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Psychological correlates of fatigue: Examining depression, perfectionism, and automatic negative thoughts

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Abstract

This study investigated whether depression, perfectionism or automatic negative thoughts would correlate with the symptomatology of fatigue in a non-clinical population. A structural model was developed to determine if depression or latent constructs of perfectionism and automatic negative thoughts would correlate with four components of fatigue (emotional distress, somatic symptomatology, general fatigue and cognitive difficulties). It was found that all aspects of fatigue were significantly correlated with depression and automatic negative thoughts, whereas only emotional distress and cognitive difficulties were correlated with perfectionism.

Keywords: Fatigue; Depression; Perfectionism; Automatic negative thoughts

1. Introduction

There have been very few studies examining the concept of fatigue, or chronic fatigue syndrome (CFS), in the psychological literature. Fatigue is one of the primary presenting symptoms of individuals seeking help from a medical professional (Komaroff, 2000), although physicians have had great difficulty identifying a fatigue related immune system dysfunction (Berger, 2004).

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The primary criterion for a diagnosis of CFS is the onset of a new and unexplained fatigue that persists for at least six months (see Friedberg, 1996). Several studies have attempted to explore a common profile of individuals suffering from extreme fatigue or CFS. For example, Wessely (1996) noted that it is common to imagine sufferers of CFS as conscientious, successful, and dedicated people with very high standards, and the pressures of life are often described as the primary factor contributing to the onset of CFS (Wessely). The profile that often emerges of individuals suffering from extreme fatigue or CFS is one of capable, active, energetic, and competent persons (Eland, 1988). However, the validity of these stereotypes is unclear. Ware and Kleinman (1992) found that CFS sufferers displayed a heightened desire for success and accomplishments that was founded on exceedingly high standards against which they gauged their personal performance. Further, a high level of "action proneness" may predict the onset or perpetuation of chronic fatigue (Van Houdenhove, Neerinckx, Onghena, Lysens, & Vertommen, 2001). Interviews with CFS sufferers indicated that they used words such as 'always on the go', and 'workaholic' to a greater extent than would non-sufferers (Ware & Kleinman).

The lack of success in finding a physiological determinant of extreme fatigue or CFS has led many researchers to explore psychological correlates of fatigue. The evidence in support of psychological factors as the primary etiology of CFS is convincing (Berger, 2004) and many physicians support this contention (Jason & Taylor, 2003), even though a large majority of patients suffering from CFS attribute their illness to physical factors (Creswell & Chalder, 2003).

1.1. Role of depression, perfectionism and automatic negative thoughts in predicting fatigue

Many individuals presenting themselves to a physician or a specialist with chronic fatigue as their primary complaint often fulfill the operational criteria required for diagnosis of a psychiatric disorder. The psychiatric diagnoses that are reported often vary; however, depression has been reported to be the most common psychiatric diagnosis linked to chronic fatigue (Wessely, 1996). Others have also reported that anxious or depressive symptoms, ranging from mild to moderate in nature, have been reported by the majority of chronic fatigue sufferers (Greenberg, 2002). However, there is very little information surrounding the role that depression plays in the development or perpetuation of the different aspects of fatigue.

Perfectionism, as one form of dysfunctional cognition, has been linked to adjustment and achievement but it has also been tied to what has been characterized as a pervasive neurotic style (Hewitt & Flett, 1991). More specifically, self-oriented perfectionism (holding excessively high standards for yourself) has been linked to increased symptoms of anxiety (e.g., Flett, Hewitt, & Dyck, 1989; Hayward & Arthur, 1998) and various elevations of depressive symptomatology (e.g., Hayward & Arthur, 1998; Hewitt & Flett, 1990). In addition, socially prescribed perfectionism (believing that others hold excessively high standards for you) has consistently been linked to increased anxiety and depression (e.g., Flett, Hewitt, Garshowitz, & Martin, 1997; Hayward & Arthur, 1998).

