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## The moderating effect of trait meta-mood and perceived stress on life satisfaction

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### ABSTRACT

The current study examined the moderating effect of meta-mood skills, and perceived stress on life satisfaction after controlling for dispositional optimism. Three-hundred and nine undergraduate students were asked to complete the trait meta-mood scale (TMMS), the perceived stress scale (PSS), the revised life orientation test (LOT-R), and the satisfaction with life scale (SWLS). Results revealed a positive correlation between dispositional optimism and life satisfaction. Also scores on the meta-mood skills were significantly related in the expected direction to scores on perceived stress and life satisfaction and showed additive value in predicting these constructs even after controlling for optimism and stress. Moreover, findings from hierarchical regression analyses indicated an interactive effect of mood clarity and stress in predicting life satisfaction after controlling for confounding effects. When students reported a high level of perceived stress, those with high mood clarity reported higher scores in life satisfaction than those with low mood clarity. However, there were no differences in life satisfaction between high and low clarity groups when perceived stress was low. Implications of these findings for future research on perceived emotional intelligence construct and for working with distressed people are discussed.

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### 1. Introduction

Over the last decades a substantial body of research has demonstrated a positive relationship between stress and a wide range of maladaptive outcomes (Cooper & Payne, 1991; Lazarus, 1999). Different acute or chronic stressful situations such as illness, life events, impose demands that people are unable to cope. Such experiences are considered to put individuals at risk for psychological and physical problems (Dohrenwend, 1998). Nevertheless, various studies indicate that the magnitude of this correlation is low to moderate, suggesting the possibility that different personal resources play a role in moderating the effects of stress on psychological adjustment (Alloy & Riskind, 2005). Some researchers have begun to consider the role of cognitive–affective variables which would facilitate coping with these demands and consequently be protective (Skodol, 1998). These personal resources will ameliorate the potentially negative influences of stress events. Dispositional optimism and trait meta-mood might be considered two of these personal resources.

According to Scheier, Carver, and Bridges (2001), optimism is a dispositional tendency of an individual to hold generalized positive expectancies even when people confront adversity or difficulty in their lives. These generalized expectancies apply to the individual's entire life domain. Consistent with this vision, optimism has been

found to be positively associated with greater life satisfaction (Chang, 1998, 2002) and less symptoms of depression (Chang & Sanna, 2003). Research has also shown optimism to have a moderating effect on how people handle new or difficult situations. When faced with difficult situations, optimists are also more likely to have positive emotional reactions and expectations. In this line, previous studies have reported significant direct and moderating effects between dispositional optimism and stress in predicting life satisfaction and depressive symptoms (Chang, 1998, 2002; Chang & Sanna, 2003). However, as Chang (1998) stated, it is necessary to investigate a number of other potential personal predictors which might be significant in understanding the relationship between life stress and adjustment.

Another important individual difference variable that might moderate the effect of stress on psychological adjustment is trait meta-mood. Mayer and Gaschke (1988) suggested that the experience of mood has at least two components: the direct experience of one's moods and the meta-experience of these moods. They are called meta-mood experiences because they pertain not to the immediate experience of feeling states but to their aloof and reflective experience instead involving thoughts and feelings about one's moods (Mayer & Stevens, 1994). This reflective process is particularly relevant to understanding individual differences in how people experience their feelings, and how they feel and regulate their emotions (Mayer & Gaschke, 1988; Mayer & Stevens, 1994). From this perspective, the way people attend to moods, discriminate between feelings and regulate emotions helps to determine coping behaviors and are essential for adaptive coping with stress over

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their life span (Mayer & Stevens, 1994; Salovey, Bedell, Detweiler, & Mayer, 1999). Although Mayer et al. were earlier concerned with transient meta-mood experiences (Mayer & Stevens, 1994), more recently their research group have been interested in the awareness of experience of mood as relatively stable by means of the trait meta-mood scale (TMMS, Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Since its introduction in 1995, the TMMS has been heavily used as a measure to assess stable individual differences in people's abilities to attend, discriminate, and regulate their moods and emotions. Thus, this self-report measure is considered to provide a proxy for perceived emotional intelligence given that it evaluates people's attitudes toward emotional experiences and their perceptions of their own emotional intelligence (Extremera & Fernández-Berrocal, 2005; Salovey, Stroud, Woolery, & Epel, 2002; Thompson, Waltz, Croyle, & Pepper, 2007).

