

Emotion awareness, mood and personality as predictors of somatic complaints in children and adults

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Abstract

Background: The relationships among somatic complaints, emotion awareness and mood have been observed in late childhood and adolescence, but very few studies have been carried out in adult populations like this work. This study also incorporates personality dimensions that can exacerbate or reduce the emergence of somatic complaints. Therefore, the aim of this study is to analyse the combined contribution of emotion awareness, mood, and personality to healthy children and adults' somatic complaints. **Method:** Self-reported questionnaires about emotion awareness, mood, personality, and somatic complaints were administered to 1,476 children (7-14 years old) and 479 adults (27-56 years old). **Results:** Emotion awareness and mood were the strongest predictors of somatic complaints ($\Delta R^2 = .32$ for children; $\Delta R^2 = .36$ for adults), and the contribution of personality dimensions was not so relevant ($\Delta R^2 = .07$ for children; $\Delta R^2 = .12$ for adults). **Conclusions:** Emotional and personality factors must be addressed in health-promotion programmes, tailored differently according to whether they are to be used with children or with adults.

Keywords: Somatic complaints, emotion awareness, personality, mood.

Resumen

Conciencia emocional, estados de ánimo y personalidad, como predictores de las quejas somáticas en niños y adultos. Antecedentes: la relación entre quejas somáticas, conciencia emocional y estados de ánimo se ha comprobado en poblaciones preadolescentes y adolescentes; sin embargo, pocos estudios han analizado esta misma relación en adultos, tal y como se propone en este trabajo. Este estudio también incorpora variables de personalidad que pueden exacerbar o reducir la aparición de quejas somáticas. Por lo tanto, el objetivo de este estudio sería el de analizar la contribución combinada de conciencia emocional, estados de ánimo y personalidad sobre las quejas somáticas de niños y adultos sanos. **Método:** diferentes auto-informes de estos constructos se administraron a 1.476 niños (7-14 años) y 479 adultos (27-56 años). **Resultados:** la conciencia emocional y los estados de ánimo fueron los predictores más potentes de las quejas somáticas ($\Delta R^2 = .32$, para niños; $\Delta R^2 = .36$, para adultos), siendo la contribución de la personalidad menos relevante ($\Delta R^2 = .07$, para niños; $\Delta R^2 = .12$, para adultos). **Conclusiones:** los programas de promoción de la salud deberían incluir factores emocionales y de personalidad, adaptándose diferencialmente a niños o a adultos.

Palabras clave: quejas somáticas, conciencia emocional, personalidad, estados de ánimo.

The subjective appraisal of somatic complaints could be a good indicator of children and adults' wellbeing (Lämmle, Worth, & Bös, 2011). Somatization is a serious problem, responsible for 4% of children's visits to paediatric services in primary care (Sánchez & Barrio, 2012) and over 50% of all adult outpatient visits (Kroenke, 2014). Specifically, over 20% of adolescents reported having experienced multiple physical symptoms (Rhee, Holditch-Davis, & Miles, 2005), and one third of children between 8-18 years old reported recurrent and continuous pains for more than three months (Perquin et al., 2000). In adults, an estimated 80% of individuals will experience one or more symptoms in any given month (Kroenke, 2003).

The outstanding fact is that most of the children and adults suffering from somatic complaints will experience a significantly poorer quality of life in all domains (Merlijn et al., 2003). To foster children and adults' wellbeing, certain individual differences based on psychological factors have been studied in relation to the variability of somatic complaints, such as emotion awareness (Rieffe, Villanueva, Adrián, & Górriz, 2009) or coping strategies (Van de Ven & Engels, 2011). In this study, three of these psychological factors will be analysed: emotion awareness, mood, and personality dimensions. As physical symptoms may be a somatization of emotions, emotional factors (awareness and mood) become central. Moreover, personality is chosen due to its discussed overlap with emotional aspects (Van der Linden, Tsaousis, & Petrides, 2012).

