04)
Item 19 (r)	0.25 (0.46)	-0.09 (0.27)	0.54 (0.66)	0.22 (0.42)
Factor 4: Lack of Clarity about Current Emotions				
Item 14	0.14 (0.44)	-0.03 (0.37)	0.13 (0.34)	0.66 (0.74)
Item 7	-0.16 (0.17)	0.04 (0.22)	0.37 (0.44)	0.47 (0.51)

Note. Structure coefficients are in parentheses. Bold coefficients mark absolute loadings larger than .30. (r) indicated reversed items. The structure of this table is based on Lavender et al. (2017) for ease of comparison.

Reliability (H3)

As expected, reliabilities were sufficient for the total scale and all subscales except the Clarity scale, converging with the pattern of the original validation study (in parentheses): Total Score: $\omega = .94$ (.86), Non-Acceptance: $\omega = .92$ (.92), Modulate: $\omega = .79$ (.85), Clarity: $\omega = .63$ (.65).

Construct and Criterion validity (H4-H5)

The S-DERS subscales all had the highest correlations with their analogue trait-DERS subscales (Table 3). Still, notably, almost all subscales from both questionnaires had substantial intercorrelations. Together with ESEM-like structure of the four factors with considerable cross-loadings, this indicates a moderate specificity of subscales, inherent to all English and German versions of the trait and state DERS (Gratz & Roemer, 2004; Gutzweiler & In-Albon, 2018; Lavender et al., 2017). A similar pattern emerged for the remaining external constructs: Experiential avoidance most strongly correlated with Non-Acceptance, but also very strongly with the Modulate subscale. Mindful Description appeared to be more specific to the Awareness subscale, as hypothesized, while Mindful Acting with Awareness was strongly correlated to all subscales, with the strongest correlation for the Modulate scale.

There were two surprising findings, which deviated from our expectations. First, the correlations between the BIS-15 scale for impulsivity and the S-DERS subscales were much smaller than expected, albeit still statistically significant for the preregistered association with the Modulate scale, as well as the non-preregistered association with the Clarity scale. Post-hoc analyses indicated this is because only the BIS-15 subscale for attentional impulsivity was substantially related to the S-DERS scales. For this subscale, the correlations conformed to the expectations, with the strongest effect for the Modulate scale at $r = .32$ (Non-Acceptance: $r = .16$, Awareness: $r = .12$, Clarity: $r = .23$).

The second surprising finding was the absence of the expected correlation between affective reactivity to the mood induction and the global S-DERS. In fact, the association went in the opposite direction, with higher state emotion regulation difficulties showing a small association with a stronger decrease in negative affect. These reactivity scores were calculated from two variables: affective valence before minus after the mood induction. Therefore, we inspected the correlations with the two separate variables (pre and post measurement). This showed that the global S-DERS score was substantially correlated with lower (i.e., more

negative) affect before but not after the mood induction (before: $r = -.22, p = .001$; after: $r = -.07, p = .260$). To test whether this observation is specific to the S-DERS, we repeated these correlation analyses with the neuroticism scores instead of S-DERS scores as a trait-based construct for negative affective reactivity, showing the same pattern (reactivity: $r = -.18, p = .008$; before: $r = -.28, p < .001$; after: $r = -.08, p = .231$). In sum, both the S-DERS and neuroticism were more strongly correlated to affect before than after the mood induction, albeit with the plausible effect direction of more negative affect (smaller values) being associated with more emotion regulation difficulties and neuroticism (higher values). To understand how two correlations in a psychologically plausible direction can lead to an unexpected effect direction for a difference score, consider the covariance decomposition:

$$\begin{aligned} & \text{cov(S-DERS, Reactivity)} \\ = & \text{cov(S-DERS, Affect}_{\text{pre}} - \text{Affect}_{\text{post}}) \\ = & \text{cov(S-DERS, Affect}_{\text{pre}}) - \text{cov(S-DERS, Affect}_{\text{post}}) \end{aligned}$$

Inserting different correlation sizes in the last line shows, if the covariance between the S-DERS and affect *before* the manipulation is more negative than after the manipulation, the observed effect will have a negative sign (i.e., the “wrong” direction). Consequently, if the covariance between the S-DERS and affect *after* the manipulation is more negative than before the manipulation, the observed effect will have a positive sign (i.e., the “right” direction). We will expand on potential psychological reasons in the discussion section.

