

Emotion Regulation and Life Satisfaction in University Students: Gender Differences

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Abstract

This study aimed to compare gender differences in nine strategies of cognitive emotion regulation and to predict life satisfaction through these strategies. The participants consisted of 302 students (202 female and 100 male) of Allameh Tabataba'i University that were selected through Multi-stage cluster sampling and assessed by Satisfaction with Life Scale (SWLS), and Cognitive Emotion Regulation Questionnaire (CERQ). The results showed that females reported more usage of Rumination while strategies of Positive refocusing, Refocus on planning and Positive reappraisal were often used by males. Also multiple regression analysis in females showed that Rumination predicted life satisfaction negatively and strategies of Positive reappraisal and putting into perspective, predicted life satisfaction positively, whereas in males strategies of Positive reappraisal and Refocus on planning predicted life satisfaction positively. The results demonstrated that there were some differences between males and females in selecting cognitive emotion regulation strategies and also a number of these strategies have a crucial role in predicting life satisfaction. Thus, teaching some adaptive strategies and removing maladaptive strategies might prove useful in increasing life satisfaction.

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1. Introduction

In contrast with psychology's traditional emphasis on negative emotions, positive psychology has begun to focus on positive end of the emotional spectrum (Seligman & Csikszentmihalyi, 2000). Studies focused on subjective well-being are prominent in this growing body of literature (Diener,

2012). Research has assumed a three component structure for subjective well-being: positive affect, negative affect, and life satisfaction (Arthaud-Day, Rode, Mooney, & Near, 2005; Diener, Oishi, & Lucas, 2009). Life satisfaction (or Satisfaction with life) is defined as a cognitive and global evaluation of the quality of life (Pavot & Diener, 2008). It is a distinct but correlated with the affective components of subjective well-being (Diener, Scollon, & Lucas, 2009).

Satisfaction with life (SWL) is an important index of mental health and predicts physical health and longevity (Bowling, & Grundy, 2009; Hirdes & Forbes, 1993; Lightsey Jr et al. 2013). Much research show positive affect, self-esteem and optimism are positively correlated with life satisfaction (Arrindell, van Nieuwenhuizen, & Luteijn, 2001; Chang, Watkins, & Banks, 2004; Kang, Shaver, Sue, Min, & Jing, 2003; Palmer, Donaldson, & Stough, 2002; Steger, Frazier, Oishi, & Kaler, 2006). Similarly, negative affect inversely predicts SWL (Kortte, Gilbert, Gorman, & Wegener, 2010; Pilcher, 1998; Thompson, Waltz, Croyle, & Pepper, 2007).

A large scale study in the Netherlands (Stubbe, Posthuma, Boomsma, & De Geus, 2005) revealed that 38% of the variance of SWL reports were attributable to heritability. Schimmack and Oishi (2005) demonstrated that SWL is relatively stable and effects of irrelevant factors are usually small. Schimmack, Diener, and Oishi (2002) showed that people tend to rely on the same sorts of information (job, relations, education, etc) to form stable life satisfaction judgments over time. However, whenever the sources of information used in formation of life satisfaction do change, reported level of SWL changes as well (Pavot & Diener, 2008).

One of the possible variables that may account for the difference in using sources of information is the difference in emotion regulation strategies used. Emotion regulation (ER) refers to the process of initiating, maintaining, modulating, or changing the occurrence, duration, and intensity of internal feeling states and motivations, often in the service of accomplishing one's goals (Eisenberg & Spinrad, 2004). Emotion regulation strategy has an important influence on experience and emotion expression as well as physical and mental health (Gresham & Gullone, 2012; Gross & Thompson, 2007; Koole, 2009). Using adaptive emotion regulation strategies is necessary to have adaptive function and non-functional emotion regulation leads to negative consequences including poor well-being (Gross & Muñoz, 1995).

