Psychometric properties of the EATQ-R among a sample of Catalan-speaking Spanish adolescents*

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Abstract
The few studies that have been conducted into the psychometric properties of the EATQ-R, even fewer for the longer version, highlight the fact that its structure differs from that of the original. The aim of this study is to translate and adapt the long version of the EATQ-R to Catalan, study its internal consistency and convergent and factorial validity, and compare differences in the EATQ-R by age and gender. The EATQ-R was administered to a sample of 1481 secondary school students ranging in age from 11 to 17 years. After eliminating 40 items from the 86 comprising the EATQ-R, an adjusted model was obtained with acceptable fit indices comprising 8 of the original 11 factors.

Keywords
temperament; adolescence; Early Adolescent Temperament Questionnaire-Revised; personality; psychometric properties

Resumen
Palabras clave

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Introduction

Although great diversity exists in the terminology and concepts used to define temperament, according to Bates (1987) it can be defined as "biologically rooted individual differences in behavior tendencies that are present early in life and are relatively stable across various kinds of situations and over the course of time."

Research into temperament in infancy and adolescence is of great relevance as it leads to further comprehension of the particular nature of subjects' interactions with their social environment and communication with other people (Levobici & Weil-Halpern, 1995), with the consequent practical implications this has for parents, teachers, researchers and clinics (Ostergren, 1997). Furthermore, along with other applications it allows us to determine the involvement of temperamental dimensions in the pathogenesis of psychopathology and develop models in which said temperamental characteristics are considered vulnerability factors for certain disorders (deBoo & Kolk, 2007).

One of the models that offers tools specifically designed to evaluate temperamental dimensions during adolescence is that proposed by Rothbart (1989), who defines temperament as constitutionally-based individual differences in reactivity and regulation. Temperament, according to Derryberry and Rothbart (1997), identifies variations in affective-motivational and attentional adaptations to human life that are both inherited and shaped by experience. Two concepts are distinguished in this model, reactivity and self-regulation. Reactivity is understood to be individual differences in response (responsivity) to stimulation which manifests itself on multiple levels, such as, for example, the behavioral or neuroendocrine, through parameters such as latency, rise time, peak intensity, and recovery time of reaction. Self-regulation refers to the processes that modulate this reactivity, including aspects such as attention, inhibitory control or activity control. Furthermore, Rothbart uses the term constitutional to refer to the relative longevity of the biological aspects of the organism influenced by "heredity, maturation and experience" (Rothbart & Derryberry, 1981).

Ellis and Rothbart (2001) have developed a specific instrument for studying temperament during adolescence: the Early Adolescent Temperament Questionnaire (EATQ), revised to EATQ-R. Factorial analysis of the EATQ-R, according to Ellis and Rothbart (2001), provides four global temperamental factors: effortful control (comprising the scales of attention, activation control and inhibitory control), surgency (which refers to emotional responses to high-intensity stimuli and low levels of fear and shyness), negative affectivity (which basically refers to the feelings of frustration and discomfort) and finally, affiliativeness (which includes affiliation, perceptual sensitivity, and pleasure sensitivity). However, Muris, Meesters and Blijlevens (2007), deBoo and Kolk (2007) and Muris and Meesters (2009), identify three second-order factors using the Dutch version. Specifically, Muris and Meesters – using the long version of the EATQ-R – obtain a first component comprising activation control, attention, and inhibitory control (positive loadings) and fear and frustration (negative loadings), a second component comprising the scales of pleasure sensitivity, affiliation, fear and perceptual sensitivity (all positive loadings) and a third component which includes the scales of high intensity pleasure and activity level (positive loadings) and shyness and fear (negative loadings). Focusing on the scales of more relevance to the three principal temperamental factors of emotionality, extraversion, and effortful control, they identify the following structure: effortful control (activation control, attention, and inhibitory control), surgency/extraversion (activity level and high intensity pleasure) and negative affectivity (fearfulness, frustration, and shyness). Affiliation, pleasure sensitivity and perceptual sensitivity are not included in the model.

