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Research Paper

Affective styles in mood and anxiety disorders – Clinical validation of the "Affective Style Questionnaire" (ASQ)

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ABSTRACT

Background: Emotion regulation plays a critical role in the development and maintenance of psychological disorders. Less is known about the association of affective styles and psychopathology. The 20-item "Affective Style Questionnaire" (ASQ) has been validated in nonclinical samples. The American and German validation studies resulted in a three-factor structure (concealing, adjusting, and tolerating). The present study aimed to investigate three aspects: (1) the validation of the ASQ within a clinical sample, (2) the examination of possible differences in affective styles between patients suffering from affective versus anxiety disorders, and (3) the association of affective styles and anxiety, depression, and stress symptoms.

Methods: Overall 917 patients receiving cognitive-behavioral therapy at an outpatient clinic participated in this study, 550 participants were female. All data were collected before the beginning of treatment.

Results: Confirmatory factor analyses revealed the same three-factor structure found in the previous Western samples (CFI = 0.90, RMSEA = 0.06): Concealing (α = 0.81), adjusting (α = 0.71), and tolerating (α = 0.70). Significantly lower scores in the ASQ subscale adjusting were found in patients suffering from affective disorders than patients suffering from anxiety disorders. The results of the regression analyses showed that the ASQ adjusting and concealing behavior seem to play a more important role than the ERQ reappraisal and suppression for depression, anxiety, and stress among clinical populations.

Limitations: A number of limitations must be taken into consideration while evaluating the present study. First and foremost, the clinical data were based on primary diagnoses. We did not ascertain comorbid diagnoses. This distinction may be important, since affective and anxiety disorders are often linked to each other. In addition, we only used data collected before the beginning of psychotherapeutic treatment and were therefore not able to analyze changes in affective styles during and after intervention. Furthermore, all data were based on self-reported information of patients. We did not implement either a therapeutic rating of affective styles or physiological measures, for instance arousal, which could have shown whether the used strategies successfully reduce negative emotions. Future research should address this question. Another limitation is the fact that we concentrated on the main categories of mental disorders and, therefore, did not subdivide patients with affective and anxiety disorders in terms of their concrete diagnoses. This is of special importance, because there might also be differences in affective styles within the main categories.

1. Introduction

Every human being experiences negative emotions but people's ways of coping vary greatly. Emotion regulation depicts the process by which individuals consciously and unconsciously modulate their emotions to respond to environmental demands (Rottenberg & Gross, 2003; Campbell-Sills & Barlow, 2007). Two regulation strategies that have received considerable empirical attention are cognitive reappraisal and expressive suppression (Gross & John, 2003; Ochsner et al., 2002). Cognitive reappraisal as an antecedent-focus strategy serves to change the negative emotional impact before distress is fully activated. Expressive suppression as a response-focused strategy is used to avoid an ongoing negative emotion. Research has shown that antecedent-focused strategies are relatively effective, whereas response-focused strategies tend to paradoxically increase negative affect (Gross, 1998; Aldao et al., 2010).

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Individuals vary in their use of strategies, in the speed and in the intensity of emotional reactions to similar threats and rewards (Dennis, 2007). This broad range of individual responses is referred to as *affective style* (Davidson, 1998, 2000, 2002; Hofmann et al., 2012). For instance, some people tolerate feeling sad or anxious, whereas others react to the onset of such emotions by immediately appraising them as intolerable and subsequently engage in maladaptive response-focused strategies (Gross & John, 2003). With the development of the "Affective Style Questionnaire" (ASQ), Hofmann and Kashdan (2010) aimed to provide a tool to assess such inter-individual differences in the habitual use of emotion regulation strategies. The ASQ was developed in a two-phase study: In their first study, the authors compiled a pool of 127 items related to the construct of emotion regulation strategies, mostly based on the work by Gross and John (1997; 2003), as well as on the acceptance and mindfulness based literature (e.g., Hayes et al., 1999). Items and self-report measurements were presented to a student sample ($N = 457$). Analyses revealed three meaningful and interpretable factors, which led to the following three affective styles: concealing, adjusting, and tolerating.

Concealing describes the tendency to avoid intrapersonal and interpersonal emotions that surface (eight items; e.g., "I often suppress my emotional reaction to things") including suppression and other response-focused strategies. *Adjusting* reflects the perception of an emotion as information, and the ability to use this information to modulate the emotional experience and expression in response to the situational demands of a particular context. This includes not only cognitive reappraisal but also other tactics that help to successfully balance emotions as needed (seven items; e.g., "I can get out of a bad mood very quickly"). Finally, *tolerating* refers to the perception of an emotion without any effort to fight this feeling, even if this emotion is negative and causes distress (five items; e.g., "It's ok if people see me being upset").