Several studies (e. g. Haga, Kraft, & Corby, 2009; Mitrofan & Ciulovică, 2012; Schutte, Manes, & Malouff, 2009) have found positive correlation between different emotion regulation strategies and reported SWL. Specifically, evidence obtained from long-term longitudinal research show self-efficacy for regulation of negative emotions (SERN), predicts life satisfaction (Lightsey Jr et al., 2013). One of the emotion regulation strategies is cognitive reappraisal, or changing the way one thinks about an emotional event. Cognitive reappraisal could be applied to decrease negative feelings and increase positive feelings and adaptive behaviors (Gross & John, 2003; Mitrofan & Ciulovică, 2012). On the contrary, another emotion regulation strategy – expressive Suppression – is negatively correlated with life satisfaction (Haga et al., 2009; Yoo, Matsumoto, & LeRoux, 2006).

The cognitive emotion regulation strategies are cognitive responses to stressful events that modify one's emotional experience (Abdi, Taban, & Ghaemian, 2012). Previous research has distinguished nine conceptually distinct cognitive emotion regulation strategies: self-blame, acceptance, rumination,

positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming others (Garnefski, Kraaij, & Spinhoven, 2001). People rely on different cognitive coping strategies (Gross & Thompson, 2007). Relying on maladaptive strategies including self-blame, rumination, catastrophizing, and blaming others may lead to different psychopathologies especially major depression (Garnefski & Kraaij, 2006; Lei et al., 2014) while adaptive cognitive emotion strategies including acceptance, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective are negatively correlated with depression and anxiety symptoms (Ehring, Fischer, Schnulle, Bösterling & Tuschen-Caffier, 2008; Garnefski & Kraaij, 2007; Martin & Dahlen, 2005).

When studying emotion regulation and well-being (and life satisfaction as its cognitive component), several methodological questions must be answered (Nyklíček, Vingerhoets, & Denollet, 2002). Is this association a direct one or indirect? In the latter case which factor mediates the association? In addition, one should take into consideration the possibility of a reverse causal path: maybe high life satisfaction helps person to use adaptive cognitive ER strategies. Finally it is possible that a “third variable” such as environmental situation or personality influence both cognitive ER strategies and life satisfaction (Nyklíček, Vingerhoets, & Zeelenberg, 2011). All of these questions imply statistical moderation effect.

In the present study we ask about the moderating role of gender in the association between cognitive emotion regulation strategies and life satisfaction. Previous research has shown males and females rely on different cognitive ER strategies (e.g. Zlomke & Hahn, 2010). There is a common belief in the Iranian society and in the whole world that women are different from men. For example emotionality is usually connected to women. This perspective is one of the most robust elements of gender stereotypes (e. g. Timmers, Fischer, & Manstead, 2003). In one study (Martin & Dahlen, 2005) American women reported higher rumination, catastrophizing, positive refocusing, refocusing on planning and positive reappraisal whereas American men scored higher on blaming others. Likewise, Garnefski, Teerds, Kraaij, Legerstee, and van den Kommer (2004) found Dutch women reported to use rumination, catastrophizing and positive refocusing more often than Dutch men. In Iran we do not have enough information about these differences. It is, however, not clear in previous findings that how this tendency to use different cognitive emotion regulation by men and women can predict their life satisfaction.

2. Research methods

2.1. Participants

The study sample consisted of 302 undergraduate and graduate students (100 males and 202 females) of Allameh Tabataba'i University (ATU) who was selected by multistage cluster sampling method. In the first stage of our sampling procedure we randomly selected four faculties of ATU: Faculty of Social Sciences, Faculty of Psychology and Educational Sciences, Faculty of Law and Political Sciences, and School of Graduate Studies. In the second stage, 3 classes were randomly

selected from each of the faculties. Finally, after excluding flawed or incomplete questionnaires, 400 questionnaires (two for each participant) were collected.

2.2. Instruments

The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985): The widely-used SWLS is a 5-item measure of overall life satisfaction. Each item is answered on a 7-point Likert scale (strongly disagree to strongly agree). Responses are summed (score 1 for strongly disagree and 7 for strongly agree) to provide an overall score. SWLS is positively correlated with subjective well-being measures (ranging from 0.47 to 0.66; Diener et al., 1985).

