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COPING AND MENTAL HEALTH: A MULTIGROUP CONFIRMATORY FACTOR ANALYSIS ACROSS GENDER

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ABSTRACT: The concept of coping it has been extensively studied in the last years because of its importance in understanding the field mental health. In this way, it is possible to find strategies focused on emotion or in the problem itself. Some studies have related the first one to metal health issues. On the other hand, active forms of coping might have positive effects on adaptation and mental health. In this context it is known that there may be some differences between genders. An interesting issue is how this concept varies between genders. In particular, some studies have claimed significant differences between mental health and gender. However, some questions remain unclear in the study of coping strategies, mental health and their relationship by gender. The present study investigated invariance across gender, in terms of mental health. Therefore, classical analysis of variance and an analysis a multigroup analysis was carried out, selecting gender as an independent variable. Women presented higher punctuation than men in the majority of factors. These differences reached the statistical significance for denial, somatic symptoms and social dysfunctions. However, the multigroup analysis was similar until a Structural covariances level. This highlights the adequacy of this scale until this level across gender. This might shed light on a theoretical, but it also an applied level. Bear in mind that most of the actions plans on mental health are aimed to develop a better understanding of the relationship between coping strategies and of their variations in terms of gender. Therefore, more research in in this field, examining the effect of other underlying variables, is needed. Moreover, a moderated mediational model across these variables reached the statistical significance, suggesting that gender might moderate the relationship among the above mentioned cognitive, behavioral and social factors on mental health.

Keywords: coping, gender, mental health, multigroup, moderated mediation

Introduction

Interest in the concept of mental health in terms of cognitive variables such as coping, has grown over the last decade in the field of psychology. In this approach, a large number of traditional authors (Haan, 1977; Menninger, 1963; Vaillant, 1977) constructed a hierarchy model of processes involved in confrontation, such as adaptation

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or defense mechanisms. Most of the theoreticians of the concept of coping (Carver, Scheier and Weintraub, 1989; Lazarus and Folkman, 1984; Moos, 1988; Moos and Billings, 1982), agree to classify two broad domains of strategies: problem-focused and emotion-focused coping. Authors like Carver et al. (1989), Lazarus and Folkman, (1984) and Moos (1988) conclude that the active forms of coping, referring to efforts to deal directly with a conflicting event, are successful because they have positive effects on adaptation, mental health or well-being. However passive forms of coping, which consist of the absence of confrontation, evasive behaviour and denial, are less successful. According to traditional authors such as Aldwin & Revenson (1987), there is a relationship that may be mediated by the type of stressor and their perception of controllability. This general view was shared by Carver & Connor-Smith (2010), stipulating that the relationship between coping and adaptation may be tempered by the nature, duration, context and controllability of the stress.

One of the most relevant works in this field was a classical theoretical model developed by Lazarus and Folkman (1984), who define the concept of coping as cognitive and constantly changing behavioral. Furthermore, the authors stipulated that the individual's response might occur after a process of cognition, which is related to how one might cope with the stressor. Moreover, this cognitive assessment might determine the individual's answer. In particular, they defined a stress model where the concept of stress refers to the interrelationships between the person and their context. Therefore, stress occurs when the person´s values exceed the resources that they possess, with the resulting detrimental effects on personal well-being and mental health (Moret-Tatay, Beneyto-Arrojo, Laborde-Bois, Martínez-Rubio and Senent-Capuz, 2016). These are different ways of dealing with the same situation and how these differences might lead to a beneficial result or not, dealing with underlying processes directly related to mental health. It is also well-known that there are significant relationships among optimism, pessimism, and mental health. A study carried out with university participants showed that optimistic people, for example, used problem-oriented coping strategies and have higher abilities of problem solving (Rezaei, Mousavi, Safari, Bahrami and Menshadi, 2015). It is also remarkable that pessimistic people opted for denial, regarding both mental and behavioral strategies.

