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# Emotional and personality predictors that influence the appearance of somatic complaints in children and adults

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## Abstract

**Background:** Personality and emotional factors may be contributing to the emergence of somatic complaints. The purpose of this study was to analyse the combined contribution of emotional awareness, moods and personality to somatic complaints in children and adults. **Method:** Participants were 1,476 children (M= 9.90 years, SD= 1.27, 52.10% girls) and 940 adults (M= 32.30 years, SD= 11.62, 64% women) who were administered self-reports. Analysis was performed using fuzzy qualitative comparative analysis (fsQCA), an analytical technique that enables in-depth analysis of how a series of causal conditions contribute to a given outcome. **Results:** Emotional awareness, moods and personality account for 59% of high levels of somatic complaints in children and 69% in adults. In both samples, interaction between low levels of emotional awareness, high levels of negative moods and low levels of positive mood, high levels of neuroticism and low levels of the other personality factors appear to lead to high levels of somatic complaints (children: raw coverage = .18, consistency = .95; adults: raw coverage = .15, consistency = .97). **Conclusion:** A similar contribution of emotional and personality components was found to explain somatic complaints in children and adults.

***Keywords:*** Somatic complaints, emotional awareness, mood, personality, fsQCA models.

## Resumen

***Predictores emocionales y de personalidad que influyen en la aparición de las quejas somáticas en niños y en adultos.*** **Antecedentes:** la personalidad y los factores emocionales pueden estar contribuyendo a la aparición de quejas somáticas. El objetivo del estudio fue analizar la contribución combinada de la conciencia emocional, los estados de ánimo y la personalidad, a las quejas somáticas en niños y adultos. **Método:** los participantes fueron 1.476 niños (M= 9.90 años, DT= 1.27, 52.10% niñas) y 940 adultos (M= 32.30 años, DT= 11.62, 64% mujeres) y completaron auto-informes. Se utilizó fuzzy qualitative comparative analysis (fsQCA), una técnica analítica que permite un análisis en profundidad de cómo una serie de condiciones causales contribuyen a un resultado dado. **Resultados:** la conciencia emocional, los estados de ánimo y la personalidad explican el 59% de los altos niveles de quejas somáticas en niños y el 69% en adultos. En ambos, la interacción entre bajos niveles de conciencia emocional, altos niveles de estados de ánimo negativos y bajos niveles de estados de ánimo positivos, altos niveles de neuroticismo y bajos niveles de los otros factores de personalidad, parecen conducir a altos niveles de quejas somáticas (niños: raw coverage= .18, consistency= .95; adultos: raw coverage= .15, consistency= .97). **Conclusión:** se encontró una contribución similar de los componentes emocionales y de personalidad a la explicación de las quejas somáticas en niños y adultos.

***Palabras clave:*** quejas somáticas, conciencia emocional, estados emocionales, personalidad, modelos fsQCA.

Somatic complaints, understood as self-reported experiences of physical discomfort (Spink, Jorgensen, & Cristiano, 2018), are common in childhood and adulthood (Karkhanis & Winsler, 2016; Sæther, Sivertsen, Haugland, Bøe, & Hysing, 2018). Tiredness, headache and stomach pain are the most frequent during adolescence (Ordóñez, Maganto, & González, 2015), while in adults, the most frequent are back pain, tiredness and pain in arms, legs and joints (Hinz et al., 2017), and their association with sleep problems (Schlar, Claßen, Hellmann, Vögele, & Gulewitsch, 2017). There are clear medical explanations in a large percentage of cases (Garnefski, van Rood, de Roos, & Kraaij, 2017). However, there is no sufficient medical explanation for at least 33% of these complaints (Steinbrecher, Koerber, Frieser, & Hiller, 2011). In addition to medical factors, a wide range of variables are therefore also considered to play a role in the aetiology of somatic complaints: social and cultural variables (Rescorla, Althof, Ivanova, & Achenbach, 2019), demographic variables such as sex and age (Pulopulos, Hidalgo, Puig-Pérez, & Salvador, 2018), emotional variables (Mazzone & Camodeca, 2018) and personality variables (Favini, Gerbino, Eisenberg, Lunetti, & Thartori, 2018)

