Psychometric Properties of the Forms of Self-Criticising/Attacking and Self-Reassuring Scale (FSCRS) in Eating Disorder Patients

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Abstract

Recent studies found self-criticism being a key trait of maintaining eating disorder (ED) symptoms. Therefore, it is of high interest to have a valid and reliable measurement instrument. For this, Gilbert et al. (2004) invented the Forms of Self-Criticising/Attacking and Self-Reassuring Scale (FSCRS) which detects the extent of self-criticism and its counterpart self-reassurance in a person. The current study contributes to a growing understanding of the psychometric properties of the FSCRS. Namely, its internal- (sensitivity of change) and external responsiveness as well as its predictive validity were examined in a sample of Dutch patients with EDs (N = 589). The results indicate that the FSCRS is sensitive to change and shows responsiveness. Furthermore, findings showed that of the three subscales *inadequate self (IS), hated self (HS)* and *reassured self (RS)*, HS was the only FSCRS factor that made a significant predictive contribution to ED pathology after twelve months. Additionally, good internal consistency was found for all three subscales both before and after twelve months of treatment. Although the current study can support good reliability, validity and responsiveness of the FSCRS, future research is needed for further examination in different samples to verify good psychometric properties of the FSCRS.

Keywords: self-criticism, eating disorders (EDs), psychometric properties, the Forms of Self-Criticising/Attacking and Self-Reassuring Scale (FSCRS).

Contents

Introduction

The concept of self-criticism is defined by Perkins et al. (2020) as a "highly negative attitude towards the self" (p. 158). Several studies already found that self-criticism seriously impacts the facilitation and maintenance of eating disorders (EDs) (Noordenbos et al., 2014; Gilbert et al., 2006; Ferreira et al., 2014; Duarte et al., 2016). Therefore, Gilbert et al. (2004) designed the Forms of Self-Criticising/Attacking and Self-Reassuring Scale (FSCRS)) to measure self-criticism and its counterpart self-reassurance. Since not much is known yet about its psychometric properties in regard to responsiveness and its predictive validity, these will be examined in the current study in a sample of ED patients.

Eating Disorders

EDs are severe psychiatric disorders detected by abnormal eating behaviours and/or by trying to control one's weight. EDs can have a strong impact on mental and physical health and daily life (Voderholzer et al., 2020). For instance, serious consequences of ED are malnutrition, heart problems, amenorrhea, dental problems when purging, weak body and brain and much more (Dickstein et al.,2014). Despite these severe consequences, awareness is still low. One issue is the underestimation of EDs in the general population but also by general practitioners and mental health care specialists (Smink et al., 2012). Mandelli et al. (2020) reported a lifetime prevalence of EDs of around 0.5 – 1% with 3 to 8 times higher in women than in men. The Diagnostic and Statistical Manual of Mental Health Disorders – 5th edition (DSM-5) defines several types of Feeding and Eating Disorders (FEDs) that are "characterized by a persistent disturbance of eating or -eating-related behaviour that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial functioning" (American Psychiatric Association (APA, 2013). The APA (2013) pointed out the following EDs that are included in the DSM-5: AN, Bulimia Nervosa (BN), Binge Eating Disorder (BED), Other Specified Feeding and Eating Disorder (OSFED), Pica, Rumination Disorder, Avoidant/Restrictive Food Intake Disorder (ARFID) and Unspecified

Feeding or Eating Disorder (UFED). The most common forms of EDs are AN, BN and BED which is why these types are defined in depth (Qian et al., 2021).

AN is defined by a decreased energy intake when compared to needed requirements that is leading to significantly low body weight, as identified by the Body Mass Index (BMI). The BMI can be calculated by the weight in kilograms divided by the square of height in meters (kg/m^2) (Wong et al., 2021). Additionally, AN can be identified by an intense fear of gaining weight and by a disturbance in viewing one's body weight or shape (APA, 2013). Moreover, Pinhas-Hamiel and Levy-Shraga (2013) described two subtypes of AN. These are the restricting type, indicated by avoidance of food intake, and the binge-eating/purging type, characterized by periods of binge eating which is compensated by purging behaviour.

Furthermore, the APA (2013) defined BN by several indicators. First, reoccurring periods of binge eating that is characterized by eating a relatively large amount of food in a short amount of time in addition to a lack of control over these periods. Second, BN is characterized by inappropriate compensatory behaviours to avoid gaining weight. Compensatory behaviours are, for example, self-induced vomiting, fasting or excessive exercising.

Lastly, Hilbert (2019) described the main indicator of a BED. This involves recurrent binge-eating episodes that are represented by consuming a large amount of food within a small amount of time. These episodes are often associated with a loss of control over eating. The main difference between BN and BED is the fact that BED happens without any compensatory behaviours that are aimed at avoiding weight gain. In contrast, characteristics of binge eating in BED include other behavioural abnormalities like eating rapidly or feeling uncomfortable (Hilbert, 2019).

If a person shows symptoms of an ED and has social, occupational or other distress in certain areas but does not meet fully the criteria for any of the disorders it is called OSFED. An example of this could be an atypical anorexia nervosa in which a person shows symptoms

of AN but does not meet the severe underweight meaning the person has a higher BMI than 18.5 (APA, 2013).

Comorbidity and Risk Factors of Eating Disorders

As reported by Rantala et al. (2019) patients with an ED have often high comorbidity with other psychological disorders. For instance, Rantala et al. (2019) reported people diagnosed with AN show a comorbidity prevalence rate from 93% to 95%. Also, patients with BN show high rates of comorbidity with 94% being comorbid with mood disorders (Rantala et al., 2019). Furthermore, comorbidity of EDs is also common with personality disorders, alcohol dependence and depressive disorders (van Hoeken and Hoek, 2020). For instance, anxiety or depression disorders are very common in patients with EDs (Weissman et al., 2020). Possible causes for this are mostly stress-triggering effects or events. Considering study-related stress, university students are at high risk for developing also mental disorders comorbid with eating disorders (Harrer et al., 2020). Estimated prevalence rates of EDs of 2-4% among young adults are reported.