With regards to the difference between gender, depressive disorders account for almost 41% of cases of disability due to mental disorders in women, however, they cause only 29.3% in men. Moreover, several studies (Chih-Che, 2016; Kessler et al., 2003; Rosenfield, Lennon and Branco, 2005; Turner, Wheaton and Lloyd, 1995;) suggest that there are no significant differences in the prevalence of mental health disorders in men and women; however, they emphasize that there are different affectations between genders.

Although many efforts have been made in this field, some questions remain unclear in the study of coping strategies, mental health and their relationship (Rosenfield et al., 2005). That is to say, how this difference across gender can interfere with a coping behavior. Understanding of these differences, might shed light on the coping strategies necessary for educational planning and actions. This is why it is so interesting to develop empirical studies on the subject, since they provide challenging guidance or evidence. Therefore, the gender differences were revisited in terms of mental health and coping in the present work. Moreover, a regression-based path analysis was proposed.

The Path analysis is a useful tool in the field because it allows us to specify a model and to examine the relationships between variables. In particular, this is a useful tool for

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the testing of a model and both direct and indirect effects on a given result (such as mediation and moderation among other relationships), under the basis of multiple regression. Moreover, it can popularly be understood as a particular case of Structural equation modelling (SEM). For the present study, this method is of interest, as it might allow us to examine the moderator role of gender on mental health and coping. In particular, the relationship among cognitive, physical and social factors across gender underlies the objective of the present work. Bear in mind that this triad of variables have also been described as an indicator of several mental health outcomes (e.g., the Beck Cognitive Triad or the successful ageing theories).To address the need for concept clarification and improve the methodological approach in achieving this outcome, the aim of this study is to evaluate a moderated mediational model in Spanish participants across gender. Finally, a multigroup analysis will be provided.

Method

Sample

The sample was of 256 university students with an age range of 18-35 and mean age of 22.73 years (SD= 4.27), from whom 40.6% were male and 59.4% were women. The marital status, 94.9% were single; 2.7% married; 0.4 % widowed and 2% divorced. The sample size was estimated under G* Power 3 (Faul, Erdfelder, Lang and Buchner, 2007), which suggested a minimum sample of 129 subjects for a number of 4 predictors in a multiple regression (see figure 1).

Instruments

Participants fulfilled sociodemographic indicators and two scales described below:

1) Questionnaire Brief COPE (Carver, 1997, examined in Spanish by Morán, Landero and González, 2010) assess how people respond when faced with difficult or stressful events; a 28-item self-report evaluates: active coping; planning; coping/positive reframing; acceptance; humour; religion; emotional support; instrumental support; self-distraction; denial; behavioural disengagement; substance use or drug refusal behaviour and self-blame. The participants had the following options for answers from 1 (not at all), to 4 (yes, a lot).

2) General Health Questionnaire- GHQ-28 (Lobo, Pérez-Echeverría and Artal, 1986): detect those likely to have or to be at risk of developing psychiatric disorders, 28-item of emotional distress and has been divided into: somatic symptoms (items 1–7); anxiety/insomnia (items 8–14); social dysfunction (items 15–21), and severe depression (items 22–28). This can be with dichotomic punctuation (presence/absence) of symptoms or as a likert scale of 4 points. The second option is the one selected in this work (from 0 to 4 points).

Procedure and design

To perform the analysis, SPSS 23.0, AMOS 18 (IBM) and the SPSS macro PROCESS created by Preacher and Hayes (2008) were employed. First of all, a descriptive analysis was carried out, examining the normality and multinormality assumptions (Comrey, 1973; Tabachnick and Fidell, 1989). We checked for internal consistency of both scales through Cronbach Alpha, as well as its item homogeneity, KMO index and the Bartlett test of sphericity (Kaiser, 1974). The EFA (exploratory factor analysis) and CFA (confirmatory factor analysis) were undertaken on second order. In this way, a promax rotation method was applied. The goodness of fit was evaluated through several indexes: the $\chi 2$ (Jöreskog and Sörbom, 1979; Saris and Stronkhorst,

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1984); the error of the root mean square approximation (RMSEA), the comparative fit index (CFI).

