

Alexithymia in Chronic Fatigue Syndrome: Associations With Momentary, Recall, and Retrospective Measures of Somatic Complaints and Emotions

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Objective: The relationship between alexithymia and real-time momentary symptom assessments has not been reported. This cross-sectional study hypothesized that alexithymia would be a predictor of somatic symptoms using three different types of symptom measurement (momentary, recall, and retrospective) in the medically unexplained illness of chronic fatigue syndrome (CFS). In addition, it was hypothesized that negative affect would be a significant mediator of the relationship between alexithymia and somatic symptoms. Finally, the relation of alexithymia to physical illness attribution (a CFS illness predictor) was explored. **Methods:** Participants were 111 adults with CFS. Alexithymia was assessed with the Toronto Alexithymia Scale. Momentary ratings of current symptoms and affect were recorded in electronic diaries carried for 3 weeks. Weekly recall of these momentary reports was also recorded. Retrospective measures included 6-month ratings of fatigue and pain, the Fatigue Severity Scale, the Brief Pain Inventory–Short Form, a CFS symptom measure, the Beck Depression Inventory–II, the Beck Anxiety Inventory, and an illness attribution rating. **Results:** Partial correlations, controlling for age and sex, yielded no significant associations between general or specific forms of alexithymia and momentary ratings of fatigue or pain. On the other hand, a significant association, partially mediated by anxiety scores, was found between a specific form of alexithymia and a retrospective pain measure. Finally, physical illness attribution was not significantly associated with alexithymia. **Conclusion:** Based on assessments of real-time and retrospectively measured symptoms, these data provided only modest support for the alexithymia construct as a predictor of somatic symptoms in people with CFS. **Key words:** alexithymia, chronic fatigue syndrome, ecological momentary assessment.

CFS = chronic fatigue syndrome; TAS-20 = Toronto Alexithymia Scale–20-item form; DIF = Difficulty Identifying Feelings; DDF = Difficulty Describing Feelings; EOT = Externally Oriented Thinking; FSS = Fatigue Severity Scale; BPI = Brief Pain Inventory; BDI-II = Beck Depression Inventory–Second edition; BDI corr = BDI corrected for somatic symptoms; BAI = Beck Anxiety Inventory; NA = negative affect.

INTRODUCTION

Alexithymia is a personality construct that denotes a deficit in the cognitive processing and regulation of emotion (1). This deficit may, in turn, result in a negative affect state that fosters a hypervigilance toward somatic sensations and increased report of somatic complaints (2). As such, alexithymia is believed to be a predisposing factor for the development of medically unexplained symptoms and somatoform disorders (3,4). Evidence for alexithymia as a possible cause of somatic symptoms would require at least some degree of correlation between measures of alexithymia and somatic complaints when measures of emotional distress are controlled for (5).

A recent meta-analytic review (6) of 16 studies (18 samples) that used the Toronto Alexithymia Scale–20 (TAS-20), the most often used measure of alexithymia, found a consistent, significant but relatively small correlation (average $r = 0.23$) between the TAS-20 and a number of measures of somatic symptom reporting. The average associations between somatic symptom reporting and the three factor subscales of the TAS-20 was stronger for the subscale, Difficulty Identifying Feelings (DIF, 0.35), but much weaker for the other two subscales, Difficulty Describing Feelings (DDF, 0.14) and Externally Oriented Thinking (EOT, -0.04). In addition, somatoform disorder groups in comparison to control groups

without somatoform disorders have shown significantly higher levels of alexithymia, although studies of functional somatic syndromes in comparison to medical conditions with similar symptoms have yielded inconsistent findings (5,6).

Alexithymia and Chronic Fatigue Syndrome

The cognitive model of chronic fatigue syndrome (CFS) (7,8), similar to the alexithymia theory of somatization, posits that patients erroneously attribute emotion-based somatic symptoms of CFS to physical disease. Perhaps the assumed failure of patients with CFS to identify emotional states (alexithymia) contributes to a denial of the role of psychological factors in the etiology of CFS (9). In several longitudinal studies of patients with CFS (10–12), endorsement of physical rather than psychological illness attribution has been associated with poor outcomes. Thus, it would be theoretically and clinically important to assess if alexithymia plays a role in physical illness attribution.

