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# Suitability of a three-dimensional model to measure empathy and its relationship with social and normative adjustment in Spanish adolescents: a cross-sectional study

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## ABSTRACT

**Objectives** (1) To examine the psychometric properties of the Basic Empathy Scale (BES) with Spanish adolescents, comparing a two and a three-dimensional structure;(2) To analyse the relationship between the three-dimensional empathy and social and normative adjustment in school.

**Design** Transversal and ex post facto retrospective study. Confirmatory factorial analysis, multifactorial invariance analysis and structural equations models were used.

**Participants** 747 students (51.3% girls) from Cordoba, Spain, aged 12–17 years (M=13.8; SD=1.21).

**Results** The original two-dimensional structure was confirmed (cognitive empathy, affective empathy), but a three-dimensional structure showed better psychometric properties, highlighting the good fit found in confirmatory factorial analysis and adequate internal consistent valued, measured with Cronbach's alpha and McDonald's omega. Composite reliability and average variance extracted showed better indices for a three-factor model. The research also showed evidence of measurement invariance across gender. All the factors of the final three-dimensional BES model were direct and significantly associated with social and normative adjustment, being most strongly related to cognitive empathy.

**Conclusions** This research supports the advances in neuroscience, developmental psychology and psychopathology through a three-dimensional version of the BES, which represents an improvement in the original two-factorial model. The organisation of empathy in three factors benefits the understanding of social and normative adjustment in adolescents, in which emotional disengagement favours adjusted peer relationships. Psychoeducational interventions aimed at improving the quality of social life in schools should target these components of empathy.

## Strengths and limitations of this study

► This paper could benefit the understanding and study of school violence given the offers an updated perspective of the study of empathy from three dimensions (cognitive empathy, emotional contagion and emotional disengagement), and its influence on social and normative adjustment in school.

► The application of rigorous analysis to test the relationships between study variables and for the analysis of the psychometric properties of the Basic Empathy Scale(confirmatory factorial analyses, structural equation models and multigroup factorial invariance analyses were used).

► This study acknowledges the need for longitudinal and cross-cultural studies to improve confidence in these results; likewise, the analysis could be limited by not having deepened the measurement of empathy in each dimension according to gender differences.

perspectives has significantly contributed to the configuration of the concept, in which at least three different cognitive-emotional processes are identified: (1) feeling what another person is feeling; (2) knowing how to interpret what the other person is feeling, that is, recognising his/her emotions and (3) showing interest in responding when facing the other person's emotion.[1 2]

The main theoretical contributions have recognised that empathy is a capacity that includes affective elements, which allow us to automatically react before the other person's emotion and cognitive elements, which implies understanding the other person's perspective, being this process more controlled and conscious.[3–5]

Studies of empathy have consistently demonstrated the use of examining both the cognitive and affective elements of empathy

## INTRODUCTION
### Empathy dimensions

The study of empathy has predominantly been carried out from three study areas: neuropsychology, developmental psychology and social psychology.[1] Every one of these scientific

to better understand adolescent behaviour.[6 7] In addition, gender is an essential aspect to consider in the studies of empathy at this age. Multiple studies show that women present higher levels of affective empathy than men.[8] However, studies outline that the gender differences could be biased by the way of measuring this concept[9] and also due to the cultural aspects, which has traditionally linked the most affective values to the female gender.[10]

Recent research suggests that the classical two-dimensional model of empathy (affective vs cognitive) may benefit from a reconceptualisation[11 12] which includes a third process based on the concept named by Decety and Jackson[2] as 'intention to respond to the others' emotion'.

The advances in neuropsychological and neuroimaging research show that empathy may be conceptualised into three components, each involving interacting, yet partially non-overlapping neural circuits.[11 13] From this perspective, it seems to be more coherent to show a three-dimensional empathy construct made up of: (1) emotional contagion, which refers to the ability to experience others' emotional states,[14] (2) cognitive empathy, which implies the ability to understand others' emotions and (3) emotional disengagement, the ability to avoid other people's emotions; perhaps as a form of self-protection against the anxiety generated by others' emotional states.[15] Emotional contagion appears to be associated with subcortical structures such as the limbic system, which provides a rapid assessment of the valence of others' emotions (pleasant or aversive), essentially automatically,[16 17] and mirror neurons. This motor neurons are located in the premotor, motor and anterior intraparietal area and are activated when we do some movements if we are being watched by other people (eg, facial mimicry of basic emotional expressions). They contribute to share the affective world with the others from the first childhood.[18 19] However, this process of emotional contagion is not sufficient in the later developmental stages to understand the others' emotions. Empathy requires understanding those emotions and their development, which implies building a representation of them which allows us to be conscious of them without confusing them with ours. This sophisticated function which refers to the cognitive empathy lies on the mind theory and appears to involve activation of the insular cortex, the ventromedial prefrontal cortex (PFC) and the medial PFC.[11] These phylogenetically recent structures which are more slowly developed than other brain areas reach their maturation at the end of adolescence or at the beginning of adulthood. Therefore, it is not until that moment that we can fully display the executive and regulation functions linked to them. The emotional disengagement, which completes the empathy construct, plays an essential role to display an adaptive empathetic response because it is an ability which avoids the fact that an extreme emotional affectation occurs compromising our welfare. It is located in the orbitofrontal cortex, the medial and dorsolateral prefrontal cortex and the anterior cingulate cortex. Its full power is reached in later developmental stages.[13]