Scores on the TMMS have been shown to correlate with a huge range of measures of psychological adjustment and to be predictive of coping behaviors (Gohm & Clore, 2002). In short, individuals with higher scores in meta-mood skills reported greater decline in ruminative thoughts (Salovey et al., 1995), less negative emotional responses and intrusive thoughts after an acute stressor (Ramos-Díaz, Fernández-Berrocal, & Extremera, 2007), fewer visits to a health center in a stressful period (Goldman, Kraemer, & Salovey, 1996), and lower symptoms reporting, anxiety and depression (Extremera & Fernández-Berrocal, 2006; Thompson et al., 2007). Thus, meta-mood experiences have also been involved in the appearance and/or maintenance of several emotional disorders such as schizotypy (Kerns, 2005), eating disorders (Gilboa-Schechtman, Avnon, Zubery, & Jeczmiem, 2006) and psychopathy (Malterer, Glass, & Newman, 2008). Finally, in terms of the specific relation of TMMS dimensions on life satisfaction, while some studies have found that emotional repair is uniquely related to well-being (Thompson et al., 2007), others have found that mood clarity is the most significant predictor of life satisfaction when positive and negative affect are controlled for statistically (Palmer, Donaldson, & Stough, 2002). Similarly, mood clarity was also found to be the best predictor of life satisfaction independently from well-known mood state constructs and personality traits in adults (Extremera & Fernández-Berrocal, 2005). These findings are in line with previous work on the TMMS in mood induction experimental studies which underline the importance of mood clarity in recovering from a negative laboratory stressor in a healthy population (Salovey et al., 1995) and less diminution in positive affect following a distressing stimulus in an Osteoarthritis sample (DeVellis, Carl, DeVellis, Blalock, & Patterson, 1998). According to the literature review, these findings suggest that there are subtle individual differences in meta-mood experiences, specifically in the ability to clearly discriminate one's emotions, that could have important implications for psychological adjustment under conditions of coping.

However, beyond direct influences of meta-mood dimensions on psychological adjustment, some authors have pointed out that these emotional skills dimensions might interact significantly with stress in the prediction of adjustment (Gohm, Corser, & Dalsky, 2005). Very few researches have actually examined the association between the TMMS dimensions and life satisfaction considering stress as an interacting variable. It might be hypothesized that individuals with higher scores on trait meta-mood and experiencing a high level of stress, will be better adjusted than their unemotionally intelligent counterparts. Theoretically, individuals with high relative to low meta-mood skills might tend to exacerbate or worsen the influence of stress on psychological adjustment, and hence, lack of emotional abilities might operate as a vulnerability factor in the link between stress and adjustment (Goldman et al., 1996; Salovey et al., 1999). Accordingly, one might expect that, given that mood clarity is the most significant predictor in

explaining life satisfaction (Extremera & Fernández-Berrocal, 2005; Palmer et al., 2002), people who are generally inclined to openly acknowledge their positive and negative emotions under conditions of stress will be more likely to engage in better life satisfaction than people who deny these emotions.

Moreover, this study also seeks to address the issue related to construct validity of TMMS dimensions. Some authors have raised concerns about the dimension of TMMS since they might overlap with other classic constructs (Extremera & Fernández-Berrocal, 2005; Palmer et al., 2002; Shulman & Hemenover, 2006). In this respect, Mayer and Salovey (1995) stated that the self-report of a clear mood may be a function of factors other than a clear differentiation of feelings. For example, mood clarity might reflect an optimistic willingness to overlook nuances of one's feelings rather than a real expertise at deciphering them (Mayer & Salovey, 1995). Similarly, Extremera, Durán, and Rey (2007) found that some TMMS dimensions (clarity and repair) and optimism were significantly related to each other, obtaining correlation indexes with life satisfaction and perceived stress very similar in direction and magnitude. Correlations between TMMS dimensions and optimism were at least moderate, suggesting that the two constructs overlap but are not identical (Extremera et al., 2007). However, since optimism is a well-documented predictor of psychological adjustment (Chang, Chang, Sanna, & Hatcher, 2008), it is conceivable that any relationship between trait meta-mood and life satisfaction may reflect joint association with optimism. To address this concern, we also sought to examine the individual and moderating effects of the TMMS dimensions and stress on life satisfaction controlling for both direct and moderating effects of optimism and stress.