Emotional awareness stands out among the different factors that seem to influence somatic complaints to the greatest extent, as emotional competencies influence the psychosocial adjustment (Schoeps, Tamarit, González, & Montoya-Castilla, 2018). In adults and children, greater emotional awareness is related to fewer somatic complaints (Villanueva, Górriz, Prado-Gascó, & González, 2015), but there seems to be no consensus about which

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dimensions of emotional awareness are associated with somatic complaints. In children, some studies show an inverse relationship with differentiating and verbal sharing of emotions, and a positive association with bodily awareness (Villanueva, Prado-Gascó, & González, 2016), whereas in others studies, the dimensions of differentiating emotions, verbal sharing of emotions, not hiding emotions and bodily awareness were negatively related to the presence of somatic complaints (Mazzone & Camodeca, 2018). The few studies with healthy adults suggest that high levels of differentiating emotions, attending to others' emotions, not hiding emotions and bodily awareness predict fewer somatic complaints (Villanueva et al., 2016). However, more research with healthy populations is needed to clarify the effect of emotional awareness on the emergence of somatic complaints (Garnefski et al., 2017).

Although emotional awareness contributes to the prediction of somatic complaints, focusing solely on that aspect is an oversimplified perspective (van der Veek, Nobel, & Derkx, 2012), given that other factors are associated with somatic complaints, such as moods (Meerman, Brosschot, & Verkuil, 2013). Research suggests that children and adults who experience higher levels of anger, sadness, and fear also tend to have high levels of somatic complaints, while those with higher levels of happiness have fewer (Wiklund, Malmgren-Olsson, Öhman, Bergström, & FjellmanWiklund, 2012). In addition, a poorly functioning management of emotional states may contribute to increased somatization (Parr, Zeman, Braunstein, & Price, 2016), but the interaction between these emotional factors in predicting somatic complaints is still unknown.

Along with emotional factors, certain personality variables seem to moderate the emergence of somatic complaints. In adolescence, the resilient profile (high levels of energy, agreeableness, conscientiousness, emotional stability, openness) is associated with fewer somatic complaints, whereas the vulnerable profile (low levels of energy, agreeableness, conscientiousness, emotional stability, openness) is related to a higher presence (Favini et al., 2018). In both adults and adolescents, neuroticism is positively associated with more somatic complaints (Denovan, Dagnall, & Lofthouse, 2019; Rosmalen, Neeleman, Gans, & de Jonge, 2007), but extraversion or agreeableness may attenuate the negative effects of neuroticism (Klinger-König et al., 2018). In other words, subjects with high levels of neuroticism but low levels of extraversion and agreeableness reported the most health symptoms. Nevertheless, most adult research has been conducted in unhealthy populations (e.g. Bekhuis, Boschloo, Rosmalen, & Schoevers, 2015; Liao et al., 2017).

To date, few studies have examined the influence of emotional and personality variables on somatic complaints (Favini et al., 2018), and even fewer studies have compared them in children and adults (Villanueva et al., 2016). In addition, most research in the area has focused on methodologies based on linear models (e.g., Garnefski et al., 2017; Mazzone & Camodeca, 2018). These linear models have shown by now the individual contributions of emotional factors (e.g. differentiating emotions, bodily awareness), and personality (neuroticism), to the development of somatic complaints (Garnefski et al., 2017; Mazzone & Camodeca, 2018; Villanueva et al., 2016). Nevertheless, these models disregard non-linear relationships which can be observed on qualitative comparative analysis (QCA) (Giménez-Espert & Prado-Gascó, 2018; Villanueva, Montoya-Castilla, & Prado-Gascó, 2017). Linear models are based on the individual contribution, and do not *a priori* consider the combination of the different variables in the study and do not take into account equifinality, i.e. the possibility of achieving different pathways leading to the same result (Eng & Woodside, 2012; Ragin, 2008). In contrast, QCA is an analytical technique that enables in-depth analysis of how a series of causal conditions contribute to a given outcome (Legewie, 2013). QCA models are based on Boolean logic and rather than the individual contribution of each attribute, the result depends to a greater extent on how those attributes are combined (Calabuig, Prado-Gascó, Crespo-Hervás, Núñez-Pomar, & Añó, 2016). Despite their interest, few psychology studies have used this technique.