The emotional regulation has been proved to be the affective process which allows to combine the previous empathic dimensions, being involved to an extent in others' emotion and managing to understanding it, but without causing high levels of stress or discomfort.[20] From a developmental point of view, the processes related to emotional contagion are the first to appear. Later, as age and brain maturation progress, other cognitive and emotional regulation functions are developed (cognitive empathy and emotional disengagement); all are related to the executive functions and to the development of the theory of the mind, acquired at later ages.[21–23]

On the other hand, a three-factor empathy model can offer certain potential benefits to differentiate between primary and secondary psychopathy. Both forms of psychopathy are associated with severe antisocial behaviour, and the empathic deficits are one of the most proffered causes. For primary psychopaths, these deficits appear to be limited to affective empathy, with cognitive empathy being at normal levels, thus the psychopath's glib and superficial charm but inappropriate affect.[24] In contrast, secondary psychopaths are characterised by affect instability and anxiety, which is not well accounted by a two-factor conceptualisation of empathy.[25] However, using a three-factor model, secondary psychopaths could have sufficient cognitive empathy and emotional contagion but more limited abilities to emotionally disengage; thus anxiety occurs, being overwhelmed with others' emotions. There is clearly explanatory power in further exploring this proposed 'new' factor structure of empathy, as this could contribute to a more coherent understanding of the relationship between empathy and this and other antisocial and prosocial behaviours.

### Measurement of multidimensional empathy

One instrument which could accommodate this new conceptualising of the definition of empathy[4] is the Basic Empathy Scale (BES).[5] This device has shown good psychometric properties and is one of the most widely used in Europe. Although there are other instruments that are commonly used to measure empathy in adolescents, this scale is the only one that has been originally developed using this population. The items on this scale were selected based on four of the five 'basic emotions' (fear, sadness, anger, happiness) and it has been validated in a number of countries using samples of varying ages including children from France[26] and Spain[27]; preadolescents from Slovakia[28] and a combination of adolescents and adults from France,[21 29] Italy,[30] Portugal,[31] China,[32 33] Singapore,[34] El Salvador,[35] Peru[36] and Spain.[37] Although appropriate psychometric properties were observed in these baseline studies and the two-factor structure proposed by the authors was an evidence (cognitive empathy and affective empathy), recent research using a French sample showed optimal results using an alternative structure, with the reorganisation of the items into the three factors.[21 26] A further potential benefit of this study is that Spanish is one of the most widely used languages in

the world; therefore, a new three-dimensional version of the BES—translated and validated in Spanish—could be a significant contribution to the study of empathy in the many Spanish-speaking countries.

### Three-dimensional empathy and social and normative adjustment

There is growing interest in the study of empathy and its potential associations with the development and maintenance of peer relations.[38] This is because studies continue to demonstrate that empathy is positively associated with psychosocial adjustment[21 39] and negatively associated with aggressive behaviours such as bullying and cyberbullying.[27 40 41] For example, greater levels of empathy have been associated with an increased likelihood of self-reported prosocial behaviour among school-aged children.[5] However, there is limited research in studies considering empathy from a three-factor conceptualisation.

Clearly, a more comprehensive understanding of the relationship between the three factors of empathy and social behaviour is warranted. This includes examining how empathy and its constituent parts might relate to social and normative adjustment in schools. Social adjustment refers to the degree to which a person engages in socially competent behaviours adaptive to the immediate social context,[42] and normative adjustment refers to the ability to align behaviour with social conventions and norms that guarantee respect towards the others.[43] This collection of attitudes and behaviours (eg, cooperation, solidarity, mutual acceptance, respect) are key components of a good collective school climate.[43 44]

This study presents two aims: (1) to analyse the psychometric properties of the BES in a large sample of Spanish adolescents and compare the three-factor structure (shown to be the best in studies conducted with non-Spanish adolescents) with the two-factor structure (the only factorial structure tested with Spanish populations); (2) to examine the associations between empathy and social and normative adjustment in school.

The hypotheses of this study were: (1) the three-factor structure will show better psychometric properties than the two-factor structure, showing invariance across gender and (2) cognitive empathy will show the strongest association with both social and normative adjustment.

## MATERIALS AND METHODS
### Study design
The study was a cross-sectional design, ex post facto, retrospective study with one group and multiple measures.[45]

### Participants
The sampling was incidental, selected under the following criteria of accessibility: permission given by the educational centre and geographical proximity for a better displacement. According to statistical requirements, to carry out an instrument validation, it is necessary to have at least 400 participants in total.[46] Thus, four educational

centres of Córdoba, Andalusia, southern Spain, were chosen, where all the students took part. The public and private character of the centres was controlled so that they were represented in the sample, so half of the selected centres belonged to every simple type of school. The final sample was composed by 747 Spanish adolescents (51.3% girls). They were students of secondary education (high school) and were aged between 12 and 17 years (M=13.84, SD=1.22).

### Instruments
Empathy was measured with the BES.[5] This scale has 20 Likert-type items with five possible responses (1=strongly disagree to 5=strongly agree), originally organised into two dimensions: cognitive empathy (nine items) and affective empathy (11 items).[5] Additionally, we used the three-factor version that redistributes the original elements by organising them in: emotional contagion (six items), cognitive empathy (eight items) and emotional disengagement (six items).[21] Higher scores indicate higher levels of empathy.

