

INTRODUCTION

Borkovec's avoidance theory of worry (Borkovec, Ray, & Stöber, 1998) posits that worry confers temporary benefit to the individual worrier by distancing them from their own anxiety-provoking mental images, and that this negative reinforcement explains the maintenance of the activity, and ultimately the development of pathological forms of worry as exemplified in Generalized Anxiety Disorder (GAD). However, what is left unexplained is why emotion, particularly anxiety, is experienced as so toxic to the worrier that worry can become an inflexible means of avoidance coping, occasionally to such an extent that a diagnosis of GAD is given?

The emotion dysregulation model of GAD (Mennin, Heimberg, Turk, & Fresco, 2002) posits that GAD is associated with four key deficits in how individuals influence, control, experience, and express their emotions (Gross, 1998, pg. 275) and explains the process by which emotions are regarded as increasingly aversive. Specifically, the pathological worrier has emotional reactions that occur more easily, quickly, and intensely than for most other people (heightened intensity) and have difficulty identifying their emotions, instead experiencing them as confusing and overwhelming (poor understanding). As a result, the worrier experiences emotions as aversive and may become anxious when they occur (negative reactivity), potentially leading to difficulty knowing when or how to diminish their emotional experience (maladaptive management).

Research examining this theory has found that both college students and patients seeking treatment for GAD endorsed more deficits in emotion regulation than participants without GAD (Fresco, Arney, Mennin, Turk, & Heimberg, 2005a; Mennin, Heimberg, Turk, & Fresco, 2005). In addition, individuals with GAD, but not controls, displayed greater increases in anxiety and rigidity in their thinking after listening to sadness- or anxiety-inducing music (Fresco et al., 2005b; Mennin et al., 2005).

Research has also examined the role of emotion regulation in disorders outside of GAD. GAD has been identified as a disorder that typically occurs in the presence of other forms of psychopathology (Kessler et al., 2005). If emotion regulation were conceptualized as a vulnerability factor common to many forms of psychopathology, it may account for this phenomenological overlap. Recent research examining the comorbidity of GAD and eating disorders (Fresco, Wolfson, Crowther, & Moore, 2005) has established that emotional dysregulation is a factor common to both disorders and may explain the high comorbidity between the two.

The emotion regulation measures used in these studies consisted of theoretically-defined composites that have not been empirically evaluated as to their internal consistency. Subsequent research has identified empirically-defined emotion regulation factors that replicated the original theoretical conceptualization of emotion dysregulation in GAD as being composed of the original four factors: negative reactivity, heightened intensity, poor understanding, and maladaptive management (Mennin, Fresco, Holaway, Moore, & Heimberg, 2005).

In the current investigation, cluster analysis was utilized to identify distinct emotion dysregulation profiles, while differences in symptoms of psychopathology among these profiles were investigated using ANOVA in a sample of college undergraduates ($n = 457$) at a large university in the Midwestern USA.

ABSTRACT

The present study utilized cluster analysis procedures to empirically identify subgroups of four factors (negative reactivity, heightened intensity, poor understanding, and maladaptive management) thought to underlie various forms of psychopathology characterized by emotional dysregulation. Self-report measures were administered to 457 undergraduate students. In order to produce a stable and robust solution, the four factors were submitted to a two-stage clustering procedure consisting of an agglomerative-hierarchical clustering method followed by an iterative non-hierarchical clustering method. Two clusters were identified, with Cluster 1 thought to be characterized by emotional dysregulation and increased risk for psychopathology and Cluster 2 by emotional regulation and relative psychological well-being. This description was verified by comparing these two clusters on various measures of psychopathology and psychological well-being. Cluster 1 was found to have higher scores on measures of anxiety, worry, depression, experiential avoidance, pessimistic attributional style, and ruminative brooding. Cluster 2 was found to have higher scores on need for cognition, a measure of psychological well-being.