The CFI has a range of values between 0 and 1 and the reference value is .90 as stipulated by Bentler (1990) (Bollen, 1989; Hu and Bentler, 1999), while in the error of the root mean square approximation (RMSEA) the smaller its value, the better the fit, the reference value being .05 (Steiger and Lind, 1980).

To hierarchical regression analysis, the bootstrapping method of testing mediation was employed under the macro method of Hayes (2013). This way measuring of the indirect effect that represents the impact of the mediator variable on the stipulated relation by a method of Bootstrapping with confidence intervals. The multgroup analysis, the goodness of fit was evaluated through the chi-square (Jöreskog & Sörbom, 1979; Saris & Stronkhorst, 1984).

Results

Table 1 shows the descriptive punctuation for both women and men. These were, in general, slightly higher for women than men. A t student test was applied for independent groups in each factor. In the case of the differences for somatic symptoms and social dysfunction, these reached the statistical significance level ($p<.05$). Moreover, the factor of Denial for the brief COPE was also statistically significant.

The Psychometric properties for the GHQ-28, the Chronbach's α .833 and homogeneity displayed values from .594 to .727. Furthermore, the percentage of total variance explained was 67.22%. In relation to the validity of Exploratory Factor Analysis (EFA), the Bartlett's test of sphericity was $p <.001$ with a value of chi-square 422.361 ($df = 6$) and the sample index value of Kaiser-Meyer-Olkin (KMO) was 0.756.

The brief COPE, the Chronbach's α .829 and homogeneity presented values from .36 to .64. In the percentage of total variance explained was 53.98%. In EFA, the Bartlett's test of sphericity was $p <.001$ with a value of chi-square 1145.782 ($df = 91$) and the sample index value of Kaiser-Meyer-Olkin (KMO) was 0.828. Table 2 shows the relationship with the factor from both scales with regards to Pearson coefficient index.

Confirmatory factor analysis was conducted through a second-order analysis under the maximum likelihood method, as well as under anonorthogonalPromax rotation (in order to maintain the factors generated correlation degree).The goodness of fit indices for both questionnaires showed an opimal fit. i) GHQ-28: $X2 = 1.26$, $p = .26$, $CFI = .99$and $RMSEA = .03$. ii) Brief COPE: $X2 = 2.75$, $p <.001$, $CFI = .89$ and $RMSEA = .08$.

We have employed a traditional mediational model to test indirect effects (see figure 2). This analysis also allows us to determine whether gender moderated the mediation, noting that it involves a cognitive (denial), a physical (somatic symptoms) and a social variable (social dysfunction). The overall model was statistically significant: $F(3,252)=16.38$, $p<.0001$, $R2=.21$. First, the path of denial on somatic symptoms was tested, which resulted in a positive significant effect ($\beta = 1.90$, $t(252)=4.85$,$p< .0001$). The second hypothesis which suggested that genderhas a role on somatic symptoms was statistically significant ($\beta = 1.39$, $t(252)=3.14$, $p<.005$). The interaction did notreach the statistical significance ($p> 0.05$).

Finally, in the table 3, a multigroup analysis is depicted across gender groups. This suggests invariance across gender groups.

Conclusion and Discussion

Different perspectives on the concept of coping, and its relationship with mental health, have raised the interest in the literature (Kayser and Revenson, 2016; Lazarus and

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Folkman, 1984; Seidl, Tróccoli and Zannon, 2001). Several studies show a direct correlation between coping strategies and improvements in the treatment of mental health (Antoni, 2003; Hsiao et al., 2016; Koolhaas and Van Reenen, 2016; Stratta et al., 2016). On the other hand, this interaction can occur so that, the limitations that individuals may have in relation to coping skills can increase or even generate an overload of stress. In a study of animals it is observed that when an animal realizes that theycannot draw up a strategy for a stress situation, cortisol indexes in the animal's body remain. Besides that, there is a strong association between coping style and the vulnerability to stress (Koolhaas and Reenen, 2016).This association is of interest due to its applied and theoretical repercussions. In the last decade, some studies have pointed out that there might be differences across gender (Angst et al., 2016; Chih-Che, 2016). Lobo, Pérez-Echeverría and Artal (1986), and Khalilnejad and Sorbi (2016), have suggested that there must be a relationship between somatic symptoms and social dysfunction. Therefore, this study aims to revisit these differences. Moreover, a study on the model's invariance was proposed.

