

Relationships between cognitive coping, self-esteem, anxiety and depression : A cluster-analysis approach

Julie Doron, Véronique Thomas-Ollivier, Hugo Vachon, Marina Fortes-Bourbousson

► **To cite this version:**

Julie Doron, Véronique Thomas-Ollivier, Hugo Vachon, Marina Fortes-Bourbousson. Relationships between cognitive coping, self-esteem, anxiety and depression : A cluster-analysis approach. Personality and Individual Differences, Elsevier, 2013, 55 (5), pp.515-520. <10.1016/j.paid.2013.04.017>. <hal-01579275v2>

HAL Id: hal-01579275

<https://hal-insep.archives-ouvertes.fr/hal-01579275v2>

Submitted on 22 Nov 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Relationships between cognitive coping, self-esteem, anxiety and depression: A cluster-analysis approach

Julie Doron^{a,b,†}, Véronique Thomas-Ollivier^b, Hugo Vachon^b, Marina Fortes-Bourbousson^b

^a Paris-East Créteil University, Department of Sport and Physical Education Sciences, Laboratory CIRCEFT-REV (EA 4384), Créteil, France

^b University of Nantes, Department of Sport and Physical Education Sciences, Laboratory "Motricité, Interactions, Performance" (EA 4334), Nantes, France

article info

Keywords:

Cognitive coping
Depression
Anxiety
Self-esteem
Cluster analysis

abstract

It is important for prevention efforts and for designing appropriate interventions to identify people at risk of depression while considering cognitive coping and individual characteristics. This study with 334 French adults examined the ways in which people may combine the use of several cognitive coping strategies and investigated whether depression, self-esteem, and state- and trait-anxiety would differ across distinctive cognitive coping profiles. A two-phased cluster analytic plan was employed to derive clusters of cognitive coping profiles. We identified three profiles that differed according to the levels of depression, self-esteem, and state- and trait-anxiety. Research should therefore not focus on a single cognitive coping strategy, but on all cognitive coping strategies that are used simultaneously to investigate the relation between cognitive coping and emotional problems. Cognitive coping profiles provided a deeper understanding of how different individuals cope with negative and unpleasant events, and they allowed us to identify targeted groups that are most likely to benefit from specific mental health promotion and prevention campaigns.

1. Introduction

Coping is of critical importance to mental health and psychological well-being (Miller, Brody, & Summerton, 1988). The ways in which people deal with stress can reduce or amplify the effects of adverse life events and conditions not just on emotional distress and short-term functioning, but also on the development of long-term mental health problems, such as depression (Skinner, Edge, Altman, & Sherwood, 2003). Although coping has been receiving increasing empirical attention, potentially important individual differences in preferred coping profile have yet to be investigated more thoroughly.

1.1. Cognitive coping

Coping is a multidimensional construct that encompasses both cognitive and behavioral regulatory processes to manage the internal and external demands encountered during a specific stressful situation (Lazarus & Folkman, 1984). The specific thoughts or cognitions by means of which people regulate their emotions in response to negative life events are assumed to be important for

mental health (Garnefski & Kraaij, 2006a). A deficiency in cognitive coping skills increases vulnerability to depression (Haaga, Thorn-dike, Friedman-Wheeler, Pearlman, & Wernicke, 2004). Therefore, this study focused specifically on the role of cognitive coping strategies in vulnerability to depression (Garnefski, Kraaij, & Spinhoven, 2001). In the literature, nine conceptually different cognitive coping strategies have been distinguished, including four maladaptive strategies of Self-blame, Other-blame, Rumination, and Catastrophizing, and five adaptive strategies of Putting into Perspective, Positive Refocusing, Positive Reappraisal, Acceptance, and Planning (Garnefski & Kraaij, 2006b; Garnefski et al., 2001).

1.2. Cognitive coping and psychological adjustment

Previous research suggests that cognitive coping is linked to indicators of low psychological adjustment associated with anxiety and depression symptoms (Garnefski, Legerstee, Kraaij, Van den Kommer, & Teerds, 2002; Garnefski, Teerds, Kraaij, Legerstee, & Van den Kommer, 2004; Garnefski et al., 2001). In general, the results suggest that people who use strategies such as Rumination, Catastrophizing and Self-blame may be more vulnerable to emotional problems compared to those who do not use these strategies. Furthermore, those who use cognitive coping strategies such as Positive Reappraisal may be less vulnerable. As cognitive processes play a significant role in the development, maintenance, and exacerbation of depression and anxiety symptoms, it seems

[†] Corresponding author. Address: Paris-East Créteil University, Immeuble Pyramide, 80, avenue du Général de Gaulle, Créteil 94009, France. Tel.: +33 1 45 17 44 68.

E-mail addresses: julie.doron@gmail.com, julie.doron@u-pec.fr (J. Doron).

important to identify cognitive coping profiles associated with vulnerability to depression and anxiety.

