Emotional expression, self-silencing, and distress tolerance in anorexia nervosa and chronic fatigue syndrome

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Objectives. Difficulties in processing emotional states are implicated in the aetiology and maintenance of diverse health conditions, including anorexia nervosa (AN) and chronic fatigue syndrome (CFS). This study sought to explore distress tolerance, self-silencing, and beliefs regarding the experience and expression of emotions in individuals diagnosed with AN and CFS. These conditions were chosen for this study because their clinical presentation is characterized by physical symptoms, yet cognitive behavioural models suggest that emotional processing difficulties contribute to the aetiology and maintenance of both.

Design. A between-subjects cross-sectional design was employed.

Methods. Forty people with AN, 45 with CFS, and 48 healthy controls (HCs) completed the Distress Tolerance Scale (DTS), Silencing the Self Scale (STSS), Beliefs about Emotions Scale (BES), and measures of clinical symptomatology.

Results. Initial group comparisons found that both AN and CFS participants scored higher than HCs on a subscale measuring difficulties in distress tolerance. AN and CFS participants were also more likely to judge themselves by external standards, endorse statements reflecting a tendency to put the needs of others before themselves, and present an outwardly socially compliant image of themselves whilst feeling hostile within. Relative to HCs, AN participants reported more maladaptive beliefs regarding the experience of having negative thoughts and feelings and revealing these emotions to
Emotional processing in AN and CFS

Differences in emotional processing are present in AN and CFS compared to HCs, with some disorder-specific variation, and may be associated with greater clinical symptomatology. These findings support current explanatory models of both AN and CFS, and suggest that emotional processing should be addressed in the assessment and treatment of individuals with these illnesses.

There is growing evidence to suggest that difficulties in processing emotional states are implicated in the aetiology and maintenance of diverse health conditions, including but not limited to eating disorders (e.g., Schmidt & Treasure, 2006), chronic fatigue syndrome (CFS; e.g., Surawy, Hackman, Hawton, & Sharpe, 1995), major depression (Saarijärvi, Salminen, Tamminen, & Äärelä, 1995), anxiety disorders (e.g., Baker, Holloway, Thomas, Thomas, & Owens, 2004), impulse control disorders (Fox, Hong, & Shina, 2008; Nock & Mendes, 2008), hypertension (Todarello, Taylor, Parker, & Fanelli, 1995), and irritable bowel syndrome (Ali et al., 2000; Jones, Wessinger, & Crowell, 2002). It has been suggested that these emotion processing difficulties are therefore transdiagnostic, operating across psychiatric and physical illness, and important to consider when attempting to construct valid explanatory and treatment models for different conditions (Baker, Thomas, Thomas, & Owens, 2007; Coughlin & Selva, 2006). This study seeks to explore selected aspects of emotional processing in individuals with anorexia nervosa (AN) and CFS. AN is a severe mental illness characterized by self-starvation and weight loss, and extreme concerns about weight, body shape, and/or eating (American Psychiatric Association [APA], 1994). CFS is characterized by persistent, medically unexplained fatigue of new or definite onset lasting for at least 6 months also accompanied by a range of somatic (e.g., musculoskeletal pain) and neurocognitive complaints (e.g., impaired memory/concentration) (Fukuda et al., 1994). These conditions were chosen for this study because their overt clinical presentation is characterized by physical symptoms, yet cognitive behavioural models suggest that emotional processing difficulties contribute to the aetiology and maintenance of both problems (e.g., Schmidt & Treasure, 2006; Surawy et al., 1995).

Cognitive-behavioural models of CFS (e.g., Surawy et al., 1995) suggest that for some vulnerable individuals, during development the child’s expression of negative emotion is met with punishment or lack of helpful attention. Displays of negative affect are not tolerated, whilst high value is attached to being happy, never giving up, and believing in the power of ‘positive mental attitude’ in overcoming adversity. This leads to problems in the development of emotional processing skills and the belief that negative emotions are ‘bad’, unacceptable, have adverse interpersonal consequences, and therefore should be avoided or at least not overtly expressed. At times of stress, such beliefs lead individuals to avoid seeking help, suppress, or ignore emotional difficulties, and to focus on somatic sensations associated with stress. Once CFS has developed, it is thought to be maintained by a range of unhelpful cognitive, emotional, and behavioural responses including inactivity/avoidance, self-critical thoughts, and frustration (Browne & Chalder, 2009; Surawy et al., 1995).

