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THE ROLE OF EMOTION-REGULATION STRATEGIES IN THE RELATIONSHIP BETWEEN DEMOGRAPHIC FACTORS AND DEPRESSION TENDENCIES

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ABSTRACT. The drastic changes characteristic to our times force individuals to face rapidly changing life conditions, resulting in an increasing number of individuals who cannot adequately adapt. There is a plethora of research indicating differences in depression tendencies between gender differences and educational levels. However, the cognitive and emotional mechanisms that may explain such differences are understudied. Our study investigates which cognitive emotion-regulation strategies mediate the relationship between gender/education, and depressive tendencies. Our results indicate a significant relationship between gender and depression tendencies; women having higher levels of depressive symptoms. We also found a significant relationship between education and depression; lower levels of depressive symptoms for participants with higher levels of education. Female participants use to a higher degree strategies as self-blame, acceptance, rumination, putting into perspective, and catastrophizing. Concerning mediational models, the relationship between gender and depression tendencies is mediated by self-blame, acceptance, rumination and catastrophizing, while the relationship between education and depression tendencies is mediated by acceptance, catastrophizing, and others blame. In conclusion, even if social factors are more intuitive and easier to identify in the

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form of social categories (gender/education groups), behind these categories stand different psychological profiles, generated by differences in using psychological mechanisms such as emotion-regulation strategies. Our study points out the need to identify such subtle mechanisms that can explain the unequal distribution of distress in the population.

***Keywords**: depression, emotion-regulation strategies, age, gender, education, mediation.*

ZUSAMMENFASSUNG. ***Die Rolle der Emotion-Regelstrategien in der Beziehung zwischen demographischen Faktoren und Depression Tendenzen.*** Die drastischen Veränderungen, die für unsere Zeit charakteristisch sind, zwingen die Individuen dazu, den schnell ändernden Lebensbedingungen gegenüberstehen, was zu einer steigenden Anzahl von Individuen führt, die sich nicht adäquat anpassen können. Es gibt eine Fülle von Untersuchungen, die auf Unterschiede in den Depressivitätstendenzen zwischen Geschlechterunterschieden und Bildungsniveau hinweisen. Die kognitiven und emotionalen Mechanismen, die solche Unterschiede erklären könnten, sind jedoch zu wenig erforscht. Unsere Studie untersucht, welche kognitiven Emotionsregulationsstrategien die Beziehung zwischen Geschlecht/ Bildung und depressiven Tendenzen vermitteln. Unsere Ergebnisse zeigen eine signifikante Beziehung zwischen Geschlecht und Depression Tendenzen; Frauen zeigen höhere depressiven Symptomen. Wir fanden auch eine signifikante Beziehung zwischen Bildung und Depression; niedrigere Niveaus von depressiven Symptomen für Teilnehmer mit einem höheren Bildungsniveau. Weibliche Teilnehmer Weibliche Teilnehmer nutzen in höherem Maße Strategien als Selbstschuld, Akzeptanz, Wiederkäuen, Relativieren und Katastrophieren. In Bezug auf Mediationsmodelle wird die Beziehung zwischen Geschlecht und Depressionstendenzen durch Selbstbeschuldigung, Akzeptanz, Wiederkäuen und Katastrophisierung vermittelt, während die Beziehung zwischen Bildung und Depressionstendenzen ist durch Akzeptanz, Katastrophisierung und andere Schuldzuweisungen vermittelt. Abschließend, auch wenn soziale Faktoren intuitiver und leichter in Form von sozialen Kategorien (Geschlect / Bildung

Gruppen) zu identifizieren sind, stehen hinter diesen Kategorien unterschiedliche psychologische Profile, ie durch Unterschiede in der Anwendung psychologischer Mechanismen wie Emotionsregulationsstrategien entstehen. Unsere Studie weist auf die Notwendigkeit hin, solche subtilen Mechanismen zu identifizieren, die die ungleiche Verteilung von Distress in der Bevölkerung erklären können.