In order to further evaluate the structure and psychometric properties of the ASQ, Hofmann and Kashdan conducted a second study administering the ASQ to another student sample ($N = 495$). Results supported the three-factor structure of concealing, adjusting, and tolerating. Internal consistency values were acceptable for all three subscales (Cronbach's alpha values of concealing: $\alpha = 0.84$, adjusting: $\alpha = 0.82$, and tolerating: $\alpha = 68$). Construct validity was also satisfactory, results showed strong relations with other emotion regulation scales. For instance, correlations were found for ASQ adjusting and the "Emotion Regulation Questionnaire" (ERQ; Gross & John, 2003) subscale reappraisal ($r = 0.57$), ASQ concealing with ERQ suppression ($r = 0.52$), and ASQ tolerating was negatively correlated with ERQ suppression ($r = -.32$).

Graser et al. (2012) translated the original ASQ into German and conducted a validation study with a student sample ($N = 640$). Results of factor analyses replicated the original three-factor structure. However, two items of the adjusting subscale (Item 2: "I have my emotions well under control" and Item 8: "I am able to let go of my feelings") loaded onto the other subscales, and thus, were reassigned to the concealing and tolerating subscale. Internal consistencies were satisfactory and consistent with the original version (concealing scale: $\alpha = 0.84$; adjusting scale: $\alpha = 0.75$; tolerating scale: $\alpha = 0.72$). Within the German sample, male and female participants differed significantly in all three subscales: Men scored significantly higher in concealing and adjusting, whereas women scored significantly higher in tolerating. In summary, both validation studies provide evidence for the applicability of the ASQ within nonclinical US and German populations.

Another cross-validation study was conducted (Ito & Hofmann, 2014) using a Japanese student sample ($N = 1{,}041$). Here, a fourth factor labeled holding was found. In addition, the authors examined the influence of affective styles on depression and anxiety symptoms in this study. Results showed strong associations of adjusting with depression ($\beta = -0.19$) and anxiety ($\beta = -0.29$). Whether these results generalize to a clinical population has not been examined so far, and will be addressed in the present study. In conclusion, the ASQ seems to be a suitable instrument to measure affective styles in a healthy population. However, as of now, the ASQ factor structure and psychometric properties have not been investigated in a clinical sample. This is of special importance, since a better understanding of emotion dysregulation might help to provide a more detailed picture of different psychological disorders, their common factors as well as their differences. The present study addresses this paucity and aimed to investigate three aspects: (1) the validation of the ASQ within a clinical sample, (2) the examination of possible differences in affective styles between patients suffering from affective versus anxiety disorders, and (3) the association of affective styles and anxiety, depression, and stress symptoms.

Regarding the validation, we first hypothesized that the three-factor structure of concealing, adjusting, and tolerating would also emerge in a clinical outpatient population in Germany. We expected the three-factor structure, because the only deviation from this factor structure was found in an Asian population, which suggests cultural differences in affective styles. Furthermore, we hypothesized that previous findings on the correlations between the ASQ and ERQ would be replicated (Hofmann et al., 2010; Ito & Hofmann, 2014): We predicted that adjusting would be positively correlated with ERQ reappraisal, and that concealing would be positively correlated with ERQ suppression. In addition, we expected to find a negative correlation between tolerating and ERQ suppression.

Secondly, we sought to examine differences of affective styles in patients suffering from mood and anxiety disorders. As part of emotion regulation research, previous studies have provided empirical data showing associations between different strategies and psychopathology (for an overview see the meta-analysis by Aldao et al., 2010). Less is known about the association of affective styles and mental disorders. One study by D' Avanzato et al. (2013) found that patients suffering from depressive disorders showed a less frequent use of reappraisal assessed with the ERQ than patients suffering from anxiety disorders, who in turn reported more use of suppression. These differences might be explained by different prefrontal activation patterns in patients with mood and anxiety disorders (Davidson, 1998, 2000, 2002). We expected to find similar differences of patients with anxiety and mood disorders with regards to their use of affective styles. Assuming that patients suffering from affective disorders show deficits in the successful use of cognitive reappraisal, they might also have difficulties in adjusting to situational demands. We, therefore, hypothesized to find lower scores in adjusting for patients suffering from affective disorders when compared to patients suffering from anxiety disorders. Conversely, we assumed to find a similar effect of concealing. More precisely, we hypothesized higher scores in concealing for patients suffering from anxiety disorders when compared to patients suffering from affective disorders. With regard to possible differences in tolerating, we did not set hypotheses a priori.