To measure social adjustment, which refers to the degree to which a person engages in socially competent behaviours adaptive to the immediate social context, the Social Adjustment Scale was applied. This presents nine Likert-type items, with seven possible responses (1=strongly disagree to 7=strongly agree). An example item for the social adjustment scale is: 'My classmates are interested in me'.[43] To measure the normative adjustment, which refers to the ability to align behaviour with conventions and social norms that guarantee respect for others, the Normative Adjustment Scale was applied. This contains five Likert-type items, also with seven possible responses (1=strongly disagree to 7=strongly agree). An example item for the social adjustment scale is: 'I ask as a question and wait for an answer before I speak'.[43] Higher scores indicate higher levels of social and normative adjustment. These two last scales were created and validated in a study on multidimensional social competence in educated Spanish adolescents.[43]

### Procedure
Permission of both school management teams and the expressed authorisation of the adolescents' families—through informed and signed consent—were obtained. Adolescents were also informed that their participation was voluntary. The paper questionnaires were administered by trained researchers and were anonymous. The average completion time was 30 min. The study was approved by the Biomedical Research Ethics Committee of Andalusia and developed in accordance with the considerations of the Declaration of Helsinki and the Spanish Society of Psychology.

Initially, the BES scale was translated into Spanish through the process of 'parallel back-translation'.[47] The scale content was further validated using a pilot study with 60 students who assisted in assessing the degree of comprehension of each item. The students' proposed changes were incorporated into the final version.

**Table 1** Frequencies and percentages of responses for each item

| Items (BES) | 1 Fr/% | 2 Fr/% | 3 Fr/% | 4 Fr/% | 5 Fr/% |
|---|---|---|---|---|---|
| BES-1 | Las emociones de mis amigos no me afectan mucho. (My friends' emotions don't affect me much). | 112/15% | 72/9.6% | 115/15.4% | 104/13.9% | 344/46.1% |
| BES-2 | Después de estar con un amigo que está triste por algo, por lo general me siento triste. (After being with a friend who is sad about something, I usually feel sad). | 104/13.9% | 86/11.5% | 141/18.9% | 168/22.5% | 248/33.2% |
| BES-3 | Puedo entender la felicidad de mi amigo(a) cuando le va bien en algo. (I can understand my friend's happiness when s/he does well at something). | 13/1.7% | 10/1.3% | 39/5.3% | 85/11.3% | 600/80.4 |
| BES-4 | Me asusto cuando veo los personajes de una buena película de terror. (I get frightened when I watch the characters of a good horror film). | 185/24.8% | 59/7.9% | 92/12.3% | 101/13.5% | 310/41.5% |
| BES-5 | Me quedo atrapado en los sentimientos de otras personas fácilmente. (I get caught up in other people's feelings easily). | 125/16.7% | 90/12% | 177/23.7% | 135/18.1% | 220/29.5% |
| BES-6 | Me resulta difícil saber cuándo mis amigos se asustan. (I find it hard to know when my friends are frightened). | 106/14.1% | 80/10.7% | 118/15.8% | 116/15.6% | 327/43.8% |
| BES-7 | No me pongo triste cuando veo a otras personas llorando. (I don't become sad when I see other people crying). | 143/19.1% | 60/8.1% | 117/15.7% | 104/13.9% | 323/43.2% |
| BES-8 | Los sentimientos de otras personas no me molestan en absoluto. (Other people's feelings don't bother me at all). | 81/10.8% | 49/6.6% | 62/8.3% | 69/9.2% | 486/65.1% |
| BES-9 | Cuando alguien se está sintiendo 'bajo de ánimos', usualmente puedo entender cómo se siente. (When someone is feeling 'down', I can usually understand how s/he feels). | 15/2% | 18/2.4% | 54/7.2% | 126/17% | 534/71.4% |
| BES-10 | Por lo general, puedo saber cuándo mis amigos tienen miedo. (I can usually work out when my friends are scared). | 50/6.7% | 51/6.8% | 142/19.1% | 181/24.2% | 323/43.2% |
| BES-11 | A menudo me pongo triste cuando veo cosas tristes en la televisión o en las películas. (I often become sad when watching sad things on TV or in films). | 128/17.1% | 57/7.6% | 102/13.7% | 117/15.7% | 343/45.9% |
| BES-12 | A menudo puedo entender cómo la gente se siente incluso antes de que me lo digan. (I can often understand how people are feeling even before they tell me). | 34/4.5% | 33/4.4% | 131/17.6% | 161/21.6% | 388/51.9% |
| BES-13 | Ver a una persona que se ha enfurecido no tiene ningún efecto sobre mis sentimientos. (Seeing a person who has been angered has no effect on my feelings). | 100/13.4% | 82/11% | 139/18.6% | 129/17.3% | 297/39.7% |
| BES-14 | Por lo general, puedo saber cuándo la gente está alegre. (I can usually work out when people are cheerful). | 19/2.5% | 21/2.8% | 83/11.1% | 135/18.1% | 489/65.5% |
| BES-15 | Tiendo a sentir miedo cuando estoy con amigos que tienen miedo. (I tend to feel scared when I am with friends who are afraid). | 195/26.1% | 83/11.1% | 168/22.5% | 122/16.3% | 179/24% |
| BES-16 | Normalmente puedo darme cuenta rápidamente cuando un amigo está enojado. (I can usually realise quickly when a friend is angry). | 31/4.1% | 18/2.4% | 67/9% | 125/16.7% | 506/67.8% |
| BES-17 | A menudo me dejo llevar por los sentimientos de mis amigos. (I often get swept up along my friends' feelings). | 170/22.8% | 92/12.3% | 180/24.1% | 150/20.1% | 155/20.7% |
| BES-18 | La infelicidad de mi amigo no me hace sentir nada. (My friend's unhappiness doesn't make me feel anything). | 70/9.4% | 48/6.4% | 99/13.2% | 100/13.4% | 430/57.6% |
| BES-19 | Normalmente no soy consciente de los sentimientos de mis amigos. (I am not usually aware of my friends' feelings). | 70/9.4% | 65/8.7% | 91/12.2% | 100/13.4% | 421/56.3% |
| BES-20 | Tengo problemas para averiguar cuando mis amigos están felices. (I have trouble figuring out when my friends are happy). | 70/9.4% | 65/8.7% | 91/12.2% | 100/13.4% | 421/56.3% |