Therefore the purpose of this study was to analyse the combined contribution of emotional awareness, moods, and personality in the somatic complaints of healthy children and adults using QCA. We can expect an equal contribution of emotional and personality components to the explanation of somatic complaints, and subtle nuances in this explanation depending on the developmental period analysed.

## Method

### *Participants*

The participants were 1,476 Spanish children aged between 8 and 14 years old ($M$ = 9.90, $SD$ = 1.27, 52% girls) from 12 public, subsidised and private schools in the Valencian region, and 940 adults aged between 18 and 56 years old ($M$ = 32.30, $SD$ = 11.62, 64% women). The adults were the parents or relatives of some participating children. The socioeconomic level of both the adults and children was medium, and they lived in an urban area in the Valencia region (Spain). The inclusion criteria were that children between the ages of 8 and 14 years were enrolled in schools in the Valencian region and whose parents had signed the informed consent.

### *Instruments*

The Emotion Awareness Questionnaire (EAQ; Rieffe, Oosterveld, Miers, Meerum-Terwogt, & Ly, 2008; adapted by Ordóñez, Prado-Gascó, Villanueva, & González, 2016) is a questionnaire composed of 30 items, grouped into six factors (Differentiating emotions, Verbal sharing of emotions, Not hiding emotions, Bodily awareness of emotions, Attending to others' emotions and Analysing one's own emotions) and answered on a three-point Likert scale (1= *Not true;* 3= *True*). The values between which the scores of this instrument range are from 1 to 3. The psychometric properties have been shown to be adequate in previous studies (Mazzone & Camodeca, 2018; Veiga, Oostervel, Fernandes, & Rieffe, 2019), as well as in this research ($\alpha$ = .59 to .65 for children; $\alpha$ = .62 to .78 for adults).

The Mood Questionnaire (Rieffe, Meerum-Terwogt, & Bosch, 2004; adapted by Górriz, Prado-Gascó, Villanueva, Ordóñez, & González, 2013) is an instrument composed of 16 items grouped in four scales (Sadness, Fear, Anger, and Happiness), answered using a three-point Likert scale (1= *Never*; 3= *Often*). The values between which the scores of this instrument range are from 1 to 3. The psychometric properties were adequate in previous studies (Rieffe et al., 2009) and in this research ($\alpha$ = .69 to .78 for children; $\alpha$ = .71 to .84 for adults).

The Somatic Complaint List (SCL; Rieffe, Oosterveld, & Meerum-Terwogt, 2006; adapted by Górriz, Prado-Gascó,

Villanueva, & González, 2015) is comprised of 11 items that are answered using a three-point Likert scale (1= *Never*; 3= *Often*). The participants indicate how often they experience somatic symptoms. The values between which the scores of this instrument range are from 1 to 3. This questionnaire has been shown to have adequate psychometric properties (Rieffe et al., 2009). In this study, the consistency was $\alpha = .81$ for children and $\alpha = .85$ for adults.

The Big Five Questionnaire of Personality for Children and Adolescents (BFQ-NA, Barbaranelli, Caprara, & Rabasca, 1998; adapted by Del Barrio, Carrasco, & Holgado, 2006) is composed of 65 items distributed in five dimensions: Consciousness, Openness, Extraversion, Agreeableness, and Neuroticism. The answer is on a five-point Likert scale (1 = *Disagree Strongly;* 5 = *Agree Strongly*). The values between which the scores of this instrument range are from 65 to 325. Previous studies have shown adequate reliability (Del Barrio et al., 2006). In this research, consistency ranges from .68 to .84.