The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001): The CERQ was designed to measure specific cognitive emotion regulation strategies used in response to the experience of threatening or stressful life events. The CERQ is a 36-item questionnaire, consisting of nine conceptually distinct subscales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming others. Cognitive emotion regulation strategies are measured on a five-point Likert scale ranging from 1 (almost never) to 5 (almost always). Each subscale contains four items, individual subscale scores are obtained by summing the items (ranging from 4 to 20). The higher the subscale score, the more the specific cognitive strategy is used. The Persian version of the CERQ (CERQ-P) has been used in the present study. The CERQ-P has demonstrated acceptable internal consistency, one month test-retest reliability and factorial validity (Abdiet al., 2011). For the current administration of the CERQ-P, in the male and female subjects the internal consistency was acceptable with the alpha for the total score was 0.76 and for subscales ranged from 0.726 (positive reappraisal) to 0.761 (blaming others).

3. Findings

The mean differences between males and females for life satisfaction and CERQ subscales along with t-statistics, p-values and Cohen's defect size are shown in table 1. Regarding life satisfaction, women were slightly more satisfied with their lives ($d = 0.22$), however the difference was not statistically significant ($p = 0.078$). Self-blaming was non-significantly more prevalent in males than in females ($p = 0.105$; $d = 0.20$). No differences regarding "acceptance", "putting into perspective", "rumination", "catastrophizing", and "blaming others" were observed. The most considerable obtained gender differences were related to males relying more on three of the traditionally adaptive strategies and as a result, more overall adaptive ones than females. Namely, males reported more usage of "positive refocus" ($p = 0.002$; $d = 0.36$), "refocus on planning" ($p = 0.022$; $d = 0.28$); and "positive reappraisal" ($p = 0.014$; $d = 0.30$). As a result, male students showed more reliance on adaptive CER strategies ($p = 0.022$; $d = 0.26$).

Table 1. Differences in reporting life satisfaction and cognitive emotion regulation strategies between male and female sample

Variables	Females (n = 202)	Males (n = 100)	T	P	D
Life Satisfaction	21.96 (6.96)	20.48 (6.56)	1.77	0.078	0.22
Self-Blaming	10.60 (2.99)	11.20 (3.01)	1.63	0.105	0.20
Acceptance	11.41 (3.25)	11.36 (3.18)	0.13	0.897	0.02
Rumination	12.92 (3.04)	12.56 (2.92)	0.97	0.333	0.12
Positive Refocus	11.52 (3.59)	12.72 (2.76)	3.21	**0.002	0.36
Refocus on Planning	13.80 (3.37)	14.72 (3.03)	2.31	*0.022	0.28
Positive Reappraisal	12.65 (3.56)	13.69 (3.19)	2.46	*0.014	0.30
Putting into Perspective	12.28 (3.31)	12.28 (2.93)	0.01	0.996	0.00
Catastrophizing	9.01 (3.13)	9.48 (3.13)	1.23	0.220	0.15
Blaming Others	8.77 (2.61)	8.88 (2.59)	0.35	0.724	0.04
Adaptive Strategies	61.67 (12.30)	64.77 (11.34)	2.30	*0.022	0.26
Maladaptive Strategies	41.30 (8.18)	42.12 (8.35)	0.82	0.415	0.10

*P< 0.05

Descriptive statistics along with zero – order Pearson correlation coefficients among the variables are presented for females, males, and total sample in Table 2. SWL was not correlated with self-blaming, acceptance, and overall maladaptive cognitive emotion regulation strategies. In males none of the strategies that traditionally are supposed as maladaptive ones were negatively correlated with life satisfaction. Even rumination was positively associated with life SWL. However, in females two of the maladaptive strategies (catastrophizing and blaming others) predicted lower life satisfaction.

In both genders self-blaming and acceptance was not correlated with life-satisfaction. In females no correlation found between rumination and life satisfaction, and in males there was a positive correlation between these variables. In both genders life satisfaction could be predicted by “*positive refocus*” (females: $r^2 = 0.04$; males: $r^2 = 0.063$). In males ($r^2 = 0.185$) “*refocus on planning*” was much more associated with life satisfaction than in females (0.029). In both male and female students, there was a similar correlation between “*positive reappraisal*” and life satisfaction (females: $r^2 = 0.102$; males: $r^2 = 0.102$). “*Putting into perspective*” was just significantly correlated with life satisfaction in females ($r^2 = 0.096$; males: $r^2 = 0.036$). In female students “*catastrophizing*” and “*blaming others*” (both $r^2 = 0.036$) accounted for lower life satisfaction, although such a relationship in male students was not found.