Whilst there is growing evidence to suggest that adverse childhood environments may increase the risk for later development of CFS (e.g., Fisher & Chalder, 2003; Heim...
et al., 2009), empirical studies exploring the specific emotional processing styles of people with CFS per se are sparse. However, there is some evidence that individuals with CFS score highly in the trait of alexithymia, denoting difficulties in the ability to recognize, label, and describe emotions, and problems in linking feelings with physiological correlates (e.g., Johnson, Lange, Tiersky, Deluca, & Natelson, 2001; van de Putte, Engelbert, Kuis, Kimpen, & Uiterwaal, 2007). Furthermore, Rimes and Chalder (2010) have found that relative to healthy controls (HCs), people with CFS are more likely to believe that they should be able to control their emotions, that experiencing negative emotion is a sign of weakness, and that others will react unfavourably to any display of emotion.

In summary, the limited available evidence suggests that people with CFS do experience difficulties in identifying their own emotions, a desire to suppress their own emotions, and possess negative beliefs about the experience and expression of negative emotions. To date, there has been no attempt to directly assess these constructs simultaneously in CFS samples, or to examine the associations with emotional processing difficulties and the central symptom of fatigue.

Recent research has also suggested that emotionally invalidating early environments may contribute to difficulties with emotional processing in AN. It has long been argued that emotional disturbance is a core feature of AN (e.g., Bruch, 1985). Indeed, people with AN experience difficulties identifying other people’s affective states (e.g., Kucharska-Pietura, Nikolau, Masiak, & Treasure, 2004; Oldershaw, Hambrook Tchanturia, Treasure, & Schmidt, 2010; Russell, Schmidt, Doherty, Young, & Tchanturia, 2009), as well as their own (e.g., Lawson, Emanuelli, Sines, & Waller, 2008; Schmidt, Jinawy, & Treasure, 1993). AN sufferers also report difficulty in tolerating strong emotions (Corstorphine, Mountford, Tomlinson, Waller, & Meyer, 2007; Waller, Corstorphine, & Mountford, 2007), and will often try to avoid potential triggers of these states (Serpell, Treasure, Teasdale, & Sullivan, 1999), or use impulsive behaviours to cope with them. For example, Corstorphine et al. (2007) explored distress tolerance in AN and bulimia nervosa (BN) patients. Compared to HCs, eating disorder (ED) patients were more likely to report a tendency to avoid situations that might trigger negative affect and were less likely to report an ability and willingness to accept distress and manage it through adaptive behavioural strategies. Avoidance of affect was also associated with both bulimic symptomatology and body dissatisfaction, suggesting that individuals with EDs may use maladaptive behavioural strategies (e.g., bingeing, vomiting) as a way of coping with intolerable emotions.

Several authors (e.g., Buchholz et al., 2007; Forbush & Watson, 2006; Geller, Cockell, Hewitt, Goldner, & Flett, 2008) have argued that people with AN are particularly high in self-silencing; a tendency to avoid expressing negative emotions due to an over-anticipation of distress and discomfort, a heightened sensitivity to the reactions of others, and a preference for stable and emotionally calm environments (Jack & Dill, 1992). One reason suggested as to why people with AN inhibit the expression of negative emotions and minimize their own needs is in order to prevent conflict and preserve close relationships (Schmidt & Treasure, 2006). A number of studies have demonstrated an association between emotional inhibition and ED symptomatology, including weight and shape concern, dietary restraint, and binge eating (Ross & Wade, 2004; Smolak & Munstertieger, 2002; Zaitsoff, Geller, & Srikameswaran, 2002).