1= strongly disagree; 2= moderately disagree; 3= neither agree nor disagree; 4= moderately agree; 5= strongly agree.
BES, Basic Empathy Scale; Fr, frequency.

**Table 2** Descriptive of the scales

| Scale/Factor | | n=767 | | | |
| --- | --- | --- | --- | --- | --- |
| | | **M** | **SD** | **Skewness** | **Kurtosis** |
| Total empathy | | 3.86 | 0.59 | −0.29 | −0.51 |
| Two factors | Affective empathy | 3.56 | 0.76 | −0.14 | −0.64 |
| | Cognitive empathy | 4.22 | 0.60 | −0.73 | 0.29 |
| Three factors | Emotional contagion | 3.33 | 0.94 | −0.25 | −0.57 |
| | Cognitive empathy | 4.23 | 0.60 | −0.72 | 0.38 |
| | Emotional disengagement | 3.89 | 1.00 | −0.80 | −0.12 |
| Social adjustment | | 5.86 | 0.82 | −0.87 | 0.58 |
| Normative adjustment | | 5.59 | 1.08 | −0.96 | 1.37 |

## Analysis of data

Questionnaires with missing data or those partially completed were removed. Eight per cent (64) of the data collected were lost. Only fully completed questionnaires were used (747).

To test the multivariate normality, the Mardia's coefficient was analysed using the MVN[48] package in R program.[49]

Confirmatory factor analyses (CFA) and structural equation modelling (SEM) were performed using the EQS V.6.2 program.[50] Given the categorical nature of the variables and the absence of multivariate normality, the estimation method of maximum likelihood was chosen with robust scaling[51] and polychoric correlations.[52] To assess the fit of the models the following indices were used: $\chi^2$ Satorra-Bentler ($\chi^2_{S-B}$),[53] value significance (p>0.001), $\chi^2$ party by the df ($\chi^2_{S-B}/df$) (≤5), the Comparative Fit Index (CFI), the Non-Normed Fit Index (NNFI) (≥0.90), the root mean square error approximation (RMSEA) (≤0.08) and the standardised root mean-square residual (SRMR) (≤0.08).[54] The Akaike Information Criterion (AIC) was also evaluated to compare the obtained models, being lower values more desirable.

Given the fact that it was necessary to recognise the factorial stability of the instrument (three-dimensional BES) from the measures and differences of empathy according to gender, a multifactorial invariance analysis was performed. This kind of testing includes a number of sequential analyses with progressively restricted models. Four different models were tested: model 1, where the same factor structure is imposed on the two groups (configural invariance); model 2, where covariances are constrained to be equal across groups; model 3, where factor loadings are constrained to be equal across groups (metric invariance) and model 4, where factor loadings and covariances are constrained to be equal across groups (residual invariance). The $\chi^2$ difference test ($\Delta\chi^2_{S-B}$) was used to test the invariance degree. Non-significant changes in $\chi^2$ suggest intergroup invariance.[47 55] Delta (Δ) differences between the adjustment indicators (NNFI, IFC, RMSEA and SRMR) were also considered. The cut-off point suggested in the literature to accept the hypothesis of invariance across groups is a change of 0.01.[56] A multigroup analysis was performed using EQS V.6.2.[50]

In addition to calculated the Cronbach's alpha (α), the McDonald's Omega ( )[57] was used to estimate the internal consistency of the instruments (α/ ≥0.60) given that the variables were categorical and reflected the absence of multivariant normality.[58] The analysis was performed using the Factor V.9.2 programme.[59] Moreover, to estimate the construct reliability, composite reliability (CR) and the average variance extracted (AVE) were computed. The cut-off points for these indices are 0.70 and 0.50, respectively. Discriminant validity was also examined by comparing the AVE of the pairs of latent variables to the shared variance—square of the correlation between the pairs of variables. If the first indicator was higher than the last indicator, the questionnaire would be considered as having shown good discriminant validity.[60] The adopted level of significance was 0.05.

## RESULTS
## Psychometric properties of BES

First, descriptive statistics were established for each item and dimension (see table 1 and table 2). The Mardia analysis showed a skewness coefficient of 57.38, $p<0.001$ and a kurtosis coefficient of 544.83, $p<0.01$, indicating non-compliance with the assumption of multivariate normality.