In general, in both male and female students there was a positive association between traditionally assumed adaptive cognitive emotion regulation strategies and life satisfaction (females: $r^2 = 0.084$; males: $r^2 = 0.160$). However, just in female students ($r^2 = 0.026$) the overall maladaptive cognitive emotion strategies were negatively associated with life satisfaction. An unexpected positive correlation was that of between allegedly adaptive and maladaptive cognitive emotion regulation strategies (females: $r^2 = 0.029$; males: $r^2 = 0.044$). We will return to this finding in the discussion section. Figure 1 plots the relation between the nine cognitive – emotion regulation strategies and life satisfaction for each gender.

Table 2. Correlation matrix of life satisfaction and cognitive emotion regulation strategies.

Variables	Group	M (S)	LS	SB	AC	RU	PRF	RFP	PRA	PP	CA	BO	AS
LS	Total	21.47 (6.86)											
	Female male												
SB	Total	10.80 (3.00)	-0.01										
	Female male		-0.03 0.07										
AC	Total	11.39 (3.22)	0.09	0.45**									
	Female male		0.05 0.18	0.44** 0.48**									
RU	Total	12.80 (3.00)	0.04	0.46**	0.52**								
	Female male		-0.04 0.21*	0.51** 0.39**	0.54** 0.49**								
PRF	Total	11.92 (3.38)	0.19**	0.12*	0.09	0.09							
	Female male		0.20** 0.25*	0.10 0.11	0.08 0.14	0.11 0.07							
RFP	Total	14.11 (3.28)	0.23**	0.20**	0.09	0.15**	0.60**						
	Female male		0.17* 0.43**	0.17* 0.23*	0.05 0.19	0.14 0.22*	0.64** 0.48**						
PRA	Total	13.00 (3.47)	0.30**	0.28**	0.11	0.15**	0.63**	0.65**					
	Female male		0.32** 0.32**	0.26** 0.30**	0.09 0.15	0.16* 0.15	0.68** 0.47**	0.65** 0.62**					
PP	Total	12.28 (3.18)	0.27**	0.26**	0.21**	0.18**	0.48**	0.38**	0.54**				
	Female male		0.31** 0.19	0.22** 0.34**	0.21** 0.22*	0.18* 0.18	0.52** 0.39**	0.42** 0.29**	0.59** 0.44**				
CA	Total	9.17 (3.13)	-0.13*	0.32**	0.28**	0.42**	-0.10	-0.12*	-0.09	0.03			
	Female male		- 0.19**	0.30** 0.33**	0.23** 0.39**	0.34** 0.57**	-0.15* -0.03	-0.16* -0.08	-0.13 -0.04	-0.06 0.23*			
BO	Total	8.80 (2.60)	-0.12*	0.01	0.13*	0.25**	-0.06	-0.06	-	-	0.44**		
	Female male		- 0.19**	0.01 0.01	0.11 0.17	0.21** 0.34**	-0.08 -0.04	-0.04 -0.11	0.17* -0.23*	- -0.14	0.44** 0.43**		
AS	Total	62.70 (11.76)	0.31**	0.36**	0.41**	0.30**	0.80**	0.77**	0.83**	0.73**	0.01	-0.10	
	Female male		0.29** 0.40**	0.33** 0.43**	0.38** 0.51**	0.31** 0.33**	0.82** 0.71**	0.77** 0.75**	0.85** 0.79**	0.76** 0.68**	-0.08 0.14	-0.10 -0.10	
MS	Total	41.57 (8.23)	-0.08	0.65**	0.51**	0.77**	0.02	0.06	0.06	0.12*	0.79**	0.58**	0.21**
	Female male		-0.16* 0.11	0.67** 0.62**	0.49** 0.55**	0.76** 0.81**	-0.01 0.04	0.04 0.10	0.05 0.07	0.07 0.23*	0.77** 0.83**	0.57** 0.59**	0.17* 0.29**