Just as Surawy et al. (1995) described in their cognitive-behavioural model of CFS, Mountford, Corstorphine, Tomlinson, and Waller (2007) proposed that Linehan’s (1993) concept of emotionally invalidating childhood environments might provide a framework
within which to understand the emotional difficulties that people with EDs often experience. Such an environment can be defined as one where the child’s early personal experiences are not validated by caregivers, and where communication of emotions is either ignored or punished. Growing up in such an environment teaches the child that their view and experience of emotions is incorrect and can lead to the development of emotional dysregulation (as the child may not have been taught how to label his or her feelings appropriately) and difficulties in distress tolerance – the ability to endure and accept negative affect, so that problem-solving can take place (Linehan, 1993). Individuals who struggle to tolerate such distress will seek to avoid potential triggers or use impulsive behaviours to cope with negative emotional states. Individuals with EDs do report difficulty in tolerating strong affect (Corstorphine et al., 2007), and make efforts to avoid experiencing intense emotional states (Serpell et al., 1999). There is also substantial clinical and empirical evidence recognizing a direct and immediate link between emotional states and eating behaviour (McManus & Waller, 1995; Meyer et al., 1998). Furthermore, people with AN are more likely to report invalidating childhood environments compared to HCs, and that these experiences are associated with ED psychopathology and measures of distress tolerance (Haslam, Mountford, Meyer, & Waller, 2008; Mountford et al., 2007).

As in the CFS literature, no attempt has previously been made to explore distress tolerance, emotional suppression, and beliefs about emotions concurrently in AN, and to examine their associations with functional ED symptoms. For both disorders, emotional processing difficulties are important clinical phenomena to explore as they may predict successful therapeutic outcomes. For example, emotional processing difficulties in AN have been found to predict outcome at 3 years (Speranza, Loas, Wallier, & Corcos, 2007). In a recent randomized controlled trial comparing counselling and cognitive behavioural therapy (CBT) for chronic fatigue, patients’ ability to acknowledge, express, and accept emotional distress was the key predictor of good outcome irrespective of treatment modality (Godfrey, Chalder, Ridsdale, Seed, & Ogden, 2007). It is clear that being able to report on and express one’s emotional experiences are central skills required to engage successfully in psychological therapy. Therefore, understanding the emotional experience of individuals with CFS and AN, and working specifically to improve difficulties, may be important to encourage positive treatment outcomes.

Study aims

It has been suggested that an invalidating environment in childhood might result in emotional processing difficulties in both AN and CFS. These difficulties include poor distress tolerance, emotional suppression or avoidance, and maladaptive beliefs about emotions. It is also possible that these difficulties may be functionally associated with symptomatology in these disorders. The aim of the current study was to explore concurrently how people with AN and CFS tolerate, express, and manage emotions relative to HCs and each other. We also examined relationships between these variables and clinical symptoms in both disorders. We hypothesized that people with AN and CFS would report lower distress tolerance, higher self-silencing, and endorse more maladaptive beliefs about the experience and expression of emotions relative to HCs. Based on clinical observations that general psychopathology is more prominent in individuals with AN than CFS, and the likely negative impact of malnutrition and starvation, we expected that there would be more pronounced emotional processing difficulties in the AN group compared to the CFS group, but that the CFS group
would report difficulties compared to HCs. Regarding the associations between emotion processing variables and symptomatology, it was predicted that there would be a positive correlation between measures of symptomatology (ED symptoms, fatigue) and measures of distress tolerance, self-silencing, and beliefs about emotions. We chose to compare people with AN and CFS because both disorders are associated with a physical symptom presentation yet similar emotional processing difficulties have been proposed to be important in their aetiology and maintenance. Investigating them simultaneously allowed the examination of the proposed emotional processing difficulties from a transdiagnostic perspective and investigation of the hypothesis that the emotional processing difficulties would be more severe in AN than in CFS.