Thirdly, we were interested in the associations of different affective styles and psychopathology. As mentioned before, associations between affective styles and both depression as well as anxiety symptoms were found in a student sample (Ito & Hofmann, 2014). Analogue to this healthy population, we presumed a negative association of adjusting with depression, anxiety, and stress symptoms in both patients suffering from affective disorders and anxiety disorders. Even though concealing did not show significant associations in a healthy population (Ito & Hofmann, 2014), we also expected a positive association of concealing with depression, anxiety and stress symptoms in a clinical sample. This assumption is mostly based on previous studies showing a significant association of the maladaptive strategy suppression with mood and anxiety disorders (Aldao et al., 2010). Because of the similarities between suppression and concealing, we assumed that concealing might also contribute to depression, anxiety, and stress symptoms in patients suffering from affective and anxiety disorders. In reverse, we presumed a negative association of tolerating with depression, anxiety, and stress symptoms.

2. Methods

2.1. Participants

A total of $N = 917$ treatment-seeking patients participated in this study before receiving cognitive-behavioral therapy at an outpatient clinic in the Ruhr region in Germany between April 2012 and December 2016. Five hundred-fifty participants (60.0%) were female and 367 (30.0%) were male. The mean age was 37.87 years ($SD = 12.90$; Range: 18–78 years). All data were collected before the beginning of treatment. The most common primary diagnoses were affective disorders ($n = 462$; 50.4%), including $n = 9$ patients suffering from a manic or bipolar disorder, $n = 177$ patients suffering from a single major depression episode, $n = 229$ patients suffering from a recurrent major depression, and $n = 47$ patients suffering from persistent or unspecified mood disorders. The second most common primary diagnoses were neurotic, stress-related and somatoform disorders ($n = 377$; 41.1%), including $n = 162$ patients suffering from phobic anxiety disorders, $n = 39$ patients suffering from a panic disorder, $n = 26$ patients suffering from a general anxiety disorder, $n = 28$ patients with an obsessive-compulsive disorder, and $n = 122$ patients suffering from either a reaction to severe stress, respectively an adjustment disorder, a somatoform disorder or an unspecified anxiety disorder. This was followed by behavioral syndromes associated with physiological disturbances and physical factors (3.7%), personality disorders (2.5%), schizophrenia, schizotypal and delusional disorders (1.0%), substance abuse (0.7%), and other disorders (0.6%). Comorbidity was not ascertained in this present study.

Prior to assessments, participants were informed about the purpose of the study, the voluntary nature of their participation, data storage and security. They provided written informed consent prior to participation. Ethics Committee of the Faculty of Psychology at the Ruhr-Universität Bochum approved the study.

2.2. Measures

2.2.1. Diagnostic interview

Diagnoses were made by trained clinical psychologists using the DIPS ("Diagnostisches Interview bei psychischen Störungen"; Schneider & Margraf, 2006), a structured clinical interview to assess mental disorders according to the criteria of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV-TR; APA, 2000). The results of previous validation studies using the DIPS indicate high interrater-reliability coefficient scores (Cohen's kappa coefficient (κ)), especially for the major diagnostic categories of anxiety ($\kappa = 0.78$) and mood ($\kappa = 0.81$) disorders (Suppiger et al., 2008; In-Albon et al., 2008) as well as high retest-reliability coefficient scores ($\kappa = 0.80$ for affective and $\kappa = 0.76$ for anxiety disorders). All diagnoses were verified through supervising senior psychotherapists.

2.2.2. Affective Style Questionnaire

The ASQ (Hofmann & Kashdan, 2010; German version: Graser et al., 2012) is a 20-item scale, measuring the three affective styles concealing, adjusting, and tolerating, on a 5-point Likert scale ranging from (1) = "not true of me at all" to (5) = "extremely true of me". The internal consistency values (Cronbach's alpha) of the scores of the ASQ subscales in the US student samples were $\alpha = 0.84$ (concealing), $\alpha = 0.80 - 0.82$ (adjusting), and $\alpha = 0.66 - 0.68$ (tolerating). In the German student sample, the consistency values for the scores of the three subscales were $\alpha = 0.82$ (concealing), $\alpha = 0.76$ (adjusting), and $\alpha = 0.71$ (tolerating).

2.2.3. Emotion Regulation Questionnaire

The ERQ (Gross & John, 2003; German version: Abler & Kessler, 2009) is a 10-item scale used to assess two types of emotion regulation strategies: *cognitive reappraisal* and *expressive suppression*. The items are scored on a 7-point Likert scale ranging from (1) = "strongly disagree" to (7) = "strongly agree" . Internal consistency values of the German version were: $\alpha = 0.74$ for the score of suppression (0.73 for the original version) and $\alpha = 0.78$ for the score of reappraisal (0.79 original version). In the current sample, alpha values were $\alpha = 0.74$ for the score of suppression and $\alpha = 0.86$ for the score of reappraisal.