1.3. The role of self-esteem and trait-anxiety

Individual differences in personality traits have been associated with both resilience to negative life events and depression induced by negative life events (Duggan et al., 2003). Among psychosocial resources, high self-esteem has been found to buffer the effects of stress on mental health, acting as a protective factor of depression and anxiety symptoms (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995; Sowislo & Orth, 2013). The vulnerability model suggests that negative evaluations of the self constitute a causal risk factor of depression (Sowislo & Orth, 2013). People with high self-esteem are more likely to use adaptive rather than maladaptive coping (Aspinwall & Taylor, 1992; Terry, 1994) and are less likely to be depressed (Mruk, 1999). Conversely, strong evidence suggests that high trait-anxiety is an important risk factor for the development of depression (Hettema, 2008; Kendler, Kuhn, & Prescott, 2004; Min, Lee, Lee, Lee, & Chae, 2012). Trait-anxiety has been implicated as one of the vulnerability characteristics associated with the development of depression (Charney, 2004; Sandi & Richter-Levin, 2009). People with high trait-anxiety rely more on avoidance and less on adaptive coping; consequently, they are more likely to be depressed (Carver, Scheier, & Weintraub, 1989; Terry, 1994). Figure 1 illustrates the relationships among the abovementioned variables.

1.4. Profiles of coping

Despite their respective strengths and weaknesses, previous studies adopted a dichotomous view of coping when investigating the relationships between cognitive coping and mental health. Such an approach has neglected the multivariate nature of coping

and the possibility that people may use more than one coping strategy when dealing with stressful situations (Sideridis, 2006). Studies on the relation between cognitive coping and dysfunction should therefore not focus on a single cognitive coping strategy but on multiple cognitive coping strategies simultaneously in order to arrive to meaningful conclusions (Garnefski et al., 2001).

As an alternative to the dichotomous view of coping, some researchers have begun examining cognitive and behavioral coping strategies in terms of “profiles” that exist across individuals using cluster analytical procedures in different settings (Gaudreau & Blondin, 2004; Kaluza, 2000; Rijavec & Brdar, 2002; Smith & Wallston, 1996; Steele, Cushing, Bender, & Richards, 2008; Wijndaele et al., 2007). For example, Wijndaele et al. (2007) identified three coping profiles in the adult population. The “Stressed” group (e.g., high passive and avoidant coping) turned out to have the most maladaptive profile associated with increased anxiety and depression and decreased physical activity. The “Nonstressed” group (e.g., high active coping) had the most adaptive profile characterized by decreased depression and anxiety and increased physical activity. Overall, coping profiles were differently associated with psychological adjustment. Despite the advantages of using this technique (cluster analysis) in coping research, little is known about the cognitive coping profiles related to depression vulnerability.

1.5. Goals and hypotheses

The aim of this paper was twofold. The first aim was to examine and describe the ways in which people combine several cognitive coping strategies to deal with negative or unpleasant events. The second aim was to investigate whether the subgroups of individuals created by the cluster analysis also differ in self-esteem, state and trait-anxiety, and depression.

