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► To cite this version:

Alexis Vancappel, Hala Kerbage, Christian Réveillère, Wissam El Hage. Validation of the French version of the Emotion and Regulation Beliefs Scale (ERBS) and Dissociation Belief Scale (DBS). *Behavioural and Cognitive Psychotherapy*, 2023, 51 (4), pp.335-348. 10.1017/S1352465823000097 . hal-04191750

HAL Id: hal-04191750

<https://hal.science/hal-04191750>

Submitted on 27 Sep 2023

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MAIN

Validation of the French version of the Emotion and Regulation Beliefs Scale (ERBS) and Dissociation Belief Scale (DBS)

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(Received 29 July 2022; revised 18 February 2023; accepted 1 March 2023; first published online 20 April 2023)

Abstract

Introduction: Dissociation is a recurrent symptom of post-traumatic stress disorder (PTSD) and is associated with emotional dysregulation. Beliefs about emotions seem to be involved in emotional dysregulation but have not been studied in relation to dissociation. Likewise, there is currently little empirical evidence of beliefs about dissociation. The aims of the study were to validate psychometric tools assessing these beliefs, to assess their role in dissociation, and to explore the mediating role of emotional dysregulation and beliefs about dissociation in the relationship between beliefs about emotion and dissociation.

Method: We recruited a sample from the general population ($n = 1009$) and a sample of patients with PTSD ($n = 90$). All participants completed self-report questionnaires to evaluate symptoms of PTSD (PTSD Checklist/Impact of Event Scale, PCL-5/IES-6), dissociation (Dissociative Experiences Scale, DES), difficulties in emotion regulation (Difficulties in Emotion Regulation Scale, DERS), beliefs about dissociation (Dissociation Beliefs Scale, DBS), and beliefs about emotion (Emotion and Regulation Beliefs Scale, ERBS).

Results: The questionnaires used to assess the beliefs about emotion (ERBS) and dissociation (DBS) had good psychometric properties. Dissociation was positively associated with positive and negative beliefs about dissociation and with negative beliefs about emotions in both the clinical and non-clinical groups. The relationship between beliefs about emotions and dissociation was mediated by emotional dysregulation and positive beliefs about dissociation in both groups.

Conclusion: The ERBS and DBS are effective tools to assess beliefs. Beliefs about emotion and dissociation seem to be involved in dissociative manifestations in both clinical and non-clinical individuals.

Keywords: beliefs about dissociation; beliefs about emotion; cognition; dissociation; emotion regulation; PTSD; questionnaire validation

Introduction

Dissociation is described as a disruption in the usually integrated functions of consciousness, memory, identity, and perception of the environment (American Psychiatric Association, 2013) and often occurs among patients suffering from post-traumatic stress disorder (PTSD) (Murphy *et al.*, 2017). Symptoms of dissociation have been described as ‘(a) a loss of continuity in subjective experience with accompanying involuntary and unwanted intrusions into awareness and behavior

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(so-called positive dissociation); and/or (b) an inability to access information or control mental functions or behaviors, manifested as symptoms such as gaps in awareness, memory, or self-identification, that are normally amenable to such access/control (so-called negative dissociation); and/or (c) a sense of experiential disconnectedness that may include perceptual distortions about the self or the environment' (Cardeña and Carlson, 2011). The study of dissociation is particularly important as it is associated with a reduced response to psychotherapy and with more residual symptoms; moreover, there is no available evidence-based treatment for dissociative symptoms (Feeny and Danielson, 2004; Kleindienst *et al.*, 2016; Lanius *et al.*, 2010; Lanius *et al.*, 2012; Price *et al.*, 2014; Steuwe *et al.*, 2012; Wolf *et al.*, 2012).