A perfectionist's tendency to engage in behavior (or to adopt cognitive frameworks) such as setting and striving toward extremely high standards, critically evaluating themselves in a harsh manner, overgeneralizing failure, and adhering to all-or-none patterns of thought, has been found to foster adjustment difficulties (Hewitt & Flett, 1991). The cognitions and behavior patterns that

typify the perfectionistic individual tie closely with the pre-morbid personality profile described by Surawy, Hackmann, Hawton, and Sharpe (1995), which has been linked to CFS. Recently, it was found that those suffering from chronic fatigue scored significantly higher on perfectionism than those not suffering from chronic fatigue, and it is possible that high levels of perfectionism may play a significant role in triggering the onset of CFS (White & Schweitzer, 2000). However, Blenkiron, Edwards, and Lynch (1999) found no relationship between perfectionism and chronic fatigue in either individuals diagnosed with CFS or healthy control subjects. Thus, the relationship between perfectionism and fatigue is anything but clear, and there is a need for more extensive research into this relationship.

Another factor that may predispose individuals to experiencing the negative side effects of chronic fatigue is automatic negative thoughts. Although automatic thoughts are an element of both normal and abnormal cognitions, individuals displaying a consistent pattern of automatic negative thoughts are more likely to experience a reduction in their ability to function and adapt positively within their environment (Beck, 1967). Automatic thoughts have been consistently discussed as a factor in the onset of major depression (e.g., Teasdale & Barnard, 1993), yet to date no study has addressed the relationship between automatic negative thoughts and the different aspects of fatigue.

1.2. The present study

This research addresses the question of whether depression, perfectionism and automatic negative thoughts will relate to the symptomatology of fatigue in a non-clinical (college student) population. More specifically, depression and latent measures of perfectionism and automatic negative thoughts are expected to relate significantly to general fatigue, as well as fatigue related emotional distress, cognitive difficulties and somatic symptomatology. This population is of substantial interest to clinicians and college administrators for many reasons, including that the start of college is a critical period for the onset of depression (Hankin et al., 1998), satisfaction with grades is related to perfectionism (Grzegorek, Slaney, Franze, & Rice, 2004), and fatigue is a significant factor in post-secondary school success (Pritchard & Wilson, 2003).

2. Method

2.1. Participants

Participants ($N = 307$) were enrolled in an undergraduate introductory psychology class and were recruited through the undergraduate participant pool where they received partial course credit for participating in the study. Participants were excluded if they were not comfortable with the use of the English language. Participants ranged between 18 and 52 years of age ($M = 19.73$, $SD = 3.96$), but the majority of the participants (83%) ranged between 18 and 20 years of age. Altogether, 120 males ($M_{age} = 19.93$) and 187 females ($M_{age} = 19.60$) participated in the study. Participants were primarily in their first year of university (75% first year, 19% second year, 4% third year, 2% fourth year) and single (91% single, 9% married, living common-law, separated or divorced).

2.2. Measures

2.2.1. Automatic thoughts questionnaire (ATQ)

The ATQ (Hollon & Kendall, 1987) is a 30-item questionnaire used to assess negative cognition by measuring the cognitive self-statements of an individual. The ATQ examines four aspects of automatic thoughts: (a) personal maladjustment and desire for change (ATQ_PERSMAL); (b) negative self-concepts and negative expectations (ATQ_NEGSC); (c) low self-esteem (ATQ_LOWSE); and (d) helplessness/giving up (ATQ_GIVUP). The ATQ has been found to have good internal consistency (alpha = 0.97; Hollon and Kendall). In this study the internal consistency of all four factors was good (alpha = 0.90 for the ATQ_PERSMAL, alpha = 0.91 for the ATQ_NEGSC, alpha = 0.74 for the ATQ_GIVUP, and alpha = 0.92 for the ATQ_LOWSE). Participants are asked to rate the frequency of a given thought during the previous week on a 5-point Likert scale.