Table 3*Correlations between S-DERS scales and other constructs*

	S-DERS				
	Total	Non-Acceptance	Modulate	Awareness	Clarity
DERS	0.78	0.64	0.63	0.55	0.48
DERS: Nonacceptance	0.64	0.69	0.44	0.32	0.30
DERS: Awareness	0.44	0.27	0.16	0.68	0.35
DERS: Clarity	0.47	0.31	0.24	0.53	0.55
DERS: Strategies	0.75	0.63	0.68	0.40	0.39
DERS: Impulse	0.58	0.42	0.57	0.32	0.36
DERS: Goals	0.46	0.36	0.50	0.20	0.19
DASS-21	0.58	0.45	0.60	0.30	0.29
Neuroticism	0.58	0.46	0.57	0.33	0.24
Affective Reactivity: Valence	-0.12	-0.07	-0.15	-0.08	-0.07
AAQ-II	0.64	0.51	0.58	0.37	0.39
BIS	0.10	0.01	0.12	0.08	0.15
FFMQ: Describe	-0.29	-0.14	-0.12	-0.48	-0.26
FFMQ: Awareness	-0.44	-0.27	-0.46	-0.29	-0.33

Note. (S-)DERS = (State) Difficulties in Emotion Regulation Scale, DASS-21 = Depression, Anxiety, and Stress Scale, BIS-15 = Barrett Impulsivity Scale, AAQ-II = Acceptance and Action Questionnaire II, FFMQ = Five Facet Mindfulness Questionnaire (short form).

Statistically significant correlations (one-sided, $\alpha = .05$) are shown in bold. The cutoffs for one-sided tests at different common statistical thresholds were:

$p < .05$ (one-sided): 0.11

$p < .01$ (one-sided): 0.16

$p < .001$ (one-sided): 0.21

Weighted versus Unweighted Subscales (Post-hoc)

The fact that S-DERS subscales consist of a different number of items implies a differential weighting of these subscales when a global score is calculated. Therefore, we tested whether equally weighting all subscales increases correlations with psychopathology-related outcomes. We calculated mean scores instead of sum scores for each subscale. Then, we calculated a global scale score as the average over those four means, leading to an equal weight for all subscales independent of the number of items. Overall, we found that the previously used (implicit) differential weighting of scales in the S-DERS is superior to equally weighting all scales for the DASS ($\Delta r = .10$), neuroticism ($\Delta r = .11$), and having been diagnosed with a mental disorder ($\Delta d = .14$). One possible explanation is that the overrepresented subscales (i.e., Non-Acceptance and Modulate) have stronger relations to the three outcomes, as indicated in Table 3. Still, this might also be a result of their higher reliability (i.e., equally representing Clarity in the total score lowers the overall reliability). Therefore, we also computed correlations between the latent (measurement error-free) S-DERS factors and the three outcomes within the ESEM framework (Figure 3). This provided evidence for both explanations as latent effect sizes were much more similar than manifest effect sizes for the four subscales, but the Modulate scale still appeared to outperform the other measures in terms of cumulative effect sizes across all three outcomes. This was driven by strong relations to DASS and neuroticism.

