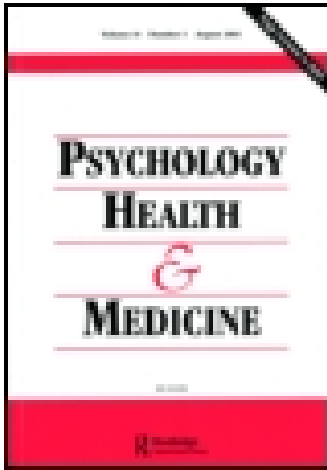


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The role of emotion awareness and mood: Somatic complaints and social adjustment in late childhood

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Emotion awareness is a key concept related to different child adjustment outcomes. This relationship, influenced by mood, has been found in the preadolescent and adolescent population for somatic complaints. However, little is known in the case of younger children and when other adjustment outcomes are included. The objective of this work is to analyze the contribution of emotion awareness and mood upon different adjustment outcomes (somatic complaints, maladjustment, and peer sociometric status), in children aged 8–12 years old. Self-reported questionnaires and peer-nomination scales were administered to 1423 children (mean age = 9.8 years old). Results support the influence of emotion awareness reinforced by mood, not only upon somatic complaints, but also upon new indicators of personal and social maladjustment, within an age bracket that has not been considered previously. These results stress the importance of emotional abilities and the corresponding affective moods in children's daily life.

Keywords: emotion awareness; mood; somatic complaints; adaptation; sociometric status

Introduction

A poor emotion awareness has been related to different areas of child development, such as somatic complaints (Rieffe, Villanueva, Adrián, & Górriz, 2009; van der Veek, Nobel, & Derkx, 2012), social competence (Mavroveli, Petrides, Rieffe, & Bakker, 2007), or social adjustment (Petrides, Frederickson, & Furnham, 2004). Nevertheless, few researchers have integrated different indicators of healthy functioning in childhood within the same study. Therefore, the aim of this work will be to examine the incidence of children's emotion awareness in a number of different outcomes of the child.

One of the closest relationships presented by emotion awareness can be its connection with self-reported somatic complaints. This relationship, however, seems to be influenced by moods, which are considered to be diffuse or overall affective states that appear without any apparent cause (Scherer, 2005). In particular, the proposed relationship among the three variables would be the fact that they present low levels of ability in emotion awareness, which prevents the person from responding to the emotional situation in an adaptive way. Thus, negative moods are likely to appear, which lead to high levels of prolonged stress and may eventually give rise to somatic complaints (Rieffe, Terwogt, & Jellesma, 2008).

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This relationship between somatic complaints, emotion awareness, and mood has been observed in the preadolescent and adolescent populations (Lahaye, Luminet, Van Broeck, Bodart, & Mikolajczak, 2010; Mavroveli et al., 2007; Rieffe et al., 2009). The inability to differentiate between emotions and a strong awareness of bodily symptoms during emotional experiences contributed independently to the prediction of somatic complaints. In addition, a reluctance to attend to one's own emotions (Rieffe, Terwogt, et al., 2008) and an increased attention to the emotions of others in adolescents (Rieffe et al., 2007) predicted a greater frequency of somatic complaints.

Yet, very few studies have analyzed this relationship in younger populations. For example, Rieffe and De Rooij (2012) observed that the abilities to differentiate emotions and body awareness were the ones most closely related with different internalizing symptoms, such as somatic complaints, in children with a mean age of 10 years old. On the other hand, van der Veek, Derkx, de Haan, Benninga, and Boer (2012) observed differences in emotion awareness in children between 7 and 18 years of age with functional abdominal pains and without pains.

Hypothesis 1: All the components of emotion awareness will predict somatic complaints in children.

Previous studies, however, do not include social outcome variables in addition to the individual ones. At the social level, emotion awareness has been related to a lesser extent with the problems the child has to adapt to different settings. Most of the studies have focused on a close concept, emotional intelligence, showing significant relations with self-reports and teachers' reports of youth and adult adaptation (Fernández, Iglesias, & Barraca, 2007; Salguero, Fernández-Berrocal, Ruiz-Aranda, Castillo, & Palomera, 2011). Thus, it becomes necessary to conduct a specific study on the relation between emotion awareness and adjustment in this age bracket of late childhood, as well as on the contribution made by mood to this relationship.