The CFA of the original two-factor structure of the BES (cognitive empathy, emotional empathy), demonstrated appropriate fit, $\chi^2_{S-B}=839.355$; $\chi^2_{S-B}/(169)=4.967$; $p<0.001$; NNFI=0.904; CFI=0.915; RMSEA=0.069 (90% CI 0.063 to 0.075); SRMR=0.088; AIC=968.962. In addition, the structure of the three-factor solution (emotional contagion, cognitive empathy, emotional disengagement) showed a CFA with good fit and indicators, $\chi^2_{S-B}=618.163$; $\chi^2_{S-B}/(167)=3.702$; $p<0.001$; NNFI=0.919; CFI=0.929; RMSEA=0.063 (90% CI 0.058 to 0.069); SRMR=0.077; AIC=284.163 (see figure 1). Internal consistency values were adequate for both the two-factor model: $\alpha_{affective-empathy}=0.70$; $\alpha_{cognitive-empathy}=0.67$; $\Omega_{affective-empathy}=0.76$; $\Omega_{cognitive-empathy}=0.71$ and the three-factor model: $\alpha_{emotional-contagion}=0.66$; $\alpha_{cognitive-empathy}=0.69$;

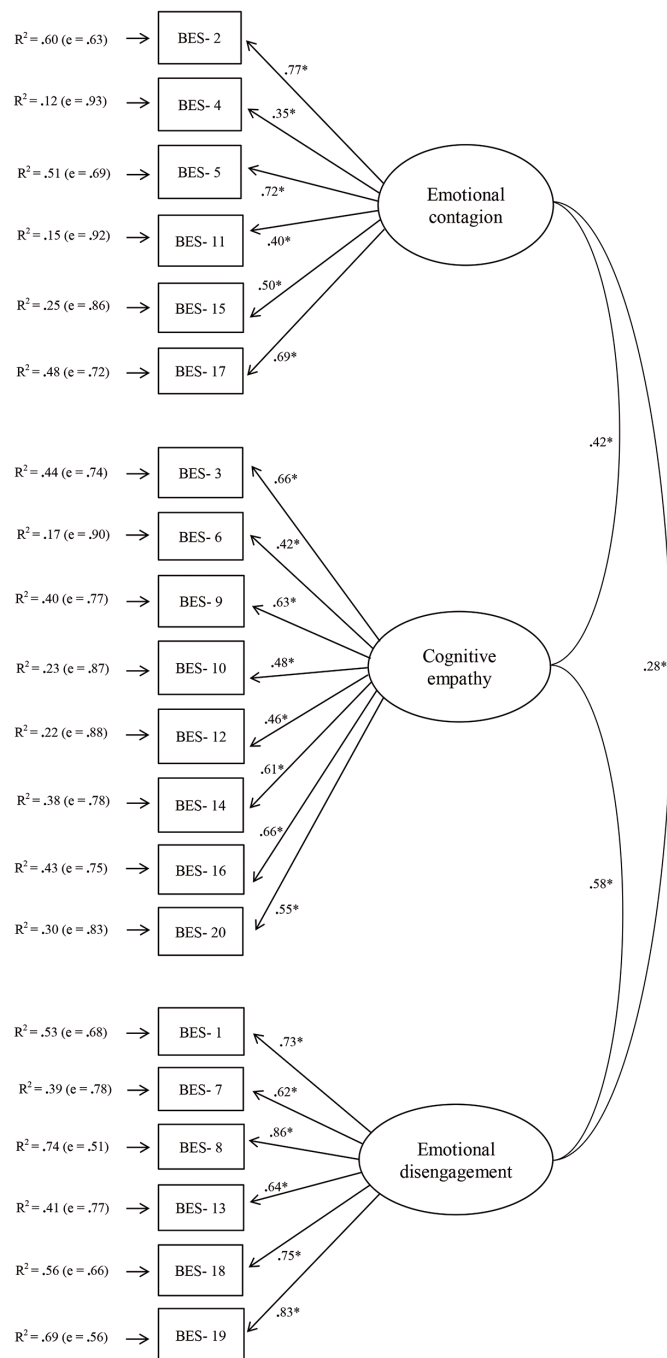**Figure 1** Confirmatory factor analysis -BES- of three factors. *$p<0.05$; BES, Basic Empathy Scale.

**Table 3** CR, AVE and square correlations (below the diagonal)

| Factor/ Dimension | BES two dimensional | | BES three dimensional | | |
|---|---|---|---|---|---|
| | AE | CE | EC | CE | ED |
| CR | 0.69 | 0.63 | 0.71 | 0.75 | 0.83 |
| AVE | 0.21 | 0.17 | 0.36 | 0.34 | 0.55 |
| SC | AE-CE (0.68**) | | EC-CE (0.18**) EC-ED (0.08**) | CE-ED (0.33**) | — |

**$p<0.01$.
AE, affective empathy; AVE, average variance extracted; BES, Basic Empathy Scale; CE, cognitive empathy; CR, composite reliability; EC, emotional contagion; ED, emotional disengagement; SC, square correlations.