2.2.2. Dysfunctional attitude scale (DAS)

The DAS (Weissmann, 1987) is a 40-item questionnaire used to assess cognitive distortions, more specifically those cognitive distortions that could underlie or even be a causal factor in depression. The DAS has a consistent two factor structure measuring: (a) social approval (DAS_SA); and (b) perfectionism (DAS_P). Both factors have been found to have good internal consistency, with coefficient alphas of 0.80 and 0.86 for the social approval and perfectionism factors, respectively. The total DAS has also been found to have good internal consistency (alpha = 0.84; Weissman). In this study the internal consistency of both factors was good (alpha = 0.73 for the DAS_SA and alpha = 0.90 for the DAS_P). Participants are asked to indicate on a 9-point Likert scale the extent to which they agree or disagree with a given statement.

2.2.3. Multidimensional perfectionism scale (MPS)

The MPS (Hewitt & Flett, 1987) is a 45-item questionnaire used to assess three dimensions of perfectionistic behavior: (a) self-oriented perfectionism (MPS_SOP); (b) other-oriented perfectionism (MPS_OOP); and (c) socially prescribed perfectionism (MPS_SPP). Hewitt and Flett found alpha coefficients for the MPS subscales of 0.86 for SOP, 0.82 for OOP, and 0.87 for SPP. Only the SOP and SPP subscales are of interest in this research. In this study the internal consistency of both factors was excellent (alpha = 0.89 for the MPS_SOP and alpha = 0.85 for the MPS_SOP). Participants are asked to indicate to what extent they agree or disagree with a number of statements on a 7-point Likert scale.

2.2.4. Profile of fatigue-related symptoms scale (PFRS)

The PFRS (Ray, Weir, Phillips, & Cullen, 1992) is a 54-item scale used to assess four major factors of fatigue: (a) emotional distress (PFRS_EMOTDIST); (b) cognitive difficulty (PFRS_COGDIFF); (c) fatigue (PFRS_FATIG), and (d) somatic symptoms (PFRS_SOMSYMP). The subscales of the PFRS demonstrate high internal consistencies with alpha coefficients ranging from 0.88 to 0.96 (Ray et al.). In this study the internal consistency of all four factors was excellent (alpha = 0.94 for the PFRS_EMOTDIST, alpha = 0.92 for the PFRS_COGDIFF, alpha = 0.88 for the PFRS_SOMSYMP, and alpha = 0.93 for the PFRS_FATIG). Participants are asked to indicate the extent to which they have experienced the given symptoms during the previous week on a 7-point Likert scale.

2.2.5. Center for epidemiologic studies-depressed mood scale (CES_D)

The CES_D (Radloff, 1987) is a 20-item questionnaire used to assess depressive symptomatology. Alpha values of 0.85 for the general population, and 0.90 for psychiatric populations are indicative of the good internal consistency of the scale (Radloff). The internal consistency was excellent in this study (alpha = 0.90). The response choices range from 0 to 3 with 0 being 'rarely or none of the time' and 3 being 'most or all of the time'.

2.3. Procedure

Following informed consent, questionnaire packages were completed in groups of approximately fifty participants

2.4. Structural model

A structural model was used to relate fatigue to depression, perfectionism, and automatic negative thoughts (see Fig. 1). One of the primary advantages of structural equation modeling is that it allows the possibility of testing multiple related hypotheses simultaneously, wherein researchers (accurately) acknowledge that different behaviors, and behavioral changes, do not occur in isolation but instead are intricately connected. The four subscales of the ATQ (ATQ_PERSMAL, ATQ_LOWSE, ATQ_GIVUP, and ATQ_NEGSC) were used to model a latent automatic negative thoughts construct. Netermeyer et al. (2002) and others, have found that although the four factor structure is appropriate, the factors are highly correlated and a single automatic negative thoughts construct is recommended. The SOP, SPP, DAS_P and DAS_SA were used to model a latent perfectionism construct, similar to the approach taken by Arpin-Cribbie et al. (in press). The DAS_SA was modeled as an indicator of perfectionism given that social approval is one of the most important aspects of perfectionism (Flett, Hewitt, Blankstein, & Koledin, 1991), Floyd,