Schlüsselwörter: *Depression, Emotionsregulationsstrategien, Alter, Geschlecht, Bildung, Vermittlung.*

Introduction

Over the past century, the entire world has witnessed fast and drastic demographic, social, technological, political, and economic changes (Amundson, 2006; Hidaka, 2012). These changes have created an environment significantly different from what humans have been used to efficiently adapt to (Eaton, Strassman, Nesse, Neel, Ewald, Williams et al., 2002). The considerable discrepancy between present and past lifestyles constrain individuals to deal with a constantly growing body of challenges, which frequently lead to impairing symptoms of stress (affecting cognitive, behavioral, physiological, emotional, social, etc., functioning), further hindering the complex processes of adaptation. Consequently, the number of individuals who experience high levels of distress and cannot function at their best is constantly increasing (Cuijpers et al., 2007; Cunningham et al., 2006; European Commission, 2005; Wittchen & Jacobi, 2005). This tendency is reflected by the growing number of adults and children suffering from diagnosable mental disorders (Flett & Hewitt, 2013; Hidaka, 2012), trend aggravated by an equally important phenomenon, namely, the case of those who do not develop clinically significant and diagnosable symptoms, but still cannot efficiently adapt to these highly stressful life challenges (Cuijpers et al., 2007; da Silva Lima & de Almeida Fleck, 2007).

Research has allocated increased interest to the investigation of strategies and mechanisms that affect individuals' emotional reactions to the demands of the environment (Johnson, Carver & Fulford, 2010). The review of several studies conducted by Suveg, Morelen, Brewer, and Thomassin (2010) indicate that the way one responds to adversity (stress, daily hassles, negative life events) is more predictive of mental health or psychopathology than the nature of the negative event itself, and that emotion-regulation strategies play a significant role in the process of (mal)adaptation.

Emotion regulation has been defined as "*the range of activities that allow an individual to monitor, evaluate, and modify the nature and course of an emotional response, in order to pursue his or her goals and appropriately respond to environmental demands*" (Nolen-Hoeksema, 2012, p. 163, as cited in Cole et al., 2004; Johnson et al., 2010). Emotion dysregulation is considered as one of the central mechanisms involved in the development of different forms of psychopathology (Aldao, Nolen-Hoeksema & Schweizer, 2010; Nolen-Hoeksema, 2012). Several theoretical approaches indicate that individuals who cannot use appropriate emotion regulation strategies to manage their exacerbated emotional reactions are prone to develop more intense and longer lasting periods of distress, which may aggravate and lead to clinically diagnosable disorders (Aldao & Nolen-Hoeksema, 2010; Nolen-Hoeksema & Aldao, 2012). According to approaches which emphasize the functional differentiation of emotion regulation strategies, rumination, suppression, avoidance, catastrophizing, other-blame, and self-blame are associated with maladaptive emotional reactions (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012), especially with depression and anxiety (Garnefski & Kraaij, 2006; Nolen-Hoeksema, 2012). On the other hand, emotion regulation strategies as acceptance, cognitive reappraisal, problem solving, putting into perspective, positive refocusing, planning, were found to be associated with positive emotional (reduction of negative emotionality), behavioral (effective interpersonal functioning), and physiological reactions (cardiac reactivity) (Garnefski & Kraaij, 2006; Nolen-Hoeksema, 2012).

Different theories have proposed that emotion dysregulation may occur in several distinct ways: (*i*) the failure to down-regulate negative emotions by using adaptive emotion regulation strategies (e.g., problem solving, reappraisal, acceptance) (Aldao et al., 2010); (*ii*) the tendency to engage in emotion regulation strategies that exacerbate negative emotions (e.g., rumination) (McLaughlin & Nolen-Hoeksema, 2011), and (*iii*) excessive attempts to downregulate negative emotions (e.g., suppression, avoidance) (e.g., Kashdan & Breen, 2007; Wenzlaff & Wegner, 2000).