Although data relating to the structural validity and internal consistency of the short version of the EATQ-R have been published for other sociocultural and linguistic contexts (see, for example, Chang, 2005; Hsu, 2011), with the exception of the aforementioned studies using the Dutch version, very little research has been done into psychometric

properties using the long version of the EATQ-R. It is therefore important not only to determine the transcultural validity of said instrument and contribute data from different languages and cultures, but also to take a more in-depth look at the factorial structure of the EATQ-R.

Catalonia is a bilingual community in which Catalan is the co-official language and at whose schools, whether private or public, it is also the vehicular language. As no version exists for Catalan-speaking adolescents, the aim of this study is to translate and adapt the long version of the EATQ-R to Catalan, study its internal consistency and factorial validity using confirmatory factor analysis (CFA) and compare differences in the EATQ-R by age and gender. Additionally, the temperamental dimensions of the EATQ-R have been correlated with the psychopathological dimensions of the YI-4 as a measure of convergent validity.

Method

Participants

The study comprised 1481 students in compulsory secondary education (736 boys and 745 girls) aged between 11 and 17 (see Table 1) and attending schools in Girona city and province (Catalonia, Spain). A total of 14 schools participated.

Instruments

As already mentioned, the Early Adolescent Temperament Questionnaire (EATQ-R; Ellis and Rothbart, 2001) is a revised version of the EATQ initially developed by Capaldi and Rothbart (1992) to evaluate adolescent temperament. Two versions are available, the complete or long version, comprising 86 items, and the reduced version, comprising 53. Each item is evaluated on a 5-point Likert scale. The longer version was used in this study. In addition to these temperamental dimensions, two behavioral scales are included: aggression and depressive mood, giving the instrument a total of 103 items. The scores for the EATQ-R scales represent the mean score for all items on the scale. This is done by dividing the total score for each scale by the number of items responded to.

To translate and adapt the instrument to Catalan, the translate-retranslate method was used. Initially, two direct and independent translations of the original version were done into Catalan. The first translation was conducted by a psychology professional who is an expert in personality psychology and reviewed by a second expert from the same field. The second translation was done by a professional translator. All of the professionals who intervened in this first stage had an excellent command of both English and Catalan. The two

Table 1. *Participants' sociodemographic characteristics*

Characteristics		n	%
Gender	Male	736	49.7
	Female	745	50.3
Age (years)	11	2	0.1
	12	248	16.7
	13	341	23.0
	14	373	25.2
	15	369	249
	16	131	8.8
	17	17	1.1
School year	Year 7	376	25.4
	Year 8	356	24.0
	Year 9	367	24.8
	Year 10	382	25.8

Source: own work

translations were compared and assessed by two independent experts. In accordance with that proposed by Sperber (2004), each item was compared and evaluated on a 7-point Likert scale according to the degree of semantic (comparability of language: formal similarity of words, phrases, sentences, etc.) and conceptual equivalence (similarity of interpretability: degree to which two items lead to the same response despite the wording of the sentence not being the same), on which 1 is highly equivalent and 7 not at all equivalent. A score equal to or higher than 3 necessarily requires the revision of said item, especially when referring to conceptual equivalence. This process led to a second version being agreed by the research team, which was administered to a group of children aged 10 to 16 in order to evaluate the degree of comprehension of all items in the new version. To do this, the assessed children were given precise instructions to highlight those items which presented comprehension difficulties. Said items were noted down by the research team in order to investigate the origin of said difficulties.

Once the detected comprehension difficulties were corrected, it was translated back by a professional translator who had not seen the original version of the questionnaire. The back-translated version was compared to the original version by a different psychology professional and professional translator in accordance with the criteria established by Sperber (2004) to evaluate the degree of semantic and conceptual similarity. Those items which were judged to have a low conceptual and/or semantic equivalence were analyzed by the research team and the translator in order to produce a final version they agreed on. More specifically, and in accordance with the recommendations of Sperber (2004) and Sánchez *et al.* (2005), those items which presented a perfect conceptual equivalence and a literal and semantic parallelism with the original version were classified as items with A-type equivalence. Those which demonstrated a satisfactory conceptual equivalence but which had some words that differed from the original version were classified as items with B-type equivalence. When items preserved the original meaning but did not have a satisfactory conceptual equivalence, they were classified as items with C-type equivalence, and finally, items with no agreement between the back-translated and original versions were classified as items with D-type equivalence.