2.2.4. Depression Anxiety Stress Scale-21

The Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995; German version: Nilges, & Essau, 2015) is a 42-item self-report instrument measuring the three negative emotional states of depression, anxiety and tension/stress. We used 21 selected items from the DASS-42 to assess levels of depression, anxiety, and stress over the past week on three 7-item subscales using 4-point Likert scales from (0) = "did not apply to me at all" to (3) = "applied to me very much or most of the time". Consistency values for the three DASS subscales were $\alpha = 0.91$ for the score of depression, $\alpha = 0.81$ for the score of anxiety, and $\alpha = 0.86$ for the score of stress in the current sample.

2.3. Statistical analysis

The Statistical Package for the Social Sciences (SPSS) 24.0 and AMOS 24.0 were used to analyze the data. In order to cross-validate the factor structure of the ASQ, a confirmatory factor analysis was conducted. Goodness-of-fit indices, including the Comparative Fit Index (CFI) and the root mean square error of approximation (RMSEA) were examined to determine how well the model fit the data. The following thresholds were considered: CFI > 0.90 and RMSEA close to 0.06 indicate a good fit (Hu & Bentler, 1999). Since the chi-square (χ^2) statistic is very sensitive to sample sizes, it was not used as goodness-of-fit index (Schlermelleh-Engel et al. 2003). Standardized factor loadings were used to assess the appropriateness of the measurement. Means and standard deviations of the ASQ subscales were calculated, and internal consistencies were determined by calculating Cronbach's alpha. Multivariate analyses of variance with age and gender as covariates (MANCOVA) were performed to test for gender and age effects on the ASQ subscales. Effect sizes were calculated using partial eta squared (η_p^2) as suggested by Cohen (1988) with > 0.01 indicating a small effect, > 0.06 indicating a medium effect and > 0.14 indicating a large effect. Correlations between the subscales of the ASQ, ERQ, and DASS were calculated to examine the ASQ's convergent and discriminant validity. Lastly, we conducted MANOVAs of the ASQ subscales among the two largest groups of patients, consisting of patients with affective and anxiety disorders. Multiple regression analyses were performed to examine the influence of the ASQ and ERQ subscales as well as gender and age on affective and anxiety symptoms. The ERQ was included in the regression analysis because most studies on emotion regulation used the ERQ and were based on the process model of emotion regulation proposed by Gross (1998). Following the procedure of previous validation studies (see Ito & Hofmann, 2014), the ASQ and ERQ subscales were simultaneously entered into analyses.

3. Results

3.1. Factor structure

The results of the first CFA showed that the goodness of fit indices were below the threshold for an acceptable model fit (CFI = 0.78, RMSEA = 0.09). The model was re-examined by exploring modification indices, allowing error terms to be correlated with each other. Following these adjustments, the results of the CFA showed that the goodness of fit indices were acceptable: The Comparative Fit Index (CFI = 0.91) indicated a good fit, and the root mean square error of approximation (RMSEA = 0.06, 90% CI: 0.06 − 0.07) was acceptable. The standardized loadings were at least moderately high (loadings > 0.40), except for two items on the factor concealing (item