CFA results of BES by gender were distributed in three factors with adequate values, for both boys: $\chi^2_{S-B}$=406.162; $\chi^2_{S-B}/(167)$=2.408; $p<0.001$; NNFI=0.901; CFI=0.909; RMSEA=0.067 (90% CI 0.059 to 0.076); SRMR=0.080; AIC=72.162 and girls: $\chi^2_{S-B}$ = 371.461; $\chi^2_{S-B}/(167)$=2.224; $p<0.001$; NNFI=0.933; CFI=0.941; RMSEA=0.059 (90% CI 0.051 to 0.067); SRMR=0.077; AIC=37.461.

The results of the multigroup analysis were adequate. $\chi^2$ differences were non-significant between models 11 and 3 and between models 1 and 4. Changes on CFI, NNFI, RMSEA and SRMR were minimal between all the models (see table 4). These results show evidence of measurement invariance across gender groups.[54 55]

The CFA of the Social Adjustment Scale showed adequate fit for the Spanish sample: $\chi^2_{S-B}$=126.338; $\chi^2_{S-B}/(27)$=4.679; $p<0.001$; NNFI=0.948; CFI=0.961; RMSEA=0.079 (90% CI 0.073 to 0.083); SRMR=0.070; AIC=122.339. The internal consistency was adequate: $\alpha_{social-adjustment}$=0.79; $\Omega_{social-adjustment}$=0.80.

The CFA of the Normative Adjustment Scale also indicated adequate fit:$\chi^2_{S-B}$=24.073; $\chi^2_{S-B}/(5)$=4.815; $p<0.001$; NNFI=0.982; CFI=0.991; RMSEA=0.034 (90% CI 0.028 to 0.038); SRMR=0.040; AIC=19.073. The internal consistency was also adequate: $\alpha_{normative-adjustment}$=0.79; $\Omega_{normative-adjustment}$=0.78.

### Explanatory model

We proposed a SEM in which empathy—organised into three factors—directly influenced social and normative adjustment. The analysis of polychoric correlations coefficients (PCC) between model variables showed moderate values between cognitive empathy and polychoric adjustment (PCC=0.40; $p<0.01$) and between cognitive empathy and normative adjustment (PCC=0.38; $p<0.01$). The final model (see figure 2) showed good fit indices, $\chi^2_{S-B}$=1544.337; $\chi^2_{S-B}/(521)$=2.964; $p<0.001$; NNFI=0.922; CFI=0.931; RMSEA=0.056 (90% CI 0.053 to 0.059); SRMR=0.080; AIC=502.377. This indicated that emotional contagion was directly related to social adjustment ($\beta$=0.12; $p<0.05$) and normative adjustment ($\beta$=0.05; $p<0.05$).

$\alpha_{emotional-disengagement}$=0.80; $\Omega_{emotional-contagion}$=0.82; $\Omega_{cognitive-empathy}$=0.71; $\Omega_{emotional- disengagement}$=0.80.

The CR analysis showed inadequate values below the cut-off points for the two-factor BES, whereas for the three-factor model, the values were suitable for each factor (see table 3). Regarding the AVE, the values were not adequate for the two-factor model. However, in the three-dimensional model, the values of emotional contagion and cognitive empathy ranged from 0.33 to 0.55, which are below the established cut-off points, although they are higher than the SC values (see table 3).

**Table 4** Multigroup analysis of BES three-dimensional by gender

| Model | $\chi^2_{\text{S-B}}$ | df | p | NNFI | CFI | RMSEA | SRMR | AIC | $\Delta\chi^2_{\text{S-B}}$ | $\Delta p$ | $\Delta df$ | $\Delta$NNFI | $\Delta$CFI | $\Delta$RMSEA | $\Delta$SRMR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model 1 | 773.746 | 334 | 0.000 | 0.919 | 0.928 | 0.063 | 0.091 | 105.75 | | | | | | | |
| Model 2 | 781.257 | 337 | 0.000 | 0.918 | 0.928 | 0.063 | 0.091 | 107.26 | 7.511 | 0.852 (NS) | 3 | 0.001 | 0.000 | 0.000 | 0.000 |
| Model 3 | 792.588 | 351 | 0.000 | 0.922 | 0.928 | 0.061 | 0.092 | 90.59 | 18.842 | 0.881(NS) | 17 | 0.003 | 0.000 | 0.002 | 0.001 |
| Model 4 | 800.911 | 354 | 0.000 | 0.922 | 0.927 | 0.062 | 0.093 | 106.65 | 27.168 | 0.898 (NS) | 20 | 0.003 | 0.001 | 0.001 | 0.002 |

Model 1=without restrictions; Model 2=covariance restriction; Model 3=restriction factor weights; Model 4=residual restrictions.
AIC, Akaike Information Criterion; BES, Basic Empathy Scale; CFI, Comparative Fit Index; NNFI, Non-Normed Fit Index; RMSEA, root mean square error approximation; SRMR, standardised root mean-square residual.

Cognitive empathy was also found to be directly related to both social adjustment ($\beta$=0.61; $p$<0.05) and normative adjustment ($\beta$=0.40; $p$<0.05). Finally, emotional disengagement was found to have a direct and negative influence on social adjustment ($\beta$= –0.08; $p$<0.05) and a direct influence on normative adjustment ($\beta$=0.07; $p$<0.05). Together these direct relationships accounted for 39% of the total variance of social adjustment and 17% of normative adjustment (see figure 2).