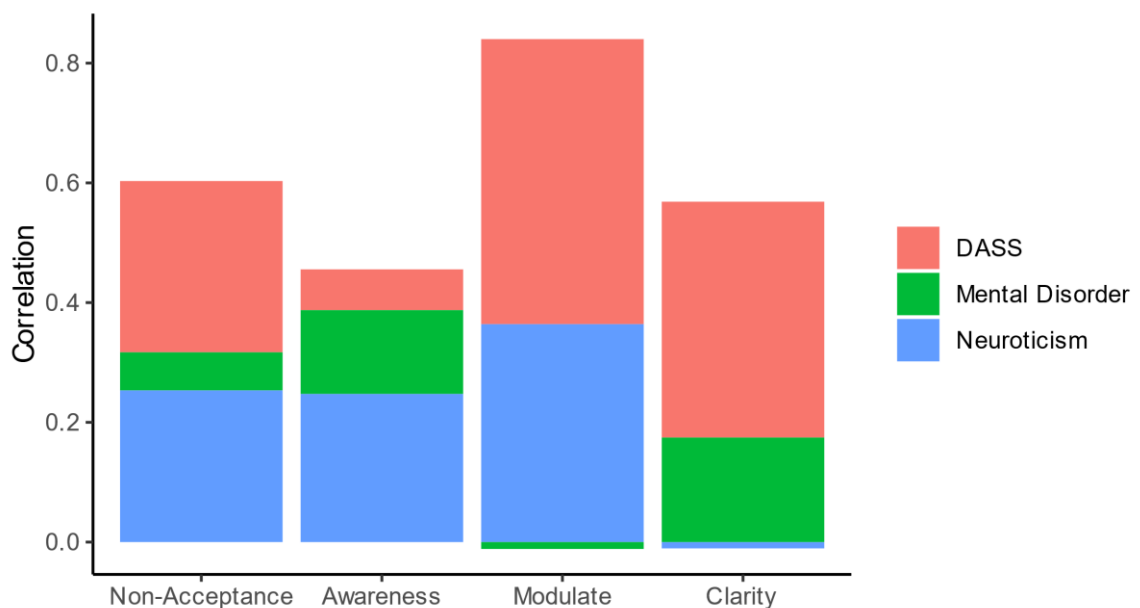


Figure 3. Latent correlations between S-DERS subscales and psychopathology-related outcomes.

Discussion

We presented a German translation and validation of the S-DERS, which might serve future studies on the temporal dynamics of emotion regulation difficulties in the laboratory or daily life. We found that our version largely conforms to the standards of the original validation study based on factor structure, reliability, and associations with related constructs.

Based on parallel analysis and item loadings, we confirmed a four-factor solution with moderately correlated factors and considerable cross-loadings. The importance of cross-loadings for the S-DERS was also confirmed by a comparison to a simple structure model, which had considerably worse fit. This four-factor solution was overall also discernible from the raw correlation matrix and the network analysis.

While all items had sufficiently large loadings on their targeted factor, two items showed stronger cross-loadings than expected. First, item 17 of the Modulate factor “My emotions feel out of control” had a substantial cross-loading on the Clarity factor. In the original trait-DERS, the item wording was “I experience my emotions as overwhelming and out of control”, which might have benefitted a stronger alignment with the Modulate versus the Clarity factor. For example, if someone is confused about their feelings (item 14, Clarity), this might be closer to experiencing emotions as out of control than them being overwhelming. Still, given that we confirmed previous patterns of only moderate discriminant validity for the S-DERS subscales, it might be advantageous to retain this item translation for consistency with the English S-DERS. Also, the trait-DERS wording combines two different items into one, “out of control” and “overwhelming”, which are both already present in the trait-DERS as separate items. This might artificially improve factor solutions by effective doubling of content, which could even favor the removal of this item from all DERS versions entirely.

The second item with substantial cross-loadings was item 7 of the Clarity scale (“I have no idea how I am feeling”), which also loaded on the Awareness scale. We would argue it is almost trivial that the awareness someone has of their current emotions influences whether they have an idea how they are feeling. In fact, a well-powered study on the trait-DERS found that the Awareness and Clarity scales were not distinct (Bardeen et al., 2016). This highlights general questions on the causal structure of the (S-)DERS.

As most previous studies, we started by assuming a common factor model, implying that latent causes (Non-Acceptance, Modulate, Awareness, and Clarity) influence the responses on the individual items. Here, we found that generally no overall factor of “emotion regulation difficulties” can be assumed, based on comparisons to a higher-order and bi-factor model. Hence, a global S-DERS score would be simply an amalgam of four correlated but distinct

factors. Network models are an alternative to such common-cause factor models, which are difficult to compare on the basis of fit measures (Fried, 2020). They represent a (mostly) hypothesis-generating tool to consider potentially causal links between single items. For example, outside its target scale, item 7 of the Clarity scale (“I have no idea how I am feeling”) is most strongly connected to item 6 Awareness scale (“I am acknowledging my emotions”). As mentioned above, recognizing one’s emotions appears as a prerequisite to acknowledging them at face-value, showing a potential causal interpretation of substantial cross-loadings for item 7. Similarly, we found that item 5 might serve as a connector between the Modulate and the Non-Acceptance scale. A hypothesis-generating causal interpretation would be, for example, that feeling very bad about oneself (item 5) may make someone expect increasingly depressed mood (item 15), which makes one feel overwhelmed (item 21) and believing one will continue to feel this way for a long time (item 10).

There are several limitations in our study. First, while our sample composition resembled that of the original S-DERS validation and had a substantial proportion of people with a history of diagnosed mental disorders, this is still a highly educated, mostly young, female sample, imposing constraints on generalizability. Secondly, while our mood induction did increase negative affect, there was no association between affective reactivity and the S-DERS. In turn, there was a substantial association between affect *before* but not after the mood induction and the S-DERS, despite the latter being administered *after* the mood induction. One potential explanation might be that despite the mood induction being successful, its only small-to-moderate effect size was not sufficient to observe an association with reactivity, as participants might fastly revert to their affective set point before the mood induction. Put simply, our mood induction might have been insufficiently strong to overwrite the emotion regulation difficulties participants experienced before the mood induction.

