Difficulties in interpersonal regulation of emotions (DIRE) questionnaire: Psychometric Properties of the Italian Version and Associations with psychopathological symptoms

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Abstract

The goal of this research was to validate an Italian adaptation of the questionnaire Difficulties in Interpersonal Regulation of Emotions (DIRE) and to investigate its associations with psychopathology. An Italian sample ($N = 630$) completed the DIRE and the Symptom Checklist-90 (SCL-90). We tested the factorial structure of the DIRE using explorative and confirmatory factorial analyses; we analysed the convergent validity in terms of zero-order correlations with SCL-90 dimensions; and, we conducted multiple regressions to test the predictivity of DIRE factors on specific SCL-90 dimensions. The Italian DIRE replicated the four-factor structure of the original measure, with two interpersonal (Vent and Reassurance-seek) and two intrapersonal (Accept and Avoid) factors. Interpersonal factors resulted correlated with SCL-90 global indexes of psychopathology. Moreover, specific association between DIRE factors and SCL-90 dimensions were found. The Italian DIRE is a reliable and valid measure to evaluate clinically-relevant forms of emotion dysregulation.

Introduction

Emotion regulation refers to the processes by which individuals influence the experience and expression of their emotions (Gross, 1998). Although emotion regulation research has historically focused on processes that occur within an individual, people often turn to others for regulating emotions, such that communication and social interaction can become part of the regulation process (Dixon-Gordon et al., 2015; Frederickson et al., 2018; Barthel et al., 2018; Messina et al., 2021a; Grecucci et al., 2021). The interpersonal context is therefore a powerful means to elicit emotional reactions (Grecucci et al., 2013a, b, 2020), as well as to regulate someone's emotions (Zaki & Williams, 2013; Rimé, 2007). For example, when experiencing distress, a person may turn to friends in an effort to seek reassurance, or ask for help from a partner, or simply share their emotions with others. Researchers have therefore begun to study Interpersonal Emotion Regulation (IER), which refers to efforts within social interactions in the pursuit of an emotion regulatory goal (Zaki & Williams, 2013; Dixon-Gordon et al., 2015; Niven, 2017). As part of their conceptualization of IER, Zaki & Williams (2013) distinguished intrinsic interpersonal regulation, which refers to processes in which an individual uses social contact in order to regulate his/her own experience, and extrinsic interpersonal regulation, which refers to situations in which a person attempts to regulate another person's emotions.

Researchers have generally characterized emotion regulation strategies as adaptive and maladaptive according to

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their effectiveness in modifying emotions (Gross & John, 2003; Webb et al., 2012; Sheppes & Gross, 2012) and based on their associations with psychopathology (Aldao et al., 2010; Hu et al., 2014). Among more widely investigated strategies, efforts to positively reappraise the event (Weber et al., 2014; Messina et al., 2015) and non-judgemental acceptance of emotional reactions (Kohl et al., 2012; Messina et al., 2016, Messina et al., 2021b; c Faustino et al., 2020) are often considered adaptive strategies, whereas repetitive ruminative thoughts about negative situations (Watkins, 2008) and suppression of emotional reactions (Wenzlaff & Wegner, 2000) are considered maladaptive. Although there is now a robust scientific literature regarding these strategies, among others, all of these strategies represent *intrapersonal* emotion regulation processes. Thus, we are left with far less empirical data regarding the adaptive and maladaptive value of interpersonal emotion regulation strategies.

Adaptive forms of intrinsic IER have been proposed to serve as a protective factors that buffer against mental health difficulties (Marroquín, 2011). For example, self-disclosure can be an adaptive way to regulate emotions (Rimé, 2007; Schwartz-Mette et al., 2021). On the other hand, some IER strategies perpetuate or even exacerbate psychopathological symptoms, such as being overly dependent on others or venting to regulate one's own emotions (Dixon-Gordon et al., 2015; Hofmann et al., 2016). The questionnaire Difficulties in Interpersonal Regulation of Emotions (DIRE) was developed by Dixon-Gordon and colleagues (2018) to evaluate clinically-relevant, potentially maladaptive forms of intrinsic IER. The DIRE is a scenario-based measure, in which participants read a series of brief interpersonal emotionally-evocative scenarios and rate the likelihood that they would engage in a variety of potential responses. In the construction of these items, the authors identified several domains of difficulties in IER (talking about one's emotions, seeking reassurance, seeking problem-solving support, and venting) that resulted in two factors of IER in the factor analysis: Venting and Reassurance-seeking factors. They also added items intended to capture intrapersonal strategies, resulting in Acceptance and Avoidance factors, to allow the examination of IER predictive value when controlling for intrapersonal strategies. In the original development and validation study (Dixon-Gordon et al., 2018), the DIRE demonstrated convergent validity based on the association of its factors with wellbeing-related constructs of emotional and interpersonal functioning. Moreover, the DIRE factors also demonstrated patterns of associations with distinct forms of psychopathology, namely depression, anxiety and borderline personality disorder. In particular, higher scores on Venting and Reassurance-seeking were associated with greater anxiety and borderline personality

disorder symptoms, and lower Reassurance-seeking factor scores were associated with depression scores. The association between borderline personality disorder symptoms and greater use of the interpersonal strategies of Reassurance-seeking and Venting to regulate emotions has been confirmed also in a second independent study (Gratz et al., 2020). These findings have provided early evidence of the clinical relevance of difficulties in IER, suggesting the need to replicate the structure of the DIRE in other samples and extend the research on the DIRE and psychopathology.