## DISCUSSION

The first aim of this study was to analyse the psychometric properties of BES[5] in a sample of Spanish adolescents, specifically to compare the two-factor structure (cognitive and affective empathy) with the three-factor structure (emotional contagion, cognitive empathy and emotional disengagement). This had not been previously examined in any Spanish sample. The results, when compared with those obtained in France[21 26] showed better psychometric properties for the three-factor version, compared with the original—and much more commonly used—two-factor structure. The evidence for this comes from numerous improvements in the adjustment NNFI, CFI, RMSEA, SRMR indices and the AIC index. In addition, the three-factor solution showed adequate values of internal consistency for all the factors. This was different Akaike low value reported for cognitive empathy of $\alpha$=0.69 with a French sample.[21] When the composite reliability values were compared, better results were found for the three-factor structure in comparison to the two-factor structure, and although low values were obtained in the AVE in the dimensions of emotional contagion and cognitive empathy, these values exceeded those of the square of the correlations.[60] Therefore, this suggests that this solution provides significantly better discriminant validity compared with the two-factor structure.

Unlike previous research using the BES and empathy more generally, this new conceptualisation allows to assess the extent to which an individual retreats from or does not engage in the emotional states of others, in addition to the more commonly assessed abilities related to emotional understanding (cognitive empathy) and emotional experience (emotional contagion).[12 15] Finally, in contrast with the studies carried out in France which eliminated one[21] and two items,[26] this Spanish validated scale maintains all the items of the original design.

The analysis of the CFA for each gender, as well as the analysis of the factorial invariance indicated that the three-factor solution was optimal for the measurement of empathy for both men and women. Despite existing socialisation aspects which could contribute to a different self-perception of empathy between both genders, results indicate that both girls and boys actually understand this construct in the same way, which is important to delve into the understanding of the building process of emotional identity that female and male children must develop throughout their lives.[61]
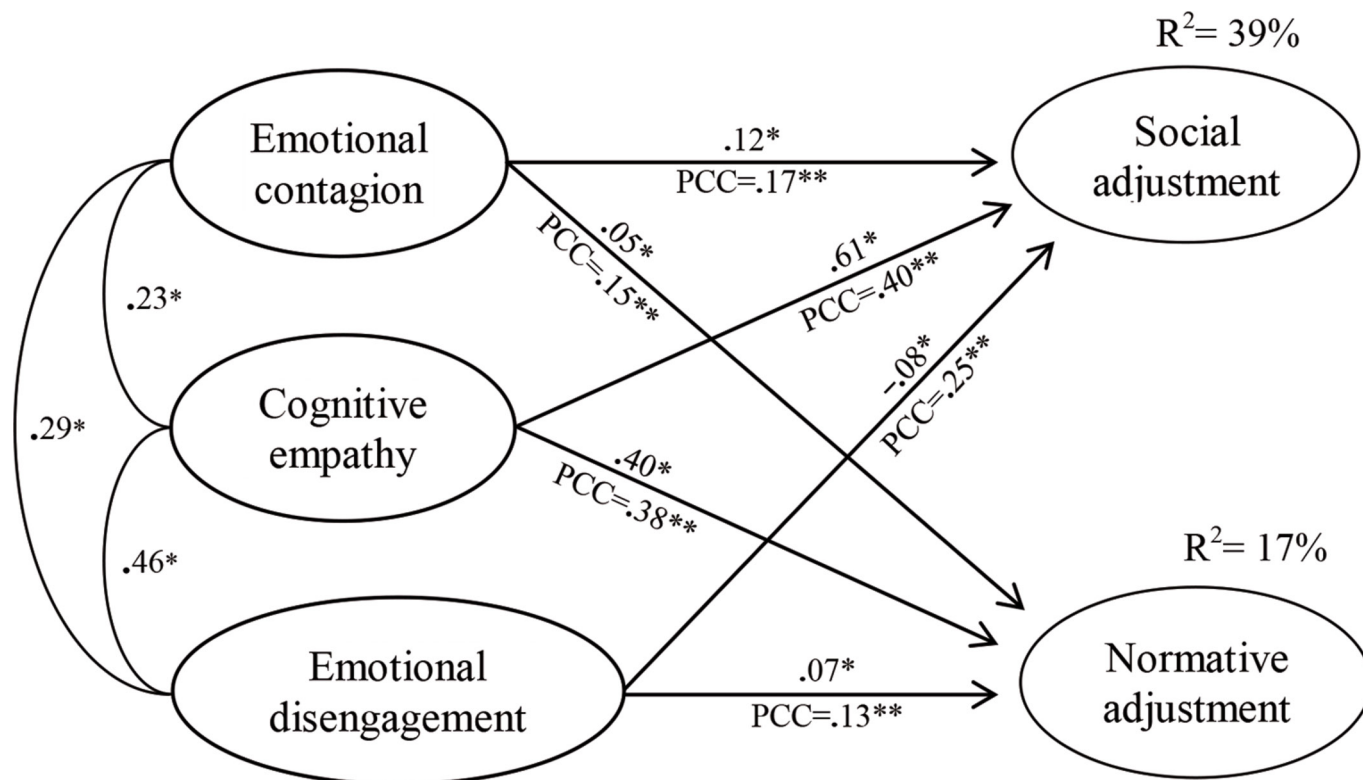
**Figure 2** Structural equation modelling final. Relationship between empathy of three factors and social and normative adjustment. *p<0.05; **p<0.01; PCC, polychoric correlations