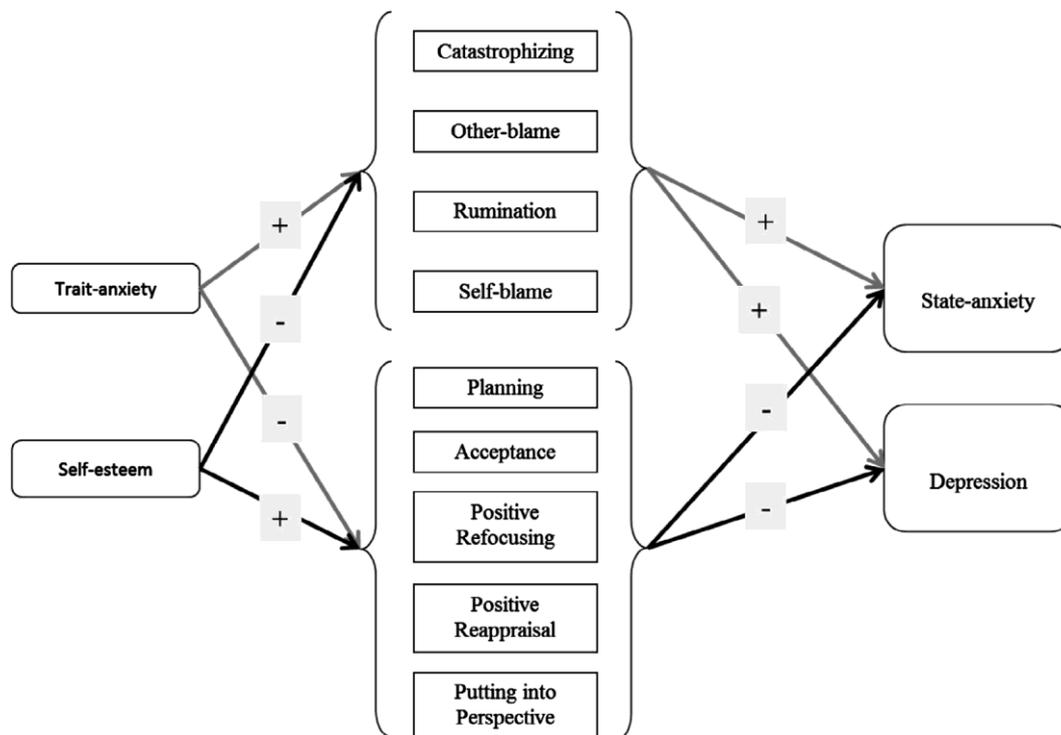


Fig. 1. The relationships among self-esteem, trait-anxiety, cognitive coping, depression and state-anxiety in traditional studies.

2. Method

2.1. Participants and procedure

A cross-sectional survey assessing psychological well-being was conducted among a nonclinical population between mid-September and mid-October 2011 in Nantes (France). The sample included 334 French adults (187 females and 147 males) aged 18–75 years of age ($M_{\text{age}} = 26.25$, $SD_{\text{age}} = 12.46$). Participants were recruited in two ways: (a) via advertisements placed within a living area not far from the university as well as at the university and (b) via advertisements in local newspapers. Participants contacted the research assistant by phone or e-mail. Subsequently, the assistant mailed the questionnaire to the participants. They returned the completed questionnaire and the written informed consent. All participants who were contacted participated in the study. In order to ensure the confidentiality of the data, participants did not write their names on the questionnaire. They were not paid for their participation, and they were all volunteers. An ethical committee also approved the protocol (GNEDS – Ref: 2011-09-03).

In order to deal with the issue of common methods variance, we used procedural remedies (see, Podsakoff, MacKenzie, & Podsakoff, 2012). We introduced a proximal separation between the measures of the predictor and criterion variables, controlled the position of different questionnaires and used different formats. Podsakoff et al. (2012) noted that this procedure should reduce the respondent's ability and/or motivation to use previous answers to fill the gaps in recall, infer missing details, or answer subsequent questions.

2.2. Measures

2.2.1. Cognitive coping

Cognitive coping was assessed using the French version (Jermann, Van der Linden, d'Acremont, & Zermatten, 2006) of the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001), which contains nine four-item cognitive coping strategies subscales. Participants were asked to indicate what they generally think when they experience negative or unpleasant events. The items were rated on a 5-point Likert scale ranging from 1 “almost never” to 5 “almost always”. All internal consistency values were >0.70 .

2.2.2. Self-esteem

The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a widely used 10-item scale assessing global self-esteem. The items were rated on a 4-point Likert scale ranging from 1 “strongly agree” to 4 “strongly disagree”. A French version by Vallières and Vallerand (1990) was used. The Cronbach's alpha coefficient was 0.86.

2.2.3. Trait and state anxiety

The State-Trait Anxiety Inventory is a widely used measure of trait and state anxiety (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). A French version by Gauthier and Bouchard (1993) was used. The STAI has both trait and state scales. Each scale consists of 20 items rated on a 4-point Likert scale ranging from 1 “Almost Never” to 4 “Almost Always”. The STAI Trait ($\alpha = 0.90$) and the STAI State ($\alpha = 0.93$) demonstrated excellent internal consistency.

2.2.4. Depressive symptoms

The Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) was developed to measure depressive symptomatology in general population. We used the French version (Fuhrer &

Rouillon, 1989) of the CES-D comprising 20 items that measure the presence and severity of depressive symptoms. The range of responses varied from 0 “rarely or none of the time” to 3 “most of the time – 5–7 days” within the last seven days. Higher scores indicated greater depressive symptoms. The Cronbach's alpha coefficient was 0.90.

2.3. Data analysis

Analyses were carried out using the SPSS 17.0 statistical software package (SPSS, Inc., Chicago, IL, USA). Descriptive statistics are presented in Table 1. To identify and classify naturally occurring patterns of cognitive coping strategies, we used cluster analysis after transforming scores into standardized z -scores and identifying multivariate outliers (Hair, Anderson, Tatham, & Black, 1998). As recommended by Henry, Tolan, and Gorman-Smith (2005), we employed a two-phased cluster analytic plan to derive clusters of cognitive coping profiles using the nine subscales of the CERQ. First, to provide the maximum flexibility in determining the appropriate number of clusters, we examined the standardized data using a hierarchical cluster analysis method (i.e., Ward's linkage clustering using minimized squared Euclidean distances as the distancing metric). This process allowed us to identify the number of clusters that maximizes differences between groups and minimizes differences in the dependent variables (i.e., cognitive coping strategies) within groups. We then used a non-hierarchical (k -means) cluster analysis to confirm the number of groups identified by the hierarchical clustering. As described by Taylor and colleagues (2001), this method provides a relatively robust identification of clusters. Henry et al. (2005) noted that this combination of clustering methods “capitalizes on the strengths of both methods and compensates for their weaknesses” (p. 124). To validate the clusters solution, a series of ANOVAs was conducted, with the cluster membership as an independent variable and the cognitive coping strategies as dependent variables (Aldenderfer & Blashfield, 1984).