In the present study, we developed an Italian adaptation of the DIRE questionnaire and we investigated its psychometric features in several aspects. Specifically, our aims were to: (1) examine whether the factor structure of the Italian version replicated the original version via (1a) exploratory factor analysis and (1b) confirmatory factor analysis; (2) test associations between the DIRE and existing measures of related constructs; and (3) identify associations between DIRE scales and symptoms of psychopathology across a broad array of psychopathology features.

Method

Participants. Volunteer participants were recruited online via social media posts and snowball sampling to complete online electronic questionnaires. Inclusion criteria were (a) age 18 and older; (b) Italian speakers; and (c) provide complete data on all questionnaires. Participants were recruited across two waves. Wave 1 ($n = 270$; 186 females; Mean age = 41.66, SD = 14.13) was recruited to address Aim 1a (examine factor structure via exploratory factor analysis). Wave 2 ($n = 360$; 310 females; Mean age = 40.45, SD = 13.61) was recruited to address Aim 1b (examine factor structure via confirmatory factor analysis). The two subsamples did not differ in terms of age ($t = -1.02$; $p = .307$).

This study received approval from the Ethical Committee for Psychological Research at University of Padua. Informed consent was obtained from all participants included in the study. Demographic features of the sample are described in Table 1.

Instruments

Difficulties in Interpersonal Emotion Regulation (DIRE). For the present study, we created an Italian adaptation of the DIRE questionnaire using a back-translation approach (see the Appendix). First, the items were translated by two translators and a clinical psychologist. Subsequently, the translated version was tested on a small group of Italian-speaking adults for clarity and equivalence.

Table 1 Demographic characteristics of the participants (*N* = 630)

Variable	Frequency	Percentage
Gender		
Female	496	78.73%
Male	133	21.11%
Other	1	0.16%
Age		
< 20	35	5.56%
21–30	142	22.54%
31–40	142	22.54%
41–50	134	21.27%
51–60	127	20.16%
61–70	41	6.51%
>70	9	1.43%
Education		
Graduate degree	96	15.24%
University Graduate	219	34.76%
High School Graduate	281	44.60%
Secondary School Graduate	34	5.40%
Relationship status		
Single	159	25.24%
Relationship without cohabitation	117	18.57%
Relationship and cohabitation	354	56.19%

As in the original version, three scenarios were presented: (1) feeling upset about a time-sensitive project that needs to be completed for school or work; (2) fighting with a significant other; and (3) thinking that friends have been avoiding you. For each scenario, individuals were asked to rate how distressed they would feel in that scenario on a scale of 0 (*not at all distressed*) to 100 (*extremely distressed*). For each scenario, participants were asked to indicate on a five-point Likert-type scale (from 1 = "*very unlikely* to 5 = "*very likely"*) the likelihood that they would respond in each of 7 ways. Thus, there are 21 total items. The items correspond to the factors established in past research: (1) Venting (2 items: "Raise your voice or criticize your friends to express how you feel" and "Complain to mutual acquaintances about your friends"); (2) Reassurance-seeking (2 items: "Keep contacting (texting, calling, etc.) friends and loved ones" and "Keep asking for reassurance"); (3) Avoidance (2 items: "Distract yourself from how you are feeling" and "Avoid feeling or showing your distress"; and (4) Acceptance (1 item: "Simply notice your feelings"). In the original version, all scales had adequate internal consistency (Venting: α = .78, Reassurance-seeking: α = .82, Avoidance: α = .65, Acceptance: α = .75), with comparable values in the present study (Venting: α = .76, Reassurance-seeking: α = .87, Avoidance: α = .72, Acceptance: α = .71).

Difficulties in Emotion Regulation Questionnaire. The DERS (Gratz & Roemer, 2004; Italian version: Giromini et al., 2012) is a 36-item self-report measure which assesses the following dimensions of emotion regulation difficulties: lack of emotional awareness (Awareness), lack of

emotional clarity (Clarity), difficulties in controlling impulsive behaviours when distressed (Impulsivity), difficulties in engaging in goal directed behaviours when distressed (Goals), non-acceptance of negative emotional responses (Non-acceptance), and limited access to effective emotion regulation strategies (Strategies). For each item participants are instructed to rate the frequency of the described behaviour (e.g., "When I'm upset, I become embarrassed for feeling that way") on a five-point Likert scale (from 1 = "*almost never*" to 5 = "*almost always*"), with high scores representing increasing difficulties with emotion regulation. The Italian version of the DERS demonstrates high internal consistency (α ranging from 0.76 to 0.94) for all subscales (Giromini et al., 2012).

Symptom Checklist-90. The Symptom Checklist-90 (SCL-90; Derogatis, 1977, 1994; Italian adaptation by Prunas et al., 2012) is a 90-item self-report inventory widely used to assess psychological distress and symptoms of psychopathology. Participants were asked to indicate the extent to which each symptom bothered them in the last week on a Likert scale from 0 (not at all) to 4 (extremely). The SCL-90 assesses symptoms across nine domains of psychopathology: Somatization (SOM), Obsessive-Compulsive symptoms (OC), Interpersonal Sensitivity (IS), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHOB), Paranoid Ideation (PAR), and Psychoticism (PSY). Moreover, it provides two global indices: (a) the Global Severity Index (GSI), which is an overall index of symptoms severity and it is calculated as the mean of all 90 items in the SCL-90; and (b) the Positive Symptom Total (PST), which is a count of all the items with non-zero responses and reveals the number of symptoms the respondent reports experiencing. In the Italian version of the SCL-90, the internal coherence resulted good for all subscales (α values between 0.70 and 0.96) (Prunas et al., 2021).