Overall, several risk factors can have an impact on developing an ED. As reported by Keel and Forney (2013), especially when being an adolescent and a woman, there is a higher risk of developing an ED. They also pointed out that specific personality traits like perfectionism or low self-esteem can contribute to being at risk. Particularly, a distorted body image can be a central risk factor. Kostecka et al. (2019) explained the concept of body image as a complex phenomenon including thoughts, feelings, bodily sensations and individual experiences related to one's body. However, it comprises two parts (1) the *body schema* and (2) one's *emotional relationship* to it. Kostecka et al. (2019) defined that body schema as a cognitive construct includes knowledge about one's body. In addition to that, an emotional relationship is described by the degree of satisfaction with one's body. Hosseini and Padhy (2019) described that body image distortion can have a significant impact on developing or

influencing an ED. They have pointed out that the diagnosis of an ED often includes a body misperception, body dissatisfaction or an unhealthy relationship with one's body.

Noordenbos et al. (2014) pointed out that self-criticism can be a predictor of developing an ED as well. Additionally, patients with EDs tend to be more sensitive to rank-related social cues and comparing with others (Werner et al., 2019). Also, they reported a relation between higher self-criticism associated with greater disgust about oneself which increases the possibility of developing an ED. Duarte et al. (2016) pointed out that self-criticism is also a maintaining factor for ED pathology and facilitates its severity in non-clinical and clinical samples.

Self-criticism

According to Gilbert et al. (2006) self-criticism includes two facets. One is about the feeling of disappointment and inadequacy, and one facet describes a person's self-disgust and self-hate. In contrast to self-criticism, self-reassurance means that a person can calm oneself down when something goes wrong (Bellur et al., 2021). Gilbert et al. (2004) described self-reassurance as a warm attitude towards oneself by accepting failures and being compassionate. However, Bellur et al. (2021) have pointed out that it cannot be assumed that self-criticism and self-reassurance are opposites nor it cannot be expected that if the one is present the other is not and vice versa. Werner et al. (2019) explained that the model by Gilbert locates self-criticism within the motivational system for competition and social ranking and within the threat-protection system of emotion regulation that mainly includes emotions like anger, anxiety and disgust. Therefore, self-critical people tend to hold negative thoughts about themselves and tend to be judgmental about their person. Also, they have lower pleasure when achieving their goals (Gilbert et al., 2006).

In comparison to Gilbert et al. (2004), Thompson and Zuroff (2004) differentiated between two levels of self-criticism. The first level is called comparative self-criticism defined as "a negative view of the self in comparison with others" (p. 421). Here, often people

see others as superior and evaluate themselves as less valuable. The second level is called internalized self-criticism. Meaning people evaluate themselves negatively compared to their internal and personal standards. Since these standards tend to be high, they mostly fail to reach them resulting in discomfort and self-criticism (Thompson & Zuroff, 2004).

Related to that, there is a significant overlap between the construct of self-criticism and perfectionism. However, perfectionism is defined as a much broader concept into which the more narrowed concept of self-criticism would fit. Gilbert et al. (2006) described perfectionism as "striving for flawlessness" (p.1300) whereby self-criticism means engaging in harsh self-judgement focusing on failure, not on success. As described by Stoeber et al. (2008) people who tend to be high in perfectionism are also overly self-critical of themselves. They differentiated between two dimensions of perfectionism, positive striving for perfectionism and self-critical perfectionism. The former includes positive aspects like having personal standards and academic achievement, and the latter describes the critical evaluation of oneself related to high expectations and fears of failure (Stoeber et al., 2008). However, the urge of striving for perfectionism is not reduced even though the personal standards are met. Often, these standards are set even higher. Consequently, this striving for perfectionism maintains dysfunctional eating behaviour and self-critical thoughts (Noordenbos et al., 2014).

The authors evaluate perfectionism as a core feature of patients with EDs (Ferreira et al., 2014). The study by Noordenbos et al. (2014) pointed out that self-criticism tends to mediate the relationship between perfectionism and EDs. Noordenbos et al. (2014) also described that EDs patients reported having critical inner voices that can be compared to an "inner dictator" (p. 338) supporting the self-critical thoughts. Patients reported experiencing this inner voice as reassuring and compassionate at first, but at a later stage of their disorder as punishing and dominating. As mentioned above, Hosseini and Padhy (2019) evaluated a distorted body image as a risk factor to develop and maintain ED pathology. This is also supported by the study of Ferreira et al. (2014). They pointed out that body image

dissatisfaction is often a result of a perceived sociocultural pressure to be thin and perfect. Therefore, patients with ED pathology tend to compare themselves with others, have high standards and are self-critical.

The Forms of Self-Criticising/Attacking and Self-reassuring Scale (FSCRS).

To measure the impact of self-criticism on psychopathology, the FSCRS was developed. Gilbert et al. (2004) constructed the FSCRS in the context of depression treatment whereby they came up with a 22-item questionnaire that gives an insight into how people handle situations of failure. The FSCRS is a self-report measurement that reports how a respondent feels when something goes wrong (Ghahremani Ochghaz et al., 2020). The questionnaire includes three underlying factors, two of self-criticism and one of self-reassurance. The factors underlying the concept of self-criticism are the *inadequate self (IS)* (9 items) measuring inadequate feelings of self-criticism and failure and the *hated self (HS)* (5 items), tending to be harsh and aggressive to oneself. Lastly, the factor for the *reassured self (RS)* (8 items) describes the characteristic of being warm and encouraging with oneself (Gilbert et al., 2004).