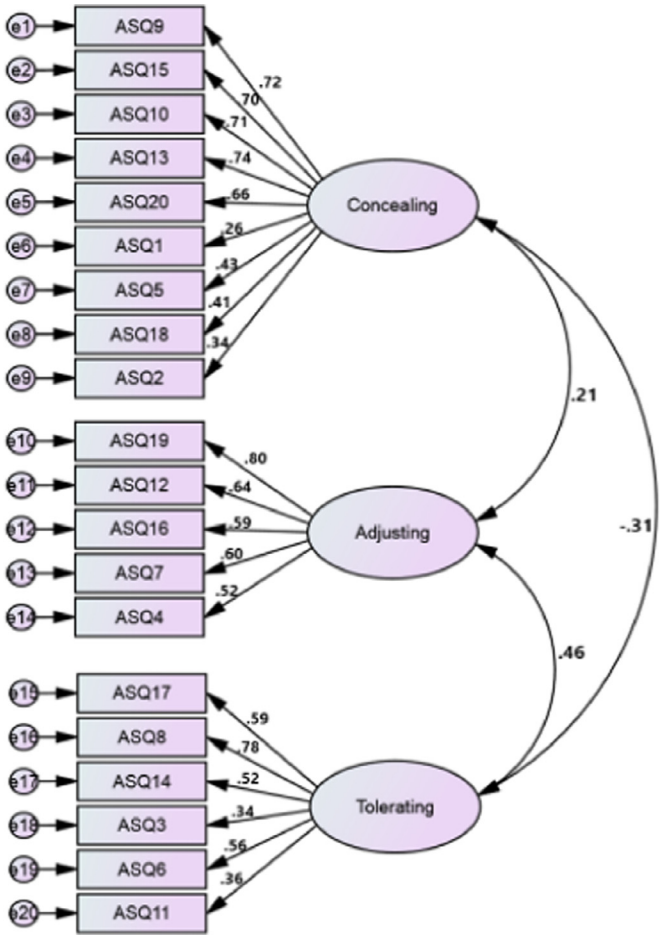

Fig. 1. Results of the CFA. Confirmatory factor analysis of the Affective Style Questionnaire. Ovals represent latent variables, squares represent the twenty items of the ASQ. Numbers next to arrows indicate factor loadings.

#1 = 0.26 and item #2 = 0.34) and two items on the factor tolerating (item #3 = 0.34 and item #11 = 0.36). Results are presented in Fig. 1.

3.2. Internal consistency and sex differences

The internal consistency value of the ASQ score was $\alpha = 0.77$ in this clinical sample. Internal consistency values of the scores of the three subscales were $\alpha = 0.82$ for the concealing factor, $\alpha = 0.76$ for the adjusting factor, and $\alpha = 0.71$ for the tolerating factor. The inter-correlations of the three factors were as followed (all ps < 0.01): $r = 0.21$ for concealing and adjusting, $r = 0.46$ for adjusting and tolerating, and $r = -0.31$ for concealing and tolerating. Female and male patients differed significantly in the ASQ subscale adjusting ($F(1, 915) = 11.29$; $p = .001$; $\eta_p^2 = 0.012$), with males showing higher scores than females. No further sex or age differences were found (all other $p > .10$).

3.3. Correlations of ASQ subscales with ERQ and DASS

Correlations between the ASQ subscales and the ERQ and DASS subscales were calculated. Results are presented in Table 1.

3.4. Comparison of ASQ, ERQ, and DASS subscales among affective and anxiety disorders

Means and standard deviations of ASQ, ERQ, and DASS subscales as well as *p*-values and effect sizes are presented in Table 2. Further analysis of variance in the two largest groups, consisting of patients suffering from affective and anxiety disorders, resulted in significant differences within the ASQ subscale adjusting ($F(1, 798) = 17.41$, $p < .001$, $\eta_p^2 = 0.021$) and the ERQ subscale reappraisal ($F(1, 798) = 12.36$, $p < .001$, $\eta_p^2 = 0.015$). In addition, the depression ($F(1, 798) = 84.12$, $p < .001$, $\eta_p^2 = 0.095$) and stress subscales ($F(1, 798) = 5.78$, $p = .016$, $\eta_p^2 = 0.007$) of the DASS differed significantly between affective and anxiety disorders.

In order to further examine differences within these two groups of patients, we first conducted multivariate analyses of variances within affective disorders and then within anxiety disorders. Results did not reveal significant differences (all $p > .05$).

3.5. Summary for the regression analyses on Depression, Anxiety, and Stress of ASQ and ERQ subscales

To examine the relationship between the DASS subscales depression, anxiety, and stress and the ASQ subscales, multiple regression analyses were conducted based on all patients suffering from affective or anxiety disorders. Results are presented in Tables 3.1 and 3.2. Overall, the ASQ adjusting subscale showed the highest negative association with depression, anxiety, and stress symptoms in patients suffering from anxiety disorders. Lower scores on the ASQ adjusting subscale were also associated with higher depression and stress symptoms in patients suffering from affective disorders.

Whereas concealing was positively associated only with depressive symptoms in patients suffering from affective disorders, it was positively associated with the entire range of anxiety, depression, and stress symptoms in patients with anxiety disorders. Tolerating only showed a negative association with anxiety symptoms in patients with affective disorders. Neither of the ERQ subscales showed significant relations to depression, anxiety, or stress symptoms (all $p > .05$).

4. Discussion

This was the first study to investigate affective styles in a large clinical outpatient sample using the ASQ. Although previous studies have shown that the ASQ is applicable to assess affective styles in

Table 1
Correlations of ASQ, ERQ, and DASS subscales.