Lastly, while the EFA models largely conformed to the criteria for conceptual replication of the original S-DERS study (with the exception of two slightly larger cross-loadings discussed above), only the SRMR index crossed the preregistered threshold for a stricter test of model fit. These thresholds were determined based on default standards in the field, which has been increasingly shown to have major shortcomings. Fit measures other than SRMR have been shown to lead to over-extraction of factors, underestimation of model fit for small sample sizes, and particularly bad diagnostic performance for determining the number for factors of RMSEA based on simulations (Haslbeck & van Bork, 2024; Hu & Bentler, 1999; Montoya & Edwards, 2021). For our sample size, more recent studies have shown that flexible cutoffs on the SRMR based on simulations have the best performance for model diagnostics

(Mai et al., 2021, Groskurth et al., 2024; McNeish & Wolf, 2023; Niemand & Mai, 2018). When performing such analyses with the FCO package (Niemand & Mai, 2018), we found a cutoff of SRMR = .055, which our ESEM model passes. Generally, we believe that for DERS-like structures, psychometric decisions based on fixed absolute literature-based thresholds might not be a fruitful path. In items and scales with such complex interrelations, it is highly unlikely that a CFA simple structure without any cross-loadings or an ESEM structure with cross-loadings for all items can reflect the true data generating model. In the long run, such formal models of emotion regulation difficulties might be improved based on clinical theory and evidence targeting causal relations.

In conclusion, the translated S-DERS showed a sufficient four-factor solution similar to the original S-DERS version. The S-DERS further showed good reliability and association with related constructs. We therefore recommend using the S-DERS when investigating temporal dynamics of emotion regulation difficulties in laboratory or daily life settings.

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**A German version of the State Difficulties in Emotion Regulation
Scale (S-DERS): Translation, Validation and
Extended Factor Models**

-Supplements-

Sicorello, M., Elsaesser, M., Kolar, D.

S-DERS (State Difficulties in Emotion Regulation Scale)

Bitte lesen Sie jede Aussage und geben Sie an, wie sehr diese auf IHRE GEFÜHLE IN DIESEM MOMENT zutrifft.

	In diesem Moment...	Überhaupt nicht	Etwas	Teils, teils	Sehr	Völlig
1.	Ich fühle mich schuldig dafür, dass ich mich so fühle.	1	2	3	4	5
2.	Ich achte gerade darauf, wie ich mich fühle.	1	2	3	4	5
3.	Ich fühle mich außer Kontrolle.	1	2	3	4	5
4.	Es ist mir peinlich, dass ich mich so fühle.	1	2	3	4	5
5.	Ich denke gerade sehr schlecht über mich.	1	2	3	4	5
6.	Ich erkenne gerade meine Gefühle an.	1	2	3	4	5
7.	Ich habe keine Ahnung, wie ich mich gerade fühle	1	2	3	4	5
8.	Ich schäme mich dafür, dass ich mich so fühle.	1	2	3	4	5
9.	Ich habe gerade Schwierigkeiten, die Dinge zu tun, die ich genau jetzt tun müsste.	1	2	3	4	5
10.	Ich glaube, dass ich mich noch für eine lange Zeit weiter so fühlen werde.	1	2	3	4	5
11.	Mir liegt etwas an meinen jetzigen Gefühlen.	1	2	3	4	5
12.	Ich ärgere mich über mich selbst, dass ich mich so fühle.	1	2	3	4	5
13.	Ich habe gerade Schwierigkeiten, mein Verhalten zu kontrollieren.	1	2	3	4	5
14.	Ich bin verwirrt darüber, wie ich mich fühle.	1	2	3	4	5
15.	Ich glaube, dass ich mich am Ende sehr niedergeschlagen fühlen werde.	1	2	3	4	5
16.	Ich nehme mir gerade Zeit herauszufinden, was ich gerade wirklich fühle.	1	2	3	4	5
17.	Meine Gefühle erlebe ich als außer Kontrolle.	1	2	3	4	5
18.	Ich bin von mir selbst genervt, weil ich mich so fühle.	1	2	3	4	5
19.	Ich glaube, dass meine Gefühle berechtigt und wichtig sind.	1	2	3	4	5
20.	Ich habe das Gefühl, schwach zu sein, weil ich mich so fühle.	1	2	3	4	5
21.	Meine Gefühle fühlen sich überwältigend an.	1	2	3	4	5

Auswertung S-DERS

Gesamtskala = SUMME (Item1-21)