Recent research showed that self-criticism has a serious impact on facilitating and maintaining ED pathology (Noordenbos et al., 2014; Gilbert et al., 2006; Ferreira et al., 2014; Duarte et al., 2016). Based on these findings, it is important to consider first measurement- and second treatment options of self-criticism. In the literature, several treatment approaches can be found. Kannan and Levitt (2013) described and evaluated the usefulness of different techniques, like psychodynamic therapies (using voice therapy), cognitive therapy (identifying and changing cognitive schemas) or emotion-focused therapy (activating and changing emotional schemas) among clinical samples and concluded improved therapeutic procedures and outcomes after treating self-criticism. In addition to this, Loew et al. (2020) found decreased self-criticism after cognitive-behavioural therapy (CBT) being a predictor for enhanced treatment among patients with depression. According to the first step, finding a

suitable measurement, several authors used and suggested the FSCRS that was developed by Gilbert and colleagues. However, some information about its psychometric properties are still missing in the literature which is why this paper investigates these in-depth.

Psychometric Properties of the FSCRS

Gilbert and his colleagues (2004) not only constructed but also evaluated the FSCRS. Regarding reliability, they concluded overall good levels of internal consistency for all three subscales indicating that the items are consistent with each other. Becoming more specific, in non-clinical samples, Cronbach's alpha ranged from .89 to .91 for IS, from .82 to .89 for HS and from .82 to .88 for RS. Whereby it ranged from .87 to .89 for IS, from .83 to .86 for HS and from .85 to .87 for RS within the clinical samples (Baião et al., 2015). Furthermore, Castilho et al. (2015) reported about the factor structure of the FSCRS by examining confirmatory factor analyses for three-, two- and one-factor. Results of the study showed that a three-factor model fitted best for the data. This is also supported by Becker (2018) who pointed out that confirmatory factor analyses in both, clinical and non-clinical samples, already showed a good fit for the three factors (inadequate-, hated- and reassured self) as well as for the two-factor model (self-criticism and self-reassurance).

Additionally, the study by Castilho et al. (2015) evaluated good construct and convergent validity for the FSCRS, the former meaning that the measurement reflects its construct and the latter indicating related constructs through self-report measures (Castilho et al., 2015). Furthermore, research by Becker (2018) showed good convergent validity of the constructs IS and HS with well-being, indicating a negative correlation. Also, the author found a positive relationship between the construct RS and mental well-being.

In addition to that, the FSCRS was used and evaluated in many different countries, for example in Portugal (Castilho et al., 2015; Baião et al., 2015), Spain (Navarrete et al., 2021) or the United Kingdom (Gilbert et al., 2004). Also, some research was already done in the

Netherlands by Sommers-Spijkerman et al. (2018) who validated the FSCRS short-form (FSCRS-SF) and also concluded comparable results to the full FSCRS as stated above.

Recent research already found a relation between self-criticism and psychopathology with the help of the FSCRS. For instance, Baião et al. (2015) found levels of self-criticism in both, people with and without psychopathology. However, the difference was that people with psychopathology scored higher on the scales underlying the factor of self-criticism and people without any psychopathology scored significantly higher on self-reassurance. Furthermore, Noordenbos et al. (2014) evaluated higher levels of self-criticism in ED patients than in the control group. In addition to that, similar levels of self-critical thoughts about mood and feelings were found in ED patients as well as in patients with depression by Thew et al. (2017). The same study also evaluated that all test groups show high interest to reduce their self-critical thoughts. Nevertheless, the study by Duarte et al. (2016) found identical levels of self-criticism between patients diagnosed with AN, BN or BED.

Moreover, the study by Navarrete et al. (2021) validated the FSCRS-SF in a Spanish sample of ED- and bipolar disorder patients as well as in a non-clinical sample. They investigated the predictive validity and concluded that the FSCRS-SF can predict levels of general distress in the participants. Furthermore, the study supported the discriminant validity of the FSCRS-SF by evaluating that it can discriminate between patients with psychological pathology who showed significantly higher scores of self-criticism than non-clinical participants. Also, the FSCRS-SF seems to be sensitive to changes, therefore, shows responsiveness indicated by decreased self-criticism and increased self-reassurance after treatment. Navarrete et al. (2021) pointed out that the FSCRS was able to detect changes in a non-clinical sample after a mindfulness- and compassion-based intervention (MCBI). The sensitivity of change, as well as the test-retest reliability, were evaluated after three months and both show acceptable scores for the subscales IS and HS. Based on these findings, Navarrete et al. (2021) concluded that interventions aiming to reduce self-criticism seem to be

effective and evaluated the FSCRS-SF as a responsive measurement. However, it is of importance to study the responsiveness in ED patients since self-criticism is associated with eating-related difficulties.

In sum, several studies supported the FSCRS and its psychometric properties in both clinical and non-clinical samples. All studies supported a three-factor-model and concluded good reliability and convergent validity (Baião et al., 2015; Castilho et al., 2015; Sommers-Spijkerman et al., 2018; Gilbert et al., 2004; Navarrete et al., 2021). Although a lot is already known about the FSCRS, this paper investigates its psychometric properties concerning an ED pathology and examines its responsiveness.

According to this, Veehof et al. (2008) emphasized the importance of measuring the responsiveness of an instrument especially when it is disease-specific and measures changes over time. Therefore, the current study will examine the responsiveness of the FSCRS by testing if the subscales are sensitive to change. Overall, responsiveness can be categorized into two different types: internal and external responsiveness. Whereby Veehof et al. (2008) defined the former as "the ability of a measure to change over a prespecified timeframe" and the latter as "the relationship between change in a measurement and change in a reference measurement of health status" (p. 611).

The Present Study

Besides these conclusions about the psychometric properties of the FSCRS, there is still missing information. Especially, it is of interest to investigate the FSCRS and its responsiveness in psychopathological populations, such as ED patients. As it is found in literature, self-criticism has a huge impact on developing and maintaining EDs.