Several studies have suggested that dissociation is associated with emotion regulation difficulties (Merckelbach *et al.*, 2017; Powers *et al.*, 2015). A recent meta-analysis including 11,596 individuals confirmed a moderate relationship between emotion regulation and dissociation (Cavicchioli *et al.*, 2021). Some authors have suggested that beliefs about emotion determine the entire process of emotion regulation (Ford and Gross, 2018; Tamir *et al.*, 2007). Others have suggested that the appraisal of emotions as unbearable would lead patients to use emotional avoidance and maladaptive strategies resulting in emotion regulation difficulties (Barlow *et al.*, 2016; Papageorgiou and Wells, 2001). Supporting this theory, empirical studies have demonstrated the role of beliefs about emotion in emotional dysregulation. For example, one study found a positive association between negative beliefs about emotion and experiential avoidance (Mancini *et al.*, 2016), while another found that beliefs about emotion played a mediating role in the relationship between parental indifference and psychological difficulties (depression, post-traumatic symptoms and borderline personality disorder symptoms) among psychiatric patients (Westphal *et al.*, 2016). Another study found a mediating role of emotional dysregulation in the relationship between beliefs about emotion and PTSD symptoms (Mazloom *et al.*, 2016). This supports the suggestion of Ford and Gross (2018) that negative beliefs about emotion increase emotional dysregulation leading to psychological difficulties. Veilleux *et al.* (2015) described three beliefs about emotion and emotion regulation that are involved in emotional difficulties: Emotional Constraint, representing the belief that emotions are forces that constrain or narrow an individual's choices in an emotional situation; Regulation Worth, representing the belief that emotion regulation is both possible and worthwhile; and Hijack, representing the belief that emotions hijack or usurp people's self-control. Finally, the causal role of beliefs about emotion was investigated in an experiment in which participants were asked to activate either a negative or a positive belief about emotion. They were then asked to watch an emotional movie. Findings revealed that participants who activated a negative emotional belief experienced a greater persistence of emotional distress and that emotion was perceived as more uncontrollable (Predatu *et al.*, 2020).

To date, no studies are available on the role of beliefs about emotion in dissociative symptoms, although emotional dysregulation seems central to dissociative manifestations (Cavicchioli *et al.*, 2021). Moreover, there are no tools in French to evaluate such beliefs. Recent data support the idea that beliefs about dissociation, as a similar concept to beliefs about emotion, might play a role in dissociative symptoms (Vancappel *et al.*, 2022b). In that study, the researchers identified positive (e.g. 'dissociation allows me to escape from aversive emotions') and negative (e.g. 'dissociation interferes with my daily life') beliefs about dissociation. However, it used a qualitative method, limiting the generalization of the findings. Similar views have been put forward for depersonalization and derealization (Hunter *et al.*, 2003; Hunter *et al.*, 2014). The authors suggested that the catastrophic appraisal of depersonalization–derealization symptoms might lead to the maintenance of such symptoms. However, they focused only on one subtype of dissociative symptoms and did not assess positive beliefs about dissociation. Other research has also been conducted on beliefs about dissociation in patients suffering from psychosis (Černis *et al.*, 2021), but here again, the results cannot be easily generalized to other populations.

Based on the above findings, the present study had several aims. The first was to validate the French version of the Emotion and Regulation Beliefs Scale (ERBS). The second was to develop a scale to assess beliefs about dissociation. To address these two aims, we examined the psychometric properties of the scales, namely factor structure, internal consistency and concurrent validity (relationship with emotion dysregulation, depression, anxiety and PTSD symptoms). The third aim was to assess the role of beliefs about emotion and dissociation in dissociative symptoms. Based on previous findings (Hunter *et al.*, 2003; Hunter *et al.*, 2014; Vancappel *et al.*, 2022b), we hypothesized that positive and negative beliefs about dissociation would be related to dissociation. The fourth aim was to explore the mediating role of emotional dysregulation and beliefs about dissociation in the relationship between dissociation and beliefs about emotions. In line with the findings of Ford and Gross (2018), we expected that emotional dysregulation would mediate the relationship between beliefs about emotions and dissociation. Likewise, we expected that the appraisal of dissociation as a way of avoiding aversive emotions (positive beliefs about dissociation) would mediate between negative beliefs about emotions and dissociation.

To address these aims, we recruited a sample of participants from the general population (aims 1 to 4) and a sample of patients suffering from PTSD (aims 3 and 4). The latter would enhance the results of the study, as patients with PTSD have a high prevalence of dissociative symptoms (Bremner *et al.*, 1993; Hill *et al.*, 2020; Swart *et al.*, 2020). This would enable us to use our findings to develop clinical interventions. We expected to observe similar associations and mediations in the two samples.

Method

Participants

We recruited two groups of participants. The first group was composed of individuals from the general population, recruited online through social networks. The second group consisted of patients at the University Hospital who had been diagnosed with PTSD by a psychiatrist, based on criteria of the *Diagnostic and Statistical Manual* – 5th edition (American Psychiatric Association, 2013). They were also assessed for potential psychiatric co-morbidities. After the attending physician had informed them about the study, the participants completed the paper-and-pencil questionnaire.

Procedure

After reading an information leaflet detailing the aims and procedures of the study, all participants gave their informed consent. The study design and consent procedures were approved by the ethics committee of Tours-Poitiers University (Comité d’Ethique de la Recherche Tours-Poitiers, no. 2020-05-23).