	ASQ-concealing	ASQ-adjusting	ASQ-tolerating	ERQ reappraisal	ERQ suppression	DASS-depression	DASS-anxiety
ASQ-adjusting	−0.18**	.					
ASQ-tolerating	0.13**	0.44**	.				
ERQ-reappraisal	0.11**	0.51**	0.23**	.			
ERQ-suppression	0.62**	−0.04	−0.36**	0.07*	.		
DASS-depression	0.18**	−0.38**	−0.29**	−0.26**	0.29**	.	
DASS-anxiety	0.06	−0.24**	−0.22**	−0.14**	0.09**	0.52**	.
DASS-stress	−0.02	−0.44**	−0.20**	−0.27**	0.02	0.60**	057**

Note: ASQ = Affective Style Questionnaire, DASS = Depression Anxiety Stress Scale, ERQ = Emotion Regulation Questionnaire.
*$p < .05$ **$p < .01$.

Table 2
Means and standard deviations of ASQ, ERQ, and DASS subscales of affective and anxiety disorders.

	Affective disorders (n = 462) Mean (SD)	Anxiety disorders (n = 377) Mean (SD)	p	η_p^2
ASQ concealing	3.02 (0.77)	2.93 (0.73)	0.079	0.004
ASQ adjusting	**2.25 (0.73)**	**2.48 (0.74)**	**<0.001**	0.021
ASQ tolerating	2.87 (0.68)	2.97 (0.71)	0.083	0.004
ERQ reappraisal	**3.46 (1.19)**	**3.79 (1.23)**	**<0.001**	0.015
ERQ suppression	3.84 (1.29)	3.71 (1.27)	0.143	0.003
Depression	**1.56 (*0.78*)**	**1.07 (*0.73*)**	**<0.001**	0.095
Anxiety	0.87 (*0.58*)	0.94 (*0.67*)	0.104	0.003
Stress	**1.58 (*0.66*)**	**1.47 (*0.67*)**	**0.016**	0.007

Note: ASQ = Affective Style Questionnaire, DASS = Depression Anxiety Stress Scale, ERQ = Emotion Regulation Questionnaire.

Table 3.1.
Results of the regression analyses on depression, anxiety, and stress of the ASQ and the ERQ subscales in affective disorders.

		R^2	β	t	p
Depression	Overall	0.14			
	Gender		0.034	0.765	0.445
	Age		−0.050	−1.109	0.268
	ASQ concealing		0.149	2.519	**0.012**
	ASQ adjusting		−0.268	−4.724	**<0.001**
	ASQ tolerating		−0.061	−1.189	0.235
	ERQ reappraisal		−0.100	−1.938	0.053
	ERQ suppression		0.077	1.267	0.206
Anxiety	Overall	0.09			
	Gender		−0.099	−2.145	**0.033**
	Age		0.125	2.700	**0.007**
	ASQ concealing		0.047	0.780	0.436
	ASQ adjusting		−0.107	−1.836	0.067
	ASQ tolerating		−0.176	−3.321	**0.001**
	ERQ reappraisal		−0.084	−1.576	0.116
	ERQ suppression		0.016	−0.254	0.800
Stress	Overall	.17			
	Gender		−0.031	−0.702	0.483
	Age		0.002	0.036	0.971
	ASQ concealing		0.062	1.071	0.285
	ASQ adjusting		−0.387	−6.951	**<0.001**
	ASQ tolerating		−0.041	−0.811	0.418
	ERQ reappraisal		−0.058	−1.149	0.251
	ERQ suppression		−0.060	−1.005	0.315

Note: ASQ = Affective Style Questionnaire, DASS = Depression Anxiety Stress Scale, ERQ = Emotion Regulation Questionnaire.

Table 3.2
Results of the regression analyses on anxiety, depression, and stress of the ASQ and the ERQ subscales in anxiety disorders.

		R^2	β	t	p
Anxiety	Overall	0.07			
	Gender		−0.124	−2.372	**0.018**
	Age		0.002	.034	0.973
	ASQ concealing		0.140	2.054	**0.041**
	ASQ adjusting		−0.214	−3.307	**0.001**
	ASQ tolerating		−0.055	−0.879	0.380
	ERQ reappraisal		0.000	−0.007	0.995
	ERQ suppression		−0.021	−0.298	0.766
Depression	Overall	0.23			
	Gender		−0.093	−1.942	0.053
	Age		−0.034	−0.736	0.462
	ASQ concealing		0.202	3.255	**0.001**
	ASQ adjusting		−0.320	−5.420	**<0.001**
	ASQ tolerating		−0.056	−0.988	0.324
	ERQ reappraisal		−0.086	−1.618	0.107
	ERQ suppression		0.129	1.960	0.051
Stress	Overall	0.18			
	Gender		−0.132	−2.682	**0.008**
	Age		−0.051	−1.063	0.289
	ASQ concealing		0.188	2.929	**0.004**
	ASQ adjusting		−0.379	−6.222	**<0.001**
	ASQ tolerating		0.068	1.154	0.249
	ERQ reappraisal		−0.092	−1.663	0.097
	ERQ suppression		−0.048	−0.704	0.482

Note: ASQ = Affective Style Questionnaire, DASS = Depression Anxiety Stress Scale, ERQ = Emotion Regulation Questionnaire.

healthy populations (Hofmann & Kashdan, 2010; Graser et al., 2012; Ito & Hofmann, 2014; Erreygers & Spooren, 2017), this was the first clinical validation study.