Another classic social indicator of the child's adjustment refers to his or her social competence in the peer group. Poor emotional recognition has been seen to be associated with a large number of negative nominations in infants' school (Miller, Gouley, Seifer, Zakriski, Eguia, & Vergnani, 2005); similarly, greater negative emotional expression has been observed in eight-year-old children who are rejected by their peers (Hubbard, 2001). Not many studies have been conducted, however, to examine different emotional components at the same time, as is the case of this research with emotion awareness. Those studies that do consider a broad emotional measure are the ones carried out with the emotional intelligence variable. These studies claim that the relationships between emotional intelligence and social competence were moderate or modest (Lopes, Salovey, & Straus, 2003; Trentacosta & Fine, 2010; Windingstad, McCallum, Mee Bell, & Dunn, 2011) or only took into account pro-social, but not anti-social, behavior (Mavroveli et al., 2007; Petrides, Sangareau, Furnham, & Frederickson, 2006).

Hypothesis 2: Emotion awareness will also help to predict adjustment problems in children and their sociometric status among peers.

Finally, improvement of predictions of emotion awareness with the addition of moods has been supported in previous studies but only for somatic complaints (Rieffe et al., 2007; Rieffe, Terwogt, et al., 2008). Again, no studies could be found about the contribution of moods to social indicators (adjustment/sociometric status).

Hypothesis 3: Both models (somatic complaints and social adjustment) will improve with the inclusion of moods.

Consequently, the aim of this study is to analyze the influence of emotion awareness and mood on different indicators of individual and social adjustment. It will examine an age bracket that has not received much attention from researchers by means of self-report and peer measures. Addressing both approaches at the same time is therefore an especially interesting undertaking.

Method

Participants

Participants in the study were 1423 children aged between 8 and 12, with a mean of 9.8 years ($SD = 1.2$). Of them, 746 were girls, accounting for 52% of the total. All the children were selected by a convenience sampling attending 12 primary schools at seven locations in three Spanish cities, located across a range of working to upper-middle class areas. From the 1423 participants, only 1310 received positive and/or negative nominations from peers (see measures, below); therefore, the analysis was performed considering this subsample.

Measures

The emotion awareness questionnaire (Rieffe, Oosterveld, Miers, Terwogt, & Ly, 2008)

This scale is a self-report questionnaire of 30 items, grouped into six key factors, namely: Differentiating emotions (*I am often confused or puzzled about what I am feeling*), Verbal sharing of emotions (*I can easily explain to a friend how I feel inside*), Analyzing one's own emotions (*It is important to understand how I am feeling*), Attending to Others' Emotions (*I usually know how my friends are feeling*), Acting out emotions (*When I am upset, I try not to show it*), and Bodily awareness of emotions (*I don't feel anything in my body when I am scared or nervous*). The factors were to be answered using a three-point Likert-type scale, and in all cases a high score meant a greater presence of that ability. The scales Differentiating emotions, Verbal sharing, and Bodily awareness were reversed scored. All the scales had shown adequate psychometric properties in previous studies (Camodeca & Rieffe, 2012; Rieffe et al., 2009), which was also confirmed in the case of this study ($\alpha = .59-.65$).

The mood questionnaire (Mood; Rieffe, Terwogt, & Bosch, 2004)

The questionnaire was adapted by the research team (Górriz, Prado-Gascó, Villanueva, Ordóñez, & González, 2013), and consisted of four mood scales (20 items): Happiness, Anger, Sadness, and Fear. The children were instructed to answer each item on a three-point response scale, thinking in the last four weeks: *I never/sometimes/often feel angry* or *I never/sometimes/often feel cheerful*. In all the dimensions, higher scores indicate a greater presence of that mood state. In earlier studies (Rieffe et al., 2009), as well as in this one, the scales displayed adequate psychometric properties ($\alpha = .69-.78$).