Participants were first asked to answer a short descriptive sociodemographic questionnaire (age, sex, years of education and professional activity). They then completed questionnaires assessing PTSD, dissociation, beliefs about emotion, beliefs about dissociation, and emotion regulation difficulties. All the scales were completed by both groups, except the PTSD Checklist for DSM-5 (PCL-5) (Blevins *et al.*, 2015), which was completed by the clinical sample, while the non-clinical sample completed the short version of the Impact of Event Scale (IES-6) (Thoresen *et al.*, 2010). The non-clinical sample also completed the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983) to counterbalance the absence of diagnostic evaluation. This enabled us to describe the sample more precisely in terms of psychopathology and strengthen the concurrent validity of the scales. The IES was preferred to the PCL-5 because it is shorter, limiting the number of items in the online questionnaire.

Measures

PTSD Checklist for DSM-5 (PCL-5)

The PTSD Checklist for DSM-5 (Blevins *et al.*, 2015) is a 20-item self-report questionnaire assessing symptoms of PTSD (PCL-5). A typical item is: 'In the past month, how much were you bothered by repeated, disturbing, and unwanted memories of the stressful experience?'. Items are rated from 0 (not at all) to 4 (extremely). The French version has excellent internal consistency ($\alpha = .94$) (Ashbaugh *et al.*, 2016).

Impact of Event Scale-6 (IES-6)

The IES-6 is a 6-item self-report questionnaire evaluating PTSD symptoms (Thoresen *et al.*, 2010). Participants rate items related to the main event they had identified on a 5-point Likert scale. A typical item is: 'Other things kept making me think about it'. Experimental studies have demonstrated that the IES-6 has good psychometric properties ($\alpha = .80$). The French version of the original 22-item scale (Weiss and Marmar, 1996) also demonstrates good psychometric properties (Brunet *et al.*, 2003).

Dissociative Experiences Scale (DES)

The DES is a 28-item self-report questionnaire evaluating trait dissociation (Bernstein and Putnam, 1986). A typical item is: 'Some people have the experience of driving a car and suddenly realizing that they don't remember what has happened during all or part of the trip'. Participants are asked to rate how often each experience happens to them on a scale ranging from 0% (never) to 100% (always). The overall score is the mean of the scores of all the items ranging from 0 to 100. French validation studies show good internal consistency ($\alpha = .94$) (Darves-Bornoz *et al.*, 1999).

Difficulties in Emotion Regulation Scale (DERS)

The DERS (Gratz and Roemer, 2004) is a 36-item self-report questionnaire assessing emotion regulation difficulties. A typical item is: 'I am clear about my feelings'. Items are rated from 1 (almost never) to 5 (almost always). The scale is composed of 6 sub-dimensions: (1) Non-Acceptance of Emotional Responses, reflecting a tendency to have negative secondary emotional responses to one's negative emotions, or not accepting reactions to one's distress; (2) Difficulties Engaging in Goal-Directed Behaviour, reflecting difficulty concentrating and accomplishing tasks when experiencing negative emotions; (3) Impulse Control, reflecting difficulty remaining in control of one's behaviour when experiencing negative emotions; (4) Lack of Emotional Awareness, reflecting the tendency to attend to and acknowledge emotions; (5) Limited Access to Emotion Regulation Strategies, reflecting the belief that there is little that can be done to regulate emotions effectively once an individual is upset; and (6) Lack of Emotional Clarity, reflecting the extent to which individuals know (and are clear about) the emotions they are experiencing. The French version has good internal consistency for all the sub-dimensions, with Cronbach's alpha values of 0.84 to 0.90 (Dan-Glauser and Scherer, 2013).

Hospital Anxiety and Depression Scale (HADS)

The HADS is a self-report questionnaire that evaluates depression and anxiety (Zigmond and Snaith, 1983). Seven questions are related to anxiety, and seven to depression. Participants rate items on a 4-point Likert scale. One item is: 'I take as much pleasure as I used to'. The French version demonstrated good psychometric properties (Cronbach's alpha from .67 to .90) (Razavi *et al.*, 1989).

Dissociation Beliefs Scale (DBS)

The DBS is a self-report questionnaire. It was developed during the current study, with 33 items from previous qualitative research (Vancappel *et al.*, 2022b). It measures what people think about dissociation. The first version of the scale was developed by one of the authors (A.V.) and was then checked and reviewed by another (W.E.H.). The items were based on statements extracted from patients' verbatim reports related to beliefs about dissociation. Participants rate each item on a 5-point Likert Scale from 1 (strongly disagree) to 5 (strongly agree). One item is: 'Disconnection disrupts my concentration'. The final version has 16 items evaluating positive and negative beliefs about dissociation.