**Method**

**Participants**

Three groups of participants were recruited: AN, CFS, and HCs. Participants were recruited over 12 months as part of a larger study exploring social and emotional functioning in AN and CFS (e.g., Oldershaw et al., 2010). Participants from all groups were excluded for poor literacy, non-fluent English, or a history of head injury or neurological illness. Forty adults with AN (37 females) were recruited from a specialist out-patient ED service in London. For eligibility, AN participants were required to have body mass index (BMI) below 18.5 kg/m² and be diagnosed using DSM-IV (APA, 1994) criteria as having restricting \( (N = 12) \) or binge eating/purging \( (N = 9) \) AN subtype or Eating Disorder Not Otherwise Specified, AN type \( (N = 19) \). Forty-five adults with CFS (35 females) were recruited from two specialist out-patient CFS treatment units in the South of England. Trained clinicians confirmed diagnoses using the operational case definition of CFS described by the United States Centre for Disease Control and Prevention (Fukuda et al., 1994). HC participants were recruited via public advertisement and through personal contacts. Fifty-six HC participants were screened for inclusion in the study. Participants were also excluded from this group if their scores on the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) exceeded one standard deviation \( (SD) \) above healthy norms (for norms, see Fairburn, Cooper, & O’Connor, 2008), if their BMI was less than 18.5 kg/m², if there was evidence of a DSM-IV Axis I disorder, or a personal/family history of AN or CFS. The additional exclusion criteria applied to this group resulted in a final sample of 47 HCs (37 females).

**Measures and procedure**

The study was approved by the local ethics committee and participants had the opportunity to ask any questions before giving their informed consent to take part. Self-report measures were posted to participants in advance of a face-to-face interview in which they met with a researcher to complete a number of other measures which were administered as part of the larger study (see above). Questionnaire completion took approximately 40 min per participant.

**Demographics**

Participants provided information regarding their age, gender, ethnicity, and educational background. AN and CFS participants were also asked about the duration of their illness
and their age at onset of illness. All participants provided their height and weight to calculate BMI (see Table 1).

<table>
<thead>
<tr>
<th>Measure</th>
<th>AN group (N = 40) M (SD)</th>
<th>CFS group (N = 45) M (SD)</th>
<th>HC group (N = 48) M (SD)</th>
<th>Group statistics F (df) or t (df)</th>
<th>p</th>
<th>Post hoc comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27.33 (11.15)</td>
<td>41.19 (14.24)</td>
<td>31.90 (9.83)</td>
<td>15.64 (2,127)</td>
<td>&lt;.001</td>
<td>CFS &gt; HC &gt; AN</td>
</tr>
<tr>
<td>BMI</td>
<td>16.57 (1.26)</td>
<td>23.96 (4.06)</td>
<td>23.34 (2.84)</td>
<td>78.87 (2,125)</td>
<td>&lt;.001</td>
<td>AN &lt; CFS = HC</td>
</tr>
<tr>
<td>Illness duration (years)</td>
<td>7.43 (8.50)</td>
<td>8.67 (9.06)</td>
<td>-</td>
<td>-0.64 (78)</td>
<td>&gt;.05</td>
<td>na</td>
</tr>
<tr>
<td>Age of onset</td>
<td>19.29 (6.49)</td>
<td>33.34 (14.92)</td>
<td>-</td>
<td>-5.35 (77)</td>
<td>&lt;.001</td>
<td>AN &lt; CFS</td>
</tr>
</tbody>
</table>

**Structured Clinical Interview for DSM-IV-TR Axis I Disorders**
The Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID; First, Spitzer, Gibbon, & Williams, 2002) is a semi-structured interview used to screen for DSM-IV Axis I diagnoses. All participants were administered the screening module of the SCID to identify possible co-morbid Axis I disorder.

**Eating Disorder Examination Questionnaire**
The Eating Disorder Examination Questionnaire (EDEQ; Fairburn & Beglin, 1994) is a measure of psychopathological and behavioural indicators of disordered eating. This 36-item self-report questionnaire is derived from the ED examination interview schedule (Fairburn & Cooper, 1993). The EDE-Q provides a global score and has four subscales measuring dietary restraint, eating concern, weight concern, and shape concern. Subscale and global scores range from zero to six, with higher scores representing greater pathology. The EDE-Q has acceptable case detection and concurrent validity in community samples (Mond, Hay, Rodgers, Owen, & Beumont, 2004). In the current study, internal consistency for each subscale was high (restraint $\alpha = .92$; eating concern $\alpha = .89$; weight concern $\alpha = .89$; shape concern $\alpha = .95$).