Differences in self-esteem, state- and trait-anxiety, and depression between clusters were analyzed by means of MANOVA and ANOVA with Tukey's HSD post hoc test. Finally, given that previous research reported gender and age differences between clusters (Wijndaele et al., 2007), participants' demographic characteristics were analyzed to add insight to the cluster profiles. ANOVA, the Tukey's HSD post hoc test, and the chi-square (X^2) test were used.

3. Results

3.1. Cluster analyses

Using the critical value of Mahalanobis distance ($\chi^2_{(13)} > 34.53$, $p < 0.001$), three multivariate outliers were identified for all cognitive coping strategies, self-esteem, depression, and trait and state anxiety variables. First, a hierarchical cluster analysis was conducted. The number of clusters was determined using the dendrogram, the agglomeration schedule coefficients, and the interpretability of the cluster solution (Aldenderfer & Blashfield, 1984). The results suggested a three-cluster solution. Second, a non-hierarchical cluster analysis was performed on the data, specifying a three-cluster solution. The three subgroups were significantly different on all cognitive coping strategies ($p < 0.05$), thus providing a solid indication of its tenability (see Table 2). Moreover, visual inspection of cluster centres and mean scores on the clustering variables suggested similar patterns across the two clustering methods.

Based on cluster means (see Fig. 2), the three identified cluster groups were (a) “Adaptive copers” ($n = 115$; 34.7%, 56 females and

Table 1
Descriptive statistics of the study variables for the total group, men and women.

Variable	Total group (N = 334)		Men (n = 147)		Women (n = 187)	
	M	SD	M	SD	M	SD
Acceptance	13.27	3.43	12.94	3.32	13.53	3.50
Positive refocusing	10.37	3.88	10.69	3.83	10.11	3.91
Refocus on planning	13.61	3.42	13.76	2.96	13.50	3.74
Positive reappraisal	13.14	3.65	13.78	3.48	12.63	3.71
Putting into perspective	13.45	3.48	13.65	3.58	13.30	3.40
Self-blame	9.85	3.05	9.27	2.64	10.31	3.27
Rumination	12.41	3.86	11.24	3.66	13.33	3.78
Catastrophizing	7.57	3.10	7.44	2.96	7.67	3.21
Blaming others	7.31	2.46	7.52	2.41	7.15	2.50
Self-esteem	29.54	6.16	31.53	5.53	27.97	6.18
Trait-anxiety	41.10	10.92	37.19	9.78	44.18	10.81
Depression	15.16	9.53	12.84	8.66	16.99	9.81
State-anxiety	36.24	11.44	33.44	10.31	38.44	11.82
Age	26.25	12.46	28.84	13.58	24.21	11.13

Table 2
Descriptive statistics and comparisons of external variables across the three cognitive coping profiles.

	Clus 1 (n = 115) Adaptive Copers			Clus 2 (n = 88) Avoidant copers			Clus 3 (n = 128) Low copers			df	F	η ²	Tukey's HSD
	M	SD	z	M	SD	z	M	SD	z				
Acceptance	14.50	3.36	0.36	14.60	2.84	0.38	11.16	2.75	-0.61	2,328	49.94	0.23	3 < 1, 2
Positive refocusing	12.95	3.48	0.66	9.78	3.74	-0.15	8.58	2.94	-0.46	2,328	53.34	0.24	1 > 2, 3
Refocus on planning	15.36	2.70	0.50	14.78	3.04	0.34	11.16	2.72	-0.71	2,328	78.70	0.32	3 < 1, 2
Positive reappraisal	15.84	2.73	0.74	13.50	3.30	0.10	10.45	2.47	-0.73	2,328	112.76	0.40	1 > 2, 3; 2 > 3
Putting into perspective	16.03	2.45	0.73	12.67	3.08	-0.22	11.80	3.05	-0.47	2,328	70.82	0.30	1 > 2, 3
Self-blame	9.05	2.66	-0.26	11.70	3.04	0.60	9.23	2.73	-0.20	2,328	27.06	0.14	2 > 1, 3
Rumination	11.87	3.48	-0.13	15.97	2.43	0.92	10.48	3.22	-0.50	2,328	82.90	0.33	2 > 1, 3; 1 > 3
Catastrophizing	6.00	1.86	-0.50	10.68	2.99	1.00	6.71	2.13	-0.27	2,328	115.10	0.41	2 > 1, 3
Blaming others	6.78	1.99	-0.21	8.84	2.64	0.61	6.59	1.91	-0.29	2,328	32.55	0.16	2 > 1, 3
Self-esteem	31.89	5.12		27.48	6.40		28.81	6.24		2,328	15.35	0.09	1 > 2, 3
Trait-anxiety	35.94	8.58		45.88	10.55		42.39	11.28		2,328	25.27	0.13	1 < 2, 3
Depression	11.60	6.95		19.86	10.71		15.11	9.24		2,328	21.18	0.11	1 < 2, 3; 2 > 3
State-anxiety	31.69	7.90		41.05	13.00		36.89	11.44		2,328	19.05	0.10	1 < 2, 3; 2 > 3
Age	27.57	12.82		25.16	12.92		25.84	11.91					

Note: *p < 0.016 (Bonferroni correction). All post hoc results presented in this table are significant at p < 0.016. Significant results are bolded.