Emotion and Regulation Beliefs Scale (ERBS)

The ERBS is a self-report questionnaire that evaluates beliefs about emotion and emotion regulation. The questionnaire is composed of 21 items. Participants rate items on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). One item is: 'People can learn how to regulate their emotions'. The English version has good psychometric properties (internal consistency ranging from 0.70 to 0.83) (Veilleux *et al.*, 2015). The French version is assessed in this study.

Statistical analysis

We used SPSS Amos 23 for the statistical analyses. All analyses were two-tailed with a .05 significance level. Here, the main analysis concerned the association between beliefs about emotion and dissociation and dissociative symptoms. Without previous data, we expected to observe a medium effect size ($r = .30$). According to G*power software, with an alpha error probability of 5% and a power ($1 - \beta$) of 90%, the sample size required is 88 participants. No data were removed from the analysis.

Validation of the French ERBS

We performed confirmatory factor analysis (CFA) on the data of the non-clinical sample. We used χ^2 , comparative fit index (CFI), Tucker–Lewis index (TLI) and root-mean square error of approximation (RMSEA). RMSEA under .08 and CFI and TLI above .90 are considered as a good model fit (Kline, 2015). CFI and TLI greater than .95 and RMSEA lower than .06 are considered to indicate excellent fit (Hu and Bentler, 1999). We calculated internal consistency for each sub-dimension using Cronbach's alpha (Cronbach, 1965) and McDonald's Omega (Hayes and Coutts, 2020). To assess concurrent validity, we conducted Pearson correlation to evaluate the association between ERBS and DERS scores.

Development of the DBS

We split the non-clinical sample into two random groups with comparable characteristics. The first group was randomly split into two sub-groups. We performed exploratory factor analysis (EFA) (*oblimin* rotation) on the first sub-group ($n = 504$) and CFA on the second ($n = 505$). The indexes used to validate the ERBS were used to assess the fit of the CFA model and the internal consistency.

Association between beliefs and dissociation

We used Pearson correlations to assess the association between beliefs (about emotion and dissociation) and dissociation in both groups.

Table 1. Descriptive data of the study samples

	Minimum	Maximum	Mean	Standard deviation
General population sample				
Age	18.00	76.00	25.26	9.49
DES	1.43	95.36	28.51	15.62
IES-6	0.00	24.00	6.65	8.20
DESR-F	43.00	167.00	96.84	25.12
HADS-Anxiety	0.00	21.00	10.32	4.26
HADS-Depression	0.00	18.00	5.66	3.61
ERBS-EC	9.00	42.00	24.25	5.49
ERBS-RW	13.00	35.00	27.57	3.98
ERBS-H	8.00	25.00	17.40	3.098
DBS-N	8.00	40.00	19.93	6.24
DBS-P	8.00	40.00	26.17	5.88
Clinical sample				
PCL-5	19.00	77.00	48.84	13.41
DES	2.86	76.71	28.55	15.97
DESR-F	57.00	166.00	113.88	24.11
DBS-N	8.00	38.00	25.29	6.65
DBS-P	8.00	40.00	26.31	6.62
ERBS-EC	12.00	41.00	27.43	6.24
ERBS-RW	14.00	35.00	26.92	4.08
ERBS-H	11.00	25.00	18.71	3.00

DES, Dissociative Experiences Scale; IES-6, Impact of Event Scale-6 items; DESR-F, Difficulties in Emotion Regulation Scale; ERBS, Emotion Regulation Beliefs Scale; EC, Emotional Constraint; RW, Regulation Worth; H, Hijack; DBS, Dissociative Beliefs Scale; N, Negative; P, Positive; PCL-5, PTSD Checklist; HADS, Hospital Anxiety and Depression Scale.

Mediation analyses

We conducted multiple linear regressions in both groups. We used the step-by-step approach to evaluate the mediators between beliefs about emotion and dissociation. In accordance with the latest guidelines (Preacher and Hayes, 2008), we used the bootstrapping technique to complete the analysis. The mediation analyses were performed using the 4th model of Preacher and Hayes' macro (Hayes, 2018).