The Big Five Inventory (BFI-10; Rammstedt & John, 2007) is an abbreviated form of the BFI-44 (Gosling, Rentfrow, & Swann, 2003), composed of 10 items distributed in five dimensions: Consciousness, Openness, Extraversion, Agreeableness and Neuroticism. Answered on a five-point Likert scale (1 = *Fully agree*; 5 = *Fully disagree*), this inventory is used to assess the adults' personality. The values between which the scores of this instrument range are from 10 to 50. The psychometric properties have been shown to be adequate in previous studies (Rammstedt & John, 2007), as well as in this study ($\alpha = .50$ to $.70$).

*Procedure*

First, the authorisation from the ethics committee of the University of Valencia and School Board was obtained. A convenience sample was selected from 12 schools in the Valencian region with which the research team had previously worked. The initial contact was a meeting held with the heads of the centre and the teachers. Next, an informative meeting was arranged with the parents in which the study was presented and the method of random selection for participation was explained to them. During the information meeting, parents signed informed consent for their children to participate in the research. The children completed the questionnaires (EAQ, MOOD, SCL and BFQ-NA) collectively during their usual school hours, over a one-hour period. The two same researchers were always present during the completion of the questionnaires. For the adults' sample, 33% of the children were randomly selected and the children gave their parents and relatives a sealed envelope. The sealed envelope includes the questionnaire that the adults had to complete (EAQ, MOOD, SCL and BFI-10), an information letter explaining the objective of the study, the confidentiality commitment and the procedure to fill in the questionnaires correctly. The adults had two weeks to answer the questionnaires. The possibility of consulting any doubt with the research team by telephone or email was offered to them. The assessments were conducted between October and March 2010-2011. All participants who did not answer 100% of the questionnaire items were removed from the study.

*Data analysis*

This is a correlational, cross-sectional design research. Concerning statistical analysis, first, descriptive analysis and calibration values were calculated; then a fuzzy-set qualitative comparative analysis (fsQCA) which allows for conjunctions of all logically possible combinations of conditions (Eng & Woodside, 2012), was performed on the children and adults.

To perform a fuzzy-set qualitative comparative analysis, the raw data responses were transformed into fuzzy-set responses. All the missing data were deleted, and all the constructs (variables) were calculated by multiplying their item scores (Villanueva et al., 2017). For constructs (variables) whose values are excessively high (such as the consciousness of the BFQ-NA, whose maximum is 95367431640000.00), it has been divided by 10000 to adapt the construct because the fsQCA is not capable of working with such high values. Then, the values of each variable were then recalibrated considering three thresholds: percentile 10 (low agreement or fully out-side the set), percentile 50 (intermediate level of agreement, neither inside nor outside the set) and percentile 90 (high agreement or fully in the set) (Woodside, 2013).

Finally, necessary and sufficient conditions tests evaluated the effect of the different variables on somatic complaints and on the absence of somatic complaints. FsQCA 2.5 software was used to perform fsQCA.

## Results

The descriptive statistics of the variables under study were calculated, as well as the calibration values for the sample of children and adults (Table 1).

First, we started by testing whether any of the causal conditions could be considered a necessary condition for the high somatic complaints level for children and adults. A condition is considered necessary when it must always be present in order for the result in question to occur. According to the results, none of the variables is a necessary condition (consistency $\leq .90$, Ragin, 2008).

Then, we analysed which combination of conditions resulted in high levels of somatic complaints in children (Table 2) and in adults (Table 3), (sufficient conditions). According to Eng & Woodside (2012), the fsQCA analysis involves two stages. First, a truth table algorithm transforms the fuzzy-set membership scores into a truth table that lists all the logically possible combinations of causal conditions and each configuration's empirical outcome. The fsQCA analysis then generates three possible solutions: complex, parsimonious, and intermediate. The literature suggests that we should focus on the intermediate solution (Ragin, 2008) which is presented here.

Regarding sufficient conditions, all variables are present for high somatic complaints, with the exception of happiness, which is absent. The frequency cutoff in the true table is established as 1 and the consistency cutoff as .95 for children (Table 2) and adults (Table 3). The solution for children indicates 354 combinations of causal conditions which can explain 59% (solution coverage: .59; solution consistency: .80) of high somatic complaints and 376 combinations of causal conditions that explain 69% (solution coverage: .69; solution consistency: .79) in adults. According to Eng & Woodside (2012), in fsQCA a model is informative when consistency is above .70. Therefore, both solutions seem to be adequate. The most important three combinations for children are shown in Table 2, while those for adults in Table 3.