Procedure. The questionnaires were prepared using Google Forms and disseminated through social media, in line with the Italian government's recommendations on limiting face-to-face interactions during the Covid-19 pandemic. We used a snowball sampling strategy: the links were initially shared on the social media and participants were encouraged to pass them on to others, with a focus on recruiting individuals from the general public.

Results

Factor Structure of the Italian Version of the DIRE. An exploratory factor analysis (EFA) was initially performed on the subsample of 270 participants recruited during the first wave of data collection. Following Dixon-Gordon et al., (2018), we conducted a maximum likelihood EFA with

Table 2 Factor loadings resulting from the Exploratory Factor Analysis (N = 270)

Items	Factors			
	Reassurance-seek	Vent	Avoid	Accept
Keep contacting (texting, calling, etc.) friends and loved ones (SC1)	**0.64**	0.04	−0.10	0.22
Keep asking for reassurance (SC1)	**0.68**	0.17	−0.13	0.10
Keep contacting (texting, calling, etc.) friends and loved ones (SC2)	**0.78**	−0.05	0.09	0.02
Keep asking for reassurance (SC2)	**0.79**	0.01	0.10	−0.04
Keep contacting (texting, calling, etc.) friends and loved ones (SC3)	**0.73**	−0.03	−0.03	−0.07
Keep asking for reassurance (SC3)	**0.71**	0.01	−0.06	−0.08
Raise your voice or complain to the person in charge (SC1)	−0.05	**0.64**	−0.01	0.21
Complain to your coworkers or classmates about how unfair the situation is (SC1)	−0.05	**0.69**	0.02	0.14
Raise your voice or criticize your significant other to express how you feel (SC2)	0.01	**0.51**	0.04	0.13
Complain to friends or acquaintances about your significant other (SC2)	0.23	**0.42**	0.20	0.08
Raise your voice or criticize your friends to express how you feel (SC3)	0.02	**0.61**	−0.11	−0.08
Complain to mutual acquaintances about your friends (SC3)	0.19	**0.50**	0.10	0.01
Distract yourself from how you are feeling (SC1)	0.09	0.03	0.26	0.11
Avoid feeling or showing your distress (SC1)	−0.12	−0.00	**0.52**	−0.00
Distract yourself from how you are feeling (SC2)	0.10	0.06	**0.49**	−0.01
Avoid feeling or showing your distress (SC2)	−0.05	−0.04	**0.60**	−0.11
Distract yourself from how you are feeling (SC3)	0.18	0.07	**0.50**	−0.00
Avoid feeling or showing your distress (SC3)	−0.03	0.01	**0.63**	−0.19
Simply notice your feelings (SC1)	0.05	−0.01	−0.01	**0.75**
Simply notice your feelings (SC2)	−0.04	0.02	0.09	**0.69**
Simply notice your feelings (SC3)	0.02	−0.02	0.10	**0.57**

Note. SC1: first scenario; SC2: second scenario; SC3: third scenario. Loadings greater than 0.40 are shown in bold

oblimin rotation (an oblique rotation that allows the factors to be correlated) and relied on a parallel analysis to decide the number of factors to retain (Horn, 1965). For our data, this method suggested that a four-factor model provided the best fit. The eigenvalues of the extracted factors were 5.16, 3.06, 1.71, and 1.49, respectively: taken together, they explained 43.92% of the variance (22.02%, 11.70%, 5.69%, and 4.49%, respectively). As can be noted in Table 2, the rotated factorial structure was very similar to that obtained by Dixon-Gordon et al., (2018), with one minor exception. Specifically, the first factor was loaded by the 3 items (one for each scenario) "Keep contacting (texting, calling, etc.) friends and loved ones" and the 3 items (one for each scenario) "Keep asking for reassurance" and thus represented the Reassurance-seeking factor (all loadings ≥ 0.64). The second factor was loaded by the items "Raise your voice and complain to the person in charge" (first scenario), "Complain to your coworkers or classmates about how it is unfair the situation is" (first scenario), "Raise your voice or criticize your significant other to express how you feel" (second scenario), "Complain to friends or acquaintances about your significant other" (second scenario), "Raise

your voice or criticize your friends to express how you feel" (third scenario), and "Complain to mutual acquaintances about your friends" (third scenario), and hence corresponded to the Venting factor (all loadings ≥ 0.43). The third factor was loaded by the 2 items "Distract yourself from how you are feeling" of the first and second (but not third) scenarios and the 3 items (one for each scenario) "Avoid feeling or showing your distress" and therefore represented the Avoidance factor (all loadings ≥ 0.50). Lastly, the fourth factor was loaded by the 3 items (one for each scenario) "Simply notice your feelings" and thus corresponded to the Accept factor (all loadings ≥ 0.57). The only exception to the original pattern reported by Dixon-Gordon et al., (2018) was due to the fact that the "Distract yourself from how you are feeling" item in the third scenario did not load on any factor (all loadings ≤ 0.26). With respect to the factors' correlations, we found a strong association between the Reassurance-seeking and Venting factors (r = .60; consistent with the idea that they represented IER strategies) and a moderate correlation between the Acceptance and Avoidance factors (r = .39; consistent with the idea that they represented intrapersonal emotion regulation strategies). All other rs ≤ 0.13.