Results

Non-clinical group

Descriptive data

We recruited 1009 participants (903 women). Their education levels were as follows: 34 participants (3.40%) had not completed high school, 118 participants (11.70%) had obtained their baccalauréat (high-school diploma), 600 participants (59.50%) had completed 1–3 years of higher education, 235 participants (23.30%) had completed 4 or 5 years of higher education, and 22 participants (2.20%) had completed more than 5 years of higher education. Concerning their professional activity: 686 participants (68.00%) were students, 93 (9.20%) were employees, 65 (6.40%) were middle managers, and under 5% had another job position. Concerning the traumatic events identified in the IES-6, the most frequently reported events were sexual violence, physical assault and harassment. The descriptive data of the different scales are presented in Table 1.

Validation of the French ERBS

Based on the structure of the initial English version of the ERBS, the CFA revealed an insufficient fit of the model, except for the RMSEA ($\chi^2 = 774$; d.f. = 187; $p < .01$; TLI = .84; CFI = .86;

Table 2. Factor loading of the DBS

	Component 1	Component 2
DBS29 'La déconnexion m'empêche de gérer correctement mes émotions'	.79	
DBS 25 'La déconnexion m'empêche de comprendre ce que je ressens'	.76	
DBS 21 'La déconnexion m'empêche de ressentir les émotions positives'	.72	
DBS 20 'La déconnexion m'empêche de résoudre les problèmes'	.71	
DBS 24 'La déconnexion m'empêche de me contrôler'	.70	-.18
DBS 18 'La déconnexion altère mes relations avec les autres'	.70	.16
DBS 13 'Me déconnecter m'empêche d'avancer dans la vie'	.66	.12
DBS 23 'Je suis impuissant face à la déconnexion'	.63	-.13
DBS 31 'Parfois, je me laisse aller à la déconnexion pour éviter de souffrir'	.25	.75
DBS 9 'Me déconnecter permet d'éviter les émotions désagréables'	.12	.70
DBS 2 'Me déconnecter m'aide à passer les moments difficiles'		.69
DBS 19 'La déconnexion m'aide à gérer la colère'		.66
DBS 15 'J'aime ne plus rien ressentir grâce à la déconnexion'		.63
DBS 33 'Je n'ai pas envie d'arrêter de me déconnecter'	-.21	.59
DBS 26 'La déconnexion me permet de m'évader dans un monde heureux'	-.22	.58
DBS 4 'Me déconnecter me permet de cacher mes émotions aux autres'	.22	.55

RMSEA = .06). We therefore added covariance between errors of similar items. This significantly increased the fit of the model, with indexes close to those identified in the initial version ($\chi^2 = 513$; d.f. = 163; $p < 0.01$; TLI = .89; CFI = .92; RMSEA = .05). We also found adequate internal consistency indexes for factor 1 ($\alpha = \omega = .72$), factor 2 ($\alpha = .77$; $\omega = .78$) and factor 3 ($\alpha = .68$; $\omega = .70$).

Validation of the DBS

After performing the EFA on the 33 original items, we used Cattell's rule and retained only the first four factors. The eigenvalues of the factors were: F1 8.18 (23.25% of the explained variance), F2 5.05 (13.71% of the explained variance), F3 1.54 (3.05% of the explained variance), and F4 1.18 (2.04% of the explained variance). The Kaiser-Meier-Olkin was good (KMO = .905). The Bartlett test was also significant ($\chi^2 = 6,88$; d.f. = 528; $p < .01$). The detailed analysis of the matrix structure demonstrated that F3 and F4 did not include items with a factor load superior to the others. Indeed, F3 contained only item 10 with a .70 factor load, F4 contained items 5, 23, 24 and 12 with factor loads of .80, .65, .62 and .60, respectively. Consequently, we removed F3 and F4. We repeated the EFA with a two-factor model showing the positive and negative beliefs about dissociation. We removed item 6 for its low factor loading, and items 3 and 8 for cross-loading ($r > .40$). We also removed items with a factor loading under .20 (items 22, 27, 5 and 7). To balance the two subscales, we kept only the eight items with the highest factor loading for F1. We repeated the EFA and found good indexes. The KMO was good (.90). The Bartlett test was significant ($\chi^2 = 2,65$; d.f. = 120; $p < .01$). The eigenvalues were: F1 4.32 (27% of variance explained) and F2 3.4 (21.24% of variance explained). The two factors showed good internal consistency F1 ($\alpha = \omega = .86$) and F2 ($\alpha = \omega = .80$). The factor loading of the different items are presented in Table 2.

The results of the CFA highlighted an insufficient fit of the two-factor model composed of a negative and a positive dimension ($\chi^2 = 452$; d.f. = 104; $p < .01$; TFI = .83; CFI = .85; RMSEA = .08). Therefore, we tested a three-factor structure (one general factor and two specific factors). We found a good fit of the model ($\chi^2 = 241$; d.f. = 87; $p < .01$; TFI = .91; CFI = .93; RMSEA = .06). We also found good internal consistency between F1 ($\alpha = \omega = .84$) and F2 ($\alpha = \omega = .80$).