For both samples, it seems that the interaction between low emotional awareness, high negative moods and low positive moods, low openness, low extraversion, low agreeableness, low

*Table 1*
Descriptive statistics and calibration values for children and adults

| | | Personality | | | | | Emotional awareness | | | | | | Mood | | | Somatic complaints |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CON | OPE | EXT | AGR | NEU | DIE | VSE | NHE | BAE | AOE | ANE | SAD | FEA | ANG | HAP | SCL |
| Children | | | | | | | | | | | | | | | | | |
| *M* | | 195542633.11 | 53767.02 | 1941245.64 | 890085.46 | 167944.69 | 391.95 | 9.77 | 55.86 | 33.02 | 129.98 | 88.89 | 4.83 | 7.16 | 7.77 | 62.25 | 610.78 |
| *SD* | | 678905779.74 | 75833.08 | 2276415.96 | 1442706.97 | 1233765.63 | 430.86 | 7.766 | 63.97 | 49.14 | 80.37 | 73.07 | 9.42 | 10.08 | 11.88 | 24.74 | 4749.36 |
| Minimum | | 0.02 | 1.00 | 32.00 | 16.00 | 1.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Maximum | | 9536743164.00 | 390625.00 | 9765625.00 | 9765625.00 | 31250000.00 | 2187.00 | 27.00 | 243.00 | 243.00 | 243.00 | 243.00 | 81.00 | 81.00 | 81.00 | 81.00 | 118098.00 |
| Asymmetry | | 7.84 | 2.43 | 1.67 | 3.30 | 16.84 | 1.89 | 1.02 | 1.68 | 2.56 | 0.10 | 0.91 | 5.59 | 3.59 | 3.93 | -0.88 | 16.38 |
| Kurtosis | | 80.12 | 6.38 | 2.21 | 13.45 | 354.68 | 4.04 | 0.04 | 2.13 | 6.93 | -1.29 | -0.24 | 37.92 | 17.78 | 19.21 | -0.75 | 334.67 |
| Calibration values | | | | | | | | | | | | | | | | | |
| | 10 | 48512.29 | 1441.80 | 108000.00 | 20736.00 | 16.00 | 32.00 | 2.00 | 4.00 | 2.00 | 24.00 | 12.00 | 1.00 | 1.00 | 1.00 | 18.00 | 2.00 |
| Percentiles | 50 | 12770099.20 | 24300.00 | 1012500.00 | 337500.00 | 1200.00 | 216.00 | 8.00 | 32.00 | 12.00 | 108.00 | 72.00 | 2.00 | 4.00 | 4.00 | 81.00 | 12.00 |
| | 90 | 450000000.00 | 139362.50 | 5859375.00 | 2250000.00 | 129440.00 | 972.00 | 27.00 | 162.00 | 81.00 | 243.00 | 243.00 | 9.00 | 16.00 | 16.00 | 81.00 | 512.00 |
| Adults | | | | | | | | | | | | | | | | | |
| *M* | | 14.81 | 11.80 | 13.08 | 14.55 | 9.56 | 424.15 | 12.98 | 64.08 | 21.98 | 160.23 | 123.76 | 6.00 | 7.07 | 11.16 | 53.78 | 397.23 |
| *SD* | | 6.01 | 6.63 | 7.01 | 5.22 | 6.18 | 366.05 | 8.64 | 66.31 | 38.88 | 72.99 | 77.48 | 9.58 | 9.39 | 9.94 | 26.96 | 1984.13 |
| Minimum | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 3.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Maximum | | 25.00 | 25.00 | 25.00 | 25.00 | 25.00 | 2187.00 | 27.00 | 243.00 | 243.00 | 243.00 | 352.00 | 81.00 | 81.00 | 81.00 | 81.00 | 34992.00 |
| Asymmetry | | 0.05 | 0.44 | 0.30 | 0.05 | 0.76 | 1.29 | 0.44 | 1.48 | 3.85 | -0.33 | 0.36 | 4.60 | 4.21 | 2.75 | -0.28 | 13.44 |
| Kurtosis | | -0.76 | -0.68 | -1.05 | -0.33 | -0.18 | 2.23 | -1.06 | 1.39 | 17.38 | -1.07 | -1.11 | 27.97 | 24.79 | 13.29 | -1.53 | 215.26 |
| Calibration values | | | | | | | | | | | | | | | | | |
| | 10 | 8.00 | 3.00 | 4.00 | 8.00 | 3.00 | 39.80 | 2.00 | 6.00 | 1.00 | 54.00 | 32.00 | 1.00 | 2.00 | 2.00 | 16.00 | 4.00 |
| Percentiles | 50 | 16.00 | 12.00 | 12.00 | 15.00 | 9.00 | 324.00 | 12.00 | 36.00 | 8.00 | 162.00 | 108.00 | 2.00 | 4.00 | 8.00 | 54.00 | 37.00 |
| | 90 | 25.00 | 20.00 | 25.00 | 20.00 | 20.00 | 972.00 | 27.00 | 162.00 | 54.00 | 243.00 | 243.00 | 16.00 | 16.00 | 16.00 | 81.00 | 668.00 |