An initial alexithymia study in patients with CFS and rheumatoid arthritis (9) found that the CFS group had significantly *lower* scores than the patients with arthritis on both the TAS-20 and the Difficulty Identifying Feelings subscale after adjusting for depression. The authors suggested that the “alexithymia” in the patients with CFS was more likely a consequence of depression, whereas alexithymia in the arthritis group represented a protective mechanism against the experience of depression. An important limitation of this study was that it did not examine the within-group relationships among alexithymia, CFS symptom severity, and negative affectivity.

Alexithymia and Negative Affect

According to the Taylor et al. (1) model, alexithymia tends to cause general distress in the individual, which is experienced not only as somatic symptoms, but also as a diffuse, undifferentiated kind of psychological distress. In fact, the alexithymia trait has been associated with both somatic symptoms and negative affect states on standardized tests (13–15). A review of largely cross-sectional studies of alexithymia in

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Received for publication July 20, 2005; revision received August 16, 2006.

This study was supported by NIH grants MH01961-02 and MO1RR10710.

DOI: 10.1097/PSY.0b013e31802b873e

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both clinical and nonclinical samples (5) concluded that a) negative affect is more strongly associated with somatic symptom measures than alexithymia, and b) the magnitude of the relationship between alexithymia and somatic symptoms is reduced when negative affect is controlled for. Furthermore, a recent longitudinal study of alexithymia and affect in a primary care sample (16) found that negative affect was the strongest independent predictor of changes in the number of somatic symptoms, whereas a specific form of alexithymia (DIF subscale) was the second strongest predictor.

Given this theoretical basis and empirical evidence for some level of interrelationship among alexithymia, negative affect, and somatic symptoms, it would be reasonable to test a specific hypothesis that may clarify the relative influences of alexithymia and negative affect on somatic symptoms. One possible hypothesis (5) is that negative affect mediates the relationship between alexithymia and somatic symptoms.

Alexithymia and Momentary Symptom Measurement

The associations between alexithymia and somatic symptoms have been assessed largely with retrospective measures that ask the subject to remember symptom severity in general or symptom severity over a set time period (e.g., pain intensity over 1 week).

If indeed alexithymia is associated with symptom severity in medically unexplained conditions such as CFS, then such associations should also be found when somatic symptoms are measured in real time in the subject's home environment, i.e., momentary assessments. A noteworthy advantage of momentary symptom recordings is that they reduce the memory biases that may occur when symptoms are reported retrospectively over longer time intervals (17).

These arguments suggest that both retrospective and momentary measurement methodologies may provide an important test of the theorized relation between the trait of alexithymia and somatic symptoms and negative affect. If CFS, as a medically unexplained condition, is viewed at least in part as a form of somatization of emotional distress with alexithymia as a predisposing and maintaining factor, then alexithymia should be associated with both retrospective and momentary measures of somatic symptoms, i.e., fatigue and pain (hypothesis 1). It is also predicted that negative affect will be a significant mediator of the relationship between alexithymia and somatic symptoms (hypothesis 2). In addition, the relationship of alexithymia to the CFS outcome predictor of physical illness attribution is explored.

METHOD

Participants

The participants were 111 adults with CFS recruited as part of a larger naturalistic study over a 30-month period using radio, TV, and newspaper advertising, ongoing announcements in a quarterly wellness newsletter, CFS and fibromyalgia web sites, physician referrals, campus and hospital listserv announcements, and talks given by Friedberg. There were no demographic differences among these sources of recruitment. Candidates were offered \$100 compensation for participation. All participants signed consent forms approved by the Stony Brook University Institutional Review Board.

Participants were diagnosed with CFS by the study physician or physician's assistant as supervised by the project physician. The diagnosis was based on the established criteria for CFS (18), which included 6 months of medically unexplained fatigue plus four of eight secondary symptoms that can be summarized into three categories: flu-like/pain symptoms, neurocognitive difficulties, and postexertional malaise. In addition, CFS criteria excluded patients who had identifiable medical or psychiatric conditions that might plausibly explain their fatigue symptoms. Psychiatric exclusions were based on the results of the Structured Clinical Interview for DSM IV (19) conducted by Friedberg or his graduate student (D.W. Leung). Participant exclusions, based on definitional criteria for CFS (18,20), were primarily the result of melancholic depression in the previous 5 years, less than four of eight secondary symptoms, sleep apnea, substance abuse in the past 2 years, and identifiable medical conditions that were associated with significant fatigue.