Given the above concerns, the purpose of the present study was threefold. The first purpose was to examine the relations between dispositional optimism, meta-mood dimensions, perceived stress and life satisfaction. Second, to determine the extent to which meta-mood dimensions account for life satisfaction beyond what is accounted for by the influence of dispositional optimism and stress. Third, we sought to determine whether there is a significant interactive model involving meta-mood dimensions and stress for predicting life satisfaction beyond what is accounted for by direct and interactive effects of dispositional optimism and stress. Given previous research on the TMMS, high levels of clarity and repair were expected to be significantly associated with less perceived stress and more life satisfaction. On the other hand, attention to moods was expected to be associated with more appraised stress and less life satisfaction. In addition, greater optimism should be significantly related to less appraised stress and more life satisfaction. Besides, consistent with our expectation for additive effects, we predicted that meta-mood dimensions would add significant incremental validity beyond what is accounted for by dispositional optimism and stress. Finally, consistent with the formulated interactive model, we hypothesized a significant meta-mood skills–perceived stress interaction in predicting levels of life satisfaction.

## 2. Method

### 2.1. Participants and procedure

Participants in the present study were drawn from two southern universities of Spain who participated voluntarily and anonymously in the study. The sample consisted of 349 undergraduate students (females = 284; males = 64; gender unidentified = 1). The participants come from a variety of disciplines, including psychology, nursing, social work, social education and primary education. Ages ranged from 18 to 56 years ( $M = 21.85$ ,  $SD = 5.72$ ).

2.2. Materials

2.2.1. Trait meta-mood scale (TMMS, Salovey et al., 1995)

The trait meta-mood scale (TMMS; Salovey et al., 1995) was designed to assess how people reflect upon their moods, and conceived thus an index of perceived emotional intelligence (Salovey et al., 2002). The scale has three factors that provide three subscale scores: attention to feelings (relating to monitoring emotions); clarity of feelings (relating to the ability to discriminate between emotions); and mood repair (relating to the ability to regulate unpleasant moods or maintain pleasant moods). We used the well-validated Spanish shorter version of the TMMS (Fernández-Berrocá, Extremera, & Ramos, 2004). The original 48 items were subjected to a principal components analysis with a varimax rotation. The items with loadings  $\leq .40$  were removed. Our shortened Spanish version includes 24 items from the original version (eight for each subscale).

2.2.2. The revised life orientation test (LOT-R; Scheier, Carver, & Bridges, 1994)

This test is a six-item measure (plus four filler items) of individual differences in dispositional optimism (e.g., “In uncertain times, I usually expect the best”). Respondents are asked to rate the extent of their agreement to these items across a five-point Likert-type scale ranging from 0 (strongly disagree) to 4 (strongly agree). We used a well-validated Spanish version (Ferrando, Chico, & Tous, 2002).

2.2.3. The perceived stress scale (PSS; Cohen, Kamarck, & Mermelstein, 1983)

This test is a 14-item measure of self-appraised stress. (e.g., “In the last month how often have you been upset because of something that happened unexpectedly?”) Respondents are asked to rate the frequency of items across a five-point Likert-type scale ranging from 0 (never) to 4 (very often). Higher scores reflect greater perceived stress in the last month. We used a well-validated Spanish version (Remor & Carrobes, 2001).

2.2.4. Satisfaction with life scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985)

This scale comprises five self-referencing statements on perceived global life satisfaction and requires subjects to rate the extent they agree or disagree with each statement on a seven point scale (1 = strongly disagree to 7 = strongly agree). Participants completed the Spanish version of the Satisfaction with life scale (Atienza, Balaguer, & Garcia-Merita, 2003).