The first aim was, therefore, to examine whether the three-factor model, found in previous validation studies in Western cultures, would fit the data of our clinical sample. As we expected, the known three-factor structure of concealing, adjusting, and tolerating, emerged in our clinical German population. The model fit the data adequately, and the goodness of fit was acceptable. This finding underlines the assumption that the previously found deviation of the three-factor structure in a Japanese sample might reveal cultural differences in affective styles. The majority of ASQ items loaded at least moderately high onto the previously assigned factors. Two items on the concealing subscale (Item 1: “People usually can't tell how I am feeling inside.” and Item 2: “I have my emotions well under control.”), and two items on the tolerating subscale (Item 3: “I can tolerate having strong emotions.” and Item 11: “It's ok to feel negative emotions at times.”) did not show sufficient loadings. Previous validation studies (e.g., Ito & Hofmann, 2014; Graser et al., 2012) also revealed items with poor loadings. For instance, Item 2 (“I have my emotions well under control”) was originally assigned to the adjusting subscale (Hofmann & Kashdan, 2010). Due to double factor loadings in the German validation study (Graser et al., 2012), the item was reassigned to the concealing subscale, still showing a poor loading. The reappearance of these precarious items, which mostly show a poor factor loading (see Ito & Hofmann, 2014, Graser et al., 2012), suggests that these items might need to be eliminated, thereby shortening the ASQ.

Regarding convergent validity, we found that adjusting was positively correlated with ERQ reappraisal, and concealing was positively correlated with ERQ suppression. In addition, tolerating was negatively correlated with ERQ suppression. These findings are in line with the results of previous studies (Hofmann & Kashdan, 2010; Graser et al., 2012) as well as with our hypothesis. Surprisingly, we did not find the gender differences described in previous studies (Graser et al., 2012). In line with the German validation study (Graser et al., 2012), we found a gender effect in the adjusting subscale, wherein male patients scored significantly higher than female patients. However, no significant differences were found for the other two subscales. This inconsistent finding highlights the need for clinical validation studies in the use of scales as clinical instruments instead of relying on data from normative or student samples. Additional research is needed to clarify, whether psychopathology might mitigate gender differences in affective styles, and, if so, whether this effect might change in the course of treatment.

The second aim of this study was to investigate possible differences in affective styles across various psychological disorders. In order to examine a wide variety of disorders, we did not implement exclusion criteria. Since most outpatients met the criteria for a primary diagnosis of either an affective or an anxiety disorder, we based our further analysis on detecting differences between patients suffering from affective or anxiety disorders. Taking a closer look at the affective styles, the patients suffering from affective disorders scored significantly lower on the adjusting subscale as well as on the ERQ subscale reappraisal than patients with anxiety disorders. These findings are in line with our hypotheses that not only concrete emotion regulation strategies but also affective styles differ between affective and anxiety disorders, and furthermore, that affective disorders lead to lower scores in adjusting. Although this finding does not explain whether a possible deficit in

adjusting might contribute to mood disorders or whether the mood disables the process of adjusting, there still seems to be a difference in adjusting skills in patients suffering from affective versus anxiety disorders. Further differences in the other two affective styles were not found: Neither concealing nor tolerating differed significantly between patients suffering from affective or anxiety disorders.

The third purpose of this study was to examine the associations of different affective styles and psychopathology. Surprisingly, the ERQ emotion regulation strategies, cognitive reappraisal and expressive suppression did not show significant associations, neither in affective nor in anxiety symptomology. However, our results revealed an interesting pattern of associations with affective styles: adjusting turned out to be clearly positive for patients with different psychopathology. The adjusting subscale showed a strong negative association with depression and with stress in patients suffering from affective disorders. We also found that the adjusting subscale was negatively associated with anxiety, depression, and stress in patients suffering from anxiety disorders. This finding is in line with our hypothesis and consistent with previous findings in a healthy population (Ito & Hofmann, 2014). Since the ASQ adjusting items assess the extent rather than the exact way, the individual feels to be able to adjust (e.g., “I know exactly what to do to get myself into a better mood.”), further research is needed to clarify the differences of adjusting between healthy and clinical populations. Even though the adjusting subscale did not explain much of the variance, the affective style adjusting seems to play a more important role than the use of cognitive reappraisal. Here, mood and anxiety disorders seem to reveal an inability to adapt to situational demands above and beyond cognitive reappraisal.