The somatic complaint list (Rieffe et al., 2007; Rieffe, Oosterveld, & Terwogt, 2006)

This list consists of 11 items and identifies the frequency with which the children have experienced and felt pain in the last four weeks, such as stomach-ache, headache, and

so on. It has a three-point response scale, for example: *I never/sometimes/often feel dizzy or I never/sometimes/often have a pain in my chest*. Again, a higher score indicates a greater presence of somatic complaints. Previous studies have shown this list to be very reliable and valid (Rieffe et al., 2009). This was also proved in the present study ($\alpha = .81$).

The multifactorial self-reported childhood adjustment test (Hernández, 1998)

This scale consists of 105 items and evaluates maladjustment in general, personal, social, school, and familial settings, for children between 8 and 18 years old: *I am always happy, I am healthy, or I am afraid of people*. Only measures of general (total score), personal (maladjustment with self and reality), and social maladjustment (problems associated with social relationships) are presented in this study due to the low contribution of the rest of the scales. According to the original author of the test (Hernández, 1998), this instrument has appropriate psychometric properties ($\alpha = .87$). The response format is dichotomous (0 = no, 1 = yes), thereby indicating the presence or absence of each of the items. In all its dimensions, higher scores indicate higher levels of maladjustment.

The direct nomination sociometric questionnaire (Arruga, 1983; Coie & Dodge, 1983)

Each child was asked to give the names of the three classmates they most like to talk to and go out on the schoolyard with (leisure situation), the three they most like to work with (work situation), and the three with whom they least like to be within each situation. The total number of nominations each child received as being liked most (positive) and being liked least (negative) by their peers in the classroom were analyzed for each situation. All the scores were standardized to allow interclass comparisons to be performed. Social Preference Index ($Z_p - Z_n$) and Social Impact Index ($Z_p + Z_n$) were calculated (Newcomb & Bukowski, 1983).

Procedure

The above-mentioned questionnaires were administered collectively during regular class time, in two to three different sessions lasting approximately 1 h each. Necessary consents from the county government, schools, parents, and ethical university commission were asked before recruiting the children.

Results

The Spearman correlations between the subscales from the Emotion awareness questionnaire (EAQ) and the outcome variables were as expected (negative in all cases, with the exception of Bodily Awareness and Social Preference leisure) (Table 1). On the other hand, the four subscales from the mood questionnaire were also related with the outcome variables in the expected direction. The correlations of the different variables with age yielded results in the same line as previous studies: higher age was associated with fewer Somatic complaints, less General and Personal maladjustment, less Sadness and Fear, and more Happiness. At the emotion awareness level, only the Differentiating emotions and Attending to others' emotions subscales were positively correlated with age ($r = .12^{**}$; $r = .10^{**}$, respectively), thus suggesting a small but significant effect of

Table 1. Spearman correlations of the subscales of Emotion awareness, Mood, and Age, with the dependent variables from the study (SCL, TAMAI, and SOCIO).

		SCL	TAMAI			SOCIO				Age
			GM	SM	PM	SP_L	SP_W	SI_L	SI_W	
EAQ	Dif.	-.31**	-.28**	-.20**	-.31**	.08*	.05	-.05	-.02	.12**
	V.S.	-.27**	-.29**	-.25**	-.32**	.06	.02	-.01	.03	-.06*
	O.E.	-.10**	-.20**	-.18**	-.13**	.08*	-.02	0	.04	.05
	O.	-.16**	-.27**	-.27**	-.22**	.14**	-.03	.02	.06	.10**
	A.O.	-.13**	-.24**	-.20**	-.23**	.02	.04	-.02	-.03	-.01
	B.A.	.22**	.08**	.03	.14**	.04	.05	-.06	-.08*	-.02
MOOD	H.	-.28**	-.30**	-.25**	-.29**	.11**	.02	-.02	.07	.15**
	A.	.42**	.40**	.36**	.33**	-.09*	-.02	-.00	-.01	.02
	S.	.50**	.38**	.30**	.42**	-.14**	-.03	.05	.01	-.12**
	F.	.43**	.30**	.23**	.36**	-.07	.04	-.03	-.03	-.08**
Age		-.11**	-.06*	-.02	-.20**	.01	.03	-.02	.08*	-

Notes: *EAQ*: Dif: Differentiating emotions; V.S.: Verbal sharing of emotions; O.E.: Analyzing one’s own emotions; O.: Attending to others’ emotions; A.O.: Acting out emotions; and B.A.: Bodily awareness. *Mood*: H: Happiness; A: Anger; S: Sadness; F: Fear. *TAMAI*: GM: General Maladjustment; SM: Social Maladjustment; PM: Personal Maladjustment. SP_L: Social Preference Leisure; SP_W: Social Preference Work; SI_L: Social Impact Leisure; and SI_W: Social Impact Work.
 * $p < .05$; ** $p < .01$.

the degree of maturity on these dimensions, while Verbal sharing of emotions was negatively correlated ($r = -.06^*$).