To further confirm the four-factor model, we performed a confirmatory factor analysis (CFA) on the subsample of 360 participants recruited during the second wave of data collection. We relied on the same set of goodness-of-fit indices used by Dixon-Gordon et al., (2018), including χ^2 (CMIN; Bollen ,1989), root mean square error of approximation (RMSEA < 0.08; Browne & Cudeck, 1993), standardized root mean square residual (SRMR < 0.08; Hu & Bentler 1999), comparative fit index (CFI > 0.90; Bentler, 1990), and the Tucker-Lewis Index (TLI > 0.90; Bentler & Bonett, 1980). The initial fit of the 4-factor model with independent measurement errors was poor ($\chi^2 = 610.11$, $p < .001$; SRMR = 0.06; RMSEA = 0.08; CFI = 0.81; TLI = 0.78). However, after adding covariances among errors across items that represented the same strategies and across items within each scenario that loaded on the same factor, the overall fit of the model became adequate ($\chi^2 = 311.72$, $p < .001$; SRMR = 0.05; RMSEA = 0.05; CFI = 0.93; TLI = 0.91).

Convergent Validity. In the full sample, we examined the zero-order associations between the DIRE scales and demographic characteristics, related constructs of emotion regulation difficulties assessed with the DERS, and psychopathological symptoms assessed with the SCL-90 (see Table 3). In terms of demographic features, older age was associated with fewer difficulties in IER (DIRE Venting and DIRE Reassurance-seeking), and with higher DIRE Acceptance scores. Female gender was associated with higher DIRE Acceptance scores and cohabitation with the partner was associated with slightly higher DIRE Venting scores. The self-reported distress associated to DIRE scenarios (DIRE Distress) was negatively correlated with maladaptive IER strategies (DIRE Venting and DIRE Reassurance-seeking), and positively with the adaptive strategy of acceptance (DIRE Acceptance). In terms of associations with related constructs, interpersonal DIRE scales (DIRE Venting and DIRE Reassurance-seeking) were significantly associated with more difficulties in emotion regulation overall (DERS total) and across all DERS subscales (with the exception of DERS Aware, which was not significantly associated with any DIRE scale). No significant associations were found between DERS total scores and the intrapersonal subscales DIRE Acceptance and DIRE Avoidance, but DIRE Acceptance was slightly negatively associated with difficulties in DERS Goal, and DIRE Avoidance was slightly significantly associated with DERS Non-acceptance scores.

With regard to psychopathology, both of the interpersonal subscales of the DIRE (DIRE Venting and DIRE Reassurance-seeking) were strongly correlated with the overall GSI and the PST of the SCL-90. Moreover, all specific symptom domains assessed with the SCL-90 (i.e., SOM, OC, IS, DEP, ANX, HOS, PHOB, PAR, PSY) were significantly correlated with DIRE IER scales. In addition, the DIRE

Table 3 Zero-order associations between the DIRE scales, demographic variables, DERS scores and SCL-90 scores

	DIRE Accept	DIRE Avoid	DIRE Vent	DIRE Reassure-Seek
A	0.71	0.72	0.76	0.87
M (SD)	3.14 (.94)	3.14 (0.82)	2.32 (0.85)	2.87 (1.03)
Age	0.17**	− 0.04	− 0.14**	− 0.24**
Gender (1 = female)	0.08*	0.03	0.06	0.07
Relationship (1 = yes)	− 0.01	0.00	0.04	− 0.02
Cohabitation with partner (1 = yes)	0.02	0.03	0.10*	0.03
DIRE Distress	− 0.08*	− 0.04	0.19**	0.28**
DERS Total	− 0.05	0.06	0.42**	0.36**
DERS Accept	0.04	0.11*	0.33**	0.27**
DERS Goal	-11*	− 0.00	0.34**	0.34**
DERS Impulse	− 0.03	− 0.01	0.38**	0.32**
DERS Strategy	− 0.07	0.01	0.39**	0.34**
DERS Aware	− 0.05	0.07	0.04	0.03
DERS Clarity	− 0.05	0.08	0.27**	0.17**
SCL-90 GSI	0.02	0.12*	0.35**	0.29**
SCL-90 PST	0.00	0.12*	0.34**	0.27**
SCL-90 SOM	0.10*	0.14**	0.29**	0.20**
SCL-90 OC	− 0.01	0.10*	0.29**	0.29**
SCL-90 IS	− 0.05	0.09*	0.40**	0.31**
SCL-90 DEP	− 0.02	0.09*	0.32**	0.28**
SCL-90 ANX	0.04	0.10*	0.30**	0.27**
SCL-90 HOS	0.02	0.09*	0.38**	0.25**
SCL-90 PHOB	0.06	0.14**	0.26**	0.18**
SCL-90 PAR	− 0.05	0.09*	0.32**	0.25**
SCL-90 PSY	0.03	0.12*	0.30**	0.26**

Note: GSI = Global Symptoms Index; PST = Positive Symptoms Total; SOM = Somatization; OC = Obsessive-Compulsive; IS = Interpersonal Sensitivity; DEP = Depression; ANX = Anxiety; HOS = Hostility; PHOB = Phobic Anxiety; PAR = Paranoid Ideation; PSY = Psychoticism

**p < .001, *p < .05

Avoidance scale was significantly correlated with all SCL-90 symptom domains (although the coefficients were generally smaller), whereas DIRE Acceptance was not correlated with any psychopathology, with the exception of an isolated correlation with somatization.