This study will add to the existing knowledge about the psychometric properties of the full version of the FSCRS in ED patients, by examining the responsiveness and the predictive validity of the FSCRS.

Based on the research topics, the following research questions (RQ), as well as corresponding hypotheses (H), were addressed:

(1) "To what extent are the FSCRS scales (*inadequate self, hated self, reassured self)* sensitive to change during ED outpatient treatment?"

H_1: Based on recent research, it is hypothesized that the FSCRS scales (*inadequate self, hated self, reassured self)* show sensitivity to change during ED outpatient treatment indicated by a low effect size.

(2) "To what extent are change scores of the FSCRS associated with changes in scores of ED pathology?"

H_2: Based on recent research, it can be assumed that change scores of the FSCRS are associated with change scores of ED pathology, indicated by a moderate/high Pearson coefficient.

(3) "Are FSCRS baseline scores predictive for ED pathology after 12 months of treatment?"

H_3: Because of past findings, it is hypothesized that baseline scores of the FSCRS subscales are predictive of ED pathology after 12 months of treatment.

Method

Design

The current paper reports an instrument validation study of an existing longitudinal dataset collected within the Human Concern Centre for Eating Disorders in the Netherlands. The study used a deductive approach by formulating hypotheses, observing data and making conclusions.

Participants and Procedure

The participants were recruited at Human Concern a centre for Eating Disorders in the Netherlands with several locations. Here, specialists offer treatment to men and women who are diagnosed with EDs. The main criteria for the treatment were: patients (1) have no other

main diagnosis than an ED, (2) do not show active suicidal actions, (3) do not suffer from severe somatic parameters, (4) do have a BMI higher than 13 and (5) have a minimum age of 17. Overall, 1176 participants were asked to participate in the study. However, 85 patients did not sign the informed consent and 110 patients had no measure at the start of treatment. Therefore, 981 patients remained. However, 392 of them did not answer all questionnaires, which is why 589 participants were left for analysis. The data collection period ranged from January 2016 until January 2020. Background information about the patients can be found in Table 1. The sample was mixed, with a higher female (98.3%) to male (1.7%) ratio. Also, the age range was distributed from age 17 to 61+ with most participants aged between 21 and 25 (27.8%). The diagnoses of the patients were AN (31.1%), BN (21.9%), BED (8.7%) and OSFED (38.4%).

To obtain information about the participants' diagnoses patients were interviewed by a psychiatrist. Additionally, participants filled in the Eating Disorder Examination Questionnaire (EDE-Q) for monitoring their symptoms during treatment. After being diagnosed by a specialized intake team, the patients got treatment combined with insight-giving therapy, cognitive behaviour change, emotion-regulation and food management. While receiving treatment, the participants filled in the questionnaires every three months. Patients received information about the study and signed informed consent. Also, they were able to withdraw at any time. The Behavioural, Management and Social Sciences Ethics Committee of the University of Twente approved to conduct the study (de Vos et al., 2021).

Table 1

Demographics of participants (n=589)

Characteristic	N	Percentage	Min	Max
Gender				
Female	579	98.3%		
Male	10	1.7%		
Age	589		17	61+

17-20	132	22.4%
21-25	164	27.8%
26-30	118	20%
31-35	65	11%
36-40	35	5.9%
41-50	54	9.2%
51-60+	17	2.9%
61+	4	0.7%
Diagnosis		
AN	183	31.1%
BN	129	21.9%
BED	51	8.7%
OSFED	226	38.4%

Materials and Measures

Instruments

First of all, a demographic questionnaire was used to gather information regarding the age and gender of the participants.

The Forms of Self-Criticizing/ - Attacking and Self-reassuring Scale (FSCRS). Furthermore, the Dutch version of the *Forms of Self-Criticising/Attacking and Self-reassuring Scale (FSCRS)* developed by Gilbert et al. (2004) and translated by Sommers-Spijkerman et al. (2017) was used. The original scale includes 24 items that indicate how critical or supportive someone thinks when things go wrong (Gilbert et al., 2004). However, two items were removed due to poor psychometric properties. Gilbert et al. (2004) also described that respondents indicate their answers on a 5-point Likert scale ranging from 'not at all like me' (0) to 'extremely like me' (4). As pointed out by Navarrete et al. (2021) the FSCRS differentiates the items into three subscales (see Appendix A). *The Inadequate* Self (IS, nine items ('I think I deserve my self-criticism')), *the Hated Self* (HS, five items ('I have a sense of disgust with myself')) and *the Reassured Self* (RS, eight items ('I still like being me')). By

summarizing the scores for every subscale there are three end scores indicating a high or low IS, HS and RS. Moreover, Duarte et al. (2019) reported acceptable internal consistency, with Cronbach's alpha of .89 for IS, .80 for HS and .84 for RS. The results of the current study are in line with previous research. Regarding reliability testing, results indicate overall good internal consistency for all three subscales of the FSCRS. At the start of treatment, Cronbach's alphas for the subscales within the sample were .84 for IS, .85 for HS and .83 for RS. Additionally, comparing the different types of EDs, Cronbach's alpha did not substantially distinguish, ranging from .82 to .84 for IS, from .82 to .88 for HS and from .80 to .84 for the RS. After 12 months of treatment, the internal consistency of all subscales improved. Cronbach's alphas after treatment were .90 for IS, .87 for HS and .90 for RS.