Additional inclusion criteria were age requirements (18–60 years), English fluency, and wakefulness between 9 AM and 9 PM daily. Eight-hundred forty-one telephone-screening interviews (conducted by Friedberg and Quick) yielded 231 candidates (27.4%) eligible for the study. Of these eligible patients, 126 (54.5%) agreed to participate. Participant withdrawal was largely the result of the time commitment involved in the larger study.

A project physician or physician's assistant confirmed a final CFS diagnosis in 123 (95.5%) of these participants of which data for this study were available for 111 subjects. The average age of the participants was 42.1 year (standard deviation [SD] = 9.5) and 74.7% (83) were women. A total of 50.4% (56) of the sample were married or cohabiting. The mean duration of the CFS illness was 8.6 years (SD = 9.5; range, 0.8–37.0 years). A total of 43.8% were working full-time, 28.4% were working part-time, 10.8% were unemployed, and 19.2% were on disability. A total of 93.2% were European American and 6.8% were Hispanic or black.

Measures and Materials

Alexithymia

Toronto Alexithymia Scale

Alexithymia was measured with the TAS-20 (21,22), a self-report measure that involves rating each of 20 items using a 5-point Likert scale. The 20 items are divided into three subscales: a) difficulty identifying feelings and distinguishing between feelings and bodily sensations (DIF); b) DDF; and c) EOT. The TAS-20 has shown excellent internal consistency (α coefficients range: 0.73–0.84 for the full TAS-20 in North American populations (23)) and test-retest reliability as well as evidence of a stable three-factor structure (6,24). To reduce the number of comparisons, only the full TAS-20 and the DIF subscale are reported because these forms of the TAS-20 have the strongest psychometric properties and predictive value (6).

Somatic Symptom Measures

Six-Month Fatigue Symptom Rating

Participants were asked to rate the intensity of their fatigue in the past 6 months on a 0 to 100 scale with zero indicating no fatigue and 100 the most intense fatigue. Then, each rating was divided by 10 to make it comparable to the similarly scaled ratings for momentary and recall fatigue (see below). Fatigue intensity represents a defining somatic dimension of (medically unexplained) CFS and thus would be expected, according to our first hypothesis, to correlate with alexithymia.

Fatigue Severity Scale

The Fatigue Severity Scale (FSS), a validated measure of the effect of fatigue on functioning, consists of nine items with response choices on a Likert-type rating scale from 1 to 7 in which 1 indicates no impairment and 7 indicates severe impairment. The initial validation study of the FSS (25) found high internal consistency, clear distinctions between patients and healthy controls, and moderate correlations with a single-item visual analog scale of fatigue intensity. The FSS has been recommended for use in CFS (26).

Six-Month Composite Pain Rating

Participants were asked to rate separately the intensity of three pain symptoms (muscle pain, joint pain, and headache) that are listed in the case definition of CFS (18). Each symptom rating, based on the prior 6 months, used a 0 to 100 scale with zero indicating no pain symptom and 100 the most severe pain symptom. The three pain symptom ratings were each divided by 10, summed, and then divided by 3 to yield a single pain rating (0–10 scale) for each participant comparable to the ratings for momentary and recall pain (see subsequently). According to our first hypothesis, pain should be related to alexithymia.

Brief Pain Inventory–Short Form

Pain was also assessed with the 15-item Brief Pain Inventory–Short Form (BPI-SF), which includes two multiitem scales measuring pain intensity and the impact of pain on functioning and well-being (27,28). Reliability estimates of the BPI-SF have consistently been above 0.85.

Chronic Fatigue Syndrome Symptom Score

CFS symptom severity was measured with a 12-item list based on the nine definitional symptoms of the illness (20) plus four additional symptoms (muscle weakness, fever or chills, nausea, alcohol intolerance) often associated with CFS (29). Each item contained a 5-point frequency scale and a 100-point intensity scale. Subjects' responses were elicited during a phone interview. The score was based on the sum of the products of frequency and intensity for each item. The alpha reliability was 0.78 for the 12-item list. It was expected that this score, which reflects primarily somatic symptoms, would also be related to alexithymia.