Correlations between cognitive processes, dissociation and emotion regulation

The correlation matrix is presented in Table 3. Overall, we found a significant association between dissociation and beliefs about emotion (r strength between 0.75 and .26), between dissociation and

Table 3. Correlation matrix

	1	2	3	4	5	6	7	8	9	10
1. DES	1									
2. IES-6	.27**	1								
3. DERS-F	.43**	.24**	1							
4. HADS-Anxiety	.41**	.32**	.61**	1						
5. HADS-Depression	.35**	.24**	.48**	.49**	1					
6. ERBS-EC	.26**	.07*	.40**	.28**	.22**	1				
7. ERBS-RW	-.07*	-.034	-.13**	-.12**	-.12**	-.10**	1			
7. ERBS-H	.25**	.10**	.40**	.28**	.16**	.50**	.11**	1		
8. DBS-N	.29**	.22**	.45**	.33**	.38**	.27**	-.11**	.23**	1	
9. DBS-P	.25**	.12**	.24**	.10**	.18**	.18**	.09**	.19**	.06	1

DES, Dissociative Experiences Scale; IES-6, Impact of Event Scale-6 items; DERS-F, Difficulties in Emotion Regulation Scale; ERBS, Emotion and Regulation Beliefs Scale; EC, Emotional Constraint; RW, Regulation Worth; H, Hijack; DBS, Dissociation Beliefs Scale; HADS, Hospital Anxiety and Depression Scale; N, Negative; P, Positive; ** $p < 0.01$; * $p < 0.05$.

beliefs about dissociation (r strength between 0.25 and .29), and between difficulty in emotion regulation and negative beliefs about dissociation (r strength between 0.24 and .45). We also found a positive association between the different beliefs about emotion and depression, anxiety and PTSD scores (r strength between 0.07 and .28).

Mediation analysis

When entered alone (Model 1), emotional constraint was a significant predictor of dissociation ($\beta = 0.83$, $p < .01$). When entered with difficulty in emotion regulation (Model 2), emotional constraint remained significant, but the beta value collapsed ($\beta = -.2$, $p < .01$). When we entered emotional constraint with difficulty in emotion regulation and positive beliefs about dissociation (Model 3), emotional constraint was no longer a significant predictor ($\beta = -.1$, $p = .093$).

Bootstrapping tended to confirm these results. When we entered dissociative symptoms as the dependent variable, emotional constraint as the independent variable and emotion regulation difficulties and positive beliefs about dissociation as mediating factors, we found a significant overall model ($F = 90.36$; $R^2 = .21$; $p < .01$). We found a significant direct effect of emotional constraint on dissociation (95% confidence interval = .10 to .45). We found a significant indirect effect of emotional constraint on dissociation through positive beliefs about dissociation (95% confidence interval = .03 to .12) and difficulties in emotion regulation (95% confidence interval = .31 to .5).

PTSD sample

Descriptive data

We recruited 90 patients (76 women), with a mean age of 36.17 years ($SD = 13.71$). Their education levels were as follows: 21 had not completed high school, 22 had obtained the baccalauréat (high-school diploma), 34 had completed 1–3 years of higher education, eight had completed 4 or 5 years of higher education, and one patient had completed more than 5 years of higher education. Regarding their professional activity, 18 patients (20.00%) were students, 28 (31.10%) were employees, 12 (13.30%) were executive managers, 13 (14.40%) had an intermediate position, six (6.60%) were artisans, shop-keepers or small business owners, and 13 (14.50%) had another situation. Among co-morbidities, we found major depressive episode ($n = 26$, 28.90%), borderline personality disorder ($n = 9$, 10.00%) and bulimia ($n = 4$, 4.40%). Other diagnoses represented less than 4% of the sample. Concerning the traumatic events, 58.89% of the patients had experienced sexual violence, 5.55% the death of a loved relative with traumatic circumstances (e.g. discovering the dead body), 17.78% physical violence, 2.22% a car accident, 4.44% harassment with death threats, 2.22% being in a war