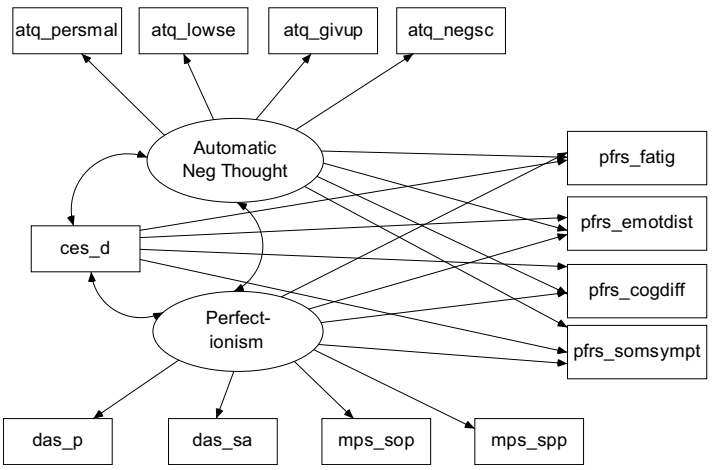

Fig. 1. The structural model used for relating the components of fatigue with depression, perfectionism and automatic negative thoughts.

Scogin, and Chaplin (2004) found that the DAS_P and DAS_SA were highly correlated and Sherry, Hewitt, Flett, and Harvey (2003) found that the correlation between the DAS_SA and the SOP was very similar to the correlation between the DAS_P and the SOP in a similar sample to that used in this study. The CES_D was used as a single indicator of depression (Phillips et al., 2006, recommend using a total score, instead of separate factors, for the CESD). The perfectionism, depression and automatic negative thought factors were allowed to intercorrelate.

Fatigue was modeled using the four original factors (PFRS_EMOTDIST, PFRS_COGDIFF, PFRS_FATIG, and PFRS_SOMSYMP) proposed by Ray et al. (1992) which were allowed to intercorrelate. Given the nature of this study it was important to model the different aspects of fatigue separately so that we could ascertain which criterion variables relate to specific aspects of fatigue. It was hypothesized that participants with higher levels of depression, perfectionism and automatic negative thoughts would also demonstrate higher levels of fatigue.

Structural equation modeling was conducted with the AMOS 6 software package (Arbuckle, 2005). The fit of the model was evaluated using the likelihood ratio statistic (χ^2), Tucker–Lewis index (TLI, Tucker & Lewis, 1973), normed fit index (NFI, Bentler & Bonnet, 1980), comparative fit index (CFI, Bentler, 1989), incremental fit index (IFI, Bollen, 1989), root mean square residual (RMSR, Bollen, 1989), and root mean square error of approximation (RMSEA, Steiger & Lind, 1980). The following cutoffs were used for declaring an acceptable fit of the model to the data: TLI > 0.95, NFI > 0.95, CFI > 0.95; IFI > 0.95, RMSR < 0.08, and RMSEA < 0.08.

3. Results

3.1. Initial screening

The scores on each item of each scale were initially screened for the presence of missing data. It was found that less than 1% of the total data points were missing. Stochastic regression imputation was used to replace missing values on individual items by regressing the item with missing data on the remaining items in the scale and then adding a random residual error. Total scale (and subscale) scores were computed from the complete data set. The scale (and subscale) scores were screened for the presence of nonnormality and extreme nonnormality was found for the DAS_P, CES_D, and the four subscales of the ATQ. For the four subscales of the ATQ the nonnormality was due to a floor effect and therefore no transformation would normalize the data. For the DAS_P and CES_D variables, natural logarithms of the original variables improved the distribution of the scores substantially, and the transformed variables were used in all analyses.

3.2. Effects of age and sex

In order to determine if the sex or age of the subjects was related to any of the variables investigated in this study, independent samples *t*-tests were used to compare males and females, and younger (20 and younger, $n = 269$) and older (21 and older, $n = 38$) subjects on each of the scales and subscales in this study. Although we would have liked to have a better representation of older subjects (e.g., older than 30) for these tests, there were very few mature students in this study. The only significant sex effects found were that females scored higher than males on the PFRS_FATIG