Subskala Non-Acceptance = SUMME(Item8+Item4+Item1+Item5+Item12+Item20+Item18)

Subskala Modulate = SUMME(Item13+Item17+Item10+Item3+Item15+Item21+Item9)

Subskala Awareness = SUMME(Item6+Item11+Item2+Item19+Item16)

Subskala Clarity = SUMME(Item14+Item7)

Table S1*S-DERS Items by Scale*

Non-Acceptance
Ich schäme mich dafür, dass ich mich so fühle. 8
Es ist mir peinlich, dass ich mich so fühle. 4
Ich fühle mich schuldig dafür, dass ich mich so fühle. 1
Ich denke gerade sehr schlecht über mich. 5
Ich ärgere mich über mich selbst, dass ich mich so fühle. 12
Ich habe das Gefühl, schwach zu sein, weil ich mich so fühle. 20
Ich bin von mir selbst genervt, weil ich mich so fühle. 18
Modulate
Ich habe gerade Schwierigkeiten, mein Verhalten zu kontrollieren. 13
Meine Gefühle erlebe ich als außer Kontrolle. 17
Ich glaube, dass ich mich noch für eine lange Zeit weiter so fühlen werde. 10
Ich fühle mich außer Kontrolle. 3
Ich glaube, dass ich mich am Ende sehr niedergeschlagen fühlen werde. 15
Meine Gefühle fühlen sich überwältigend an. 21
Ich habe gerade Schwierigkeiten, die Dinge zu tun, die ich genau jetzt tun müsste. 9
Awareness
Ich erkenne gerade meine Gefühle an. 6
Mir liegt etwas an meinen jetzigen Gefühlen. 11
Ich achte gerade darauf, wie ich mich fühle. 2
Ich glaube, dass meine Gefühle berechtigt und wichtig sind. 19
Ich nehme mir gerade Zeit herauszufinden, was ich gerade wirklich fühle. 16
Clarity
Ich bin verwirrt darüber, wie ich mich fühle. 14
Ich habe keine Ahnung, wie ich mich gerade fühle. 7

Table S2		
	Original Items (English)	German Translation
1.	I feel guilty for feeling this way.	Ich fühle mich schuldig dafür, dass ich mich so fühle.
2.	I am paying attention to how I feel.	Ich achte gerade darauf, wie ich mich fühle.
3.	I feel out of control.	Ich fühle mich außer Kontrolle.
4.	I am embarrassed for feeling this way.	Es ist mir peinlich, dass ich mich so fühle.
5.	I am feeling very bad about myself.	Ich denke gerade sehr schlecht über mich.
6.	I am acknowledging my emotions.	Ich erkenne gerade meine Gefühle an.
7.	I have no idea how I am feeling.	Ich habe keine Ahnung, wie ich mich gerade fühle
8.	I feel ashamed with myself for feeling this way.	Ich schäme mich dafür, dass ich mich so fühle.
9.	I am having difficulty doing the things I need to do right now.	Ich habe gerade Schwierigkeiten, die Dinge zu tun, die ich genau jetzt tun müsste.
10.	I believe that I will continue feeling this way for a long time.	Ich glaube, dass ich mich noch für eine lange Zeit weiter so fühlen werde.
11.	I care about what I am feeling.	Mir liegt etwas an meinen jetzigen Gefühlen.
12.	I am angry with myself for feeling this way.	Ich ärgere mich über mich selbst, dass ich mich so fühle.
13.	I am having difficulty controlling my behaviors.	Ich habe gerade Schwierigkeiten, mein Verhalten zu kontrollieren.
14.	I am confused about how I feel.	Ich bin verwirrt darüber, wie ich mich fühle.
15.	I believe that I am going to end up feeling very depressed.	Ich glaube, dass ich mich am Ende sehr niedergeschlagen fühlen werde.
16.	I am taking time to figure out what I am really feeling.	Ich nehme mir gerade Zeit herauszufinden, was ich gerade wirklich fühle.
17.	My emotions feel out of control.	Meine Gefühle erlebe ich als außer Kontrolle.
18.	I am irritated with myself for feeling this way.	Ich bin von mir selbst genervt, weil ich mich so fühle.

19.	I believe that my feelings are valid and important.	Ich glaube, dass meine Gefühle berechtigt und wichtig sind.
20.	I feel like I'm a weak person for feeling this way.	Ich habe das Gefühl, schwach zu sein, weil ich mich so fühle.
21.	My emotions feel overwhelming.	Meine Gefühle fühlen sich überwältigend an.