3. Results

3.1. Descriptive analyses

Pearson correlations, means, standard deviations and reliability of the different subscales used for the present sample are presented in Table 1. As expected, the respective dimensions of the TMMS were moderately correlated with each other. Greater attention to feelings was positively associated with greater perceived stress. The significant inverse correlation between scores on the attention to feelings and perceived stress is consistent with the notion that higher ability to attend to mood is related to greater symptom reports (Goldman et al., 1996). In addition, higher clarity and repair were moderately associated with dispositional optimism. Although the associations between the two TMMS dimensions and dispositional optimism were significant, they were not too high as to indicate redundancy. Also higher clarity and repair were positively related to life satisfaction and negatively associated with perceived stress. Finally, as expected, greater disposi-

Table 1

Means, standard deviations, reliabilities and correlations of the variables of interest.

	1	2	3	4	5	6
1. TMMS-attention	–					
2. TMMS-clarity	.27**	–				
3. TMMS-repair	.12*	.38**	–			
4. LOT-R	–.00	.25**	.49**	–		
5. PSS	.11*	–.32**	–.40**	–.50**	–	
6. SWLS	–.01	.33**	.35**	.32**	–.49**	–
M	3.36	3.09	3.10	3.28	1.70	4.80
SD	.85	.80	.84	.78	.73	1.22
Alpha	.89	.88	.85	.75	.74	.84

\*  $p < 0.05$ .

\*\*  $p < .01$ .

tional optimism was significantly associated with less perceived stress and with greater life satisfaction.

3.2. Hierarchical regression analyses

To examine both the predictive utility of the TMMS dimensions and the potential moderating effect of meta-mood dimensions on perceived stress in accounting for variance in life satisfaction, we conducted a series of hierarchical regression analyses. Preliminary analyses indicated no significant sex and age differences for the main outcome variables. Therefore, these socio-demographic variables were not included in regression analyses. Similarly, given that attention was not correlated with life satisfaction it was not included in further analyses. For our regression equations, in the first step, scores on the LOT-R and perceived stress were entered for controlling confounding effects. In the next step, we included the TMMS dimensions (clarity and repair) in order to examine the contribution of these dimensions in predicting life satisfaction and perceived stress.

For predicting life satisfaction, a total of 30% of this variance was accounted for ( $R = 0.54$ ,  $R^2 = 0.30$ ;  $F(4, 343) = 54.54$ ;  $p < 0.001$ ). As Table 2 shows, perceived stress and optimism were found to account for a significant amount of the variance in life satisfaction ( $R^2 = .27$ ). In addition, mood clarity was found to account for a significant amount of additional variance in predicting life satisfaction ( $\Delta R^2 = .03$ ), even after we accounted for the variance attributable to optimism and perceived stress. Results of these analyses are presented in Table 2.

Finally, to test for the potential moderating between  $LOT \times$  stress and  $TMMS$  dimensions  $\times$  stress, we conducted a separate hierarchical regression analysis in which a multiplicative term was entered in the final step of the equation (Aiken & West, 1991). We performed a hierarchical multiple regression analysis with interaction term in separate analyses given that including interaction analysis along with main variables might have altered the significant incremental effect formulated of the main effects

Table 2

Hierarchical regression analyses showing amount of variance in life satisfaction accounted for by optimism, stress and TMMS dimensions.

	$R^2$	F	$\beta$	P	$\Delta R^2$
<i>Life satisfaction</i>					
Step 1	0.27	54.54			0.27
Stress			–0.37	0.01**	
LOT-R			0.06	0.20	
Step 2	0.30	31.31			0.03
Clarity			0.13	0.01**	
Repair			0.11	0.06	

N = 349.

\*\*  $p < 0.01$ .