Relative Associations with Symptom Domains. To better understand the unique associations of the DIRE scales with the specific symptom domains, we conducted a series of multiple linear regressions. All DIRE factors and DIRE distress were included as predictors. Separate analyses were conducted with each SCL-90 symptom domain as an outcome. Given the co-occurrence of psychopathology symptoms, we included GSI scores as a covariate. Results showed that the DIRE scales have large predictive utility and they show unique associations with distinct forms of psychopathology symptoms, controlling for other symptoms. In

Table 4 Multiple Regression Analyses Examining DIRE factors and SCL-90 symptoms

	SOM	OC	IS	DEP	ANX	HOS	PHOB	PAR	PSY
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
R^2	0.70***	0.81***	0.79 ***	0.85***	0.85***	0.65***	0.52***	0.70***	0.79***
DIRE Distress	-0.00 (0.00)	0.00 (0.00)**	0.00 (0.00)'	0.00 (0.00)*	0.00 (0.00)	-0.00 (0.00)'	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)*
DIRE Accept	0.08 (0.02)***	-0.02 (0.02)	-0.05 (0.02)**	-0.03 (0.02)*	0.02 (0.01)	0.01 (0.02)	0.02 (0.02)	-0.06 (0.02)**	0.01 (0.01)
DIRE Avoid	0.01 (0.59)	0.01 (0.02)	0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.03 (0.02)	0.03 (0.02)	0.00 (0.03)	0.00 (0.02)
DIRE Vent	0.02 (0.02)	-0.07 (0.02)**	0.04 (0.02)*	-0.02 (0.02)	-0.03 (0.02)*	0.12 (0.03)***	-0.00 (0.02)	0.03 (0.03)	-0.01 (0.02)
DIRE Reassurance	-0.04 (0.02)'	0.05 (0.02)**	0.02 (0.02)	0.01 (0.02)	0.01 (0.01)	-0.01 (0.02)	-0.01 (0.02)	0.01 (0.02)	-0.00 (0.01)
GSI	1.00 (0.03)***	1.12 (0.02)***	0.97 (0.02)***	1.19 (0.02)***	1.10 (0.01)***	0.83 (0.03)***	0.63 (0.03)	1.02 (0.03)***	0.87 (0.02)***

Note: GSI = Global Symptoms Index; PST = Positive Symptoms Total; SOM = Somatization; OC = Obsessive-Compulsive; IS = Interpersonal Sensitivity; DEP = Depression; ANX = Anxiety; HOS = Hostility; PHOB = Phobic Anxiety; PAR = Paranoid Ideation; PSY = Psychoticism

***p < .001, **p < .01, *p < .05

particular, DIRE Venting was associated positively with greater IS and HOS symptoms and negatively associated with ANX and OC symptoms. DIRE Reassurance-seeking was associated with greater OC symptoms and less SOM symptoms. DIRE Acceptance was significantly and negatively associated with IS, DEP and PAR, and positively associated with SOM. Please see Table 4 for details of these regression results.

Discussion

In the present study, we developed and investigated the psychometric features and association to self-reported symptoms of psychopathology of an Italian adaptation of the DIRE questionnaire. The DIRE is a reliable and valid self-report measure suitable for the identification of maladaptive patterns of IER (Dixon-Gordon et al., 2018). Despite the importance of IER to the field of emotion regulation generally (Zaki & Williams, 2013) and to psychopathology in particular (Marroquín, 2011), prior to the present study there remained only an English version of the DIRE, hampering the study of IER. Our study addressed this gap, developing an Italian adaptation of the DIRE which largely replicated the factor structure of the original measure, and demonstrated convergent validity with a range of psychopathology symptoms. The psychometric properties of the Italian adaptation of the DIRE questionnaire were generally favourable. With respect to reliability, internal consistency coefficients of all subscales were comparable to those obtained in the original development sample (Dixon-Gordon et al., 2018). Both the exploratory and confirmatory factor analyses produced clear replications of the four factors structure, with two interpersonal factors (*Vent* and *Reassurance-seek*) and

two intrapersonal factors (*Accept* and *Avoid*). The interpersonal factors showed good concurrent validity, with strong correlations with other measures of difficulties in emotion regulation. Finally, a large range of significant associations with symptoms of psychopathology assessed with the SCL-90 (Derogatis et al., 1977) confirms the validity of the DIRE as a suitable questionnaire for the evaluation of clinically-relevant phenomena.

The findings of the present study clearly support the clinical relevance of IER as assessed with the DIRE questionnaire. First, we showed that using venting or excessive reassurance-seeking to regulate emotions was associated with more difficulties in emotion regulation, including lack of emotional clarity, difficulties in controlling impulsive behaviours, difficulties in engaging in goal directed behaviours when distressed, non-acceptance of negative emotional responses, and limited access to effective emotion regulation strategies. These associations between difficulties in emotional functioning and the interpersonal domains of the DIRE were consistent with the results of the original validation study, which also reported associations between the DIRE IER scales and poorer emotional functioning and interpersonal functioning (Dixon-Gordon et al., 2018). These associations between the IER scales and adverse emotion regulation are consistent with the general problems associated with reassurance-seeking and venting in extant work. For instance, past work has documented that reassurance seeking has been associated with other maladaptive emotion regulation strategies, such as rumination and catastrophizing (Selby et al., 2009) and with the maintenance of negative emotions (Osborne & Williams, 2013). Likewise, although venting is often intended to reduce unpleasant emotions (Bushman et al., 2001), it actually exacerbates negative mood (Bushman, 2002).