As expected, women presented higher punctuation than men in the majority of factors. These differences reach the statistical significance for denial, somatic symptoms and social dysfunctions. This supports the idea that women tend to interiorize and ruminate more (Nolen-Hoeksema, 2012). The results were similar to others in the literature that also employed the GHQ-28 (Ardakani et al., 2016). Furthermore, these differences seem to be highlighted after a study of moderated mediation by gender.Denial yielded two statistically significant path coefficients (to social dysfunction and somatic symptoms). However, some of the effects were moderated by gender, suggesting that women with higher levels of denial report social dysfuntion and somatic symptoms. According to Nolen-Hoeksema (2012), women are more prone to internalizing disorders than men, which often leads to anxiety and depression. At work, these differences might be shown as somatic symptoms, as well as behavioural and cognition processes such as denial and social dysfuncion. These differences might be also related to how women tend to ruminate and blame themselves more often. Women often have to deal with feelings such as hopelessness, and in turn, suffer more fears and phobias. In contrast, men tend to externalize their problems, they are more aggressive and impulsive, which sometimes includes antisocial disorder and substance abuse (World Health Organization [WHO], 2013). Furthermore, other studies found similar results, claiming that indeed there are differences related to gender (Barrón, Castilla, Casullo and Verdú 2002; Chih-Che, 2016). Specifically, the authors stated, after a study with university students, that women have a greater repertoire of coping strategies focused on emotion. Moreover, Moret-Tatay et al. (2016) stated that strategies focused on emotion are related to poor mental health rather than strategies focused on the problem, according toa Bayesian network approach.

On the other hand, a multigroup analysis was carried out. This is a useful tool to measure variation among different populations, or in other words, representative groups. Cheung and Rensvold (2002), recommend the invariance analysis on the development of a psychometric test. Moreover, as pointed out by Bou and Satorra (2009), it also allows us to deepen the particularities of each of the groups. According to the findings in this second part of the present work, the strength of subgroup analysis is not strong enough to claim that the gender groups are different in terms of parameters. This suggests that invariance across gender is expected in the model.

The study are limitations.-The participants were selected through non-probability sampling, which can introduce distortions in the results when you consider that the final sample may have a high component of self. The evaluation, even if supervised was by

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trained professionals, this was completed online. Thus self-report bias may occur. However, as mentioned before, this is an area where more research is needed. The implication of the findings can be employed on both levels, ~~on a~~ theoretical and applied ~~one~~. First, this might shed light on the moderated mediational model that gender might have over the coping and mental health associations. In particular, it is remarkable that the variables that had reached the statistical significance were related to the cognition, physical and social triad. On an applied level, this is a result of interest for educational planning and actions. Bear in mind that the WHO (2013) suggests that there are significant differences between mental health and gender. Thus, gender differences appear in particular in the statistics of common mental disorders (depression, anxiety and somatic complaints). These disorders, which are predominate ~~in~~ of women, affect approximately 1 in 3 people in the community and is problem for public health. Current predictions suggest that unipolar depression will be the second leading cause of disability worldwide by 2020, and in turn will have twice the incidence in females. Besides, as the problem of depression is more common in women than in men, it is also more persistent in women.