**Fatigue Scale**
The Fatigue Scale (FS; Chalder et al., 1993) is an 11-item questionnaire measuring physical and mental fatigue symptoms. Participants rate the extent to which they feel fatigued compared to usual during the past month, ranging from 0 (Less than usual) to 3 (Much more than usual). The scale has good clinical validity in the general population (Loge, Ekeberg, & Kaasa, 1998) and in patients diagnosed with CFS (e.g., Deale, Chalder, Marks, & Wessely, 1997; Quarmby, Rimes, Deale, Wessely, & Chalder, 2007). In the current study, internal consistency for the FS was high ($\alpha = .96$).

**Hospital Anxiety and Depression Scale**
The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) is a widely used self-report measure consisting of 14 items, 7 tapping depression and 7 anxiety. Based on feelings and behaviour during the previous week, items are scored 0–3, leading to a maximum score of 21 for each subscale. The HADS has been recommended as a
screening tool in CFS (Deale & Wessley, 2000) and is widely used in research involving AN participants. In the current study, internal consistency for both anxiety ($\alpha = .91$) and depression ($\alpha = .88$) subscales was high.

**Distress Tolerance Scale**
The Distress Tolerance Scale (DTS; Corstorphine et al., 2007) is a 20-item self-report measure of distress tolerance, defined as the ability to endure and accept negative affect so that problem-solving can take place (Linehan, 1993). The items of the DTS load onto three separate but correlated subscales: (1) anticipate and distract, reflects responses that anticipate distress and distract from negative affect; (2) avoidance of affects, measures the extent to which respondents report avoiding situations that might trigger an emotional response; (3) accept and manage, reflects the extent to which individuals are able to accept distress in their life and manage it through adaptive behaviours. Higher scores on the anticipate and distract and avoidance of affect subscales represent more pathological responses. The accept and manage subscale is reverse-scored so that lower scores represent more pathological responses. Corstorphine et al. report adequate internal consistency for the DTS and this was replicated in the current study (anticipate and distract $\alpha = .70$; avoidance of affect $\alpha = .81$; accept and manage $\alpha = .68$). It should be noted that whilst the original DTS consisted of 20 items, Corstorphine et al. (2007) found that only 14 items loaded onto any of the three subscales. As such, the remaining 6 items are not included in this analysis.

**Silencing the Self Scale**
The Silencing the Self Scale (STSS; Jack & Dill, 1992) is a 31-item questionnaire designed to tap schemata concerning the suppression of emotions in the context of establishing and maintaining intimate relationships. Each item is rated for agreement on a five-point scale (1 = strongly disagree; 5 = strongly agree), with higher scores representing greater self-silencing. The STSS is divided into four subscales: (1) externalized self-perception, the extent to which respondents judge themselves by external standards; (2) care as self-sacrifice, the extent to which respondents put the needs of others before themselves to secure relationships; (3) silencing the self, the extent to which respondents inhibit fulfilling their own needs and expressing themselves to preserve relationship harmony; and (4) divided self, the extent to which respondents attempt to present an outwardly compliant self at all costs. Psychometric investigations of the STSS have generally supported its reliability and validity (e.g., Stevens & Galvin, 1995). In the current study, internal consistency for each of the STSS subscales was acceptable (externalized self-perception $\alpha = .83$; care as self-sacrifice $\alpha = .71$; silencing the self $\alpha = .85$; divided self $\alpha = .87$).

**Beliefs about Emotions Scale**
The Beliefs about Emotions Scale (BES; Rimes & Chalder, 2010) is a 12-item self-report scale that measures beliefs about the experience and expression of emotions (e.g., ‘If I lose control of my emotions in front of others, they will think less of me’, ‘I should not let myself give in to negative feelings’). Items are rated on a Likert-type scale from 0 to 6, with higher scores representing more maladaptive beliefs. The BES items have been found to load onto one single factor with good internal consistency ($\alpha = .91$) in individuals with CFS (Rimes & Chalder, 2010). In the current study, internal consistency
was also excellent ($\alpha = .93$). The BES has demonstrated good construct validity, being correlated significantly with measures of perfectionism and self-sacrificing. Furthermore, the BES has demonstrated sensitivity to change as a result of therapeutic intervention (Rimes & Chalder, 2010).

**Data analysis**

An *a priori* power calculation was conducted to estimate the required sample size. This was based on the experimental measures used as part of the protocol for the wider study (Oldershaw *et al.*, 2010). Based on this power calculation, the required sample size was successfully recruited.