The Eating Disorder Examination Questionnaire (EDE-Q). Furthermore, the EDE-Q developed by Fairburn and Beglin (1994) was used to assess the eating behaviours of the participants according to the DSM-V criteria (APA, 2013). The EDE-Q is a self-report questionnaire answered on a 7-point Likert scale (0 = not 1 day; 6 = every day) over the past four weeks (Mond et al., 2004). The questionnaire includes items regarding the frequency of specific eating behaviours and their severity (see Appendix B). Furthermore, the EDE-Q contains four subscales namely the restraint- (five items), the eating concern- (five items), the shape concern- (eight items) and the weight concern (five items) -subscale and thereby differentiates between important constructs of different EDs (Fairburn & Beglin, 1994). The subscale scores were summarized and divided by four, therefore, a global score was calculated. A higher score indicated more ED pathology. As reported by Aardoom et al. (2012) the EDE-Q showed good reliability as well as discriminant validity. Moreover, Peterson et al., (2007) came up with a Cronbach's alpha of .90 for the global score of the EDEQ, indicating great internal consistency. In addition to that, they calculated coefficients of Cronbach's alpha ranging from .70 to .83 for the four subscales, indicating acceptable

internal consistency. The results of the study indicate that the EDEQ is an acceptable instrument to measure ED pathology in participants.

Statistical Analysis

For the statistical analyses, the present study used SPSS version 28 (IBM, 2021). First, descriptive statistics were analyzed to provide an overview of the participants' demographics (Table 1).

A Shapiro-Wilk test was conducted to test the data for normality. Assessing the normality of data is required to verify a normal distribution. If the normality of data might be violated, results may not be reliable and valid (Razali & Wah, 2011). After visually inspecting the QQ-plots, no significant deviations were found. Therefore, parametric tests were examined to address the hypotheses. According to Kwak and Kim (2017), parametric tests can state higher statistically correct statements in contrast to non-parametric tests, called the central limit theorem. Furthermore, the rule of thumb of the central limit theorem describes that a higher sample size results in more normally distributed means and therefore, a skewed distribution does not have a large effect (Kwak & Kim, 2017).

Internal Responsiveness.

To measure the sensitivity of change of the FSCRS subscales, a paired sample t-test was conducted via SPSS. The internal responsiveness indicates to which extent the FSCRS can detect improvement (Veehof, et al., 2008). The paired t-test was examined to test the significant difference between the two time points within the sample (Xu et al., 2017). Furthermore, the data were split to compare the effects of the subscales related to the four diagnoses AN, BED, BN and OSFED. The effect sizes were interpreted with Cohen's coefficient. As described by Lakens (2013) Cohen's *d* describes the standardized mean difference of an effect between two groups. In the current study, Cohen's *d* measures the standardized difference of one group between the first and the second measurement. Cohen (1998) reported the classification guidelines as followed: small (d = .20), medium (d = .50)

and large (d = .80). Kover & Atwood (2013) described an effect lower than .20 as “trivial” (p. 6), therefore, the hypothesis can be accepted if an effect above .20 is determined. However, to determine clinical relevance a larger effect size is of interest for effective treatment. Furthermore, the data were split to compare the effects of the subscales related to the four diagnoses AN, BED, BN and OSFED.

External Responsiveness.

To examine the external responsiveness of the FSCRS change scores of the three subscales and the EDE-Q global score was calculated by subtracting the end score and the start score. Afterwards, a Pearson correlation was executed. A correlation measures the degree of association between two variables and can be interpreted as followed: 0.50 – 1 = strong association; 0.30 – 0.49 = medium correlation; < 0.29 = small correlation. Because it can be assumed that both variables vary together, it is of interest to determine the strength of the linear relationship (Asuero et al., 2006).

Predictive Validity.

To explore the predictive validity of the FSCRS to the criterion of ED pathology, the baseline scores of the three subscales were correlated with the EDE-Q at 12 months and for controlling with the baseline EDE-Q score via multiple linear regression analysis. Based on the insights of previous research, it can be assumed that scores of self-criticism act as a predictor of ED pathology. Besides testing the data for linearity, they were also inspected for homoscedasticity and multicollinearity. Whereby the former indicates whether the variance errors are dependent on the values of the independent variables and the latter inspects high correlations of two or more independent variables (Olayisade & Awolusi, 2021). According to Daoud (2017) the degree of multicollinearity can be interpreted by the variance inflation factor (VIF) as followed: VIF = 1 (not correlated), 1 < VIF < 5 (moderately correlated) and VIF > 5 (highly correlated). After inspecting tests for homoscedasticity, it can be concluded that the data are homoscedastic (see Appendix C). Results of the test for multicollinearity

showed moderate correlation (VIF < 5) for all three subscales of the FSCRS, respectively. Therefore, it can be concluded that the multicollinearity is acceptable and all variables could be included in the model.

Results

After visually inspecting QQ-plots it can be concluded that the results of the Shapiro-Wilk test showed a normal distribution for all three subscales of the FSCRS. The mean scores, standard deviations and range scores of the FSCRS subscales can be seen in Table 2.

Internal Responsiveness

As it can be seen in Table 2, the paired sample t-test showed a significant difference between the start of the treatment and after twelve months for all subscales of the FSCRS and the diagnoses ($p < .001$). Regarding H_1, the sensitivity to change showed a medium effect size for all the subscales of the FSCRS indicating that the self-criticism and self-reassurance scores are substantially different after treatment. Therefore, H_1 can be accepted.

Furthermore, Table 2 displays the effect sizes of the subscales correlating with the different ED diagnoses. Here, it is noticeable that there was a rather small change for all subscales of the FSCRS for patients with AN. Additionally, there was a medium effect size for the subscales IS, HS and RS for patients with BN. The effect size of change for all the subscales was medium for patients with OSFED. Furthermore, the effect size was large for all the subscales for patients with a BED. The results indicate that the treatment had a rather small effect on patients with AN and a large effect on patients with BED.