One of the major directions in the scientific investigation of emotion regulation has focused on the conscious cognitive mechanisms involved in the adaptive and maladaptive processes. An important advantage implied in investigating cognitive emotion-regulation strategies lies in the possibility to change them, either through personal experiences or psychotherapeutically (Garnefski, Kraaij & Spinhoven, 2002). Garnefski et al.'s (2002) approach identified nine specific conscious cognitive emotion-regulation strategies, as: *self-blame*, *acceptance*, *rumination*, *positive refocusing*, *refocus on planning*, *positive reappraisal*, *putting into perspective*, *catastrophizing*, and *other blame*. Positive reappraisal, acceptance, problem-solving have long been associated with adaptive emotional reactions, while rumination, catastrophizing, self and other blame with maladaptive reactions (Aldao & Nolen-Hoeksema, 2012).

Gender and education differences in maladaptive emotional reactions and emotion regulation

Literature has documented that across different nations and cultures, twice as many women develop depression than men (Nolen-Hoeksema, 2012; Parker & Brotchie, 2010). Theories hypothesize that besides sex roles, social factors, biological determinants, differences in the use of emotion regulation strategies may significantly contribute to these discrepancies (Nolen-Hoeksema & Aldao, 2012). Furthermore, research also indicates that overall, women have a greater tendency to use

more (both adaptive and maladaptive) emotion regulation strategies than man do (Nolen-Hoeksema, 2012). These approaches suggest that women have a more passive reaction towards their emotions and are prone to analyze them (Nolen-Hoeksema, 2012), being more likely to use emotion-regulation strategies as rumination for example (Cox, Mezulis & Hyde, 2010; Lopez, Driscoll & Kistner, 2009). Men are more action oriented, and in order to control the emotion eliciting situation, they engage more frequently in problem solving or reappraisal (Tamres, Janicki & Helgeson, 2002).

Aldao and Nolen-Hoeksema (2010), Aldao et al. (2010) have shown that the use of maladaptive emotion regulation strategies (rumination, suppression, avoidance, worry) are systematically, more strongly associated to psychopathology than adaptive strategies (problem solving, reappraisal, etc.) (Aldao & Nolen-Hoeksema, 2012). These findings have significant practical utility, considering the fact that prevention and intervention of emotional disorders heavily capitalizes on teaching clients how to use adaptive strategies efficiently (Roemer, Orsillo & Salters-Pedneault, 2008). Beside gender, level of education has also been found to be a significant predictor of depression. Thus, lack or lower levels of education are consistently associated with the selection of adaptive emotion regulation strategies across different cultures and nations (e.g., Ohayon, 2007; Pikhart, Bobak, Pajak, Malyutina, Kubinova, Topor et al., 2004). People with higher levels of education have better access to information, possess a larger pool of options regarding emotion regulation strategies, which increases their chances to select the group of strategies that best suit the contextual demands of the situation, as well as facilitates the adherence to prevention and intervention (Gotlib & Hammen, 2009).

Based on the scientific documentation regarding gender and educational differences in both depression and emotion regulation strategies, the major objective of our study was to explore which cognitive emotion-regulation strategies mediate the relationship between gender and education on one hand, and depressive symptoms on the other.

Study

Participants

In our study we included 962 healthy participants from the general population, 338 males and 624 females, with a mean age of 40 years (SD=9 years). Regarding level of education, the mean was 14 years of schooling with a standard deviation of 3 years. After providing informed consent, participants completed the questionnaire packets that took 45 minutes to fill, in a face-to-face assessment session with the researcher.

Measures

Demographic variables are: age, gender, and level of education.

Depression tendencies were measured with the Beck Depression Inventory-II (BDI, Beck, Rush, Shaw & Emery, 1979; Romanian adaptation David & Dobrean, 2012). The BDI is a 21-item, multiple-choice format inventory, designed to measure the presence of depression in adults and adolescents. Each of the 21 items assesses a symptom or attitude specific to depression, inquiring its somatic, cognitive and behavioral aspects. By its assessments, single scores are produced, which indicate the intensity of the depressive episode. Scores ranging from 0 to 9, represent normal levels of depression. Scores situated between 10 and 18 represent mild to moderate depression; values between 19 and 29 represent moderate to severe depression, while scores above the value of 30 represent severe depression. Internal consistency indices of the BDI are usually above .90. In our study we did not use clinical cut-off points for analysis or selection of participants, but treated depression tendencies as a continuum ranging from minimal to maximal scores obtained by participants on the BDI scale.