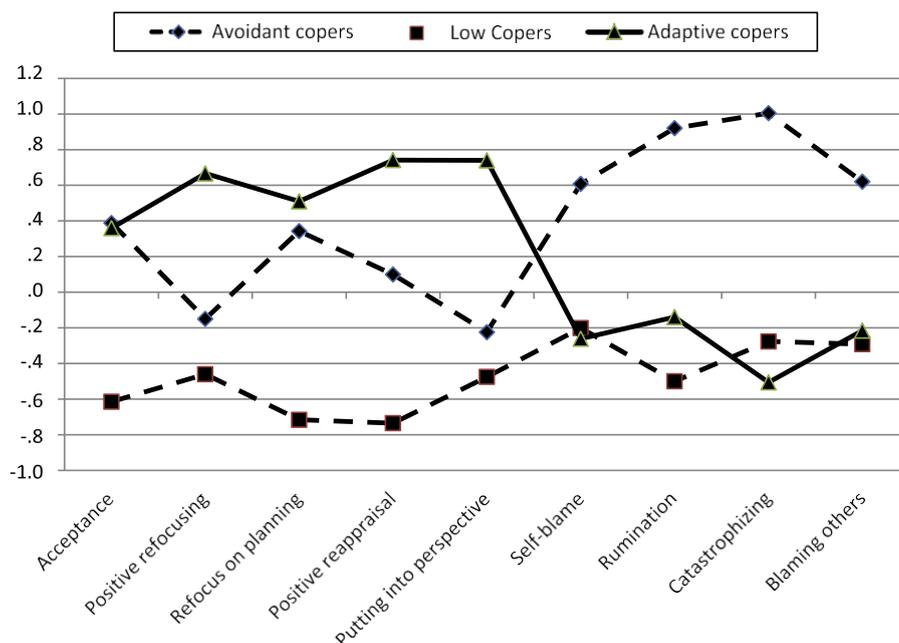


Fig. 2. Standardized scores of cognitive coping strategies across the three cognitive coping profiles.

59 males), (b) "Avoidant copers" (n = 88; 26.6%, 57 females and 31 males), and (c) "Low copers" (n = 128; 38.7%, 72 females and 56 males).

3.2. Differences in self-esteem, anxiety, and depression among clusters

The results of a MANOVA yielded a significant multivariate effect of the cognitive coping profile on the dependent variable (Wilk's $\lambda = 0.83$, $F_{(8,650)} = 7.64$, $p < 0.001$, partial $\eta^2 = 0.08$). After a Bonferroni correction, the results of univariate ANOVAs indicated that depression, state-anxiety, trait-anxiety, and self-esteem differed significantly ($p < 0.016$) across the three profiles of cognitive coping. The results of post hoc comparison using Tukey's HSD are presented in Table 2.

3.3. Gender and age in cluster composition

The results of profile (3) x gender (2) chi-square test of association indicated no gender differences among the clusters

$\chi^2_{(2)} = 5.24, p > 0.05$). The results of the ANOVA showed no age differences among the clusters ($F_{(2,328)} = 1.04, p = 0.35$).

4. Discussion

The present study aimed to identify people at risk of depression, taking into consideration cognitive coping and individual characteristics, such as trait-anxiety and self-esteem. Using cluster analysis, our results provided empirical evidence to support the proposition that people use several cognitive coping strategies simultaneously to deal with negative and unpleasant events.

Based on their multivariate cognitive coping responses on the CERQ, participants were categorized into three groups not confounded by age and gender. Adaptive copers displayed higher levels of positive reappraisal, positive refocusing, and perspective taking compared to avoidant copers and low copers. Avoidant copers reported higher levels of self-blame, rumination, catastrophizing, and blaming others compared to adaptive copers and low copers. Low copers used relatively low levels of coping strategies overall. Given that the cognitive coping strategies are assumed to be important for mental health (Garnefski & Kraaij, 2006a), this study extended the cognitive coping literature by not focusing only on a single strategy but on multiple cognitive coping strategies used simultaneously (profile) (Garnefski et al., 2001; Sideridis, 2006). Moreover, while previous cluster-analytic studies (Gaudreau & Blondin, 2004; Kaluza, 2000; Rijavec & Brdar, 2002; Smith & Wallston, 1996; Steele et al., 2008; Wijndaele et al., 2007) have examined both cognitive and behavioral coping strategies in terms of “profiles”, our study brought additional insights to the coping literature by focusing specifically on cognitive coping strategies in terms of “profiles”. Thus, this study provided a deeper understanding of the combined use of several cognitive coping strategies to deal with negative and unpleasant events by identifying subgroups of individuals based on their multivariate profiles of cognitive coping.