External Responsiveness

Regarding the second research question, the Pearson's r test showed a significant correlation between change scores on all three subscales of the FSCRS and the EDE-Q global change score (see Table 2). Results indicated moderately strong correlations between the IS change score and the EDEQ change score ($r(587) = .65$, $p < .001$). Furthermore, a moderate correlation was found between the HS change score and the EDE-Q change score ($r(587) =$

.58, $p < .001$) as well as a moderate relation between the RS change score and the EDE-Q change score ($r(587) = -.58$, $p < .001$). These results indicate that there is a relationship between change in the measurement of the FSCRS subscales and change in the reference measurement that is the EDE-Q. Therefore, the second hypothesis can be accepted. Comparing the different EDs, results showed that BED correlated the strongest with the change scores of IS ($r(49) = .71$, $p < .001$) and RS ($r(49) = -.64$, $p < .001$). In addition to that, BN showed strong correlations as well with the change scores of IS ($r(127) = .66$, $p < .001$), HS ($r(127) = .58$, $p < .001$) and RS ($r(127) = -.58$, $p < .001$).

Predictive Validity

Regarding research question three, Table 3 shows the regression coefficients for the multiple regression analysis. Furthermore, it provides an overview of the two steps. During Step 1, baseline scores of the EDE-Q were added to the model, explaining 29% of the variance of the global EDE-Q score after 12 months of treatment, F (1, 587) = 239.167, p < .001. After including the factors IS, HS and RS the variance explained by the model was 30.8% F (3, 584) = 5.105, p = .002. The factors explained additional 1.8% of the model, R squared change = .018, F (3, 584) = 5.105, p = .002. In the model, the factor HS reached statistically significance with a beta = .18 (p = .002). Furthermore, the factor IS was found to be significant with a beta = -.13 (p = .012). Whereas the factor RS was the only factor not reaching statistical significance with a beta = -.04 (p = .455).

Table 2

Descriptive statistics, alpha coefficients, change scores, t-tests, and Cohen's d.

Scales	**EDs**	**N**	**Mean**	**SD**	**α1**	**α2**	**EDE-Q** *r(p)*	**t-**	**d**	**CI (95%)**
IS 1		589	24.98	6.50	.84	.90	.65*	.48*	.46	.37 –
IS 2			21.45	8.32						.54
	AN	183			.84	.90	.62*	.59*	.33	.18 – .48

	BN	129			.83	.90	.66*	.47*	.54	.36 – .73
	BED	51			.83	.94	.71*	.48*	.74	.42 – 1.04
	OSFED	226			.82	.90	.66*	.41*	.44	.30 – .58
HS 1		589	8.12	5.06	.85	.87	.58*	.64*	.42	.34 –
HS 2			6.27	5.24						.51
	AN	183			.88	.89	.57*	.64*	.32	.17 – .47
	BN	129			.84	.88	.58*	.65*	.54	.36 – .73
	BED	51			.82	.82	.41*	.64*	.65	.35 – .95
	OSFED	226			.83	.87	.61*	.64*	.40	.26 – .54
RS 1		589	12.69	5.62	.83	.90	.58*	.58*	.55	-.63 –
RS 2			15.88	6.86						-.46
	AN	183			.84	.88	-.51*	.56*	.43	-.58 – -.28
	BN	129			.80	.90	-.58*	.52*	.59	-.78 – -.40
	BED	51			.84	.93	-.64*	.79*	.79	-.1.11 – -.48
	OSFED	226			.84	.91	-.60*	.56*	.56	-.70 – -.42

Note. *p <0.001

IS = Inadequate self; HS = Hated self; RS = Reassured self; SD = standard deviation; a1 = alpha at start of treatment; a2 = alpha after twelve months; t- = t-test; d = Cohen's; CI = confidence interval

Table 3

Results of linear regression analysis, coefficients and R scores.

Scales	***B***	***SE***	**ß**	***t***	***R²***	***F***	***p***
Step 1							
Constant	.21	.17		1.24			.225
EDEQ (baseline)	.67	.04	.54	15.47	.29	239.167	<.001
Step 2							

Constant	.87	.36		2.38			.018
EDEQ (baseline)	.60	.05	.48	11.46	.30	5.105	<.001
IS	-.02	.01	-.13	-2.53			.012
HS	.05	.01	.18	3.15			.002
RS	-.01	.01	-.04	-.75			.455

Note. B = unstandardized B; SE = standard error; ß = standardized beta; t = t score; R^2 = R square; F = F change; p = significance.

Discussion

The current study aimed to examine the psychometric properties of the FSCRS within a sample of 589 eating disorder patients in the Netherlands. The internal- and external responsiveness as well as the predictive validity were investigated. Overall, findings indicate that the FSCRS showed internal- as well as external responsiveness and predictive validity, therefore, all hypotheses can be accepted.

Internal Responsiveness

Furthermore, it can be evaluated that the subscales IS, HS and RS showed moderate differences regarding their sensitivity to change indicated by medium effect sizes meaning the FSCRS is able to detect differences after treatment. Therefore, it can be evaluated that the current study found internal responsiveness of the FSCRS. These results are in line with research by Sommers-Spijkerman et al. (2018) who evaluated significant improvements in the FSCRS-SF of their intervention group after three months. In contrast to the current study, they found moderate effect sizes for HS and large effect sizes for IS and RS in which the greatest changes were observed in the depressive symptoms group. Whereas the present results indicate moderate effect sizes for IS and large effect sizes for HS and RS in patients with ED pathology. In addition to that, Navarrete et al. (2021) evaluated the sensitivity of change among social workers. They concluded large effect sizes for all three subscales after three months of well-being training. Moreover, these results are consistent with previous literature

that concluded that self-criticism is a maintaining factor for ED pathology (Noordenbos et al., 2014; Gilbert et al., 2006; Ferreira et al., 2014; Duarte et al., 2016). The current study also found differences in the sensitivity of change in ED pathology. Furthermore, it is important to notice that patients diagnosed with AN showed the smallest change after treatment of 12 months for all scales whereas patients with BED showed the largest change after treatment. According to Dunkley and Grilo (2007) self-criticism is related to both the over-evaluation of shape and weight which is especially common in patients diagnosed with BED. Therefore, it can be concluded that the FSCRS can measure change during outpatient treatment. Overall it can be said that ED patients show significantly lower levels of self-criticism and higher levels of self-reassurance after twelve months of treatment, thus indicating that the FSCRS is sensitive to changes, thus H_1 can be accepted.