All data were analysed using SPSS Version 15. All significance test results are quoted as two-tailed probabilities. An alpha level of .05 was used for all statistical tests unless otherwise specified. If assumptions required for parametric tests were violated then non-parametric tests were carried out. When the same results were obtained from parametric and non-parametric tests, only the former are reported. Demographic variables for each group were compared using one-way analyses of variance (ANOVA), followed-up with Tukey’s HSD *post hoc* tests. Independent samples *t* tests were used to compare AN and CFS groups in terms of duration of illness and age of onset. Differences between the groups in terms of their scores on the symptomatology measures (EDE-Q, FS, HADS) were also explored using one-way ANOVAs with Tukey’s HSD. Initial one-way ANOVAs were also used to explore differences between the three groups on each of the emotional processing measures. Given the significant differences between the groups in terms of their age and scores on the HADS (see below), further analyses of covariance (ANCOVA) were carried out on the emotional processing variables to assess the influence of these factors on test scores. Age, depression, and anxiety scores were entered as covariates. These results are reported only where significant effects of covariates occurred. Finally, partial correlations were calculated to explore relationships between symptomatology (EDE-Q, FS) and emotional processing variables, while controlling for age, anxiety, and depression. Correlations including the EDE-Q were calculated for the AN group only and correlations including the FS were calculated for the CFS group only.

**Results**

**Demographic variables**

Means ($M$), standard deviations ($SD$), and results of statistical tests for demographic variables are presented in Table 1. *Post hoc* analyses revealed that CFS participants were significantly older than HCs, who were significantly older than people with AN. As expected, the AN group had significantly lower BMIs than both CFS and HC groups, who did not differ from one another. AN and CFS participants did not differ from each other in terms of their illness duration, however, AN participants had a significantly earlier age of onset.

**Anxiety and depression**

Significant group differences emerged for self-reported anxiety and depression (see Table 2). The AN group were more anxious than both CFS and HC groups, and the CFS group were more anxious than HCs. Both AN and CFS participants were more depressed than HCs, but did not differ from each other.
Between-group comparisons for disorder-specific symptomatology

Significant differences were observed on all of the EDE-Q subscales and on the FS (Table 2). For each EDE-Q subscale, AN participants scored significantly higher than CFS and HC groups, who did not differ from one another. The CFS group were significantly more fatigued than either AN or HC participants, with AN participants intermediate and significantly different to both.

Between-group comparisons for emotional processing scales

The results of the initial ANOVAs comparing the three groups on the DTS, STSS, and BES are presented in Table 3. Bonferroni’s correction for multiple comparisons was applied for each measure (0.05/4 subscales = 0.01 for STSS; 0.05/3 subscales = 0.02 for DTS). On the DTS, significant group differences were observed on the avoidance of affect subscale only, with AN and CFS participants scoring significantly higher than HCs, but not different from each other. Significant group differences were observed for each of the STSS subscales (all \( p < .01 \)), except for the Silencing the Self subscale. AN participants reported the greatest level of externalized self-perception, with CFS participant scores.
intermediate between AN and HCs. AN and CFS participants had significantly higher scores than the HCs on the care as self-sacrifice subscale, but were not different from each other. AN and CFS participants rated themselves more highly on the divided self subscale than HCs, but did not differ from each other. The AN group had significantly higher BES scores than both CFS and HC groups, and there was a non-significant trend for the CFS group to have higher scores than HCs ($p = .07$).

Following the initial ANOVAs, further one-way between-groups ANCOVAs were conducted to control for the effects of differences in age, anxiety, and depression. After adjusting for age and HADS scores, the only group difference to remain significant was that observed for the STSS care as self-sacrifice subscale [$F(2, 116) = 3.11, p < .05$, partial $\eta^2 = .05$], with AN and CFS groups scoring significantly higher than HCs, but not different from each other.

**Correlations between Symptomatology and Emotional Processing Scales**
Partial correlation was used to explore the relationship between ED symptomatology (EDE-Q subscales) and emotional processing variables in the AN group while controlling for age, depression, and anxiety. Bonferroni’s correction was applied resulting in $r$ coefficients being significant at $p < .004$ (0.05/13 subscales). There were significant strong, positive partial correlations between BES scores and the EDE-Q global score ($r = .62, p < .001$), eating concern ($r = .55, p = .001$), weight concern ($r = .6, p < .001$), and shape concern ($r = .59, p < .001$) subscales. Due to the more stringent alpha level imposed by the Bonferroni correction, no other significant correlations were observed between the EDE-Q and other emotional processing measures.