Previous studies have shown that children's self-reported somatic complaints are related to difficulties in emotion awareness (van der Veek, Nobel, & Derkx, 2012b; Villanueva, Prado-Gascó, González, & Montoya, 2014). In particular, four components of emotion awareness (differentiating emotions, analysing one's own emotions, bodily awareness, and verbal

sharing) predict somatic complaints in children aged 8-12 years. In some studies, negative moods are shown to make a significant contribution to this prediction (Rieffe et al., 2009; Villanueva et al., 2014). In particular, the proposed relationships among somatic complaints, emotion awareness and mood could be explained by a low level of ability in emotional competence, which prevents a person from handling emotional situations adaptively. Thus, negative moods are likely to appear, which in turn lead to high levels of prolonged stress and may eventually give rise to somatic complaints (Rieffe, Meerum-Terwogt, & Jellesma, 2008a; Rieffe et al., 2010).

In addition to emotional variables, certain personality dimensions can exacerbate or reduce the appearance of somatic complaints by exerting an influence on the subjective estimation of different situations in everyday life and the way people react to them (Bobic, 2012). Some studies have found a significant relation between chronic pain and neuroticism in preadolescents and adolescents with a current disease (Merlijn et al., 2003) and between quality of life in paediatric asthma and benevolence (Lahaye, Van Broeck, Bodart, & Luminet, 2013). In this same population, Van de Ven and Engels (2011) found that high scores on extraversion and benevolence and low scores on neuroticism were related to a better quality of life in these adolescents. However, most studies are mainly based on adults and non-healthy populations.

On the contrary, the relationships among somatic complaints, emotion awareness, and mood have been observed in late childhood and adolescent populations (Rieffe et al., 2009; van der Veek, Derkx, de Haan, Benninga, & Boer, 2012a) but very few studies have done the same in adult populations. For example, research has shown that adults with somatoform disorders have significantly greater difficulty to identify their emotions (Kooiman, Bolk, Brand, Trijsburg, & Rooijmans, 2000), and strong relationships between negative affect and somatic symptoms have been found (De Gucht, Fischler, & Heiser, 2004). However, further specific research in adults must be conducted, including a global measure of emotion awareness and its relation to mood.

Regarding studies on adults' personality, research has shown a clear relation between neuroticism and somatic complaints (Wongpakaran & Wongpakaran, 2014). Moreover, a combination of high neuroticism with other dimensions, such as low extraversion or low agreeableness, has also been found to be linked to poorer self-reported health behaviour (Noyes et al., 2001).

However, to our knowledge, no study has investigated the influence of emotion awareness, mood, and personality on the somatic complaints of healthy children and adults. Only one study analysed the relation between emotion awareness and personality in children with paediatric asthma, finding that higher scores on two specific dimensions of emotion awareness, that is, verbal sharing of emotions and bodily awareness, were associated with a better quality of life (fewer symptoms) and remained significant predictors over and above agreeableness (the only significant personality dimension) (Lahaye et al., 2013).

Consequently, the aim of this study is to analyse the combined contribution of emotion awareness, mood, and personality on children and adults' somatic complaints. This study presents separate models for children and adults pertaining to a community sample as opposed to a specific paediatric population.

Methods

Participants

Participants in the study were 1476 children aged 7-14, with a mean age of 9.9 years ($SD = 1.27$), attending primary school. Of this sample, 758 were girls, accounting for 52.1% of the total.

Moreover, 479 adults were included in the study, 250 of whom were women, accounting for 53% of the total. The age range was 27-56 years ($M = 42.8$, $SD = 4.62$). Of these adults, 32% had a college degree, 57% a high school degree, and 12% had a basic level of schooling.

All participants—children and adults—came from a medium socioeconomic level in an urban context. They were administered the same set of instruments, with the exception of the Personality Questionnaire, which was different for the two age groups but had the same dimensions.