* $P < 0.05$; ** $P < 0.01$

LS: Life Satisfaction. SB: Self-Blaming. AC: Acceptance. RU: Rumination. PRF: Positive Refocus. RFP: Refocus on Planning. PRA: Positive Reappraisal. PP: Putting into Perspective. CA: Catastrophizing. BO: Blaming Others. AS: Adaptive Strategies. MS: Maladaptive Strategies

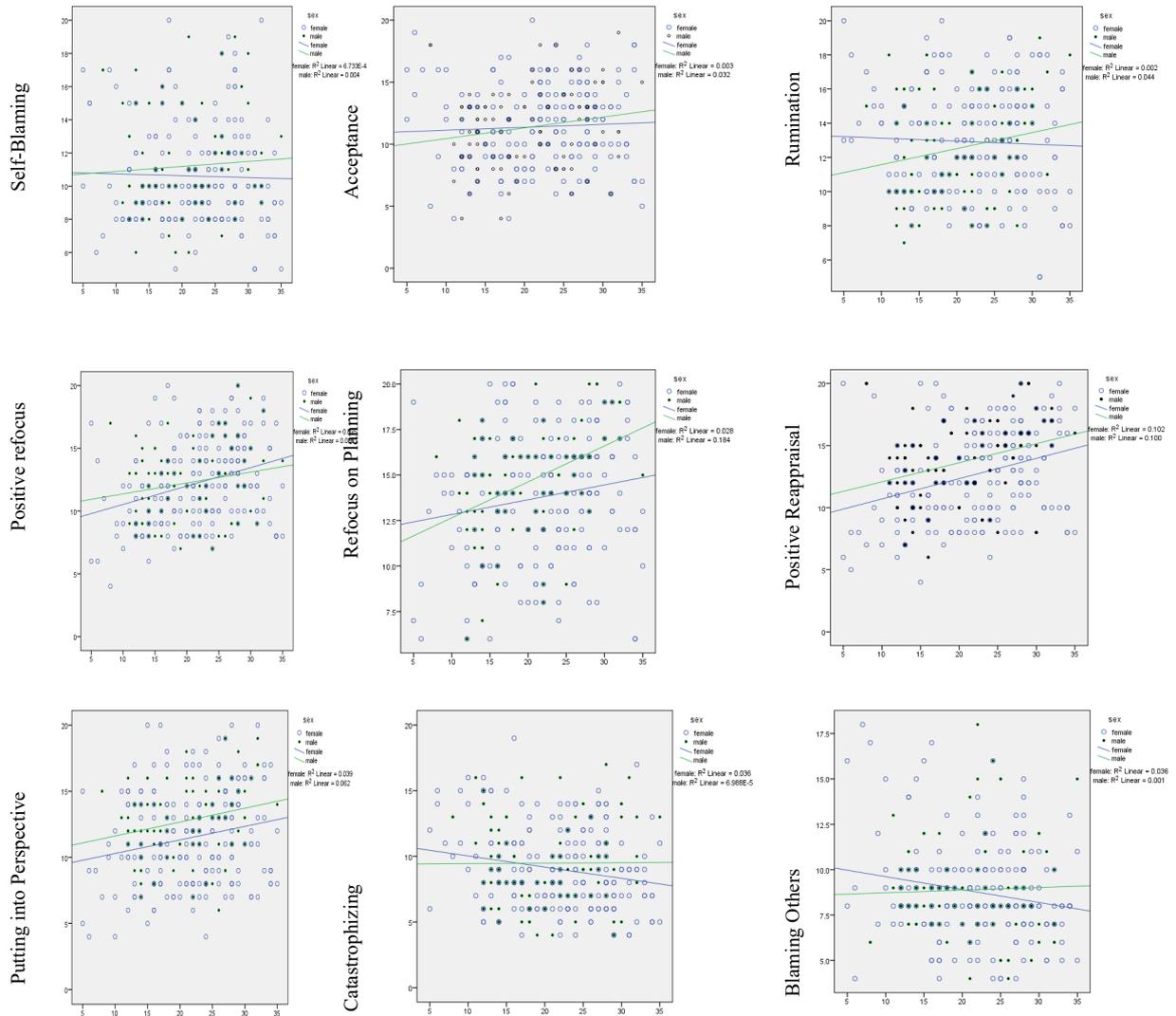


Figure 1. Scatter plot for the relation between different emotion regulation strategies and life satisfaction in males (green) and females (blue). In all plots, the horizontal axis represents life satisfaction.