Partial correlations also explored the relationship between fatigue and emotional processing variables in the CFS group while controlling for age, anxiety, and depression. Bonferroni’s correction resulted in alpha being set at $p < .006$ (0.05/9 subscales). FS scores did not correlate significantly with any of the emotional processing variables after controlling for age, anxiety, and depression.

**Discussion**
This study aimed to examine self-reported distress tolerance, self-silencing and beliefs about emotions in samples of individuals diagnosed with AN and CFS. These constructs have not previously been simultaneously explored in either CFS or AN. Relative to HCs, individuals with AN and CFS reported greater suppression of their own emotions and needs, with AN participants particularly endorsing beliefs about the utility of this approach in securing successful attachments to others. Both AN and CFS participants were more likely to evaluate themselves with reference to external rather than internal standards and report that they strive to present an outwardly compliant self whilst subjectively growing angry and hostile. AN and CFS participants struggled with distress tolerance and reported a tendency to avoid affect, further suggesting that both of these groups actively try to inhibit their own experience of emotion. Consistent with our prediction, the AN participants showed more pronounced global emotional processing difficulties than the CFS group.

The current study failed to detect group differences on the anticipate and distract or the accept and manage subscales of the DTS, which is in contrast to a previous study (Corstorphine et al., 2007). This discrepancy between our own findings and those of Corstorphine et al. might be explained by the fact that their sample comprised both AN and BN cases, whereas the present study included people with AN only.
AN participants reported more maladaptive beliefs than HCs about experiencing negative thoughts and feelings, the acceptability of expressing emotions to others, and the perceived consequences of revealing their emotions to others. These findings are supportive of previous suggestions that AN sufferers experience negative emotions as unacceptable and believe that they should not be expressed for fear of being criticized and/or rejected (e.g., Schmidt & Treasure, 2006). There was also a trend for CFS participants to report more maladaptive beliefs than HCs, and with greater numbers of participants this difference may have reached significance.

The preliminary findings described above should also be interpreted cautiously. When controlling for group differences in age, anxiety, and depression, most of the significant group differences in emotion processing disappeared. The only difference to remain significant was that observed for the STSS care as self-sacrifice subscale. Participants in the AN and CFS groups were more likely than HCs to endorse items on this scale which measures the tendency to put the needs of others before oneself in order to secure relationships. This finding is important in two respects. Firstly, it suggests that both people with AN and CFS are particularly likely to place others needs before their own, even when differences in their age and levels of anxiety and depression are controlled for. Secondly, the lack of significant effects for the other emotional processing variables suggests that comorbid anxiety and depression are important factors to consider. It is likely that the difficulties with distress tolerance and other aspects of emotion processing observed in AN and CFS are mediated by the heightened anxiety and depression seen in these conditions, and therefore not solely related to the disorders (AN, CFS) themselves. With larger samples it would have been interesting to have completed more sophisticated path analyses in order to explore this question further. This would be a key recommendation for future research. From a clinical perspective, this finding suggests that a detailed assessment of the role of anxiety and depression in mediating emotional difficulties is also something which should be considered in the overall formulation of individuals with AN and CFS.

When examining associations between disorder-specific symptomatology and emotional processing variables in AN, the only variable found to correlate with EDE-Q scores was the BES. That is, negative beliefs about emotions were associated with greater eating, weight, and shape concerns. Due to the correlational nature of the data it is impossible to make conclusions about causality here. However, the current findings do point to a strong link between the core psychopathology of AN and the possession of negative beliefs about experiencing and expressing emotions. This would make sense in the context of recent models of AN which suggest such a link between emotion and core ED symptomatology (e.g., Schmidt & Treasure, 2006). Interestingly, after controlling for age, anxiety, and depression, our measure of fatigue did not correlate significantly with any of the emotion processing variables. Associations between fatigue and either distress tolerance or self-silencing have not previously been explored. A previous study (Rimes & Chalder, 2010) did find fatigue to be significantly positively associated with BES scores. However, that study recruited larger samples who were matched for age, suggesting that the null findings in the current study may be due to reduced power imposed by smaller sample sizes and the fact that we had to control for differences in age.