Instruments

The Emotion Awareness Questionnaire (EAQ) (Rieffe, Oosterveld, Miers, Meerum-Terwogt, & Ly, 2008b). This scale was adapted by Ordóñez, Prado-Gascó, Villanueva, and González (2016). It is a self-reported questionnaire of 30 items, grouped into six key factors of emotion awareness: Differentiating Emotions, Verbal Sharing of Emotions, Not Hiding Emotions, Bodily Awareness of Emotions, Attending to Others' Emotions and Analysing One's Own Emotions. The factors were to be answered using a three-point Likert-type scale, and in all cases, a high score indicated greater emotion awareness. The scales Differentiating Emotions, Verbal Sharing, and Bodily Awareness were reverse scored. Adequate psychometric properties in previous studies (Ordóñez et al., 2016) were also confirmed in the case of this study ($\alpha = .59$ to $.65$ for children; $\alpha = .62$ to $.78$ for adults).

The Mood Questionnaire (Rieffe, Meerum-Terwogt, & Bosch, 2004). This questionnaire was adapted by Górriz, Prado-Gascó, Villanueva, Ordóñez, and González (2013). It contains four mood scales: Happiness, Anger, Sadness, and Fear. Participants were instructed to answer each item on a three-point response scale reflecting on the previous four weeks: "*I never/sometimes/often feel angry*". In all dimensions, higher scores indicated 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 ($\alpha = .69$ to $.78$ for children; $\alpha = .71$ to $.84$ for adults).

The Somatic Complaint List (SCL; Rieffe, Oosterveld, & Meerum-Terwogt, 2006). This list was adapted by Górriz, Prado-Gascó, Villanueva, and González (2015). It consists of 11 items that identify the frequency with which participants experience and feel pain, such as stomach aches and headaches. It has a three-point response scale, for example: "*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), as in this study ($\alpha = .81$ for children; $\alpha = .85$ for adults).

The Big Five Questionnaire of Personality for Children and Adolescents (BFQ-NA, Barbaranelli Caprara, & Rabasca, 1998; Spanish adaptation: Del Barrio, Carrasco, & Holgado, 2006). This questionnaire comprises 65 items, which are measured on a five-point response scale. Based on the model of Big Five personality factors, the dimensions assessed are Neuroticism, Extraversion,

Openness, Agreeableness, and Conscientiousness. Previous studies have shown this questionnaire to be reliable and valid (Del Barrio et al., 2006), as in this one ($\alpha = .68$ to $.84$).

The Big Five Inventory (BFI-10; Rammstedt & John, 2007). This inventory is an abbreviated form of the Big Five Inventory (BFI-44; Gosling, Rentfrow, & Swann, 2003). It comprises 10 items, which are measured on a five-point response scale. Based on the model of Big Five personality factors, the dimensions assessed are Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. The psychometric characteristic results indicate that the BFI-10 scales retain significant levels of reliability and validity in English and German samples (Rammstedt & John, 2007), as in this study ($\alpha = .50$ to $.70$).

Procedure

Questionnaires for children were administered in 12 schools in 7 Spanish towns, selected by convenience sampling, after permission was obtained from the local educational authorities, from the School Council in each centre, and from the children’s parents. They were administered inside the school collectively in 2-3 different sessions lasting approximately 1 hour each.

The questionnaires for adults were given to a percentage of children (33%) to pass on to their parents with a cover letter explaining the objective and procedure. Parents were selected randomly from the 1476 children who participated in the study.

Data analysis

To analyse the relations among the variables, Spearman correlation analyses for children and adults were performed. Next, to determine the prediction of SCL, hierarchical regression models for children and adults with SCL as the criterion variable were conducted. In the first and second steps, gender and age were entered as independent variables. In the third step, the EAQ dimensions and Mood were added to the equation as independent variables. Finally, personality dimensions were included as independent variables in the fourth step. The confidence interval was 95%.