Negative Affect Measures

Beck Depression Inventory (BDI-II)

Depressive symptomatology was measured with the Beck Depression Inventory–Second Edition (BDI-II (30)), a 21-item self-report instrument with well-established psychometric properties (31). Depression has been consistently associated with alexithymia (5).

Beck Anxiety Inventory

Anxiety symptoms were measured with the Beck Anxiety Inventory (BAI), a 21-item self-report measure with high internal consistency ($\alpha = 0.92$) and established and replicated construct validity (32,33). Factor analysis of the BAI yielded a first-order factor labeled anxiety that had salient loadings for all 21 items on the BAI, but only one item on the BDI-II. Anxiety has been associated with alexithymia in several studies (5).

Illness Attribution

Illness Attribution Rating

Attributions were measured using five response options in which patients were asked to state whether their illness was mainly physical or psychological (34). A higher rating indicates stronger psychological attributions. Physical illness attributions have been associated with poor prognosis in several longitudinal and naturalistic studies (10–12). Given the similarities between the two constructs, physical illness attribution may be associated with alexithymia.

Momentary Measure

Electronic Diary

The electronic diary was a palm pilot computer (model: Palm Vx) with software (Satellite Forms) specifically designed to record momentary data. The system has been successfully used in many other studies (e.g., (35,36)). The palm pilot emitted auditory prompts that were linked to a display of symptom rating scales. A participant-operated stylus was used to select a response to each numerical symptom scale. The software recorded the time and date of each entry. To avoid interruptions of important ongoing activities (e.g., business meetings), participants were allowed to enter data in between scheduled prompt times. Off-schedule data entry was seldom done, because

participants answered 92% of the scheduled prompts, an excellent level of compliance.

To obtain a representative diurnal sample of symptoms and affect without undue subject burden (12), the palm pilots prompted subjects for 21 days six times a day every 2 hours plus or minus a randomly programmed 1- to 20-minute interval (i.e., Ecological Momentary Assessment (37)). The first daily prompt occurred within 1 hour of the subject's waking and the last daily prompt approximately 12 hours later. No prompt signals occurred during the subject's reported sleep time. After each prompt, several response-activated screens were displayed, each with a numerical rating scale (0–10). The end point anchors on the numerical scales were none (0) and highest (10). The scales were labeled "fatigue now," "pain now," and "negative feelings now." Subjects were instructed to record intensity ratings on the 0 to 10 scale for each of these subjective states. It was expected that the momentary measures of fatigue, pain, and negative feelings would all be directly related to alexithymia.

Recall Measure

Symptoms and Affect

At the end of each week of momentary assessment, recall ratings of fatigue, pain, and negative feelings for that week based on a 0- to 10-point numerical rating scale were obtained from subjects by telephone.

Procedure

During the study period (March 2002 to August 2004), participants first completed the standardized questionnaires and were then trained individually on how to use the palm pilot electronic diary and how to answer the electronic diary questions about symptom and affect ratings. Subsequently, the 3 weeks of momentary and recall data collection were completed.

Statistical Analysis

For data analysis, momentary and weekly recall measures were aggregated and averaged over the 3-week data collection period. In addition, BDI-II scores were corrected (BDI corr) by removing the effect of the somatic factor (30,38), which included fatigue-related symptoms, from the total score. The remaining items were focused on cognitive and emotional phenomena related to depression.

In the initial analysis, bivariate partial correlations controlling for the potentially confounding demographic variables of age and sex (39–41) were calculated between alexithymia scores (full TAS-20 and DIF subscale), somatic symptom measures, and negative affect (NA) measures. NA measures that show significant associations with both alexithymia and somatic symptoms would suggest NA mediation of a significant alexithymia–somatic symptom relationship (42). Both depression and anxiety scores as well as generalized negative affect have been associated with alexithymia (5,6,16,43,44). NA mediation of significant alexithymia–somatic symptom relationships was tested with a series of regression analyses (42,45). All significance tests were two-tailed using an α of 0.05.