Limitations
There are several limitations to the current study. Firstly, the design was cross-sectional and therefore definitive conclusions regarding causality cannot be made. Second, our
relatively small sample sizes limited the analyses that could be conducted and also placed constraints on the power to detect differences. With larger sample sizes it is possible that some of the group differences found for emotional processing variables may have remained even after covarying for age, anxiety, and depression. Third, the study employed self-report measures only, which are inherently biased towards socially desirable responding. Future research might benefit from including both self-report and experimental or observer-rated measures of emotional processing. Fourth, our three samples were not matched for age and as a result we had to control for this in our analyses, which may have reduced power. Given the later onset of CFS to AN, it is difficult to match these groups for both age and illness duration, the latter of which was achieved in the current study. Finally, the conclusions drawn here may have been strengthened had we also included a measure of invalidating childhood environments in our protocol. This would have allowed for a more direct examination of the links between such environments, later emotion processing difficulties, and the respective symptomatology associated with AN and CFS.

**Implications**

In spite of these limitations, this study adds an important message to previous research which has linked impaired emotional processing with deleterious health outcomes (Esterling, L’Abate, Murray, & Pennebaker, 1999). It provides tentative evidence suggestive of disturbed emotional processing strategies in two disabling, but very distinct illnesses which have previously been underexplored. Taken together, our findings do provide some support for current explanatory models for both disorders (Schmidt & Treasure, 2006; Surawy et al., 1995) and there may be some diagnostic overlap in the specific emotional processing difficulties experienced by people suffering with AN and CFS. By studying the two disorders simultaneously, it was possible to test the hypothesis that the emotional processing difficulties would be more severe in the AN group than the CFS group, and this was confirmed. The results improve our understanding of the similarities and differences in emotional processing across disorders. This study design is consistent with a developing trend in psychopathological processes research to take a transdiagnostic perspective rather than looking at each disorder in isolation (e.g., Mansell, Harvey, Watkins, & Shafran, 2009).

The tendency of both groups to suppress and avoid emotions, and to hold maladaptive beliefs about the consequences of emotional expression, suggests a target for intervention in both of these disorders. There is currently limited evidence to support psychological or pharmacological treatments for AN (National Institute for Health and Clinical Excellence [NICE], 2004), and whilst CBT is suggested as a first-line intervention for CFS (NICE, 2007), existing cognitive behavioural interventions are limited in their consideration of emotional processing. Recent advances in developing more tailored, empirically driven interventions which focus on the role of emotional functioning and its link with cognition and behaviour in AN and CFS may provide positive outcomes. For example, Corstorphine (2006) presents the rationale and outline for an innovative cognitive–emotional–behavioural therapy (CEBT) for EDs, including AN. It aims to enable people with EDs to understand the experience and expression of emotions, so that they can identify and challenge their beliefs and attend and respond to their emotions adaptively. Such skills are intended to reduce the need for maladaptive emotional coping and compensatory behaviours. CEBT draws on a range of models and techniques, including CBT, dialectical behavioural therapy (Linehan, 1993), mindfulness approaches
and experiential work. The aim of CEBT is not to present an entirely original therapy, but to reconfigure existing material in a way that is useful in the treatment of EDs specifically. Similarly, a combination of CBT and mindfulness approaches which encourage healthy emotional processing are being developed and tested for use with people who have CFS with some promising preliminary outcomes (e.g., Rimes & Wingrove, 2010; Surawy, Roberts, & Silver, 2005).

Future research might also consider exploring comparisons between AN, CFS, and other clinical conditions in order to clarify the specificity of the observed emotional processing difficulties in these groups. It might be particularly interesting to examine comparisons with people experiencing mood and anxiety disorders, and a physical illness group such as fibromyalgia or rheumatoid arthritis. The role of comorbid depression and anxiety in influencing emotional processing has been highlighted by the current study and it has demonstrated the importance of taking these variables into account when researching emotional processing.

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References


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