In addition, concealing showed a positive association with the symptomatology: It was positively associated with depression in patients suffering from affective disorders, and there was also a strong positive association of anxiety, depression, and stress in patients suffering from anxiety disorders. Contrary to previous findings of concealing in a healthy population (Ito & Hofmann, 2014), and consistent with our hypothesis, this affective style also seems to be relevant in terms of the development of psychopathology, especially in anxiety disorders. Concealing seems to play a more important role in anxiety disorders than in affective disorders. Although patients with anxiety disorders do not seem to use the concealing tendency more often or more intensely than patients suffering from affective disorders, the process of concealing still appears to be related to their anxiety symptomatology. The reason for the especially maladaptive role of concealing in anxiety disorders might, at least partially, be caused by the paradoxical effect of suppression increasing anxiety symptoms (Gross & Levenson, 1997; Campbell-Sills et al., 2006). However, since the ERQ suppression did not show such relations, the ASQ concealing seems to account for more maladaptive concealing behavior. Another contributing factor might be the fact that concealing assesses the tendency not only to suppress (e.g., “I often suppress my emotional reactions to things.”), but also to hide different negative emotions (e.g., “People usually can't tell when I am upset.” or “People usually can't tell when I am sad.”). Therefore, evaluation by others becomes more important and seems to determine emotional reactions. This might especially apply to patients suffering from social anxiety disorders. Further research is needed to clarify the exact role of concealing.

Finally, tolerating only showed a negative association with anxiety symptoms in patients suffering from affective disorders. This finding is partly in line with our hypothesis, however, we expected to find a more prominent role of tolerating in the psychopathology of both affective and anxiety disorders. Nevertheless, this finding underlines the assumption that affective styles differ in patients suffering from affective and anxiety disorders.

Taken together, the majority of previous emotion regulation studies tend to focus on the subscales of ERQ reappraisal and suppression. The results of this present study, however, show that the ASQ adjusting and concealing behavior seem to play a more important role than reappraisal and suppression for depression, anxiety, and stress among clinical populations.

5. Limitations

A number of limitations must be taken into consideration while evaluating the present study. First and foremost, the clinical data were based on primary diagnoses. We did not ascertain comorbid diagnoses. This distinction may be important, since affective and anxiety disorders are often linked to each other. In addition, we only used data collected before the beginning of psychotherapeutic treatment and were therefore not able to analyze changes in affective styles during and after intervention. Furthermore, all data were based on self-reported information of patients. We did not implement either a therapeutic rating of affective styles or physiological measures, for instance arousal, which could have shown whether the used strategies successfully reduce negative emotions. Future research should address this question. Another limitation is the fact that we concentrated on the main categories of mental disorders and, therefore, did not subdivide patients with affective and anxiety disorders in terms of their concrete diagnoses. This is of special importance, because there might also be differences in affective styles within the main categories. For instance, due to the very different moods that need to be regulated, a patient suffering from a bipolar disorder might show different affective styles than a patient suffering from a recurrent depressive disorder. In addition, a patient suffering from social anxiety disorder might display a very different affective style than a patient suffering from general anxiety disorder, because their anxiety symptoms are elicited differently depending on the situation.

6. Conclusions

In conclusion, these results provide evidence that the ASQ is applicable in clinical populations and seems to be a helpful instrument in uncovering functional and dysfunctional affective styles. A better understanding of patient's initial tendency to dysregulate emotions may contribute to an optimized treatment outcome. Future research should, therefore, assess whether affective styles change through psychotherapeutic interventions, and if so, in which way. Furthermore, treatments could be developed directly aiming at advancing functional and reducing dysfunctional affective styles. These findings warrant additional research on the use of affective styles throughout the course of psychotherapeutic treatment.

Contributors

All authors reviewed and approved the final manuscript.

Christina Totzeck, Tobias Teismann, and Stefan Hofmann conducted the study design and wrote the draft of the manuscript. Ruth von Brachel and Verena Pflug contributed to the data assessment and data preparation. Xiao Chi Zhang conducted the statistical analyses. Jürgen Margraf proofread the draft of the article.

All authors state their compliance with the Code of Ethics of the World Medical Association (Declaration of Helsinki). They also agree to the ethical standards of the Faculty of Psychology's Ethical Commission of the Ruhr-Universität Bochum.

Conflict of interest

Conflicts of interest: none.

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