*Note:* Personality: CON = Consciousness. OPE = Openness. EXT = Extraversion. AGR = Agreeableness. NEU = Neuroticism. Emotional awareness: DIE = Differentiating emotions. VSE = Verbal of sharing emotions. NHE = Not hiding emotions. BAE = Bodily awareness of emotions. AOE = Attending to others' emotions. ANE = Analysing one's own emotions. Mood: SAD = Sadness. FEA = Fear. ANG = Anger. HAP = Happiness. Somatic complaints: SCL = Somatic complaints

consciousness, and high neuroticism can lead to high levels of somatic complaints.

In children, the first most important combination (low levels of consciousness, openness, extraversion, agreeableness, differentiating emotions, verbal sharing of emotions, not hiding emotions, attending to others' emotions and analysing one's own emotions; and high levels of neuroticism, sadness, fear and anger) can explain 18% of high somatic complaints (raw coverage = .18, consistency = .95). The second most important combination (low levels of consciousness, openness, agreeableness, differentiating emotions, verbal sharing of emotions, bodily awareness of emotions, attending to others' emotions and analysing one's own emotions; and high levels of neuroticism, sadness, fear, anger and happiness) can explain 14% of high levels of somatic complaints (raw coverage = .15, consistency = .95).

Meanwhile, in adults, the first two most important combinations can explain 15%. The first most important combination (raw coverage = .15, consistency = .97) include low levels of consciousness, openness, extraversion, agreeableness, differentiating emotions, verbal sharing of emotions, not hiding emotions, bodily awareness of emotions, analysing one's own emotions and happiness; and high levels of sadness, fear and anger. The second most important combination (raw coverage = .15, consistency = .97) include low levels of consciousness, openness, extraversion, agreeableness, differentiating emotions, verbal sharing of emotions, bodily awareness of emotions, analysing one's own emotions and happiness; and high levels of neuroticism, sadness, fear and anger.

In general, the absence of consciousness, openness, and agreeableness were associated to high somatic complaints in both groups (combined with the other components), but the presence of neuroticism also leads to high somatic complaints in children, and the absence of extraversion leads to in adults. Something similar applied to emotional awareness: in both groups, the absence of differentiating emotions and verbal sharing of emotions were related to high somatic complaints. However, the absence of attending to other emotions was exclusive to children, and the absence of bodily awareness only appeared in adults. Finally, the absence of happiness was only present as a condition for adults with high somatic complaints.