Although cutoff scores have been established empirically to distinguish high- and low-alexithymic subjects (46–48), only seven subjects (6.0%) exceeded the cutoff (>60) for "high" alexithymia. Thus, the frequency of clinical alexithymia was considered to be too low for statistical analysis.

RESULTS

Table 1 presents the means and standard deviations for the standardized retrospective measures of alexithymia, somatic symptoms and negative affect.

TAS-20 Scales: Associations with Momentary Ratings and Retrospective Measures

TAS-20 (general alexithymia)

Nonsignificant associations were found between the TAS-20 and momentary, recall, and retrospective measures of fatigue and

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TABLE 1. Means and Standard Deviations for Standard Retrospective Measures

| | TAS-20 | DIF | BDI | BAI | FSS | BPI |
|--------------------|--------|-------|-------|-------|------|------|
| Mean | 44.27 | 15.97 | 10.70 | 15.38 | 5.95 | 3.84 |
| Standard deviation | 10.93 | 5.42 | 7.49 | 8.70 | 0.94 | 1.96 |

TAS-20 = General Alexithymia; DIF = Difficulty Identifying Feelings; BDI = Beck Depression Inventory (corrected); BAI = Beck Anxiety Inventory; FSS = Fatigue Severity Scale; BPI = Brief Pain Inventory–Short Form (pain intensity subscale).

pain (Tables 2 and 3). Significant associations were found between the TAS-20 and the Beck depression and anxiety measures.

Difficulty Identifying Feelings Subscale

As with the TAS-20, no significant associations were found between the DIF subscale and momentary, recall, or retrospective measures of fatigue (Tables 2 and 3). However, a significant correlation was found between the DIF subscale and the BPI–Short Form (pain intensity subscale), a retrospective measure of pain ($pr = 0.29$; $p < .002$). Significant associations were also found between the DIF and the Beck depression and anxiety measures.

Mediation Analysis

The significant moderate associations between Beck anxiety scores and both alexithymia and somatic symptom measures (Table 4) suggested that anxiety, rather than depression or momentary NA, played a mediational role between alexithymia and somatic symptoms. To test for mediation, we conducted a series of three regression analyses (42) with the results expressed as unstandardized regression coefficients (B). The first regression analysis confirmed that the DIF was a significant predictor of BPI-measured pain intensity ($B = 0.110$; $t(90) = 3.26$; $p < .003$). The second regression analysis showed that the DIF was a significant predictor of the BAI ($B = 0.620$; $t(90) = 4.15$; $p < .0001$). The third regression analysis revealed that both the DIF ($B = 0.077$;

TABLE 3. Standard Retrospective Measures: Partial Correlations (controlling for age and sex) Among Alexithymia, Somatic Symptoms, and Negative Affect

| | FSS | CFS | BPI | BAI | BDI corr |
|--------|------|------|-------|-------|----------|
| TAS-20 | 0.09 | 0.14 | 0.20 | 0.42‡ | 0.34‡ |
| DIF | 0.14 | 0.19 | 0.29* | 0.38‡ | 0.32† |

* $p < .05$, † $p < .01$, ‡ $p < .001$.

TAS-20 = General Alexithymia; DIF = Difficulty Identifying Feelings; FSS = Fatigue Severity Scale; CFS = chronic fatigue syndrome symptom score; BPI = Brief Pain Inventory–Short Form (pain intensity subscale); BAI = Beck Anxiety Inventory; BDI corr = Beck Depression Inventory (corrected).

$t(90) = 2.15$; $p < .04$) and the BAI ($B = 0.054$; $t(90) = 2.34$; $p < .03$) were significant predictors of the BPI.

In summary, 30% of the relationship between the DIF and BPI-measured pain intensity was mediated through BAI anxiety scores (partial mediation) based on the percent decline in the unstandardized regression coefficient (B) when the BAI was added to the equation ($1 - 0.077/0.110$). The Sobel test (45) confirmed a significant indirect effect ($t = 2.00$; $p < .05$).

Alexithymia and Illness Attribution

Finally, illness attribution of CFS to physical causes (illness attribution rating) was not significantly associated with the TAS-20 ($pr = 0.17$; $p = .11$) or the DIF subscale ($pr = 0.02$; $p = .70$).