Beyond identifying cognitive coping profiles, the present study aimed to investigate whether these subgroups of individuals differ in state-anxiety and depression. Our results indicated that “Adaptive copers” reported better functioning in terms of displaying fewer levels of depression and state-anxiety, whereas “Avoidant copers” displayed higher levels of both symptoms. Using a different methodology (cluster analysis), these findings indicated that combined adaptive forms of cognitive coping are more associated with better psychological adjustment and decreased risk of depression compared to combined avoidant or maladaptive forms of cognitive coping. In traditional studies, adaptive cognitive coping strategies and maladaptive ones were negatively and positively associated with depression and anxiety symptoms, respectively (Garnefski et al., 2001, 2002, 2004). Thompson and colleagues (2010) showed that particularly rumination exacerbated depression by interfering with effective problem solving. However, the present study highlighted that not only certain cognitive coping strategies related to psychological adjustment, but also the profile of cognitive coping as a whole. Therefore, the “Adaptive Copers” profile may act as a buffer against depression and anxiety (Thompson et al., 2010).

In order to provide a deeper understanding of our cognitive coping profiles, it seems important to consider the cluster members’ dispositional characteristics, such as trait-anxiety and self-esteem. In the present study, group membership was significantly related to trait-anxiety and self-esteem. Adaptive copers reported higher levels of self-esteem and fewer levels of trait-anxiety compared to low copers and avoidant copers. These results supported that people with high self-esteem rely more on adaptive coping and less on avoidance (Aspinwall & Taylor, 1992;

Terry, 1994) and are less depressed (Mruk, 1999; Sowislo & Orth, 2013). Self-esteem may inhibit stress proliferation indirectly through its effect on choice of coping strategy, in particular, through the positive association with adaptive coping and negative association with avoidance (Rosenberg et al., 1995). Moreover, given that adaptive copers displayed lower levels of depression and state-anxiety, our results supported that higher level of self-esteem and lower levels of trait-anxiety act as a buffer against anxiety and depressive symptoms (Rosenberg et al., 1995; Sowislo & Orth, 2013). Conversely, low levels of self-esteem and high levels of trait-anxiety seem to act as an important risk factor for the development of depression and anxiety (Hettema, 2008; Kendler et al., 2004). The “Avoidant Copers” profile associated with high anxiety-trait and low self-esteem may be implicated as one of the vulnerability characteristics associated with anxiety and depression symptoms.

In addition, “Low Copers” who used relatively low levels of cognitive coping strategies overall retained our attention (Gaudreau & Blondin, 2004; Rijavec & Brdar, 2002; Smith & Wallston, 1996; Steele et al., 2008). Our results indicated that low copers differed from other profiles in terms of depression and state-anxiety and that they had equivalent levels of self-esteem and trait-anxiety compared to avoidant copers. They experienced more depression and state-anxiety compared to the adaptive copers while exhibiting higher levels of psychological adjustment compared to the avoidant copers. Wijndaele et al. (2007) obtained similar results, indicating that individuals from the intermediate group experienced more anxiety and depression compared to the nonstressed group and less anxiety and depression compared to the stressed group. While our results support previous studies, showing that lower copers exhibited higher levels of psychological adjustment compared to avoidant copers, our results did not support that low copers experienced less psychological distress compared to adaptive copers (Gaudreau & Blondin, 2004; Smith & Wallston, 1996). Clearly, future research needs to further examine this coping profile, specifically the situational characteristics and the primary cognitive appraisals associated with the low utilization of coping strategies. Furthermore, future studies should investigate whether the intermediate profile is associated positively with psychological adjustment in situations where high level of stress can render the use of coping strategies necessary.

In spite of its contributions, this study is not exempt from certain limitations. First, the use of a self-report questionnaire administered at one time point might have increased the possibility of a method bias (Podsakoff et al., 2012). Second, given the cross-sectional nature of this study, the direction of the causality of the present results cannot be determined. In order to deal with these problems, prospective future research should improve the study design. This is particularly important regarding the bounds between cognitive coping, individual characteristics, and psychological adjustment in order to give more credit to the idea that certain cognitive coping profiles are actually more adaptive compared to others in a given context. A final limitation concerns the participants in the current study. To increase generalization, our results should be replicated using a more representative sample.