## Discussion

The objective of this study was to analyse the combined contribution of emotional awareness, moods and personality to somatic complaints in healthy children and adults using the fsQCA method. Based on the results, no individual variable needs always to be present for high levels of somatic complaints

*Table 2*
Combinations from intermediate solution for somatic complaints on children

| **Frequency cutoff: 1; all variables are present except for happiness** | **High level of somatic complaints** | | |
|---|---|---|---|
| | **Consistency cutoff: .95** | | |
| | **1** | **2** | **3** |
| Consciousness | ❍ | ❍ | ❍ |
| Openness | ❍ | ❍ | ❍ |
| Extraversion | ❍ | | ❍ |
| Agreeableness | ❍ | ❍ | ❍ |
| Neuroticism | ● | ● | ● |
| Differentiating emotions | ❍ | ❍ | ❍ |
| Verbal sharing of emotions | ❍ | ❍ | ❍ |
| Not hiding emotions | ❍ | | ❍ |
| Bodily Awareness of emotions | | ❍ | |
| Attending to others' emotions | ❍ | ❍ | ❍ |
| Analysing one's own emotions | ❍ | ❍ | |
| Sadness | ● | ● | ● |
| Fear | ● | ● | ● |
| Anger | ● | ● | ● |
| Happiness | | ● | ❍ |
| Consistency | .95 | .95 | .96 |
| Raw Coverage | .18 | .15 | .15 |
| Unique Coverage | .001 | .001 | .001 |
| **Overall Solution Consistency** | | | .80 |
| **Overall Solution Coverage** | | | .59 |

● = presence of condition/high levels, ❍ = absence of condition/low levels. *All sufficient conditions are adequate, raw coverage between .15 and .18*

*Table 3*
Combinations from intermediate solution for somatic complaints on adults

| **Frequency cutoff: 1; all variables are present except for happiness** | **High level of somatic complaint** | | |
|---|---|---|---|
| | **Consistency cutoff: .95** | | |
| | **1** | **2** | **3** |
| Consciousness | ❍ | ❍ | ❍ |
| Openness | ❍ | ❍ | ❍ |
| Extraversion | ❍ | ❍ | ❍ |
| Agreeableness | ❍ | ❍ | ❍ |
| Neuroticism | | ● | |
| Differentiating emotions | ❍ | ❍ | ❍ |
| Verbal sharing of emotions | ❍ | ❍ | ❍ |
| Not hiding emotions | ❍ | | ❍ |
| Bodily Awareness of emotions | ❍ | ❍ | ❍ |
| Attending to others' emotions | | | ❍ |
| Analysing one's own emotions | ❍ | ❍ | ❍ |
| Sadness | ● | ● | ● |
| Fear | ● | ● | ● |
| Anger | ● | ● | |
| Happiness | ❍ | ❍ | ❍ |
| Consistency | .97 | .97 | .98 |
| Raw Coverage | .15 | .15 | .14 |
| Unique Coverage | .001 | .002 | .001 |
| **Overall Solution Consistency** | | | .79 |
| **Overall Solution Coverage** | | | .69 |

● =presence of condition/high levels, ❍ = absence of condition/low levels. *All sufficient conditions are adequate, raw coverage between .14 and .15*

to occur. However, it seems that the interaction between low levels of emotional awareness (differentiating emotions, verbal sharing of emotions, not hiding emotions, bodily awareness of emotions, attending to others' emotions, analysis one's own emotions), high levels of negative moods (sadness, fear, anger), low levels of positive moods (happiness), low levels of openness, extraversion, agreeableness and consciousness, along with high levels of neuroticism, can lead to high levels of somatic complaints in children and adults. An equal contribution of emotional and personality components to the explanation of somatic complaints (as expected in the hypothesis) in both developmental periods, can therefore be found, when not only linear regression models are used (Villanueva et al., 2016).

The results obtained with fsQCA are congruent with those of Villanueva et al. (2016), but they also include extraversion, openness and agreeableness to their predictive combinations. Moreover, in the study of Villanueva et al. (2016), emotional awareness was the strongest predictor of somatic complaints, being the contribution of personality dimensions not so relevant. On the contrary, in this study there is no major prevalence of one type of component, but instead an enriching combination of the presence/absence of all of them. These results appear also to be consistent with previous research (Mazzone & Camodeca, 2018; Parr et al., 2016) showing that both emotional factors and personality characteristics influence the development of somatic complaints. However, the differences between the results of the present study and those of previous ones seem to evidence that the fsQCA method is a complementary methodology for linear regression models, which that can offer additional information about combinations of attributes to explain a specific result.