The moderate correlations between the EAQ and Mood scales (Table 2) and the variance inflation factors ranged from 1.20 to 1.95, (lower than 10 and 4), suggest the absence of multicollinearity among the independent variables (Hair, Anderson, Tatham, & Black, 1995; Menard, 1995).

The next step was to conduct a hierarchical regression analysis with Somatic complaints, Maladjustment measures and Sociometric measures as the criterion variables (Tables 3 and 4). In the first and second step, personal variables (gender and age) were entered, both showing low contributions to variance, although significant in general (especially in the case of gender), (Table 3). In the third and fourth step, Emotion awareness and Mood subscales were entered, respectively. A significant increase in the amount of explained variance occurred with the addition of the EAQ scales in step 3 ($\Delta R^2 = .16$ for Somatic complaints and an additional range of .18–.23 for Maladjustment measures). All EAQ scales made significant contributions to Somatic complaints, except for Attending to others’ emotions and Acting out emotions. In the case of Maladjustment measures, only Bodily awareness was not a significant predictor. The rest of the subscales significantly contributed in the expected direction.

As regards the Sociometric measures, only two scales from the EAQ contributed (and to just a small extent) to the prediction of Social Preference leisure ($R^2_{adj} = .02$, $F = 7.9$), namely: Others’ emotions (*standardized Beta* = .12) and Differentiating emotions (*standardized Beta* = .06). In the case of Social Preference in the work setting ($R^2_{adj} = .02$, $F = 8.1$), the predictive scales were the same: Others’ emotions (*standardized Beta* = .12) and Differentiating emotions (*standardized Beta* = .07). On the other hand, the R^2_{adj} values corresponding to Social Impact, in both leisure and work situations, were below .001. Therefore, the presentation of the rest of the sociometric results was thus not considered to be significant.

Table 2. Spearman correlations of the subscales of Emotion awareness and Mood.

	1	2	3	4	5	6	7	8	9	10
EAQ	1									
1. Dif.	1									
2. V.S.	.32**	1								
3. O.E.	-.18**	.05	1							
4. O.	.07*	.14**	.39**	1						
5. A.O.	.27**	.33**	-.04	.14**	1					
6. B.A.	-.29**	-.18**	.26**	.12**	-.17**	1				
7. H.	.11**	.14**	.23**	.22**	.07**	.03	1			
8. A.	-.19**	-.21**	-.06*	-.16**	-.17**	.14**	-.19**	1		
9. S.	-.26**	-.28**	-.04	-.20**	-.18**	.12**	-.28**	.55**	1	
10. F.	-.25**	-.24**	-.01	-.11**	-.11**	.20**	-.13**	.46**	.52**	1

Notes: *EAQ*: Dif: Differentiating emotions; V.S.: Verbal sharing of emotions; O.E.: Analyzing one's own emotions; O.: Attending to others' emotions; A.O.: Acting out emotions; and B.A.: Bodily awareness. *Mood*: H: Happiness; A: Anger; S: Sadness; F: Fear.

* $p < .05$; ** $p < .01$.

Table 3. Hierarchical regression analyses for gender, age, and the subscales of the EAQ on somatic complaints, and three measures of maladjustment (general, personal, and social).