Emotion regulation strategies were measured with the Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski, Kraaij & Spinhoven, 2002; Romanian adaptation, Perte & Tincas, 2010). The CERQ is a

self-report questionnaire designed to measure cognitive coping strategies, assessing what people think after confronting specific negative events, or to assess the way people generally react after confronting negative events. The scale is comprised of nine sub-scales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, other blame, each subscale containing four items. Subjects have to indicate on a five-point Likert scale (almost never – to – almost always) the frequency with which they use the specific cognitive emotion regulation strategy. The internal consistency of the original subscales for adult population range from .75 to .86.

Results

Descriptive statistics

Table 1 presents the descriptive statistics of the main variables included in the analysis. One of the main information that can be identified from table 1 is the level of depression of women (M=8.73, SD=8.27), significantly higher (p= .006) than the one identified for men (M=7.20, SD=8.00), but with a small effect size (Cohen's d=0.17). Also, as the coping strategies are concerned, the results show that women use with a significantly higher frequency cognitive emotion regulation strategies as self-blame, acceptance, rumination, putting into perspective and catastrophizing with effect sizes that vary from small to medium.

In the next step, we analyzed which of the coping strategies used most frequently by women are significantly correlated with depression. In Table 2 we present the correlation matrix between depression and cognitive emotion regulation strategies, along with the level of education, which will be analyzed in the second part of the results section.

As Table 2 shows, among the coping strategies more frequently used by women (self-blame, acceptance, rumination, putting into perspective and catastrophizing), only self-blame, acceptance, rumination

and catastrophizing were significantly correlated with depression. As a consequence, only these four coping strategies were tested as mediators of the relationship between gender and depression.

Table 1. *Descriptive statistics for the main variables of the study*

Variables	Male (N=338) M ±SD	Female (N=624) M ±SD	p value	Cohen's d
Age	40.48 ± 9.09	39.90 ± 8.95	0.340	-
Education	14.27 ± 2.89	13.95 ± 3.29	0.133	-
Depression	7.20 ± 8.00	8.73 ± 8.27	0.006**	0.17
Self-blame	8.99 ± 2.50	9.49 ± 9.74	0.005**	0.07
Acceptance	10.97 ± 3.95	11.76 ± 3.27	0.001**	0.21
Rumination	10.15 ± 2.86	10.73 ± 3.15	0.005**	0.19
Positive refocusing	10.81 ± 3.92	11.21 ± 3.76	0.121	-
Refocus on planning	13.78 ± 3.16	14.15 ± 3.44	0.097	-
Positive reappraisal	13.58 ± 3.47	13.83 ± 3.70	0.311	-
Putting into perspective	11.86 ± 3.43	12.79 ± 3.57	0.001**	0.26
Catastrophizing	7.59 ± 2.99	8.08 ± 3.26	0.024*	0.15
Others blame	7.86 ± 2.87	7.81 ± 2.81	0.798	-

**Statistically significant at p< 0.05, ** p< 0.01*

Table 2. *Correlation matrix between education, coping strategies and depression symptoms*

	1	2	3	4	5	6	7	8	9	10	11
1. Education	1										
2. Depression	-.19**	1									
3. Self blame	.02	.39**	1								
4. Acceptance	-.08*	.20**	.44**	1							
5. Rumination	-.02	.30**	.52**	.46**	1						
6. Positive re-focusing	-.10**	.00	.06	.18**	.06	1					

	1	2	3	4	5	6	7	8	9	10	11
7. Refocus on planning	-.02	-.05	.24**	.31**	.31**	.46**	1				
8. Positive re-appraisal	.04	-.10**	.20**	.31**	.26**	.49**	.73**	1			
9. Putting into perspective	-.05	.02	.24**	.38**	.25**	.43**	.50**	.59**	1		
10. Catastro-phizing	-.18**	.47**	.41**	.24**	.42**	.06*	.05	-.02	.12**	1	
11. Other blame	-.14**	.36**	.27**	.14**	.31**	.07*	.03	-.09**	.08*	.58**	1