Table 3 presents results of regression predicting satisfaction with life. As seen models predicting SWL from overall CER strategies were significant accounting 17.3% of females, 22.9% of males, and 14.4% of overall sample variance. In addition we explored the predictability of interaction between gender and each CER strategies for life satisfaction. Most of the CER strategies significantly predicted SWL and the best predictors of life satisfaction were the interaction between gender and “*positive reappraisal*”, “*putting into perspective*”, “*refocus on planning*”, and “*positive refocus*” explaining 11%, 8.5%, 7%, and 5.4% of SWL variance respectively. For females the best predictors of life satisfaction were “*positive reappraisal*” ($p = 0.005$), and “*putting into perspective*” ($p = 0.026$); and “*refocus on planning*” was the best predictor of life satisfaction in male students.

Table 3. Multiple linear regressions of cognitive emotion regulation strategies on life satisfaction in males and females

Variables		B	SE	β	T	P	R ²	F	P
Self-Blaming	total	-0.349	0.155	-0.153	-2.251	0.025	0.010	1.213	0.213
	female	-0.243	0.195	-0.118	-1.407	0.161			
	male	-0.312	0.252	-0.143	-1.241	0.218			
Acceptance	total	0.247	0.143	0.116	1.733	0.084	0.018	2.806	0.062
	female	0.226	0.175	0.105	1.289	0.199			
	male	0.217	0.238	0.106	0.915	0.363			
Rumination	total	0.080	0.162	0.035	0.493	0.623	0.012	1.760	0.174
	female	-0.130	0.200	-0.057	-0.648	0.518			
	male	0.312	0.287	0.139	1.087	0.280			
Positive Refocus	total	-0.169	0.155	-0.084	-1.091	0.276	0.054	8.602	0.000
	female	-0.157	0.190	-0.081	-0.824	0.411			
	male	0.012	0.272	0.005	0.046	0.964			
Refocus on Planning	total	0.143	0.159	0.068	0.897	0.371	0.070	11.179	0.000
	female	-0.103	0.194	-0.050	-0.534	0.594			
	male	0.712	0.274	0.328	2.595	0.011			
Positive Reappraisal	total	0.444	0.167	0.225	2.667	0.008	0.110	18.551	0.000
	female	0.578	0.208	0.300	2.826	0.005			
	male	0.190	0.271	0.092	0.701	0.485			
Putting into Perspective	total	0.372	0.147	0.173	2.536	0.012	0.085	13.932	0.000
	female	0.402	0.180	0.191	2.241	0.026			
	male	0.199	0.257	0.089	0.774	0.441			
Catastrophizing	total	-0.227	0.149	-0.103	-1.519	0.130	0.026	4.041	0.019
	female	-0.214	0.181	-0.096	-1.184	0.238			
	male	-0.190	0.274	-0.091	-0.695	0.489			
Blaming Others	total	-0.076	0.168	-0.029	-0.450	0.653	0.024	3.696	0.026
	female	-0.187	0.206	-0.070	-0.907	0.365			
	male	0.204	0.282	0.081	0.725	0.470			
All Strategies	total						0.144	5.478	0.000
	female						0.173	4.449	0.000
	male						0.229	2.975	0.004

4. Discussion

It has been recognized in some other research that males and females regulate their emotions in different manners. There was, however, insufficient Iranian data available. According to the data of this study, like many other research, men used more adaptive strategies than female. Women, however, did not demonstrate that they would use more catastrophizing as a negative strategy than men. In other words there was no significant difference between two groups. This result did not match with the American sample (Martin and Dehlen, 2005) and Dutch sample (Garnefski, Teerds, Kraaij, Legerstee, and van den Kommer, 2004).

There was also no significant differences between the male and female students in life satisfaction (LS). As mentioned, men reported more positive emotion regulation strategies. Since there is strong relation between positive ER strategies and life satisfaction, we expect that men have more LS as a

result. Based on other sets of data, emotion regulation strategies could predict about 14 percent of life satisfaction. This finding shows there are many other factors that influence LS in our group and can explain these indifferences.