Table 4. Multiple regression model

Predictors of dissociation	Standardized β	t	R	R^2	F	p
General population sample						
Model 1			0.88	0.78	3.98	<0.01
ERBS-EC	0.83	59.84				<0.01
Model 2			0.90	0.81	2.20	<0.01
ERBS-EC	0.20	3.79				<0.01
DERS-F	0.71	13.44				<0.01
Model 3			0.90	0.82	1.49	<0.01
ERBS-EC	0.10	1.68				= 0.09
DERS-F	0.62	10.8				<0.01
DBS-P	0.19	3.57				<0.01
Clinical sample						
Model 1			0.88	0.77	294.45	<0.01
ERBS-EC	0.88	17.16				<0.01
Model 2			0.92	0.85	248.01	<0.01
ERBS-EC	-0.20	-1.24				= 0.22
DERS	1.11	6.90				<0.01
Model 3			0.92	0.85	166.66	<0.01
ERBS-EC	-0.29	1.63				= 0.11
DERS-F	0.99	5.33				<0.01
DBS-P	0.21	1.20				= 0.23
			0.90	0.80	179.81	<0.01
Model 4						
ERBS-EC	0.23	1.33				= 0.19
DBS-P	0.68	1.99				<0.01

DESR-F, Difficulties in Emotion Regulation Scale; ERBS, Emotion and Regulation Beliefs Scale; EC, Emotional Constraint; DBS, Dissociation Beliefs Scale; P, Positive.

Table 5. Correlation matrix of the PTSD sample

	PCL-5	DES	DERS	DBS-N	DBS-P	ERBS-EC	ERBS-RW	ERBS-H
PCL-5	1							
DES	.54**	1						
DERS-F	.47**	.65**	1					
DBS-N	.39**	.39**	.57**	1				
DBS-P	.24*	.39**	.31**	.36**	1			
ERBS-EC	.14	.22*	.270*	.19	.27*	1		
ERBS-RW	-.02	-.12	-.10	.06	.07	-.14	1	
ERBS-H	.10	.17	.22*	.17	.17	.56**	-.014	1

DES, Dissociative Experiences Scale; PCL-5, PTSD Checklist for DSM-5; DESR-F, Difficulties in Emotion Regulation Scale; ERBS, Emotion and Regulation Beliefs Scale; EC, Emotional Constraint; RW, Regulation Worth; H, Hijack; DBS, Dissociation Beliefs Scale; N, Negative; P, Positive; ** $p < .01$; * $p < .05$.

zone or being held hostage, and 3.33% life-threatening medical interventions. The descriptive data are presented in Table 1.

Associations between cognitive processes, dissociation and emotion regulation

The correlation matrix is presented in Table 5. Overall, we found a positive association between scores for dissociation and beliefs about dissociation (r strength between 0.39 and .39). We found an association between emotional constraint and beliefs about dissociation ($r = .22$), but no

significant association with the other beliefs. We found an association between beliefs about emotion and difficulties in emotion regulation (r strength between 0.22 and .27).

Mediation analysis

When entered alone (Model 1), emotional constraint was a significant predictor of dissociation ($\beta = .88, p < .01$). When entered with difficulty in emotion regulation (Model 2), emotional constraint was no longer a significant predictor ($\beta = -0.20, p = .22$). When we entered emotional constraint with both difficulty in emotion regulation and positive beliefs about dissociation (Model 3), emotional constraint was not a significant predictor ($\beta = -.29, p = .11$), nor was beliefs about dissociation ($\beta = -.21, p = .23$). When we entered emotional constraint and positive beliefs about dissociation, emotional constraint was not significant ($\beta = .23, p = .186$), but beliefs about dissociation were ($\beta = -.68, p < .01$). The results are presented in Table 4.

For the bootstrapping procedure, when we entered dissociative symptoms as the dependent variable, emotional constraint as the independent variable and emotion regulation difficulty as the mediator, we found a significant overall model ($F = 31.91; R^2 = .42; p < .01$). We found a non-significant direct effect of emotional constraint on dissociation (95% confidence interval = $-.3$ to $.56$). We found a significant indirect effect of emotional constraint on dissociation through difficulty in emotion regulation (95% confidence interval = $.09$ to $.80$).

When we entered dissociative symptoms as the dependent variable, emotional constraint as the independent variable, and positive beliefs about dissociation as the mediator, we found a significant overall model ($F = 8.85; R^2 = .41; p < .01$). We found a non-significant direct effect of emotional constraint on dissociation (95% confidence interval = $-.19$ to $.84$). We found a significant indirect effect of emotional constraint on dissociation through positive emotional beliefs (95% confidence interval = $.02$ to $.50$).