** Statistically significant at p< 0.05, **at p< 0.01*

Mediators of the relationship between gender and depression

For all the mediation models, we analyzed the regression equations used to assess mediation following MacKinnon (2008), in which we calculated the effect of the predictor upon the mediator (a), the direct effect of the mediator upon the criterion (b), the total effect of the predictor upon the criterion (c), the direct effect of the predictor upon the criterion (c'), and the mediated effect (a*b or c-c'). In each of the mediation diagrams presented below, we also included the standard version for each effect (β) and its standard error (SE). For testing the statistical significance of each mediation effect, we calculated the Z test in which the standard error of the mediated effect was calculated following the recommendations of Sobel (1982). Also, for each analysis, we calculated the effect size of the mediation effect, which is the percent of the total effect, explained through the mediator, calculated by dividing the mediation effect to the total effect and multiplying the result by 100.

Self-blame

In Figure 1, the mediation diagram of self-blame is presented in relationship between gender and depression.

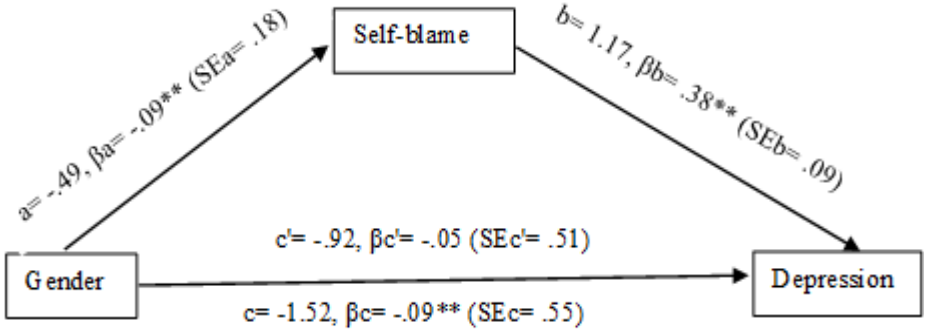

Figure 1. The diagram for the mediation of self-blame between gender and depression

As Figure 1 shows, there is a significant but small total effect of gender upon depression (βc= -.09, p=.006). When controlling for the mediator, the predictor has no significant direct effect (βc'= -.05, p=.072). The mediation effect (c-c'=a*b) proved to be statistically significant according to the Sobel test (Z=-2.66, p= .007). The proportional effect size of the mediation effect indicates that 39% of the total relation between gender and depression is mediated by self-blame.

Acceptance

Figure 2 describes the mediation diagram of acceptance in the relationship between gender and depression.

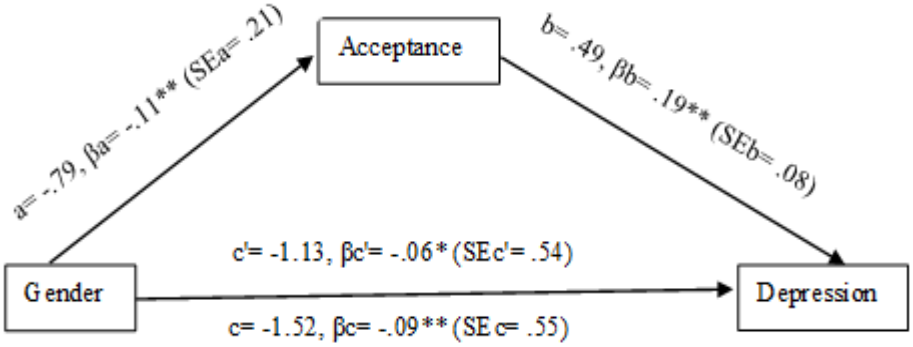

Figure 2. The diagram for the mediation of acceptance between gender and depression

As Figure 2 shows, when controlling for the mediator, the predictor still has a significant direct effect (βc'= -.06, p=.038). The mediation effect (c-c'=a*b) proved to be statistically significant according to the Sobel test (Z= -3.20, p= .001). The proportional effect size of the mediation effect indicates that 26% of the total relation between gender and depression is mediated by acceptance.

Rumination

Figure 3 describes the mediation diagram of rumination in the relationship between gender and depression.