External Responsiveness

In regards to the second research question, results showed significant positive correlations between the change scores over 12 months of the subscale IS and ED pathology as well as between the subscale HS and the EDE-Q score. Both coefficients were above .50 indicating a strong correlation (Asuero et al., 2006). Therefore, it can be concluded that both the IS and the HS vary with the EDE-Q and have a strong linear relationship. Based on this, results illustrate that if the score of self-criticism decreases the score of ED pathology also decreases. Additionally, the results showed a relatively strong negative correlation between the subscale RS and the EDE-Q indicating that if one variable increases the other decreases. Based on this, it can be concluded that if the participants' scores of the RS increase, the scores of the EDE-Q decrease. Concluding, the findings mean that the subscales of the FSCRS vary with the EDE-Q and therefore, H_2 can be accepted. Therefore, it can be concluded that the FSCRS shows external responsiveness in terms of that the change of the subscales of the FSCRS have a relationship between the change in a reference measurement, the EDE-Q. The current findings support previous research by Navarrete et al. (2021) regarding the correlation

between changes in scores of the FSCRS scales and ED pathology. Also, their findings support that measurement and treatment of self-criticism are essential for patients with ED pathology. Moreover, further research observed improvements in depressive symptoms after treatment of self-criticism measured by the FSCRS-SF. As self-criticism is strongly linked to psychopathology (Werner et al., 2019), the current study found it to be the strongest correlated in patients with BED. Related to that, Dunkley and Grilo (2007) executed a study with BED patients and found that interventions of self-criticism help reduce depressive symptoms that are a crucial part of a BED. Additionally, the pattern of results is consistent with previous literature that concluded self-criticism is a maintaining factor for ED pathology (Noordenbos et al., 2014; Gilbert et al., 2006; Ferreira et al., 2014; Duarte et al., 2016). Results indicated that there is a change in both the measurement instrument, the FSCRS, as well as in the reference measurement, the EDEQ. This supports the external responsiveness of the FSCRS.

Predictive Validity

Referring to research question three, results showed that the three FSCRS scales predicted 1.8% of the changes in EDE-Q scores over 12 months. Different than expected, the subscales do not predict much change in ED pathology. This is in contrast with the findings that support external responsiveness of the FSCRS meaning the change scores of the FSCRS and the change score of the EDE-Q correlate with each other. However, findings of the predictive validity indicated that HS was the only factor of the FSCRS that showed significant positive results indicating a predictive relation of ED pathology. Contrasting to that, findings indicated a significant negative relation between the factor IS and the EDE-Q. Lastly, results showed that the factor RS made a prediction of ED pathology, however, the results were not significant. Nonetheless, research by Navarrete et al. (2021) found significant results regarding the predictive validity of RS from the FSCRS-SF to distress at three months.

A possible cause for differences in results might be the different measurement time points. The current study tested the predictive nature of the FSCRS after 12 months of treatment whereas Navarrete et al. (2021) already tested it after three months. All in all, the current results indicate that the subscales of the FSCRS predict 1.8% of the change in EDE-Q scores after 12 months. Based on these results, H_3 can be accepted. Although the results show significance the predictive validity is quite small and it is of interest that the study by Navarrete (2021) found different findings. This should be addressed in future research.

Strengths and Limitations

There are several strengths of the current study. First of all, the study made use of questionnaires that showed good reliability and validity for the FSCRS (Gilbert et al., 2004) as well as for the EDE-Q (Aardoom et al., 2012). Secondly, the study examined psychometric properties of the FSCRS that were not investigated yet namely the responsiveness and the predictive validity. Thirdly, a strength of this study is that it examined psychometric properties of the subscales of the FSCRS but also zoomed in on differences between the EDs. Lastly, the results are consistent with recent research findings on the FSCRS and its overall good psychometric properties. However, most studies focused on investigating the reliability, validity or factor model of the instrument (Gilbert et al., 2004; Baião et al., 2015; Castilho et al., 2015; Navarrete et al., 2021; Becker, 2018). Therefore, an important strength of this study is that it took a new perspective on the psychometric properties of the FSCRS.

Nevertheless, also some limitations of the present study were found. First of all, the sample consisted of more females (98.3%) than males (1.7%). Therefore, the results are primarily representative of women with ED pathology. Also, earlier studies concluded results mainly for females (Sommers-Spijkerman et al., 2018; Baião et al., 2015; Noordenbos et al., 2014). However, ED pathologies are more often diagnosed in women than in men (Mandelli et al., 2020), therefore, the results of the current study are generalizable for ED patients. As reported by Stoeber et al. (2008) more women show a higher need for perfectionism which is

connected to being overly self-critical. Although the results of the FSCRS and its subscales indicate that it is a reliable and valid instrument, the results cannot be generalized to males. Therefore, future research could address differences in gender in the concepts of self-criticism and self-reassurance in both clinical and non-clinical samples.

Furthermore, criteria for treatment included being diagnosed with an ED pathology as the main diagnosis, therefore, leaving out patients who may be diagnosed with another main disorder and with an ED as a second diagnosis. As stated earlier, EDs are highly comorbid with other psychological disorders indicated by prevalence rates of 93% to 95% (Rantala et al., 2019). Therefore, it cannot be said to which extent results are influenced by other diagnoses which might have influenced the quality of the instrument. It is important to point out that comorbidity might have had an influence on the results and should be addressed in future research.

Lastly, another limitation of the current study is limited knowledge about the actual treatment that patients received. Therefore, it is not known to which extent the treatment had an impact on the current results. In addition to that, the current study did not include a control group that received no treatment. Therefore, it is difficult to draw conclusions about the effectiveness of the treatment.