Second, a range of forms of psychopathology were correlated with difficulties in IER. Specifically, higher global symptom severity and a greater total number of reported symptoms were correlated with endorsement of venting and reassurance-seeking as strategies to regulate emotions. The associations between psychopathology and the domains of the DIRE IER scales replicated the results of the original version validation study (Dixon-Gordon et al., 2018). Extending past work, our findings revealed that the DIRE interpersonal scales were associated with a range of specific symptom domains. In particular, all symptom domains, across somatization, obsessive-compulsive symptom, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism, were associated with greater endorsement of both venting and reassurance-seeking. These findings align with extant research and theoretical models of interpersonal functioning in psychopathology. For instance, excessive reassurance-seeking has been associated with depression (Burns et al., 2006; Joiner et al., 2001), and may transmit distress and negative mood from one person to another, perpetuating depression via its deteriorating influence on the interpersonal relationships (Joiner et al., 1999, Joiner 1994). Excessive reassurance-seeking has been linked to anxiety (Kobori & Salkovskis, 2013; Cougle et al., 2012; Hofmann et al., 2016) and personality disorders (Gratz et al., 2020). Similarly, intense emotional expressions such as venting are thought to reduce social support and increase isolation in borderline personality disorder (Lazarus et al., 2014; Fitzpatrick et al., 2021; Schenk et al., 2019). In line with present findings, past work has documented associations between venting and anxiety (Ravindran et al., 1996; Roy-Byrne et al., 1992; Whatley et al., 1998) and depression (Klostermann et al., 2011; Kopper & Epperson, 1996). For instance, in depression, venting or "co-brooding" is thought to enhance negative emotions (Horn & Maercker, 2016). Our findings are among the first to link maladaptive IER with a range of other forms of psychopathology beyond depression and anxiety.

Although the focus of this work has been to enrich our measures of interpersonal forms of emotion regulation, the findings also have bearing on the measurement of intrapersonal emotion regulation strategies. The intrapersonal DIRE scales did not show all expected associations with general difficulties in emotion regulation and psychopathology. Namely, the DIRE Acceptance scale was not inversely correlated to more general difficulties in regulating emotion as assessed with the DERS. Moreover, although there were negative correlations between symptoms of psychopathology and the use of acceptance to regulate emotions, these were not statistically significant (with the exception of an isolated correlation between acceptance and somatization). These results align with previous investigations showing that adaptive strategies have weaker associations with clinical difficulties and psychopathology than maladaptive strategies (Aldao & Nolen-Hoeksema, 2012; Aldao et al., 2010). Similarly, emotional avoidance was not correlated to more difficulties in regulating emotion (with the exception of a significant association with specific difficulties related to non-acceptance of emotions), although it was significantly positively correlated with all of the symptom domains assessed. Although we did not directly compare the efficacy of intrapersonal and interpersonal regulation strategies, there were generally relatively larger effect sizes in terms of the IER strategies. This observation is an important counterpoint to the experimental finding that receiving empathic IER was more effective in reducing distress than employing intrapersonal strategies (Levy-Gigi & Shamay-Tsoory, 2017). Taken together, IER may be particularly potent in leading to either optimal or adverse consequences, depending on the strategy selected.

Our examination of the relative associations between the DIRE scales and specific symptom domains, while controlling for general severity, allowed us to identify the links between the DIRE scales and unique aspects of the distinct symptom domain. Several insights emerged from this analysis. First, venting was specifically predictive of symptoms of hostility and interpersonal sensitivity domains, both related to anger regulation. Due to the centrality of anger regulation in borderline personality disorder, we consider this result in line with past work demonstrating a link between venting and borderline personality traits (Dixon-Gordon et al., 2018). Second, venting was inversely associated with anxiety (and specifically general anxiety and obsessive-compulsive dimensions), suggesting that more severity of anxiety symptoms correspond to less use of venting, consistent with the internalizing nature of these anxiety symptoms (Levesque, 2011). Third, acceptance was uniquely and inversely associated with depression, interpersonal sensitivity and paranoid ideation, suggesting that intrapersonal components of regulation may be more influential in these symptom domains than IER. Taken together, these results suggest that each specific form of psychological suffering may emerge from different patterns of intrapersonal and interpersonal regulation difficulties. Future studies should clarify these associations in specific psychopathology domains.

The present study had several limitations. First, this study relied entirely on self-report measures. Future studies will likely benefit from peer/other report as well as direct observation and coding of interpersonal regulation constructs. Second, although this sample had the benefit of being a large community sample, demographic information was limited (e.g., missing race/ethnicity information) and it was composed of non-clinical participants. Given the theoretical

clinical relevance of IER to clinical work, findings from this study should be replicated with clinical samples (possibly assessed with clinician-administered diagnostic measures additionally to self-reports) to better determine how specific clinical groups vary in the use of maladaptive IER strategies.

These limitations notwithstanding, the present study represents a step toward the understanding of maladaptive components of interpersonal components of emotion (dys-)regulation. Findings from this study provide support for good psychometric properties of the Italian version of the DIRE allowing the development of IER research in this population. Moreover, they confirm and extend the general validity and clinical relevance of the DIRE dimensions, accounting for their potential clinical usefulness in terms of identifying treatment targets, as indicated by its association with psychopathology symptoms.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This study received approval from the Ethical Committee for Psychological Research at University of Padua.