Discussion

The first aim of our study was to evaluate the psychometric properties of the French ERBS. We found acceptable internal consistency and we confirmed the three-factor structure with indexes similar to those of the initial version (Veilleux *et al.*, 2015). We also found significant associations between beliefs about emotion and difficulty in emotion regulation, anxiety, depression and PTSD. This confirms that the ERBS has good concurrent validity and provides further support for theoretical models suggesting that such beliefs determine the emotion regulation process (Barlow *et al.*, 2016; Ford and Gross, 2018).

The second aim of this study was to develop a standardized scale to assess beliefs about dissociation. We found good psychometric properties of the DBS. We established a good fit of a three-factor structure, suggesting a general concept of beliefs about dissociation and two specific components, namely, positive and negative beliefs. Positive beliefs consist mainly of the idea that dissociation is a way of avoiding emotions. Negative beliefs involve the negative consequences of dissociation on daily life. In contrast to previous findings (Vancappel *et al.*, 2022b), both positive and negative beliefs were positively associated with dissociation, in both the non-clinical and the PTSD samples. This may be explained by the fact that individuals with higher levels of dissociation are more prone to have thoughts or ruminations about it. Therefore, the relationship between dissociation and beliefs about dissociation appears to be two-directional. The positive association between dissociation and negative beliefs is in line with previous research, suggesting that a catastrophic perception of dissociation can increase dissociation itself (Hunter *et al.*, 2003).

We found a positive association between dissociation and negative beliefs about emotion. This association was significant for every sub-dimension of the ERBS for the non-clinical group but only for the emotional constraint sub-dimension for the PTSD sample. The difference

between the two groups could be largely explained by the lower statistical power of the PTSD group. Overall, it suggests that people who perceive their emotions negatively are more likely to use dissociation to avoid aversive emotions.

Finally, we found a mediating role of difficulty in emotion regulation and positive beliefs about dissociation in the relationship between emotional constraint and dissociation in both groups. This suggests that the more people think emotions are overwhelming, the more difficulty they have regulating their emotions, and the more they perceive dissociation as a way of avoiding emotions. The increase in the two latter mechanisms results ultimately in an increase in dissociation itself. However, we only found a significant model with the two mediating factors in the non-clinical sample. This may again be due to the lower statistical power of the PTSD sample. Overall, these findings support the view of Ford and Gross (2018) that a negative appraisal of emotion would lead to emotional difficulties and greater use of avoidance strategies (e.g. dissociation). Further work is required to examine the relationships between the concepts mentioned in the present article (dissociation, PTSD, beliefs about emotion and dissociation, and emotional dysregulation).

Strengths

This study evaluated a number of mechanisms involved in dissociation in a clinical and a non-clinical sample. The sample sizes were adequate for mediation analysis. The findings suggest effective psychotherapeutic interventions to reduce dissociation, particularly, as previously suggested, through the modification of beliefs about dissociation and emotion (Vancappel *et al.*, 2022a; Vancappel *et al.*, 2022b).

Limitations

This study has a number of limitations. The tools used are self-report evaluations. There is a considerable imbalance between men and women in both samples. The study is cross-sectional and does not reveal causal relationships. The factor structure of the scales was only assessed in the non-clinical sample, due to the insufficient sample size of the clinical sample. Consequently, it is possible that the factor structures would have been different in a clinical sample. Finally, we used different tools to assess PTSD symptoms within the clinical and non-clinical sample. Therefore, we cannot compare the samples on this dimension.

Conclusion

The ERBS and DBS can be used to assess cognitive beliefs. Beliefs about emotion and dissociation seem to be involved in dissociative manifestations. Further research should be conducted to evaluate the role of such beliefs and the interest of potential therapeutic interventions based on their modification.

Data availability statement. The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Acknowledgements. None.

Author contributions. All authors contributed to the study conception and design. All authors gathered the data. The first author performed the statistical analyses and wrote the first version of the manuscript.

Alexis Vancappel: Conceptualization (lead), Data curation (lead), Formal analysis (lead), Investigation (lead), Methodology (equal), Project administration (lead), Writing – original draft (lead); **Hala Kerbage:** Conceptualization (equal), Writing – review & editing (equal); **Christian Reveillere:** Conceptualization (equal), Writing – review & editing (equal); **Wissam El Hage:** Conceptualization (equal), Investigation (equal), Methodology (equal), Writing – review & editing (equal).

Financial support. This work did not receive any specific grant from funding agencies from the public, commercial, or non-lucrative sectors.

Conflicts of interest. The authors declare that they have no competing interests related to this work.

Ethical standards. The study and informed consent procedures were approved by the ethics committee of the University of Tours-Poitiers, France (Comité d’Ethique de la Recherche Tours-Poitiers, no. 2020-05-23).

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