DISCUSSION

This study tested the validity of alexithymia as an explanatory construct for somatic symptoms in the medically unexplained illness of CFS. To that end, the associations between alexithymia and momentary, recall, and retrospective measures of fatigue and pain were examined. Our first hypothesis was modestly supported: Only one somatic symptom measure, retrospectively measured pain intensity (BPI–Short Form), was significantly associated with a specific form of alexithymia (DIF subscale). This significant association was partially mediated by anxiety scores. On the other hand, no significant correlations were found between general alexithymia and momentary, recall, or retrospective measures of fatigue or pain. In addition, alexithymia was not associated with physical illness attribution.

Alexithymia and Somatic Symptoms in Chronic Fatigue Syndrome

Overall, these data do not provide support for a link between general alexithymia and somatic symptoms (fatigue and pain) in the medically unexplained illness of CFS. For our standardized retrospective pain measure, the nonsignificant correlation (0.20) between the TAS-20 and the pain intensity subscale of the BPI–Short Form was slightly lower than the average association (0.23) between TAS-20-measured alexithymia and somatic symptom scales as reported in a recent meta-analysis of alexithymia studies (6). On the other hand, in

TABLE 2. Momentary, Recall, and Retrospective Symptom Ratings: Partial Correlations (controlling for age and sex) Among Alexithymia, Somatic Symptoms, and Negative Affect

| | Fatigue | Pain | Negative Affect |
|--|---------|------|-----------------|
| Momentary measures (3-week means) | | | |
| TAS-20 | −0.10 | 0.13 | 0.21* |
| DIF | −0.02 | 0.14 | 0.14 |
| Recall measures (3-week means) | | | |
| TAS-20 | −0.08 | 0.10 | 0.22* |
| DIF | 0.02 | 0.16 | 0.12 |
| Retrospective measures (6-month ratings) | | | |
| TAS-20 | −0.07 | 0.04 | |
| DIF | −0.07 | 0.01 | |

TAS-20 = General Alexithymia; DIF = Difficulty Identifying Feelings.
* $p < .05$.

TABLE 4. Partial Correlations (controlling for age and sex) Among Alexithymia, Negative Affect, and Somatic Symptoms

| | TAS-20 | DIF | FSS | CFS | MF | BPI | MP |
|-----------|--------|-------|-------|-------|-------|-------|-------|
| Mediators | | | | | | | |
| momNF | 0.21* | 0.14 | 0.13 | 0.16 | 0.10 | 0.17 | 0.27* |
| BDI corr | 0.30† | 0.29† | 0.17 | 0.22* | 0.15 | 0.10 | 0.07 |
| BAI | 0.33† | 0.31† | 0.23* | 0.43‡ | 0.32† | 0.30† | 0.31† |

* $p < .05$, † $p < .01$, ‡ $p < .001$.

TAS-20 = Toronto Alexithymia Scale; DIF = Difficulty Identifying Feelings; FSS = Fatigue Severity Scale; CFS = chronic fatigue syndrome symptom score; momNF = momentary fatigue; BPI = Brief Pain Inventory–Short Form (pain intensity subscale); MP = Momentary Pain; momNF = momentary negative feelings; BDI corr = Beck Depression Inventory–II corrected; BAI = Beck Anxiety Inventory.

the current study, the correlations between the TAS-20 and the fatigue measures (6-month fatigue rating and FSS) were virtually nil.

As with the full TAS-20 (general alexithymia), the DIF subscale, which represents a specific type of alexithymia, showed nonsignificant associations with both momentary fatigue and pain. On the other hand, the DIF subscale was significantly correlated (0.29) with a retrospective symptom measure, the pain intensity subscale of the BPI–Short Form. This correlation was somewhat lower than that found between the DIF and somatic symptoms scales (average $r = 0.35$) in the studies reviewed by De Gucht and Heiser (6). Like with the TAS-20, much weaker, nonsignificant correlations were found between the DIF and our fatigue measures.

With a larger sample, the nonsignificant associations between alexithymia and fatigue measures in the current study would have been more likely to be statistically significant. A sample size of 146 would have been needed for 80% power to detect a correlation of 0.23, the average association between general alexithymia and somatic symptom reports found in the previously cited meta-analytic study (6). The current study ($N = 111$) had 68% power to detect this correlation. Yet the correlations in the current study between general alexithymia and fatigue symptoms were under 0.20 and thus the clinical significance of such findings is questionable.