Furthermore, previous research in Iran has demonstrated “catastrophizing” and “blaming others” are two CER strategies that are more negatively correlated with mental health (Sayyah, Olapoor, Ardameh, Shahidi, &Yaghubi Asgharabad, 2014), and resiliency (AndamiKhoshk, Golzari, &Esmailinassab, 2013). So, as resiliency and mental health are related to LS, with no difference in catastrophizing, we can explain no difference in LS.

Results have also indicated that some of CER strategies play an important role in the life satisfaction of males, females or both, and some of them are not important in life satisfaction. Not surprisingly, positive strategies in both men and women students could positively predict LS. Between those strategies, however, refocus on planning was more efficient on men and putting into perspective and positive reappraisal on women. Min, Yu, Lee, and Chae (2013) found that more frequently use of “refocus on planning” predicted higher level of resilience. In addition, Lei and his colleagues (2014) indicated that patients with major depressive disorder had significantly lower scores on refocus on planning. This study has assessed only LS, but the above-mentioned finding can explain some research that show lower depression in men.

In negative strategies, results are more challenging. The obtained finding regarding Rumination (no correlation with LS in females and positive correlation in males) may appear as surprise. Previous research indicates rumination exacerbates depressive symptoms; increases negative thinking, impairs problem solving, and erodes social support (see Nolen-Hoeksema, Wisco, &Lyubomirsky, 2008). In another study (Martin& Dahlen, 2005) CERQ rumination could predict depression, anxiety, stress, and trait anger. One takes a closer look at the items comprising this subscale, this correlation makes sense. For example, one item says; “I often think about how I feel about what I have experienced”. People often engage in rumination because they want to explain and solve their problems (Papageorgiou& Wells, 2003). According to the Iranian, this item can be thought of as kind of introspection and with this perspective it is understandable why rumination in our study is positively correlated with “refocus on planning”. Other studies also found similar correlation between rumination and refocus on planning subscales (Martin&Dahlen, 2005). Interestingly, Sayyah and his colleagues (2014) did not find any correlation between rumination and GHQ subscales too.

As another interesting data, negative subscales, catastrophizing and self-blame just in men negatively predicted LF and did not have an influential role in women. This finding has important function in counselling and psychotherapy with men. In other words, this sign should consider more important when a man applies it. In summary, according to our data, we can consider emotion regulation as an influential factor in predicting life satisfaction.

4.1.Suggestions and limitations

Due to the fairly high correlation between subscales of CERQ-P, especially between traditionally assumed adaptive and maladaptive strategies, it is necessary to re-examine the construct validity of the CERQ. In future studies, it is required to examine other models of emotion regulation (e.g. process model; see Webb, Miles, &Sheeran, 2012) and the concept of subjective well-being instead of life

satisfaction to include emotional components as well as cognitive ones. In addition, to minimize the problems inherent in self-report questionnaires (e.g. reliance on memory, and social desirability) using measures such as experience sampling method (ESM) is also recommended. Besides, in the absence of longitudinal research, the exact nature of any causal association between CER strategies and life satisfaction is unclear, so it seems necessary to perform such research. Finally, using larger and more representative samples as well as obtaining more demographic information would help generalize our results to the research population with more confidence.

5. Conclusions

In this article we have provided new findings about gender differences in the association between cognitive emotion regulation strategies and life satisfaction. In general, men reported more use of adaptive strategies, especially “positive refocus”, “refocus on planning” and “positive reappraisal”. We also attained new findings that were not predicted, and therefore it is necessary to perform similar research to assess the results. We assume that possibly there are some cultural issues for explanation of some of our findings which were different with those of other countries. Finally, in both men and women there was a positive correlation between relying on adaptive and maladaptive CER strategies. In the discussion section we have tried to explain our findings in term of previous studies and theories and suggested new ideas. The results also demonstrated that there are some differences between males and females in selecting cognitive emotion regulation strategies and also a number of these strategies have a crucial role in predicting life satisfaction. Thus, work on some adaptive strategies through educational program and modifying maladaptive strategies might contribute to life satisfaction improvement.

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