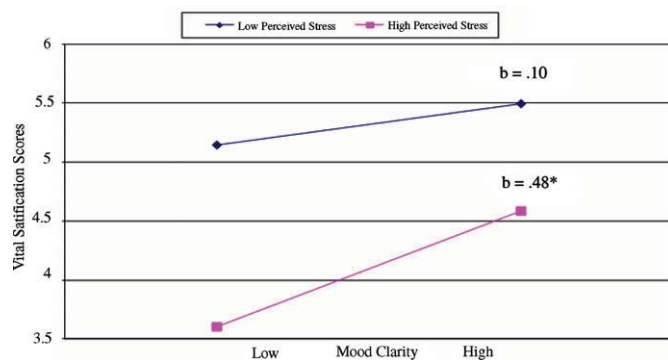
**Table 3**  
Regression results for the moderating effect of TMMS dimensions and stress on life satisfaction.

	$R^2$	$F$	$\beta$	$P$	$\Delta R^2$
<i>Life satisfaction</i>					
Step 1	0.25	58.59			0.25
Stress			−0.38	0.01**	
LOT-R			0.03	0.51	
Step 2	0.29	35.68			0.04
Clarity			0.15	0.01**	
Repair			0.13	0.02*	
Step 3	0.31	22.28			0.02
LOT-R × stress			−0.00	0.87	
Clarity × stress			0.14	0.00**	
Repair × stress			0.02	0.97	

$N = 349$ .

\*\*  $p < 0.01$ .

\*  $p < 0.05$ .



**Fig. 1.** Effects of perceived stress and mood clarity on life satisfaction scores.

of the TMMS dimensions on life satisfaction. Results of these analyses are presented in Table 3.

As can be seen in Table 3, according to the formulated interactive model, we found a mood clarity × perceived stress interaction explaining a significant incremental portion of variance in life satisfaction ( $\Delta R^2 = .02$ ), beyond the variance contributed by the main effect of optimism, stress and the TMMS dimensions.

To illustrate the mood clarity × perceived stress interaction for life satisfaction, we plotted the regression of life satisfaction on mood clarity at high and low levels of stress (see Fig. 1). Consistent with procedures outlined by Aiken and West (1991), we used the simple slope for the regression of life satisfaction on mood clarity by using the high (one standard deviation above the mean) and low (one standard deviation below the mean) values for perceived stress. As Fig. 1 shows, there was a significant positive relation between mood clarity and life satisfaction at high levels of perceived stress, ( $b = 0.48$ ),  $t(345) = 5.02$ ,  $p < .01$ ). However, at low levels of stress, the relation between mood clarity and life satisfaction was nonsignificant ( $b = 0.10$ ,  $t(345) = 1.03$ , ns). Hence, among students experiencing high stress, mood clarity was a significant determinant of life satisfaction. In contrast, at low levels of stress, mood clarity did not influence life satisfaction.

#### 4. Discussion

The present study was conducted to integrate and expand on previous research examining the additive and interactive influence of meta-mood abilities and perceived stress on life satisfaction by taking into account the role of optimism and perceived stress.

Consistent with previous findings (e.g., Chang, 1998), our results showed that greater optimism was significantly associated

with greater life satisfaction. In addition, as did previous literature, dispositional optimism and perceived stress were found to be negatively related to each other (Chang, 2002; Chang & Sanna, 2003). Likewise, in accord with a growing literature on trait meta-mood and psychological adjustment (Salovey et al., 1995, 2002; Thompson et al., 2007), this study found that high scores on the TMMS dimensions, specifically mood clarity and emotional repair, were moderately and significantly associated with less perceived stress and higher life satisfaction. Finally, although scores on the TMMS dimensions and the LOT-R were positively and significantly correlated they were not so high as to suggest that these measures were redundant with each other (0.25 for clarity and 0.50 for repair). Consistent with discriminant validity of the TMMS, these findings suggest that optimism and the TMMS dimensions, albeit related, may reflect relatively different cognitive processes which might impact emotional functioning through different mechanisms. Our results from hierarchical regression analysis lend more support to growing research on construct validity of the TMMS (Extremera & Fernández-Berrocal, 2005; Palmer et al., 2002; Shulman & Hemenover, 2006) and underline the additive value of meta-mood dimensions in predicting important well-being indexes. Independent of the influences of dispositional optimism and perceived stress, our set of results have indicated that mood clarity and emotional repair also play an important role in how adults experience satisfaction and pleasure in their lives. This last finding is valuable because both optimistic dispositions and self-appraised stress are well-documented predictors of life satisfaction. As Salovey et al. (2002) suggest, individuals who are most aware of their feeling states and believe they can repair negative mood states turn their attentional resources toward coping, minimizing the impact of stressful events and exhibiting higher psychological adjustment. This effect might be considered independent in part from their own optimistic dispositions.