METHODS

Participants

- 457 undergraduate students
- 40% Male, 60% Female
- 12% African American, 84% Caucasian, 4% Other
- Participants ranged from 17-57 years of age ($M = 22.73$, $SD = 9.1$)

Emotion Regulation Measures

- Affective Control Scale (ACS; Williams et al., 1997)
- Berkeley Expressivity Questionnaire (BEQ; Gross & John, 1997)
- Toronto Alexithymia Scale (TAS; Bagby et al., 1994a; Bagby et al., 1994b)
- Trait Meta-Mood Scale (TMMS; Salovey et al., 1995)

Construct Validity Measures

- Acceptance and Action Questionnaire (AAQ; Hayes, 1996)
- Attributional Style Questionnaire (ASQ; Seligman et al., 1979)
- Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991)
- Need for Cognition Scale (NFC; Cacioppo, Petty, & Kao, 1984)
- Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990)
- Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991)

RESULTS

The four factors (negative reactivity, heightened intensity, poor understanding, and maladaptive management) were submitted to an agglomerative, hierarchical cluster analysis. Examination of the agglomeration schedule was utilized to determine the appropriate number of clusters (Hair et al., 1995), which indicated that a 2 cluster solution was superior to a 3 cluster solution (see Fig. 1). Participants in Cluster 1 evidenced relatively high negative reactivity and maladaptive management, and poor clarity of their emotions. Cluster 2 was characterized by low scores on these three emotion regulation factors. However, the two clusters did not differ on emotional intensity. Next, the scores were subjected to a non-hierarchical/K-Means cluster analysis, and agreement between the two, as judged by calculation of Cohen's (1960) Kappa (κ), was used as a more objective determinant of the relative stability of the two solutions (Hartigan, 1975; Milligan, 1980). This analysis suggested that the two-cluster solution ($\kappa = .70$) was significantly more stable than the 3-cluster solution ($\kappa = -.17$).

MANOVA was then used as an exploratory technique to determine psychopathology symptom profiles specific to the two clusters (see Table 1 for means and SD 's by cluster). The Cluster 1 was found to have significantly higher mean scores on all measures of psychopathology, including: anxiety [$F(1, 442) = 31.22, p < .001, f = .27$], worry [$F(1, 442) = 31.60, p < .001, f = .27$], depression [$F(1, 442) = 51.00, p < .001, f = .34$], experiential avoidance [$F(1, 442) = 99.33, p < .001, f = .47$], pessimistic explanatory style [$F(1, 442) = 7.34, p = .007, f = .13$], and ruminative brooding [$F(1, 442) = 48.02, p < .001, f = .33$]. The Cluster 2 was found to have significantly higher mean scores on the measures of psychological well-being, such as need for cognition [$F(1, 442) = 15.02, p < .001, f = .18$].

DISCUSSION

The findings provide further evidence supporting the dimensions of emotion regulation articulated in Mennin et al.'s emotion dysregulation model of GAD as they relate more broadly to indices of psychopathology.

- The emotion regulation scales seemed to agglomerate into emotional regulation and emotional dysregulation clusters.
- Interestingly, heightened intensity of emotions did not feature prominently in the cluster solution. Although only anecdotal, this finding complements previous results suggesting that heightened intensity of emotions may in fact be a signature characteristic of GAD.
- Extra-test measures lent confidence to the claims that Cluster 1 is indicative of emotional dysregulation and Cluster 2 is indicative of emotional regulation.

Limitations

- Participants consisted of relatively high-functioning college students, resulting in uncertain generalizability to the general public
- The cluster analysis and follow-up tests were exploratory in nature. Thus, replication studies will be needed before strong conclusions can be drawn from these results.

Future Studies

- Exploring the agglomerative nature of the four emotion regulation factors in a clinical sample to determine the external validity of the current results
- Examining the emotional reactivity of the emotion regulation clusters in a mood priming paradigm

Fig. 1

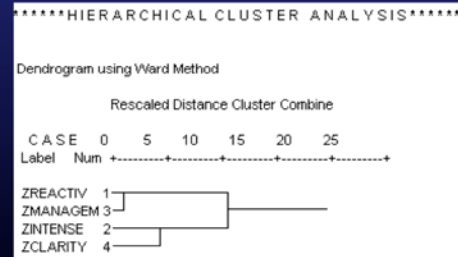


Table 1

Variable	Cluster 1 M (SD)	Cluster 2 M (SD)
Anxiety (MASQ)	26.93 (9.19)***	22.74 (5.26)
Depression (MASQ)	59.46 (9.75)***	50.79 (9.49)
Experiential Avoidance (AAQ)	36.58 (5.70)***	31.08 (5.75)
Pessimistic Explanatory Style (ASQ)	4.29 (.69)**	4.11 (.72)
Ruminative Brooding (RSQ)	10.92 (3.38)***	8.75 (3.06)
Worry (PSWQ)	52.23 (12.31)***	45.39 (13.04)
Need for Cognition (NFC)	53.32 (10.74)	57.52 (11.87)***

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