References

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, *30*(2), 217–237

Aldao, A., & Nolen-Hoeksema, S. (2012). When are adaptive strategies most predictive of psychopathology? *Journal of Abnormal Psychology*, *121*(1), 276–281. https://doi.org/10.1037/a0023598

Barthel, A. L., Hay, A., Doan, S. N., & Hofmann, S. G. (2018). Interpersonal emotion regulation: A review of social and developmental components. *Behaviour Change*, *35*(4), 203–216

Burns, A. B., Brown, J. S., Plant, E. A., Sachs-Ericsson, N., & Joiner, T. E. Jr. (2006). On the specific depressotypic nature of excessive reassurance-seeking. *Personality and Individual Differences*, *40*(1), 135–145

Bushman, B. J. (2002). Does venting anger feed or extinguish the flame? Catharsis, rumination, distraction, anger, and aggressive responding. *Personality and Social Psychology Bulletin*, *28*(6), 724–731

Bushman, B. J., Baumeister, R. F., & Phillips, C. M. (2001). Do people aggress to improve their mood? Catharsis beliefs, affect regulation opportunity, and aggressive responding. *Journal of Personality and Social Psychology*, *81*(I), 17–32

Cougle, J. R., Fitch, K. E., Fincham, F. D., Riccardi, C. J., Keough, M. E., & Timpano, K. R. (2012). Excessive reassurance seeking and anxiety pathology: Tests of incremental associations and directionality. *Journal of anxiety disorders*, *26*(1), 117–125

Derogatis, L. R., Lipman, R. S., & Covi, L. (1977). *SCL-90. Administration, scoring and procedures manual-I for the R (revised) version and other instruments of the Psychopathology Rating Scales Series*. Chicago: Johns Hopkins University School of Medicine

Dixon-Gordon, K. L., Bernecker, S. L., & Christensen, K. (2015). Recent innovations in the field of interpersonal emotion regulation. *Current Opinion in Psychology*, *3*, 36–42

Dixon-Gordon, K. L., Haliczer, L. A., Conkey, L. C., & Whalen, D. J. (2018). Difficulties in interpersonal emotion regulation: Initial development and validation of a self-report measure. *Journal of Psychopathology and Behavioral Assessment*, *40*(3), 528–549

Faustino, B., Vasco, A. B., Silva, A. N., & Marques, T. (2020). Relationships between emotional schemas, mindfulness, self-compassion and unconditional self-acceptance on the regulation of psychological needs.Research in Psychotherapy: Psychopathology, Process, and Outcome, 23(2)

Fitzpatrick, S., Liebman, R. E., & Monson, C. M. (2021). The borderline interpersonal-affective systems (BIAS) model: Extending understanding of the interpersonal context of borderline personality disorder.Clinical Psychology Review,101983

Giromini, L., Velotti, P., De Campora, G., Bonalume, L., & Zavattini, C., G (2012). Cultural adaptation of the difficulties in emotion regulation scale: Reliability and validity of an Italian version. *Journal of clinical psychology*, *68*(9), 989–1007

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of psychopathology and behavioral assessment*, *26*(1), 41–54

Gratz, K. L., Richmond, J. R., Edmonds, K. A., Rose, J. P., & Tull, M. T. (2020). Integrating social comparison into the understanding of emotion regulation in borderline personality. *Journal of Social and Clinical Psychology*, *39*(8), 727–760

Grecucci, A., Messina, I., Amodeo, L., Lapomarda, G., Crescentini, C., Dadomo, H., Panzeri, M., Theuninck, A., & Frederickson, J. (2020). A dual route model for regulating emotions: Comparing models, techniques and biological mechanisms. *Frontiers in Psychology*, *11*, 930

Grecucci, A., Giorgetta, C., Bonini, N., & Sanfey, A. G. (2013a). Reappraising social emotions: the role of inferior frontal gyrus, temporo-parietal junction and insula in interpersonal emotion regulation. *Frontiers in Human Neuroscience*, *7*(September), 523

Grecucci, A., Giorgetta, C., Bonini, N., & Sanfey, A. (2013b). Living emotions, avoiding emotions: behavioral investigation of the regulation of socially driven emotions. *Frontiers in Psychology*, *3*, 616

Grecucci, A., De Pisapia, N., Venuti, P., Palladino, M. P., & Job, R. (2015b). Baseline and strategic mindful regulation: behavioral and physiological investigation. *Plos One*, *10*(1), e0116541

Grecucci, A., Messina, I., & Monachesi, B. (2021). La ricerca sulla regolazione emozionale: stato dell'arte e sviluppi futuri. *Giornale italiano di psicologia*, *48*(3), 733–760

Grecucci, A., Thneuick, A., Frederickson, J., & Job, R. (2015c). Mechanisms of social emotion regulation: from neuroscience to psychotherapy. In M. L. Bryant (Ed.), Handbook on Emotion Regulation: Processes, Cognitive Effects and Social Consequences. Nova Publishing

Gross, J. J. (1998). Antecedent-and response-focused emotion regulation: divergent consequences for experience, expression, and physiology. *Journal of personality and social psychology*, *74*(1), 224

Hofmann, S. G., Carpenter, J. K., & Curtiss, J. (2016). Interpersonal emotion regulation questionnaire (IERQ): Scale development and psychometric characteristics. *Cognitive therapy and research*, *40*(3), 341–356

Hu, T., Zhang, D., Wang, J., Mistry, R., Ran, G., & Wang, X. (2014). Relation between emotion regulation and mental health: a meta-analysis review. *Psychological reports*, *114*(2), 341–362

Joiner, T. E. (1994). Contagious depression: Existence, specificity to depressed symptoms, and the role of reassurance seeking. *Journal of personality and social psychology*, *67*(2), 287