Results

For children, the correlations EAQ, Mood, Personality, and Somatic Complaints were negative in all cases, with the exception of Bodily Awareness, Negative Moods, and Neuroticism (Table 1). For adults, the same pattern was found, with the exception of Bodily Awareness, which presented a significant negative correlation with Somatic Complaints for this age range. Consistently, in both groups of participants, the lowest correlations between variables were yielded between the Somatic Complaints and Personality dimensions (with the exception of Neuroticism).

The next step was to test hierarchical regression models for children and adults (Table 2). For children, at Steps 1 and 2, neither age nor gender made a substantial contribution to somatic complaints ($\Delta R^2 = .00$ and $.01$, respectively), despite their significance in the model. At Step 3, with the EAQ and Mood variables added to the equation, the model explained 32% of the variance for somatic complaints. Thus, higher levels of Differentiating Emotions ($\beta = -.13$), Verbal Sharing ($\beta = -.05$), Analysing One’s Own Emotions ($\beta = -.06$), and Happiness ($\beta = -.16$) predicted fewer somatic complaints. In contrast, higher

levels of Bodily Awareness ($\beta = .11$), Sadness ($\beta = .22$), Anger ($\beta = .12$), and Fear ($\beta = .16$) predicted more somatic complaints. Personality dimensions at Step 4 explained only an additional 7% of the variance of somatic complaints. Hence, higher levels of Openness ($\beta = .13$) and Extraversion ($\beta = .20$) predicted more somatic complaints, while higher levels of Conscientiousness ($\beta = -.27$) predicted fewer somatic complaints.

For adults, again, gender and age did not make an important contribution ($\Delta R^2 = .02$ and $.01$, respectively). However, the Emotion Awareness dimensions and Mood did, explaining 36% of the variance of somatic complaints. Higher levels of Differentiating Emotions ($\beta = -.10$), Attending to Others’ Emotions ($\beta = -.11$), Not Hiding Emotions ($\beta = -.13$), Bodily Awareness ($\beta = -.22$), and Happiness ($\beta = -.17$) predicted fewer somatic complaints. Nevertheless, higher levels of Sadness ($\beta = .22$), Anger ($\beta = .12$), and Fear ($\beta = .16$) predicted more somatic complaints. Finally, in step 4, Personality dimensions made an additional contribution of 12% to the variance, Conscientiousness being the only significant dimension ($\beta = -.12$).

Discussion

The aim of this work was to explore the combined contribution of emotion awareness, mood, and personality on children’s and adults’ somatic complaints. As expected, emotion awareness, mood, and personality contributed to the prediction of somatic complaints in both children and in adults, explaining 40% and 51%, respectively. These psychological factors were able to offer something to the prediction of somatic complaints, though not all to the same extent. In line with previous studies (Lahaye et al., 2013; Mikolajczak, Luminet, Leroy, & Roy, 2007), children’s and adults’ somatic complaints were mainly explained by emotional

Table 1
Correlations of Personality, Emotion awareness, and Mood, with SCL

		SCL-C	SCL-A
EAQ	DIF	-.31**	-.43**
	VS	-.28**	-.31**
	NH	-.14**	-.31**
	BA	.22**	-.36**
	AO	-.18**	-.21**
MOOD	OE	-.10**	-.19**
	H	-.28**	-.46**
	AN	.42**	.43**
	S	.49**	.58**
BFQ-BFI	F	.44**	.52**
	N	.16**	.30**
	O	-.07**	-.10*
	E	-.04	-.19**
	AG	-.09**	-.13**
	C	-.10**	-.15**

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

EAQ: DIF: Differentiating Emotions; VS: Verbal Sharing of Emotions; NH: Not Hiding Emotions; BA: Bodily Awareness; AO: Attending to Others’ Emotions; OE: Analysing One’s Own Emotions. MOOD: H: Happiness; AN: Anger; S: Sadness; F: Fear. BFQ-BFI: N: Neuroticism; O: Openness; E: Extraversion; AG: Agreeableness; C: Conscientiousness. SCL-C: Somatic complaints children; SCL-A: Somatic complaints adults

variables, the personality dimensions making a small contribution to the final model. In the general debate on the relationship between emotional intelligence and personality, these results seem to support the idea of emotional aspects as an ability and thus not as overlapping with personality traits (Kong & Zhao, 2013; Mayer, Salovey, & Caruso, 2008). Moreover, health-promotion programmes must take into account the greater explanatory power of emotional variables versus personality.