[$M_{\text{males}} = 17.98$, $M_{\text{females}} = 22.37$, $t(296) = 2.76$, $p = 0.006$] and the PFRS_EMOTDIST [$M_{\text{males}} = 31.81$, $M_{\text{females}} = 38.61$, $t(297) = 2.69$, $p = 0.008$] and males scored higher than females on the DAS_P [$M_{\text{males}} = 43.72$, $M_{\text{females}} = 40.03$, $t(298) = 2.049$, $p = 0.041$]. The fact that females score higher than males on fatigue supports the findings of ter Wolbeek, van Doornen, Kavelaars, and Heijnen (2006). There were no differences between the younger and older subjects on any of the variables investigated in this study. For the fatigue related variables we also tested for any age differences within each gender or whether there was an interaction between sex and age. All of these tests were not significant.

3.3. Structural equation modeling

Correlations among each of the scales used in the structural model are presented in Table 1. The fit of the model to the data was good, χ^2 (df = 48) = 127.11, $p < 0.001$, CFI = 0.971, NFI = 0.955, IFI = 0.971, RMSR = 0.044, RMSEA = 0.073, with all standardized residuals (in absolute value) less than 3. Correlations among the criterion variables were all statistically significant (with $p < 0.001$); specifically $r = 0.62$ between automatic negative thoughts and perfectionism, $r = 0.56$ between automatic negative thoughts and depression, and $r = 0.51$ between perfectionism and depression.

3.3.1. Depression and fatigue

As expected, all aspects of fatigue were significantly correlated with depression, β (standardized regression coefficient) = 0.51, $z = 11.42$, $p < 0.001$ for PFRS_EMOTDIST, $\beta = 0.36$, $z = 6.73$, $p < 0.001$ for PFRS_COGDIFF, $\beta = 0.45$, $z = 7.82$, $p < 0.001$ for PFRS_FATIG, and $\beta = 0.32$, $z = 7.22$, $p > 0.001$ for PFRS_SOMSYMP. More specifically, those scoring higher on depression scored higher on all aspects of fatigue.

Table 1
Correlations between each of the variables used in the structural model

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. DAS_SA	1												
2. DAS_P	0.60	1											
3. CES_D	0.43	0.40	1										
4. ATQ_PERSMAL	0.47	0.47	0.67	1									
5. ATQ_NEGSC	0.43	0.50	0.63	0.82	1								
6. ATQ_LOWSE	0.39	0.47	0.51	0.70	0.82	1							
7. ATQ_GIVUP	0.41	0.42	0.52	0.67	0.76	0.68	1						
8. PFRS_FATIG	0.31	0.28	0.62	0.51	0.45	0.35	0.47	1					
9. PFRS_EMOTDIST	0.48	0.42	0.81	0.66	0.60	0.51	0.53	0.67	1				
10. PFRS_COGDIFF	0.41	0.41	0.65	0.55	0.52	0.43	0.57	0.72	0.71	1			
11. PFRS_SOMSYMP	0.31	0.29	0.55	0.43	0.41	0.39	0.44	0.74	0.67	0.69	1		
12. MPS_SOP	0.25	0.36	0.14	0.18	0.12	0.11	0.02	0.10	0.18	0.14	0.13	1	
13. MPS_SPP	0.39	0.50	0.35	0.39	0.40	0.35	0.33	0.31	0.40	0.34	0.31	0.40	1

Note. $r > 0.113$ is statistically significant at $\alpha = 0.05$ and $r > 0.149$ is significant at $\alpha = 0.01$.

3.3.2. Automatic negative thoughts and fatigue

Similarly, all aspect of fatigue were significantly related to automatic negative thoughts, $\beta = 0.29$, $z = 5.51$, $p < 0.001$ for PFRS_EMOTDIST, $\beta = 0.26$, $z = 4.11$, $p < 0.001$ for PFRS_COGDIFF, $\beta = 0.23$, $z = 3.39$, $p < 0.001$ for PFRS_FATIG, and $\beta = 0.22$, $z = 3.08$, $p = 0.002$ for PFRS_SOMSYMP. Again, those scoring high on automatic negative thought also scored higher on all aspects of fatigue.