As seen in Figure 3, when controlling for rumination, gender still has a significant direct effect (βc'= -.06, p=.048). The mediation effect (c-c'=a*b) proved to be statistically significant according to the Sobel test (Z= -2.74, p= .006). The proportional effect size of the mediation effect indicates that 31% of the total relation between gender and depression is mediated by rumination.

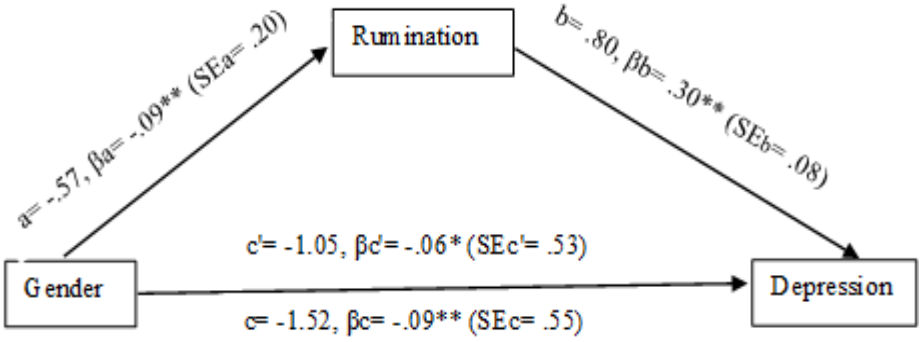

Figure 3. The diagram for the mediation of rumination between gender and depression

Catastrophizing

Figure 4 describes the mediation diagram of catastrophizing in the relationship between gender and depression.

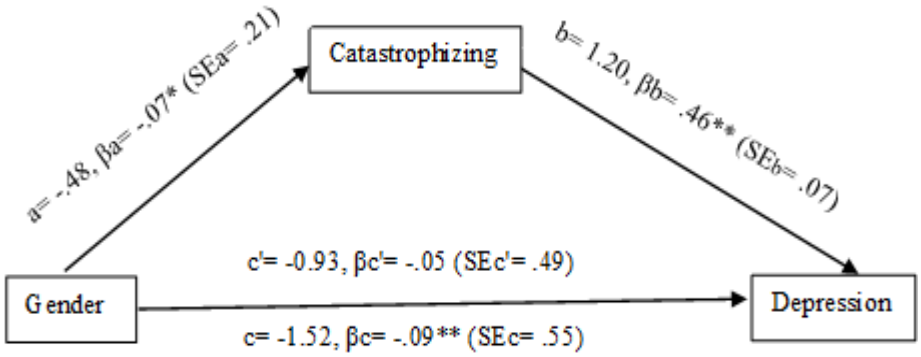

Figure 4. The diagram for the mediation of catastrophizing between gender and depression

As Figure 4 indicates, when controlling for catastrophizing, gender has a no significant direct effect (βc'= -.05, p=.058). The mediation effect (c-c'=a*b) proved to be statistically significant according to the Sobel test (Z= -2.26, p= .023). The proportional effect size of the mediation effect indicates that 39% of the total relation between gender and depression is mediated by catastrophizing.

Mediators of the relationship between education and depression

As Table 2 indicated, there is a negative and significant small to moderate relationship between education and depression. The same correlation matrix indicates also that education is negatively associated with acceptance, positive refocusing, catastrophizing and other blame. In turn, among these four coping strategies only acceptance, catastrophizing and other blame were significant correlates of depression.

As a consequence, we tested all these three cognitive strategies as mediator of the relationship between education and depression, following the same steps of analysis as mentioned previously.

Acceptance

Figure 5 describes the mediation diagram of acceptance in the relationship between education and depression.

As Figure 5 shows, there is a significant but small to moderate total effect of education upon depression (βc= -.19, p=.001). When controlling for positive refocusing, education still has a significant direct effect (βc'= -.17, p=.001). The mediation effect (c-c'=a*b) proved to be statistically not significant according to the Sobel test (Z=-2.43, p= .014). The proportional effect size of the mediation effect indicates that 10% of the total relation between education and depression is mediated by acceptance.