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ANEXO

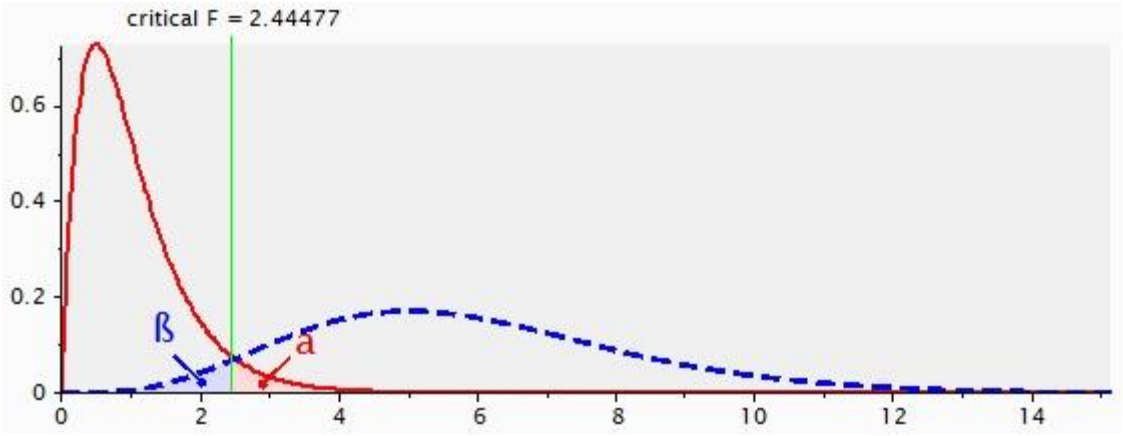

Figure 1. Distribution plot of the sample size estimation, in terms of statistical power and error probability.

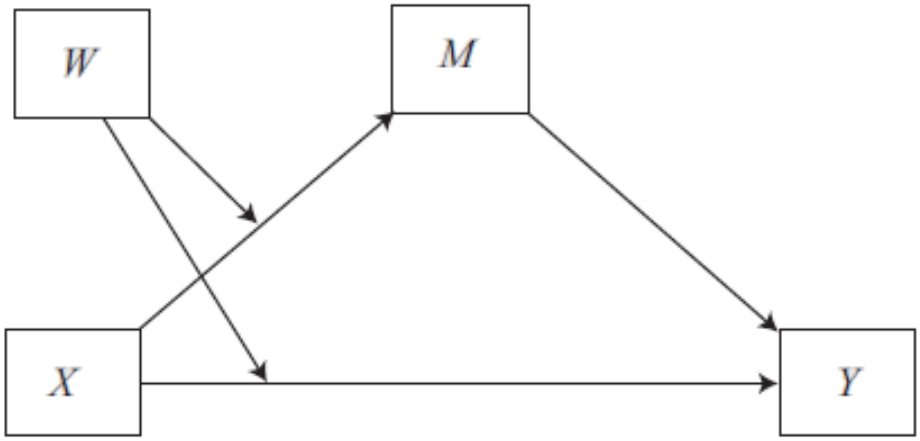

Figure 2.Test of moderated mediation. In our model, Denial was X, somatic symptoms M, gender was W, and social dysfunction Y.

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Table 1
Descriptive analysis of the tested variables (mean and standard deviation) and it significant level after a t test, in terms of gender

	Groups	Men		Women		
	Factors	Mean	SD	Mean	SD	*p*
GHQ-28	somatic symptoms	4.39	3.07	6.12	3.92	**.000**
	insomniaanxiety	6.94	4.19	7.98	5.07	.074
	social dysfunction	6.07	3.33	7.08	3.61	**.025**
	depression	2.07	3.36	2.78	4.58	.177
Brief COPE	Self-distraction	2.48	.85	2.63	.80	.152
	Active coping	2.95	.83	2.84	.80	.300
	Denial	1.42	.60	1.62	.79	**.027**
	Substanceuse	1.42	.77	1.39	.72	.703
	Use of instrumental support	2.40	.94	2.53	.97	.268
	Use of emotional support	2.37	.93	2.49	.92	.338
	Behavioraldisengagement	1.56	.66	1.63	.66	.414
	Venting	2.27	.80	2.26	.81	.905
	Positive reframing	2.88	.82	3.03	.82	.174
	Planning	2.95	.83	2.87	.88	.462
	Humor	2.24	.96	2.13	.89	.391
	Aceptation	2.94	.83	2.93	.79	.901
	religion	1.61	.82	1.45	.79	.131
	Self-blame	2.28	.85	2.47	1.01	.116