Unlike the alexithymia–fatigue associations, the relationships between alexithymia and pain measures were stronger when age and sex were not controlled for. In fact, these associations were almost identical to the average associations found in the meta-analysis of associations between the TAS-20 and somatic symptoms (6). Although these latter findings more clearly replicate previous studies, it also suggests that failure to control for demographic variables related to symptoms may inflate the pattern and significance of associations in alexithymia studies.

Comparison With Wood and Wessely Study

The mean alexithymia scores in our study and the Wood and Wessely (9) CFS study were comparable to adult community norms (49) despite the different recruitment populations (community-based sample versus a tertiary care clinic). Wood and Wessely's contention that alexithymia in CFS is more a reflection of depression than the alexithymia trait itself is also consistent with the current findings, which showed

significant moderate associations between alexithymia and anxiety and depression measures. In their words: "the ability to identify and distinguish affects from physical sensations may be acutely disturbed during a depressive illness in a state-dependent manner" (p. 394). This large-scale replication and extension of the Wood and Wessely data suggests that alexithymia is unlikely to be an important illness correlate in CFS.

Alexithymia, Somatic Symptoms, and Negative Affect

The relatively low correlations among alexithymia, somatic symptoms, and negative affect in this study may be in part the result of the small proportion (6.0%) of the study sample that exceeded cutoff scores for clinical alexithymia. This suggests that high somaticizers who are more likely to report higher fatigue, pain, and negative affect ratings may have been excluded. Indeed, a recent prospective study of alexithymia and medically unexplained symptoms in primary care (16) found that the DIF dimension of alexithymia was predictive of consistently high levels of medically unexplained symptoms from baseline to follow up in a high symptom subgroup but was not predictive of increases in unexplained symptoms among the full study sample.

Furthermore, in the current study, the preponderance of significant associations was between NA and somatic symptoms rather than alexithymia and somatic symptoms. Notably, anxiety partially mediated (statistically) the single significant relationship between alexithymia and somatic symptoms. Negative affect in general has been associated with somatic symptom reporting (e.g., (3,50–52)). In addition, negative affect has been found to be a stronger longitudinal predictor of medically unexplained symptoms in primary care in comparison to alexithymia (16). Future alexithymia studies in other medically unexplained illnesses could conceivably confirm the role of negative affect as a mediator of the relationship between alexithymia and somatic symptoms.

Alexithymia and Illness Attribution

In the current study, alexithymia was not significantly related to physical illness attribution. This finding suggests that the presumably important outcome variable of illness attribution in CFS (e.g., (15)) is not influenced by alexithymia. Although physical illness attribution has been predictive of less favorable outcomes in naturalistic studies of patients with

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CFS, changing physical attributions to more psychological perceptions of illness causation does not appear to be necessary for successful outcomes (reduced symptom severity, functional improvements) in clinical intervention studies for patients with CFS (e.g., (53)). Thus, similar to alexithymia, it is not clear if physical illness attribution directly contributes to symptomatology and illness persistence in CFS. Alternatively, both alexithymia and illness attribution in CFS may be associated with other behavioral variables such as negative affect and activity avoidance (54) that may be more important in determining symptom severity and functional status.

This study is limited by the absence of a control condition of another fatiguing chronic illness that may have provided more information about the comparative role of alexithymia in symptomatically similar conditions. Also, the inclusion of a standardized experiential measure of emotion recognition, e.g., Levels of Emotional Awareness Scale (55), may have yielded an additional level of validation of the results. Finally, the small percentage of minority subjects suggests that our findings may not generalize to the population of patients with CFS, which has shown a much higher percentages of minorities (56).

If experiential measures of alexithymia confirm the present findings, then it may be more fruitful to examine other psychological trait factors in CFS that may play a role in symptom severity. For example, in patients with CFS, a defensive high anxious coping style has been identified (57) that may impinge directly on physical well-being in a way consistent with the cognitive model of CFS.

We thank Arthur Stone, Joseph Schwartz, and Stephanie Sohl for their help in preparing this article.

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