Although significant differences were found between different types of EDs after 12 months of treatment, the current study does not provide more detailed information about its separate measurements for AN, BN, BED and OSFED respectively. For instance, results show a high correlation and stronger effect sizes of BED regarding ED pathology than the other EDs. Therefore, it is advised to address this in future research.

Conclusion

For future research, it is advised to address differences in gender of the FSCRS in clinical as well as in non-clinical samples to test if the current results are also generalizable for men. Furthermore, future research might examine to which extent results are influenced

by comorbidity. Lastly, it would be of interest to provide more detailed information about differences of the FSCRS in ED pathology, for instance in AN, BN, BED and OSFED respectively to adapt suitable treatment options for various diagnoses.

In sum, the current study contributes to a growing understanding of the psychometric properties of the FSCRS in patients with ED pathology. Considering the severe impact of EDs on mental health and its serious consequences stated by Dickstein et al. (2014), for instance, malnutrition, heart problems and even death, it is important to raise awareness of the possible causes and consequences of EDs in society. Results show that the FSCRS can be evaluated as a reliable instrument to measure self-criticism and self-reassurance in Dutch EDs patients. Furthermore, it can be concluded that the FSCRS is a responsive instrument both, internally and externally. However, its predictive validity is questionable in the sample of the current study and needs further investigation. Based on these results, it can be concluded that the FSCRS can be used in practical settings as a measurement instrument to detect changes in self-criticism during ED outpatient treatment. Also, the FSCRS can be recommended to use in clinical settings by therapists and psychologists for measuring self-criticism and self-reassurance over time.

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Appendices

Appendix A

The Forms of Self-Criticising/Attacking and Self-Reassuring Scale (FSCRS) – Items

1.	I am easily disappointed with myself	IS
2.	There is a part of me that puts me down	IS
3.	I am able to remind myself of positive things about myself	RS
4.	I find it difficult to control my anger and frustration at myself	IS
5.	I find it easy to forgive myself	RS
6.	There is a part of me that feels I am not good enough	IS
7.	I feel beaten down by own self-critical thoughts	IS
8.	I still like being me	RS
9.	I have become so angry with myself that I want to hurt or injure myself	HS
10.	I have a sense of disgust with myself	HS
11.	I can feel lovable and acceptable	RS
12.	I stop caring about myself	HS
13.	I find it easy to like myself	RS
14.	I remember and dwell on my failings	IS
15.	I call myself names	HS
16.	I am gentle and supportive with myself	RS
17.	I can’t accept failures and setbacks without feeling inadequate	IS
18.	I think I deserve my self-criticism	IS
19.	I am able to care and look after myself	RS
20.	There is a part of me that wants to get rid of the bits I don’t like	IS
21.	I encourage myself for the future	RS
22.	I do not like being me	HS

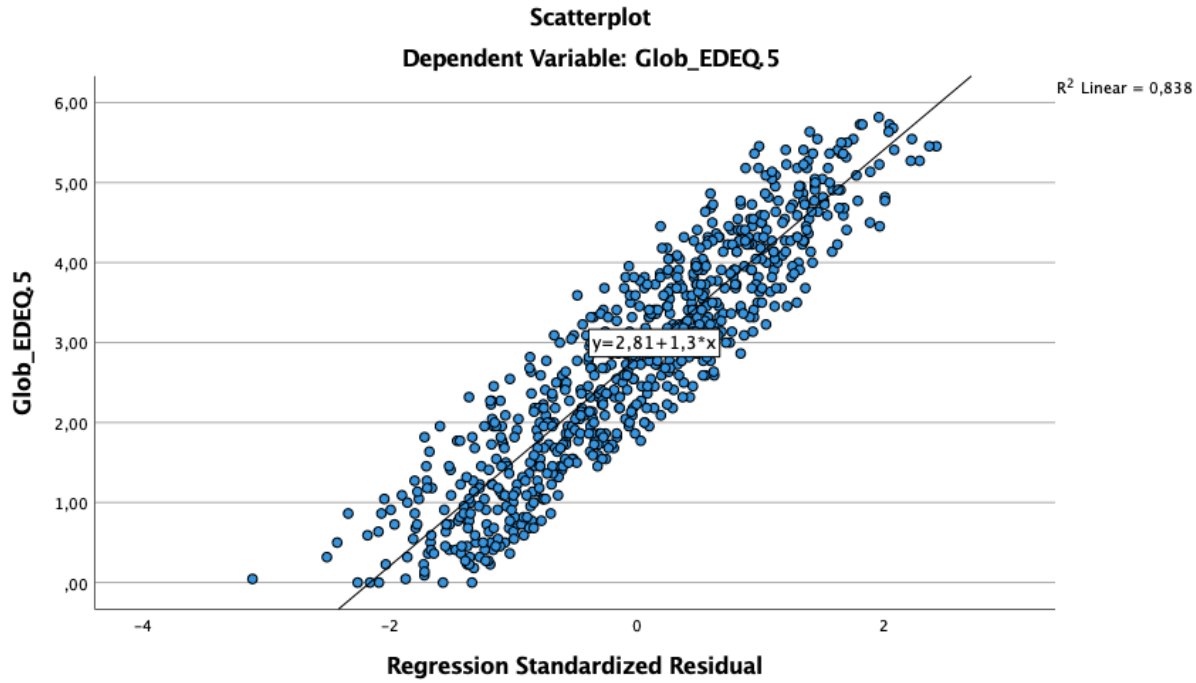
Appendix B

The Eating Disorder Examination Questionnaire (EDE-Q)

https://www.corc.uk.net/media/1273/ede-q_quesionnaire.pdf

Appendix C

Scatterplot of homoscedasticity test results.



Note. The figure illustrates the results of homoscedasticity. The scatterplot shows that the data points have the same scatter with equal distance from the line, indicating homoscedasticity.