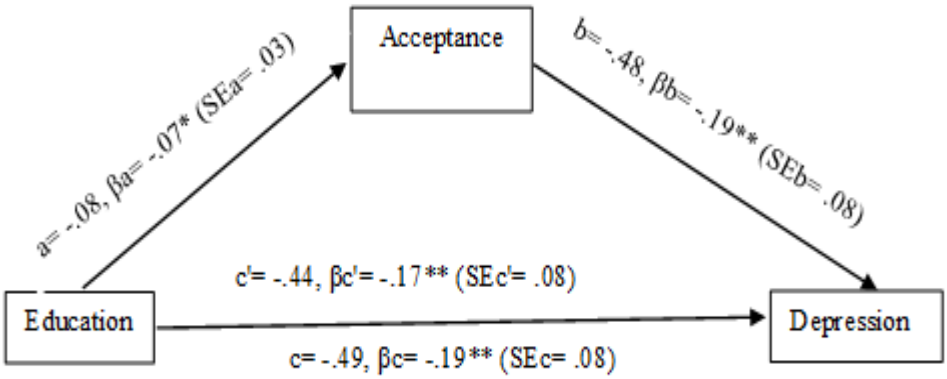

Figure 5. The diagram for the mediation of positive refocusing between education and depression

Catastrophizing

Figure 6 describes the mediation diagram of catastrophizing in the relationship between education and depression.

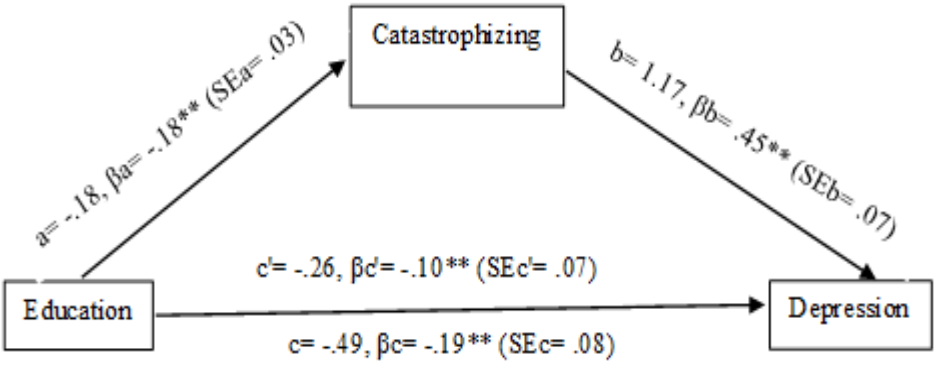

Figure 6. The diagram for the mediation of catastrophizing between education and depression

As Figure 6 indicates, when controlling for catastrophizing, gender has a no significant direct effect (βc'= -.10, p=.001). The mediation effect (c-c'=a*b) proved to be statistically significant according to the Sobel test (Z= -5.64, p= .001). The proportional effect size of the mediation effect indicates that 47% of the total relation between education and depression is mediated by catastrophizing.

Other blame

Figure 7 describes the mediation diagram of other blame in the relationship between education and depression.

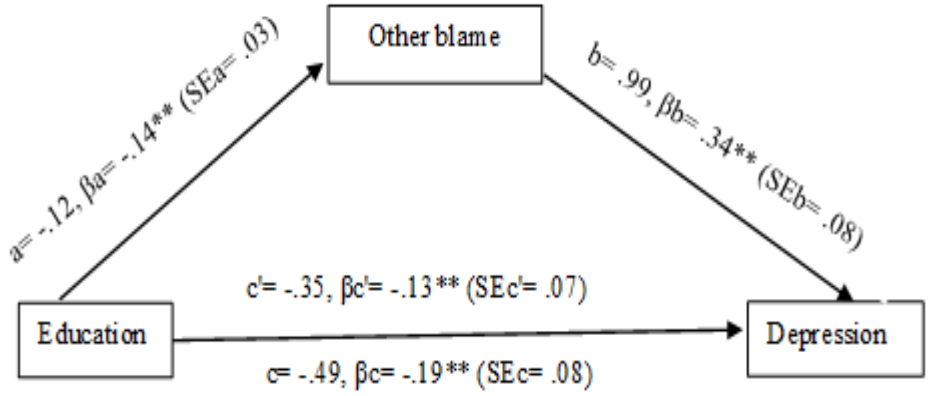

Figure 7. The diagram for the mediation of other blame between education and depression

As Figure 7 shows, when controlling for other blame, education has a no significant direct effect (βc'= -.13, p=.001). The mediation effect (c-c'=a*b) proved to be statistically significant according to the Sobel test (Z= -3.80, p= .001). The proportional effect size of the mediation effect indicates that 28% of the total relation between education and depression is mediated by other blame.