4.1. Conclusion

This study utilized an alternative methodology (cluster analysis) that may provide researchers with a useful way of examining distinct combinations of cognitive coping strategies in a mental health setting. Cluster analysis has the potential to make a major contribution to applied health psychology research through the identification of groups that might best benefit from specific mental health promotion, prevention campaigns, and/or interventions as well as further research (Clatworthy, Buick, Hankins, Weinman,

& Horne, 2005). Because of the exploratory nature of this investigation, the results will require replication (perhaps in a clinical sample) to fully explore the theoretical and clinical implications of these results. It will also be important to assess whether the coping profiles have better predictive utility compared to the measures of individual coping strategies.

References

- Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Beverly Hills, CA: Sage Press.
- Aspinwall, L. G., & Taylor, S. E. (1992). Modeling cognitive adaptation: A longitudinal investigation of the impact of individual differences and coping on college adjustment and performance. *Journal of Personality and Social Psychology*, 63, 989–1003. <http://dx.doi.org/10.1037/0022-3514.63.6.989>.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267–283. <http://dx.doi.org/10.1037/0022-3514.56.2.267>.
- Charney, D. S. (2004). Psychobiological mechanisms of resilience and vulnerability: Implications for successful adaptation to extreme stress. *The American Journal of Psychiatry*, 161, 195–216. <http://dx.doi.org/10.1176/appi.ajp.161.2.195>.
- Clatworthy, J., Buick, D., Hankins, M., Weinman, J., & Horne, R. (2005). The use and reporting of cluster analysis in health psychology: A review. *British Journal of Health Psychology*, 10, 329–358. <http://dx.doi.org/10.1348/135910705X25697>.
- Duggan, C., Milton, J., Egan, V., McCarthy, L., Palmer, B., & Lee, A. (2003). Theories of general personality and mental disorder. *British Journal of Psychiatry*, 182, 19–23. <http://dx.doi.org/10.1192/bjp.182.44.s19>.
- Fuhrer, R., & Rouillon, F. (1989). La version française de l'échelle CES-D (Center for Epidemiologic Studies-Depression Scale). Description et traduction de l'échelle d'auto-évaluation. *European Psychiatry*, 4, 163–166.
- Garnefski, N., & Kraaij, V. (2006a). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences*, 40, 1659–1669. <http://dx.doi.org/10.1016/j.paid.2005.12.009>.
- Garnefski, N., & Kraaij, V. (2006b). Cognitive Emotion Regulation Questionnaire: Development of a short 18-item version (CERQ-short). *Personality and Individual Differences*, 41, 1045–1053. <http://dx.doi.org/10.1016/j.paid.2006.04.010>.
- Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and depression. *Personality and Individual Differences*, 30, 1311–1327. [http://dx.doi.org/10.1016/S0191-8869\(00\)00113-6](http://dx.doi.org/10.1016/S0191-8869(00)00113-6).
- Garnefski, N., Legerstee, J., Kraaij, V., Van den Kommer, T., & Teerds, J. (2002). Cognitive coping strategies and symptoms of depression and anxiety: A comparison between adolescents and adults. *Journal of Adolescence*, 25, 603–611. <http://dx.doi.org/10.1006/jado.0507>.
- Garnefski, N., Teerds, J., Kraaij, V., Legerstee, J., & Van den Kommer, T. (2004). Cognitive emotion regulation strategies and depressive symptoms: Differences between males and females. *Personality and Individual Differences*, 36, 267–276. [http://dx.doi.org/10.1016/S0191-8869\(03\)00083-7](http://dx.doi.org/10.1016/S0191-8869(03)00083-7).
- Gaudreau, P., & Blondin, J. P. (2004). Different athletes cope differently during a sport competition: A cluster analysis of coping. *Personality and Individual Differences*, 36, 1865–1877. <http://dx.doi.org/10.1016/j.paid.2003.08.017>.
- Gauthier, J., & Bouchard, S. (1993). Adaptation canadienne-française de la forme révisée du State-Trait Anxiety Inventory de Spielberger. *Revue Canadienne des Sciences du Comportement*, 25, 559–578. <http://dx.doi.org/10.1037/h0078881>.
- Haaga, D. A. F., Thorndike, F. P., Friedman-Wheeler, D. G., Pearlman, M. Y., & Wernicke, R. A. (2004). Cognitive coping skills and depression vulnerability among cigarette smokers. *Addictive Behaviors*, 29, 1109–1122. <http://dx.doi.org/10.1016/j.addbeh.2004.03.026>.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analyses* (5th ed.). Upper Saddle River, NJ: Prentice Hall, pp. 469–518.
- Henry, D. B., Tolan, P. H., & Gorman-Smith, D. (2005). Cluster analysis in family psychology research. *Journal of Family Psychology*, 19, 121–132. <http://dx.doi.org/10.1037/0893-3200.19.1.121>.