When the results obtained with fsQCA in children and adults are compared, the combination of these components appears to be more explanatory of somatic complaints in adults (69%) than in children (59%). The predictive profiles of somatic complaints through emotional factors and personality characteristics are similar in children and adults. However, the results show that subtle nuances in the explanation of somatic complaints depending on the developmental period analysed, can also be found, as posited in the hypothesis. In this respect, high neuroticism seems to be part of the three main combinations of children predicting high somatic complaints, whereas it does not occur in adults. These results show that perhaps neuroticism is a more important element in the appearance of somatic complaints during childhood, but its influence wanes as the individual ages. On the other hand, the extraversion trait was only present as a condition for adults with high somatic complaints. These results may seem logical, as some authors have conceptualized extraversion and neuroticism as the extremes of an activation-inhibition scale (Klinger-König et al., 2018; Pickering, Corr, & Gray, 1999). As a result, in children, a high inhibition behavior (neuroticism) may lead to more somatic complaints, while a low activation behavior (extraversion) may lead to the same in adults.

Likewise, low bodily awareness appears in the three main combinations of adults, but not in those of children. Previous studies have found contradictions in this dimension, due to both positive and negative relationships found with somatic

complaints (Mazzone & Camodeca, 2018; Ordóñez et al., 2015). The results of this research suggest that the influence of bodily awareness may depend on age. While in adults the low bodily awareness contributes to the combination that explains high somatic complaints, it does not seem to be an important condition in children. As for low levels of attending to others' emotions, this appears to be a relevant condition within the combination in predicting high somatic complaints in children (perhaps due to the importance of the socialization function of peers in this age group), but not in adults.

Finally, the condition of low happiness appears in the three adult combinations that are the greatest predictors of high somatic complaints, while in children, depending on the combination, high or low happiness is included. Although these results have discrepancies with previous studies (Wiklund et al., 2012), they seem to reflect that children with high somatic complaints can feel happy at the same time, and the two aspects are not mutually exclusive. Indeed, previous studies found that children with low and high levels of somatic complaints differed in their identification of negative emotions, but not in identifying happiness (Rieffe et al., 2004). These results show that emotional and personality factors are combined differently in childhood and adulthood.

Despite the interest of this study, it is not without some limitations. First, the sampling was not probabilistic and focused solely on the Valencia Region, which makes it difficult to generalise the results. Second, the sample of adults was obtained through the children, which reduces the independence of the data collected. In this sense, a substantial component of social desirability may be added, which could lead to an alteration or bias in the response to the questionnaires. In future research it would be advisable to make a random selection of the sample and avoid dependence on the participants. Third, only self-reported measures are used to carry out the assessment. This point may have an impact on research, as it does not allow parents to be used as informants for children. In future research, it would be recommended that parents be informants of their children (see Rescorla, Althof, Ivanova, & Achenbach, 2019) in order to obtain richer information by being able to complement it with the information provided by the children themselves. Furthermore, it would be recommended not only to use self-reports, but also to include implicit personality measures (see Martínez-Loredo, Cuesta, Lozano, Pedrosa, & Muñiz, 2018) or objective measures such as hair cortisol (see Villanueva et al., 2017). And finally, the existence of disease diagnoses has not been taken into consideration. Therefore, it would be interesting for future research to collect this information during the evaluation. Despite its limitations, this study makes two fundamental contributions. First, it confirms the influence of emotional awareness, moods, and personality on the development of somatic complaints, and provides differentiated models for children and adults. Second, it incorporates a novel methodology that focuses on the importance of different combinations or paths that explain a given result. It is therefore evident that the fsQCA method is a complementary methodology for linear regression models, which that can offer additional information about combinations of attributes to explain a specific result. In conclusion, this study shows how emotional factors and personality traits influence the emergence of somatic complaints in childhood and adulthood. Furthermore, the factors that explain the development of somatic complaints differ depending on the stage of life. It is therefore necessary to establish intervention programs that develop emotional awareness, taking into account moods and personality traits, as well as the stage of life.

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