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Table 2

*Pearson Correlation Coefficient for the scales of GHQ-28 and COPE (*p<0.05; **p¡*

	somatic symptoms	insomniaanxiety	social dysfunction	depression	Self-distraction	Active coping	Denial	Substance use	Use of instrumental support	Use of emotional support	Behavioraldisengagement	Venting	Positive reframing	Planning	Humor	Aceptation	religion	Self-blame
somatic symptoms	1	,664**	,461**	,572**	,229**	-,062	,417**	,189**	,158*	,212**	,299**	,245**	-,018	,115	-,014	-,011	,165**	,461**
insomniaanxiety	,664**	1	,433**	,593**	,255**	,105	,340**	,180**	,295**	,304**	,281**	,275**	,094	,277**	,053	,113	,178**	,483**
social dysfunction	,461**	,433**	1	,647**	,053	-,230**	,279**	,096	,064	,074	,377**	,086	-,175**	-,037	-,034	-,111	,053	,333**
depression	,572**	,593**	,647**	1	,096	-,163**	,325**	,277**	,175**	,182**	,361**	,170**	-,149*	,053	,010	-,019	,167**	,463**
Self-distraction	,229**	,255**	,053	,096	1	,312**	,277**	,201**	,315**	,377**	,164**	,359**	,372**	,343**	,107	,376**	,118	,267**
Active coping	-,062	,105	-,230**	-,163**	,312**	1	,077	,036	,372**	,332**	-,054	,172**	,515**	,523**	,212**	,380**	,124*	,125*
Denial	,417**	,340**	,279**	,325**	,277**	,077	1	,303**	,210**	,287**	,420**	,235**	,007	,119	,059	,051	,167**	,366**
Substance use	,189**	,180**	,096	,277**	,201**	,036	,303**	1	,113	,211**	,368**	,152*	,037	,092	,262**	,083	,079	,283**

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Use of instrumental support	,158*	,295**	,064	,175**	,315**	,372**	,210**	,113	1	,771**	,110	,458**	,422**	,518**	,227**	,289**	,250**	,368**
Use of emotional support	,212**	,304**	,074	,182**	,377**	,332**	,287**	,211**	,771**	1	,195**	,461**	,379**	,421**	,216**	,310**	,141*	,329**
Behavioraldisengagement	,299**	,281**	,377**	,361**	,164**	-,054	,420**	,368**	,110	,195**	1	,145*	-,038	,074	,014	-,049	,081	,362**
Venting	,245**	,275**	,086	,170**	,359**	,172**	,235**	,152*	,458**	,461**	,145*	1	,369**	,380**	,217**	,324**	,163**	,321**
Positive reframing	-,018	,094	-,175**	-,149*	,372**	,515**	,007	,037	,422**	,379**	-,038	,369**	1	,612**	,401**	,488**	,156*	,173**
Planning	,115	,277**	-,037	,053	,343**	,523**	,119	,092	,518**	,421**	,074	,380**	,612**	1	,311**	,477**	,218**	,321**
Humor	-,014	,053	-,034	,010	,107	,212**	,059	,262**	,227**	,216**	,014	,217**	,401**	,311**	1	,291**	,132*	,185**
Aceptation	-,011	,113	-,111	-,019	,376**	,380**	,051	,083	,289**	,310**	-,049	,324**	,488**	,477**	,291**	1	,085	,211**
religion	,165**	,178**	,053	,167**	,118	,124*	,167**	,079	,250**	,141*	,081	,163**	,156*	,218**	,132*	,085	1	,182**
Self-blame	,461**	,483**	,333**	,463**	,267**	,125*	,366**	,283**	,368**	,329**	,362**	,321**	,173**	,321**	,185**	,211**	,182**	1

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Table 3
Goodness of fit on the multigroup analysis

Model	NPAR	CMIN	DF	P	CMIN/DF	CFI	RMSEA
Unconstrained	78	395.82	194	0.00	2.04	0.87	0.06
Measurementweights	66	402.03	206	0.00	1.95	0.87	0.06
Structuralcovariances	57	429.40	215	0.00	1.99	0.86	0.06
Measurementresiduals	39	447,965	233	0.00	1.92	0.86	0.06
Saturatedmodel	272	0.00	0			1.00	0.16