3.3.3. Perfectionism and fatigue

When fatigue was related to perfectionism, only the PFRS_EMOTDIS ($\beta = 0.13$, $z = 2.24$, $p = 0.025$) and PFRS_COGDIFF ($\beta = 0.18$, $z = 2.\ 42$, $p = 0.015$) components were significantly correlated with perfectionism, whereas the PFRS_SOMSYMP ($\beta = 0.09$, $z = 1.23$, $p = 0.220$) and PFRS_FATIG ($\beta = 0.02$, $z = 0.328$, $p = 0.743$) were not significantly related to perfectionism.

To further explore whether gender and/or age would significantly impact on any of the primary relationships in the model two further models were analyzed. The first model was a multiple group model wherein separate models were fit for males and females. It was found that the relationship between each of the components of fatigue and depression, automatic negative thoughts and perfectionism did not differ between males and females. Further, when age was included as a predictor of the four components of fatigue, it did not significantly relate to any of the components of fatigue, nor did any of the previously significant relationships between the four components of fatigue and depression, automatic negative thoughts and perfectionism become non-significant.

4. Discussion

The present study examined the research hypothesis that levels of fatigue in a non-clinical population would relate to levels of depression, automatic negative thoughts and perfectionism. As expected, all four of the components of fatigue measured by the PFRS (fatigue, emotional distress, cognitive difficulties and somatic symptomatology) were significantly related to depression. These results provide support for previous studies that have linked depression and fatigue (e.g., Wessely, 1996) and highlight the importance of investigating depression levels in clients seeking help for fatigue related illnesses. Further, each of the components of fatigue were also significantly related to automatic negative thoughts. To the best of our knowledge this relationship has not previously been investigated, and these results shed light on the role that automatic negative thoughts may play in the onset or perpetuation of fatigue related symptoms. It is also expected that cognitive behavioral therapies, specifically addressing negative (and likely dysfunctional) thought patterns, may prove beneficial to clients. In fact, a recent study by Wittkowski, Toye, and Richards (2004) found that group cognitive behavioural therapy with CFS patients can lead to significant improvements in both fatigue and cognitive functioning.

Previous studies have found conflicting results when it comes to the relationship between perfectionism and fatigue (e.g., Blenkiron et al., 1999; White & Schweitzer, 2000), although this study may help shed light on this issue by examining the different components of fatigue separately. Specifically, perfectionism was related significantly to fatigue related emotional distress and cognitive difficulties, whereas it was not related to general levels of fatigue or somatic symptomatology. This is important information for medical professionals given that the typical profile of an individual

suffering from CFS is one of an individual bogged down with work and tasks while trying to maintain a possibly unachievable level of perfection. The results of this study indicate that although perfectionism may be contributing to an individual's emotional or cognitive difficulties, the more physical symptomatology of fatigue is more likely related to depression and/or negative automatic thoughts.

The main limitation of this study, as with many psychological studies, is that the results are based on self-report data and it is possible that the responses of the participants may not accurately represent their own personal reality. However, it is important to note that in this study the individual perceptions of the participants to the scale items are most important and any possible discrepancy between their perceptions and their actual behavior may not nullify the internal validity of the study. A second limitation of the study, pointed out by a reviewer of the paper, was that multicollinearity could be present in the constructs investigated in the model. Although it is clear from the interfactor correlations that the constructs in the model were related, the fact that most of the proposed relationships between the different aspects of fatigue and depression, automatic negative thoughts and perfectionism indicates that there was still important variability for the prediction of fatigue that was not shared among the predictor variables. This also indicates that the significant relationships between the different aspects of fatigue and depression, automatic negative thoughts and perfectionism cannot all be attributed to a common depression construct. Finally, a reviewer indicated that screening for the presence of a fatigue related health condition or a CFS diagnosis is recommended, and we agree with this point.

This study attempts to provide a greater understanding of the psychological correlates of fatigue and it is hoped that future studies will continue to investigate the potential causal relationship between fatigue and psychological variables (e.g., automatic negative thoughts, depression and perfectionism). For example, clinical intervention or longitudinal studies may help delineate more precisely the psychological correlates that are most important in the onset and/or perpetuation of fatigue related symptoms.

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