In addition, a differential prediction of emotion awareness, mood, and personality on somatic complaints, depending on the developmental stage being analysed, was found. More specifically, in children, all the mood states and four subscales of the EAQ questionnaire—i.e., Differentiating Emotions, Verbal Sharing, Analysing One's Own Emotions, and Bodily Awareness—were the most important predictive variables for somatic complaints and had already been corroborated by previous studies (Lahaye et al.,

2010; van der Veek et al., 2012b). In the cases of Differentiating Emotions, Verbal Sharing, and Analysing One's Own Emotions, the relationship was negative. In the case of Bodily Awareness, the relationship was positive, and children with the highest bodily awareness reported more somatic complaints. Global rather than specific emotion awareness—presenting problems in differentiating between emotions, verbal sharing and analysing their own emotions—and a strong awareness of body symptoms may be the basis underlying the experience of children's somatic complaints. The role of moods was also clear in this relation because all of them contributed to it. This finding reinforces the hypothesis that emotion awareness precedes the appearance of moods, which are in turn related to children's perception of health (Rieffe et al., 2010).

In the case of adults, four dimensions of emotion awareness predicted somatic complaints. Two of them were the same dimensions as for children: Differentiating Emotions and Bodily Awareness, and the other two were particular for adults, Not Hiding Emotions and Attending to Others' Emotions. That is, having an undifferentiating emotion awareness, presenting problems in acting out emotions and in attending to others' emotions, and having a low awareness of body symptoms were associated with a higher number of somatic complaints in adults. These results are challenging, as they show two new aspects: the different valence of bodily awareness in children and adults and the adaptive value in adult health of not hiding emotions and attending to others' emotions.

In adults, a better understanding of the fact that emotions consist of a subjective feeling state and physiological arousal was related to fewer somatic complaints. However, the opposite pattern appeared for children. The difficulty involved in verbally labelling emotional experiences might make children develop a higher bodily awareness, which may prevent them from performing a careful analysis of the emotion-evoking situation and thus diminish their chances of handling that situation adaptively (Rieffe et al., 2007). Another explanation may lie in two possible interpretations of the Bodily Awareness dimension in the EAQ questionnaire (Lahaye et al., 2013): excessive attention to bodily symptoms, associated with hypervigilance, catastrophization, and maladaptive outcomes, and another type of attention that is paid “non-judgementally and mindfully”, consequently leading to adaptive consequences. These two interpretations are possibly linked to a developmental pattern, the first explanation more frequent in children and the second one found specifically in adults.

Second, the adaptive value of expressing emotions overtly for somatic complaints in adults is outstanding. Not in vain, self-control (a factor composed of emotion regulation, stress management, and impulsiveness) was the best predictor of bodily sensations, over and above the five personality dimensions in adults (Mikolajczak et al., 2007). In relation to the adaptive value of taking into account others' emotions in adults, it is worth noting the developmental difference that takes place in relation to children. In children, what is more important in suffering somatic complaints is a low ability to attend their own emotions, not those of others. This low ability is not surprising if we think of the introspective developmental tasks related to identity that the child has to face in the preadolescent and adolescent periods, an aspect that is already consolidated in adults.