Predictors	Criterion variables										
	SCL			GM			PM			SM	
	ΔR^2	β		ΔR^2	β		ΔR^2	β		ΔR^2	β
Step 1	.01**			.01**			.002			.01**	
Gender		-.08**			.08**			-.04			.08**
Step 2	.01***			.003			.04***			.001	
Gender		-.08**			.08**			-.05			.08**
Age		-.11***			-.05			-.20***			-.03
Step 3	.16***			.23***			.21***			.18***	
Gender		-.07**			.05*			-.05*			.04
Age		-.06*			.01			-.14***			.03
EAQ		-.23***			-.21***			-.22***			-.14***
Dif.		-.14***			-.16***			-.18***			-.15***
V.S.		-.12***			-.20***			-.15***			-.15***
O.E.		-.11***			-.19***			-.14***			-.22***
O.		-.01			-.10**			-.09***			-.08**
A.O.		.15***			.06*			.10***			-.02
B.A.											
Total R^2 adj	.17***			.24***			.25***			.18***	
n	1309			1310			1310			1310	

Notes: *EAQ*: Differentiating emotions; *V.S.*: Verbal sharing of emotions; *O.E.*: Analyzing one's own emotions; *O.*: Attending to others' emotions; *A.O.*: Acting out emotions; and *B.A.*: Bodily awareness. *TAMAI*: GM: General Maladjustment; SM: Social Maladjustment; and PM: Personal Maladjustment.

* $p < .10$; ** $p < .05$; *** $p < .001$.

Table 4. Regression analyses for the subscales of the EAQ and MOOD on Somatic complaints, and three measures of maladjustment (general, personal, and social), considering β of step 4.

Predictors	Criterion variable											
	SCL			GM			PM			SM		
	ΔR^2	β		ΔR^2	β		ΔR^2	β		ΔR^2	β	
Step 1												
Step 2												
Step 3												
<i>EAQ</i>												
Gender		-.06**	.05**		.05**			-.04*				.04
Age		-.02	-.03		-.03			-.11***				-.04
Dif.		-.13***	-.13***		-.13***			-.14***				-.07**
V.S.		-.05*	-.09***		-.09***			-.11***				-.09**
O.E.		-.06**	-.15***		-.15***			-.11***				-.10***
O.		-.04	-.13***		-.13***			-.09***				-.17***
A.O.		.02	-.07**		-.07**			-.07**				-.06**
B.A.		.11***	.02		.02			.07**				-.01
Step 4	.22***		.14***		.14***			.13***				.11***
<i>MOOD</i>												
H.		-.16***	-.16***		-.16***			-.17***				-.15***
A.		.12***	.19***		.19***			.08**				.20***
S.		.24***	.11***		.11***			.14***				.06*
F.		.17***	.10***		.10***			.17***				.08**
Total R^2 -adj	.39***		.38***		.38***			.38***				.29***
n	1309		1310		1310			1310				1310

Notes: *EAQ*: Dif: Differentiating emotions; V.S.: Verbal sharing of emotions; O.E.: Analyzing one's own emotions; O.: Attending to others' emotions; A.O.: Acting out emotions; and B.A.: Bodily awareness. *Mood*: H: Happiness; A: Anger; S: Sadness; F: Fear. TAMAI: GM: General Maladjustment; SM: Social Maladjustment; and PM: Personal Maladjustment. * $p < .10$; ** $p < .05$; *** $p < .001$.

With the addition of the Mood scales, a significant increase in the amount of explained variance occurred ($\Delta R^2 = .22$ for Somatic complaints and $\Delta R^2 = .11-.14$ for Maladjustment measures), (see Table 4). In both cases, all the subscales significantly contributed in the expected direction: positively for Happiness and negatively for the rest of negative moods. However, social Preference and Impact displayed explained variances below .10 in all the predictive variables, and hence their results are not presented here in detail. Finally, the total model explained 39% of the variance in Somatic complaints, 38% in General and Personal maladjustment, and 29% in Social Maladjustment.

Discussion

The aim of this work was to study the influence of emotion awareness and mood on different adjustment variables in children aged between 8 and 12 years old. As expected, the first hypothesis was partially supported by the results. All the components of emotion awareness predicted children's somatic complaints, except Attending to others' emotions and Acting them out. Attending to others' emotions was found to be unrelated to somatic complaints in this age bracket. This component, however, does appear as significant in the preadolescent population (Rieffe & De Rooij, 2012), perhaps due to the importance of the processes of social comparison in the formation of adolescent identity.