The second objective of this study was to evaluate the magnitude of the relationship between the three identified dimensions of empathy and both social and normative adjustment. In general, the percentage of variance explained suggested that empathy was significantly associated with both of these forms of adjustment. The results of the final model suggested that cognitive empathy played a primary role. The relationship between emotional contagion and social adjustment was low but direct, but the relationship with emotional disengagement was low and inverse, indicating that higher levels of disengagement—or failing to fully engage with the others' emotions—did not develop to optimal interpersonal relationships.[62] However, it is important to consider the moral characteristics of the peer group. Aggressive groups could expect immoral actions from their members. In this case, emotional disengagement from peer's negative emotions (eg, anger, hostility), particularly those involved in recruitment for bullying for example, could facilitate prosocial behaviour when facing up considerable emotional peer pressure. In this case, emotional distancing could therefore benefit moral action.

The results also showed a direct relationship between cognitive empathy and normative adjustment. This could suggest that understanding others' emotions such as sadness, anger or fear facilitates compliance with school rules, perhaps because this ability facilitates a sense of connection and group cooperation.[63] In other words, attitudes and behaviours such as respect for the others' opinions, waiting in turn to speak, letting others work

and in general, engagement with social and normative conventions benefitted from increased levels of cognitive empathy. Cognitive empathy might benefit acceptance, respect and solidarity, favoring an improvement in social interactions and interpersonal relationships. Consequently, adolescents who understand others' emotions and understand the purpose of school rules are more likely to regulate their behaviour accordingly.[64]

Emotional contagion and emotional disengagement showed a low but direct association with normative adjustment. This suggests that although it may be necessary to be involved to some degree in the others' emotions (for example, feeling anger, sadness or fear when others experience these), it is also important to keep emotional distance. This may be beneficial for providing space to evaluate what behavioural responses are most appropriate, and at the same time it may allow some control over one's own emotional response. This affective space could offer the opportunity to interpret social situations more carefully when dealing with emotional experiences that could be potentially overwhelming.

In summary, this study suggested that a Spanish version of the BES structured into three factors measured empathy in adolescents more adequately and fit more coherently with what is known about emotional functioning from a psychological and neuropsychological point of view. In spite of the limitations that measuring a psychological construct through self-reports entail—due to the neuropsychological ability it implies—this research presents some strong points: on the one hand, it offers

scientific evidence based on confirmatory, reliability, validity and factorial invariance analyses which support the suitability of measuring empathy from a three-factor model, following the recent contributions from neuropsychology, psychology and psychopathology. On the other hand, it allows us to have a Spanish version of the BES, which will foster its use in Spanish-speaking countries and which will allow a cross-cultural comparison. Furthermore, this work reaffirms the potential importance of strengthening these three components of empathy for improving the quality of peer relationships in school.[64] That is, social adjustment appears to be related with the understanding of others' emotions, and to some extent, it seems to be involved or invested in these. On the other hand, normative adjustment appears to be related to the understanding of others' emotions and to the ability to strike a balance between being overwhelmed by the others' emotional experiences and being emotionally disengaged. This key result illustrates the potential importance of emotional regulation for both the emotional contagion and disengagement components of empathy, as possible ways to stimulate improved interpersonal relationships and the establishment of moral reciprocity. Emotional regulation and subsequent controls on contagion and disengagement could restrict the emergence of uncritical and risky attitudes towards the others' emotions, which have been found to be present among those involved in bullying and cyberbullying.[65 66]

This study also showed that empathy contributed to the development of a healthy school culture. It further suggests that individuals suffering from cyberbullying to understand each other's feelings may be more able to negotiate egocentric positions and achieve sufficient emotional distance to make decisions that best fit the group, in opposition to individual goals. Empathy also promotes critical judgements that prevent individuals from getting carried away by emotions such as anger or sadness, and also benefits the emergence of more satisfied perhaps less conflicted relationships in the classroom. Overall, it seems that better skills in understanding others' emotions foster interpersonal relationships, resulting in the prosocial behaviour necessary for better social life and school environment.[64]

Finally, having a better instrument with recognised and proven prosocial properties to assess the dimensions of empathy demonstrated to be related to optimal peer interpersonal relationships should help to guide the design and implementation of educational programmes. These ought to be aimed at promoting the identification of others' emotions and the emotional regulation, which appears to allow a certain affective distancing without becoming fully emotionally disengaged.

The limitations of the study are related to social desirability, the use of self-report questionnaires and the fact that the sample was selected based on convenience. All of these aspects could bias its results. This potential response bias was mitigated as far as possible by providing anonymity to the participants and by ensuring that they were aware their responses would not be connected with them. This should encourage honest responding. In addition, in the analysis of the psychometric properties of the three-factor BES, low values in the average variance were extracted for emotional contagion and cognitive empathy. The adequate values of the other parameters and the fact that this device has been validated with different participants and cultures suppose sufficient criteria of validity and reliability to support the adequacy of this scale for measuring empathy. In future research, it would be advisable to carry out cross-cultural and prospective longitudinal studies which would allow to consolidate the results obtained here in different samples, as well as to investigate whether empathy changes over time and whether these changes are associated with changes in social or normative adjustment.

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