- Hettema, J. M. (2008). What is the genetic relationship between anxiety and depression? *American Journal of Medical Genetics*, 148, 140–146. <http://dx.doi.org/10.1002/ajmg.c.30171>.
- Jermann, F., Van der Linden, M., d'Acremont, M., & Zermatten, A. (2006). Cognitive Emotion Regulation Questionnaire (CERQ): Confirmatory factor analysis and psychometric properties of the French translation. *European Journal of Psychological Assessment*, 22, 126–131. <http://dx.doi.org/10.1027/1015-5759.22.2.126>.
- Kaluza, G. (2000). Changing unbalanced coping profiles: A prospective controlled intervention trial in worksite health promotion. *Psychology and Health*, 15, 423–433. <http://dx.doi.org/10.1080/08870440008402003>.
- Kendler, K. S., Kuhn, J., & Prescott, C. A. (2004). The interrelationship of neuroticism, sex, and stressful life events in the prediction of episodes of major depression. *American Journal of Psychiatry*, 161, 631–636. <http://dx.doi.org/10.1176/appi.ajp.161.4.631>.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Miller, S. M., Brody, D. S., & Summerton, J. (1988). Styles of coping with threat: Implications for health. *Journal of Personality and Social Psychology*, 54, 142–148. <http://dx.doi.org/10.1037/0022-3514.54.1.142>.
- Min, J.-A., Lee, N.-B., Lee, C.-U., Lee, C., & Chae, J.-H. (2012). Low trait anxiety, high resilience, and their interaction as possible predictors for treatment response in patients with depression. *Journal of Affective Disorders*, 137, 61–69. <http://dx.doi.org/10.1016/j.jad.2011.12.026>.
- Mruk, C. J. (1999). *Self-esteem: Research, theory, and practice* (2nd ed.). New York: Springer.
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 65, 539–569. <http://dx.doi.org/10.1146/annurev-psych-120710-100452>.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Rijavec, M., & Brdar, I. (2002). Coping with school failure and self-regulated learning. *European Journal of Psychology of Education*, 17, 177–194. <http://dx.doi.org/10.1007/BF03173257>.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review*, 60, 141–156. <http://dx.doi.org/10.2307/2096350>.
- Sandi, C., & Richter-Levin, G. (2009). From high anxiety trait to depression: A neurocognitive hypothesis. *Trends in Neuroscience*, 32, 312–320. <http://dx.doi.org/10.1016/j.tins.2009.02.004>.
- Sideridis, G. D. (2006). Coping is not an 'either' or': The interaction of coping strategies in regulating affect, arousal and performance. *Stress and Health*, 22, 315–327. <http://dx.doi.org/10.1002/smi.1114>.
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, 129, 216–269. <http://dx.doi.org/10.1037/0033-2909.129.2.216>.
- Smith, C. A., & Wallston, K. A. (1996). An analysis of coping profiles and adjustment in persons with rheumatoid arthritis. *Anxiety, Stress, and Coping*, 9, 107–122. <http://dx.doi.org/10.1080/10615809608249395>.
- Sowislo, J. F., & Orth, U. (2013). Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies. *Psychological Bulletin*, 139, 213–240. <http://dx.doi.org/10.1037/a0028931>.
- Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the state-trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Steele, R. G., Cushing, C. C., Bender, J. A., & Richards, M. M. (2008). Profiles and correlates of children's self-reported coping strategies using a cluster analysis methodology. *Journal of Child and Family Studies*, 17, 140–153. <http://dx.doi.org/10.1007/s10826-007-9153-2C.M>.
- Taylor, S., Fedoroff, I. C., Koch, W. J., Thordarson, D. S., Fecteau, G., & Nicki, R. M. (2001). Posttraumatic stress disorder arising after road traffic collisions: Patterns of response to cognitive behavior therapy. *Journal of Consulting and Clinical Psychology*, 69, 541–551. <http://dx.doi.org/10.1037/0022-006X.69.3.541>.
- Terry, D. J. (1994). Determinants of coping: The role of stable and situational factors. *Journal of Personality and Social Psychology*, 66, 895–910. <http://dx.doi.org/10.1037/0022-3514.66.5.895>.
- Thompson, R. J., Mata, J., Jaeggi, S. M., Buschkuhl, M., Jonides, J., & Gotlib, I. H. (2010). Maladaptive coping, adaptive coping, and depressive symptoms: Variations across age and depressive state. *Behaviour Research and Therapy*, 48, 459–466. <http://dx.doi.org/10.1016/j.brat.2010.01.007>.
- Vallièrès, E. F., & Vallerand, R. J. (1990). Traduction et validation canadienne-française de l'échelle de l'estime de soi de Rosenberg. *International Journal of Psychology*, 25, 305–316.
- Wijndaele, K., Matton, L., Duvigneaud, N., Lefevre, J., De Bourdeaudhuij, I., Duquet, W., et al. (2007). Association between leisure time physical activity and stress, social support and coping: A cluster-analytical approach. *Psychology of Sport and Exercise*, 8, 425–440. <http://dx.doi.org/10.1016/j.psychsport.2006.08.001>.