Another differential prediction of somatic complaints in children and adults was focused on personality dimensions. For children, contrary to previous studies (Lahaye et al., 2013;

Predictors	Criterion variables			
	Children		Adults	
	SCL		SCL	
	ΔR^2	B	ΔR^2	β
Step 1		.00*		.02**
	Gender		.11***	.02
Step 2		.01***		.01*
	Age		-.03	-.08*
Step 3		.32***		.36***
EAQ	DIF		-.13***	-.10*
	VS		-.05*	.01
	OE		-.06*	.00
	AO		-.04	-.11*
	NH		.01	-.13**
	BA		.11***	-.22***
MOOD	H		-.16***	-.17***
	A		.12***	.01
	S		.22***	.27***
	F		.16***	.09
Step 4		.07***		.12***
BFQ_NA / BFI	C		-.27***	-.12***
	O		.13*	.01
	E		.20***	-.01
	AG		-.00	.00
	N		.02	.04
Total				
R^2_{adj}		.40***		.51***
N		1436		458

* $p < .05$; ** $p < .01$; *** $p < .001$
 BFQ: N: Neuroticism; O: Openness; E: Extraversion; AG: Agreeableness; C: Conscientiousness. EAQ: DIF: Differentiating Emotions; VS: Verbal Sharing of Emotions; NH: Not Hiding Emotions; BA: Bodily Awareness; AO: Attending to Others' Emotions; OE: Analysing One's Own Emotions. MOOD: H: Happiness; AN: Anger; S: Sadness; F: Fear. SCL-C: Somatic complaints children; SCL-A: Somatic complaints adults

Merlijn et al., 2003; Van de Ven & Engels, 2011), higher levels of extraversion and openness and lower levels of conscientiousness were related to a higher number of somatic complaints. These dimensions are possibly linked to somatic complaints in healthy children, in comparison to previous studies involving children with health problems. In fact, in the study by Merlijn et al. (2003), neuroticism was not significant in the group of children with no chronic pain. These authors noted that compared to normative data for both groups, that is, children with and without chronic pain, the scores on neuroticism remained within the normal range for adolescents from the general population. These children's results can also be explained by differences in the assessment of personality. For example, Merlijn et al. (2003) used an inadequacy scale of a personality questionnaire, and Lahaye et al. (2013) employed a parental report of children's personality.

Only conscientiousness contributed to the prediction of somatic complaints in the same direction in adults as in children: Higher conscientiousness was related to fewer somatic complaints. Again, these results do not support previous studies that found neuroticism to be the main personality factor related to somatic complaints in adults (Noyes et al., 2001; Wongpakaran & Wongpakaran, 2014). However, if conscientiousness is related to the way in which we control, regulate and direct our impulses, it is not surprising that high scores on this feature are linked to a low number of somatic complaints. Focusing on the meaning of conscientiousness, some studies have highlighted the distinction between rumination and more adaptive forms of self-reflection, showing that this conscientiousness may be associated with more accurate and extensive self-knowledge (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). This self-knowledge, and enhanced self-awareness in children and adults may promote positive emotional states and therefore fewer somatic complaints. Future research must further explore the role

of personality dimensions in populations with and without health problems.

Finally, some limitations in the current study should also be considered. One limitation was that data were collected only through self-report measures. Although children and adults provide good knowledge of their inner experiences (Lundqvist, Rugland, Clench-Aas, Bartonova, & Hofoss, 2010), subjective and objective indicators of health should be included in future research. Likewise, this work is based on cross-sectional data and therefore excludes causal relations among the variables under study and does not include mediating effects. Moreover, as the sampling was not probabilistic and was obtained in the Valencian Community, the generalization of the results is limited. In the same sense, as the adult sample was collected from the children, it was not an independent sample. Thus, the results could be mediated by the parents' modelling of children's emotional functioning. To avoid these limitations, longitudinal studies need to be conducted to test mediating models, as performed by Rieffe and De Rooij (2012) and Kong and Zhao (2013).

Despite these limitations, the results of this study support the differential contribution of emotion awareness, mood, and personality to the prediction of somatic complaints, as well as some important developmental traits to be considered. If specific emotional and personality factors are not addressed in health-promotion programmes that are tailored differently according to whether they are to be used with children or adults, the treatment needs will never be met.

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