Moreover, consistent with support for an interactive model, this study found that mood clarity interacted significantly with perceived stress in predicting life satisfaction. Thus, scores based on the mood clarity × perceived stress interaction were found to add significant incremental validity in predicting life satisfaction above and beyond what was accounted for by the main effects of optimism, perceived stress and meta-mood dimensions. These findings go beyond those that have previously indicated that both meta-mood dimensions and perceived stress are merely and independently related to life satisfaction (e.g., Extremera et al., 2007). Our preliminary study suggests that the impact of mood clarity as a protective factor is most salient in those moments in which students perceived themselves to be burdened by a great deal of self-appraised stress. In high stress conditions, students reporting a high level of clarity exhibit higher scores in life satisfaction than those reporting a low level of mood clarity. However, when perceived stress was low, there were no differences in life satisfaction between high and low clarity groups. Taken together, these findings point to the possible role of mood clarity as an effective buffer against the negative psychological consequences of stress on life satisfaction, becoming most important under conditions of stress when individuals are forced to reflective process those moods elicited by stressful environment. Hence, individuals who understand their emotional experience in stressful moments are in a better position to know how they need to respond to environmental demands. This argument is supported by previous research in which mood clarity was related to less depression (Rude & McCarthy, 2003), higher recovery of positive mood following a stressful event (DeVellis et al., 1998; Salovey et al., 1995), and higher scores on self-esteem and lower social anxiety (Salovey et al., 2002).

Our results also might provide useful information by identifying specific emotional styles associated with more positive adjustment during times of high stress and pointing to targets for intervention



in distressed individuals. Thus, this research lends credence to those stress management programs that focus in part on developing emotional abilities, involving understanding own emotions, to enhance coping in individuals experiencing stress in daily life. With respect to potential clinical implications, the data suggests that, independently for therapists to include techniques for modifying negative generalized expectancies when they work with distressed people, they should also use emotional exercises for improving meta-mood abilities. Considering meta-mood experiences into our understanding of emotional adjustment has possible implications for prevention and treatment efforts in clinical populations. Our beliefs about mood and emotions may affect the degree to which individuals in distressing situations engage in processing and integrating the cognitive and emotional aspects of the experience (Salovey et al., 1999). Since the processing and integration of distressed events is necessary to avoid the development of emotional reactions and ruminative thoughts (Salovey et al., 1995), assessing the degree to which attitudes about and cognitive responses to emotion facilitate or impede emotional processing may be important in predicting risk of psychological maladjustment and emotional disorders (Malterer et al., 2008; Rude & McCarthy, 2003). Intervening at the therapeutic level of beliefs about, and responses to, intense moods might be an important part of therapeutic efforts aimed at preventing the appearance of these maladaptive emotional reactions.

Several limitations of this study are acknowledged. One limitation was the reliance on self-report measures to evaluate emotional skills. The TMMS has been largely used in individual differences research for measuring perceived emotional intelligence, but it would be beneficial to include abilities measures or multiple perspectives to reduce the problem of common method variance with outcome variables also measured by self-report. The use of a cross-sectional design in this research necessarily limits the interpretations of our associations because one cannot draw any inferences about cause and effect. However, based on previous experimental research, there is reason to believe that meta-mood dimensions are important prospective predictors of mood recovery in distressing situations (DeVellis et al., 1998; Ramos-Díaz et al., 2007; Salovey et al., 1995). Third, as the present sample was undergraduate students, one must be cautious in generalizing the present set of findings to general populations. Besides, further research should examine and confirm our results in clinical populations involving clinical distressed and non distressed groups.

Despite these limitations, our study lends support to the individual resources literature that underlines the role of cognitive-emotional variables as buffering against stress. Future research focus on individual differences in meta-mood skills might be worthwhile to understanding how people adapt to stresses in life and also as a potential target for dealing with distressed individuals.

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