Conclusions and Discussions

Our study is based upon several main premises. First, the fast and drastic demographic, social, technological, political, and economic changes over the past century generate high levels of distress in population. Second, distress is not equally distributed in the population, such variations being easily identified as a function of gender and education. Third, there is scientific literature confirming that emotion regulation strategies are highly involved in distress in general and specifically in depression, and those strategies are differentially used by gender or education categories. Based upon these premises, our study aimed at exploring precisely which emotion regulation strategies mediates the relationship between gender and education on one hand, and depressive symptoms on the other.

First of all, our study has identified a significant effect of small magnitude of gender upon depression, with women having higher levels of depressive symptoms. These results are in accordance with the literature (Nolen-Hoeksema, 2001; 2012; Parker & Brotchie, 2010), indicating that women in general are more prone to develop and report significantly higher levels of depression than men.

Also, our results confirm the findings of previous studies, which indicate that there are significant differences in depression depending on the level of education (e.g., Ohayon, 2007; Pikhart et al., 2004). Thus in our sample we found a significant effect of small to medium magnitude of education upon depression, with lower levels of depressive symptoms for participants with higher levels of education. Such differences are usually attributed to the fact that those with higher levels of education have better access to information, possess a larger pool of options regarding emotion regulation strategies, which increases their chances to select the group of strategies that best suit the contextual demands of the situation, as well as facilitates the adherence to prevention and intervention (Gotlib & Hammen, 2009).

Exploring gender differences in using emotional regulation strategies, our results show that women use to a higher degree than men strategies as self-blame, acceptance, rumination, putting into perspective, and catastrophizing. It seems that we cannot talk about a predominance of rather functional or rather dysfunctional strategies for women. As scientific literature confirms (Nolen-Hoeksema, 2012), women use emotion-regulation strategies to a higher degree than men, irrespective of their functional (adaptive) or dysfunctional (maladaptive) value.

Concerning mediational models, our results proved that the relationship between gender and depression is mediated by self-blame, acceptance, rumination and catastrophizing, with relative mediational effect sizes between 26% and 39% of the total effect. What is worth mentioning here is the fact that functional strategies have lower mediational values (26% of the total effect) while dysfunctional strategies have higher mediational values (31% - 39% of the total effect).

Analyzing the mediators of the relationship between education and depression, we brought empirical evidence for acceptance, catastrophizing and others blame, with relative mediational effect sizes ranging from 10% to 47% of the total effect. Again, it is worth mentioning that functional strategies play a less important role (10% of the total effect), while dysfunctional strategies seem to be of greater importance (28% - 47% of the total effect).

These results may be interpreted in the light of the relationship between adaptive and maladaptive emotion-regulation strategies to psychopathology. Research has repeatedly indicated that maladaptive emotion regulation strategies are more strongly related to pathological reactions than adaptive strategies (Aldao & Nolen-Hoeksema, 2012; Aldao & Nolen-Hoeksema, 2010; Aldao, Nolen-Hoeksema & Schweitzer, 2010), since the use of dysfunctional strategies may narrow the individual's attentional focus, thus hindering his/her ability to select and use more adaptive strategies. The finding regarding the relatively weak mediational value of adaptive strategies is also important especially when individuals receive recommendations of how and when to use specific emotion regulation strategies (Roemer, Orsillo & Salters-Pedneault, 2008).

As an overall observation, even if social factors are more intuitive and easier to identify in the form of social categories (gender/education groups), behind these categories stand different psychological profiles, generated by differences in using psychological mechanisms such as emotion-regulation strategies. Our study points out the need to identify such subtle mechanisms that can explain the unequal distribution of distress in population.

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