The rest of the subscales (differentiating emotions, analyzing one's own emotions, bodily awareness, and verbal sharing), predicted somatic complaints. The importance of the first three components is corroborated by previous studies (Lahaye, Fantini-Hauwel, Van Broeck, Bodart, & Luminet, 2011; van der Veeck, Nobel, et al., 2012). However, the prediction power of Verbal sharing was rather new, although some authors found similar relations between low experience of somatic complaints and good communication with parents, in children aged 11–13 years old (Ottova et al., 2012); low verbal expression of emotions in adolescents with bulimia nervosa (Sim & Zeman, 2010), or in asthmatic children with low quality of life (Lahaye, Van Broeck, Bodart, & Luminet, 2013).

In the case of Differentiating emotions, Verbally sharing them, and Analyzing one's own emotions, the relationship was negative. Therefore, the children with the most somatic complaints had problems when it came to differentiating between emotions, verbally sharing them and analyzing their own emotions; in other words, their emotion awareness was global rather than specific. In the case of Bodily awareness, however, the relationship was positive and children with the highest bodily awareness reported more somatic complaints. Maybe children with more somatic complaints may be focusing excessively on the bodily symptoms, associated with hypervigilance and catastrophization, and neglecting the analysis of its causes (Lahaye et al., 2013). As these authors suggested, maybe the items of the Bodily Awareness subscale are assessing a type of attention mainly associated with maladaptive outcomes. Or perhaps, children with somatic complaints generally present more intense emotions that are usually accompanied by more apparent bodily signs (Rieffe et al., 2007).

The second hypothesis proposed that all the components of emotion awareness will contribute to predict the problems the child has with adjustment and his or her socio-metric status. This claim has been partially supported, since the Bodily awareness subscale did not appear systematically as a predictive variable of maladjustment measures, except for Personal maladjustment. This sensitivity to perceive the relationship between bodily symptom and emotion does not appear to be so important in predicting maladjustment.

Likewise, in the case of sociometric status, emotion awareness did not seem to predict it significantly, which supports the absence or the existence of only a weak relationship among variables (Petrides et al., 2006; Windingstad et al., 2011). Social impact was not related with the predictive variables, whereas social preference was – albeit only moderately. This relationship between social preference and emotion awareness was exemplified through the abilities to differentiate emotions and attend to others' emotions, which are basic competences for appropriate group interaction (Saarni, 2007). Perhaps, as observed by Petrides et al. (2004), the relationship between these emotional variables and outcome variables, such as academic achievement, only becomes apparent in vulnerable groups, for example, those with low intelligence quotients. If, instead of social preference or impact, the relationship between emotional variables and sociometric categories, such as rejected children, was analyzed, the relationship would be clearer.

Third, as also hypothesized, the inclusion of mood has improved the prediction variables of individual and social adjustment, with the exception of sociometric status. All these moods have contributed to the prediction of somatic complaints, thus confirming previous studies (Rieffe et al., 2010), being that negative moods made the highest significant contribution in most of the measures. Results show that emotion awareness presented a limited independent contribution in the prediction of somatic complaints. This reinforces the hypothesis that emotion awareness precedes the appearance of moods, which are in turn related with children's perception of health. However, emotion awareness added more explanatory power to the measurement of maladjustment, perhaps due to the social nature of some of its components (attending to others' emotions, sharing verbally, and acting out).

Lastly, possible limitations to the results of this work could be the following. First, it would be necessary to include other kinds of objective measures, such as academic achievement, failure to attend school, or reports about medical check-ups, for example. Likewise, this work is based on cross-sectional data, which excludes causal relations among the variables under study in this research. Thus, longitudinal studies like the one proposed by Rieffe and De Rooij (2012) need to be conducted, in order to determine the causal relationships between emotion awareness and different indicators of childhood functioning. Despite the limitations, this study supports the influence of emotion awareness, reinforced by mood, not only on somatic complaints but on new indicators of social adjustment, such as maladjustment, within an age bracket that has not been considered previously. Intervention in promoting specific emotion awareness skills, in this age range mainly, verbal sharing of emotions, and a specific and not diffused emotion awareness (differentiating and analyzing own emotions) would prevent negative moods from emerging, facilitating a low appearance of somatic complaints in children, and a better adjustment.

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