Joiner, T. E., Metalsky, G. I., Gencoz, F., & Gencoz, T. (2001). The relative specificity of excessive reassurance-seeking to depressive symptoms and diagnoses among clinical samples of adults and youth. *Journal of Psychopathology and Behavioral Assessment*, *23*(1), 35–41

Klostermann, K., Chen, R., Kelley, M. L., Schroeder, V. M., Braitman, A. L., & Mignone, T. (2011). Coping behavior and depressive symp- toms in adult children of alcoholics. *Substance Use & Misuse*, *46*(9), 1162–1168

Kobori, O., & Salkovskis, P. M. (2013). Patterns of reassurance seeking and reassurance-related behaviours in OCD and anxiety disorders. *Behavioural and Cognitive Psychotherapy*, *41*(1), 1–23

Kohl, A., Rief, W., & Glombiewski, J. A. (2012). How effective are acceptance strategies? A meta-analytic review of experimental results. *Journal of behavior therapy and experimental psychiatry*, *43*(4), 988–1001

Kopper, B. A., & Epperson, D. L. (1996). The experience and expression of anger: Relationships with gender, gender role socialization, de- pression, and mental health functioning. *Journal of Counseling Psychology*, *43*(2), 158–165

Lazarus, S. A., Cheavens, J. S., Festa, F., & Rosenthal, M. Z. (2014). Interpersonal functioning in borderline personality disorder: A systematic review of behavioral and laboratory-based assessments. *Clinical psychology review*, *34*(3), 193–205

Levesque, R. J. R. (2011). Externalizing and internalizing symptoms. Encyclopedia of adolescence, 903–905

Levy-Gigi, E., & Shamay-Tsoory, S. G. (2017). Help me if you can: Evaluating the effectiveness of interpersonal compared to intrapersonal emotion regulation in reducing distress. *Journal of behavior therapy and experimental psychiatry*, *55*, 33–40

Messina, I., Bianco, F., Cusinato, M., Calvo, V., & Sambin, M. (2016). Abnormal default system functioning in depression: implications for emotion regulation. *Frontiers in psychology*, *7*, 858

Messina, I., Bianco, S., Sambin, M., & Viviani, R. (2015). Executive and semantic processes in reappraisal of negative stimuli: insights from a meta-analysis of neuroimaging studies. *Frontiers in Psychology*, *6*, 956

Messina, I., Calvo, V., Masaro, C., Ghedin, S., & Marogna, C. (2021a). Interpersonal Emotion Regulation: From Research to Group Therapy. *Frontiers in Psychology*, *12*, 636

Messina, I., Calvo, V., Masaro, C., Ghedin, S., & Marogna, C. (2021c). Interpersonal Emotion Regulation: From Research to Group Therapy. Frontiers in Psychology, 12, 636

Niven, K. (2017). The four key characteristics of interpersonal emotion regulation. *Current opinion in psychology*, *17*, 89–93

Osborne, D. W. S., & Williams, C. J. (2013). Excessive reassurance-seeking. *Advances in Psychiatric Treatment*, *19*(6), 420–421

Prunas, A., Sarno, I., Preti, E., Madeddu, F., & Perugini, M. (2012). Psychometric properties of the Italian version of the SCL-90-R: a study on a large community sample. *European psychiatry*, *27*(8), 591–597

Ravindran, A. V., Griffiths, J., Merali, Z., & Anisman, H. (1996). Primary dysthymia: A study of several psychosocial, endocrine and immune correlates. *Journal of Affective Disorders*, *40*, 73–84

Rimé, B. (2007). Interpersonal emotion regulation. *Handbook of emotion regulation*, *1*, 466–468

Roy-Byrne, P. P., Vitaliano, P. P., Cowley, D. S., Luciano, G., Zheng, Y., & Dunner, D. L. (1992). Coping in panic and major depressive disorder: Relative effects of symptom severity and diagnostic comorbidity. *The Journal of Nervous and Mental Disease*, *180*(3), 179–183

Selby, E. A., Anestis, M. D., Bender, T. W., & Joiner, T. E. (2009). An exploration of the emotional cascade model in borderline personality disorder. *Journal of Abnormal Psychology*, *118*(2), 375–387

Schenk, N., Zimmermann, R., Fürer, L., Krause, M., Weise, S., Kaess, M., & Schmeck, K. (2019). Trajectories of alliance ruptures in the psychotherapy of adolescents with borderline personality pathology: timing, typology and significance. Research in Psychotherapy: Psychopathology, Process, and Outcome, 22(2)

Sheppes, G., & Gross, J. J. (2012). Emotion regulation effectiveness: What works when. *Handbook of Psychology, Second Edition*, *5*

Schwartz-Mette, R. A., Lawrence, H. R., Shankman, J., Fearey, E., & Harrington, R. (2021). Intrapersonal Emotion Regulation Difficulties and Maladaptive Interpersonal Behavior in Adolescence. *Research on Child and Adolescent Psychopathology*, *49*(6), 749–761

Webb, T. L., Miles, E., & Sheeran, P. (2012). Dealing with feeling: a meta-analysis of the effectiveness of strategies derived from the process model of emotion regulation. *Psychological bulletin*, *138*(4), 775

Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. *Annual review of psychology*, *51*(1), 59–91

Whatley, S. L., Foreman, A. C., & Richards, S. (1998). The relationship of coping style to dysphoria, anxiety, and anger. *Psychological Reports*, *83*(3), 783–791

Zaki, J., & Williams, W. C. (2013). Interpersonal emotion regulation. *Emotion*, *13*(5), 803–810