Items which were not classified with A-type equivalence were analyzed by the research team and the translator together, paying special attention to the items classified as type D, to produce a final version. This version was reviewed by a professional specialized in editing documents with a degree in Catalan philology to guarantee grammatical correctness and spelling.

YI-4 (the Youth's Inventory-4) (Gadow & Sprafkin, 1999) is a self-reported questionnaire based on DSM-IV criteria (APA, 1994) that allows the identification of emotional and behavioural disorders in 12 to 18-year-old adolescents. It consists of 120 items, through which 18 disorders are evaluated (AD/HD, oppositional defiant disorder, conduct disorder, generalized anxiety disorder, social phobia, separation anxiety disorder, obsessive-compulsive disorder, post-traumatic stress disorder, specific phobia, panic attack, schizoid personality, schizophrenia, major depressive disorder, dysthymic disorder, bipolar disorder, drug use, eating disorder and tics), grouped into 13 psychopathological dimensions. The YI-4 permits two different types of scoring: the criterial or diagnostic model (presence or absence of symptoms) and the dimensional model (severity of symptoms). The authors report good psychometric properties regarding discriminant validity and correspondence with clinical diagnoses as well as reliability. The Spanish version, translated and adapted by the authors themselves, was used for this study. The Y4 was scored using the dimensional scoring method in which each symptom is assessed on a Likert scale of 0 to 3 points (never = 0; sometimes = 1; often = 2; and very often = 3 points).

Procedure

After requesting the corresponding permit from school heads and the Autonomous Government of Catalonia's department of education, participants

were informed of the general aims of the research and that the confidentiality of their data was guaranteed. The protocol for administering the questionnaire was submitted to schools and parents for their approval. Once consent had been obtained, they were administered to groups of students in the classroom during class time. After reading the items on the questionnaire carefully, all children received standardized instructions regarding how to respond to them. The adolescents were accompanied by researchers during the questionnaire administration process in case they needed help or clarification.

Data analysis

A confirmatory factor analysis (CFA) was conducted using version 18.0 of the AMOS program to investigate whether the factors indentified by Ellis and Rothbart (2001) were a good fit for the Spanish EATQ-R data. The method of maximum likelihood (ML) was employed. Lost data were treated using the Expectation Maximization (EM) method. The following were used to test the fit of the model: the index χ^2 and its associated level of significance, the ratio χ^2 / df (degrees of freedom) and the indices Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR). RMSEA and SRMR values below 0.05 and 0.08, respectively, and those above .90 for CFI, GFI and AGFI indicate a good fit (Browne & Cudech, 1993; Hoyle, 1995). However, the value of 0.06 has been suggested as a cut-off point for RMSEA (Hu & Bentler, 1999). Values between 2 and 5 for the ratio χ^2 / gl indicate a good fit to the model (Byrne, 2001). In addition, the internal consistency indices of the factors were calculated and differences compared by age and gender. Following the objectives of the research, we have also calculated the linear correlations between temperament scales and psychopathological dimensions using for this version 19.0 of the statistical package SPSS.

The minimum level of significance required in all statistical tests was $p < 0.05$.

Results

Table 2 shows the descriptive statistics for the scales of the EATQ-R and the internal consistency indices considering the original structure. With the exception of the scales activity level, pleasure sensitivity and shyness, which show good internal consistency, the rest of the values range from 0.47 to 0.69.

Confirmatory factor analysis

Table 3 shows the adjusted goodness indices for each of the theoretical models analyzed. Model 1

Table 2. *Mean, standard deviation and internal consistency of scales of the EATQ-R considering the original structure.*

Dimension	Scale mean (DT)	Cronbach's Alpha	Interval correlations item total corrected score
Activation Control	3.22 (0.63)	0.63	0.02 - 0.50
Affiliation	3.93 (0.58)	0.69	0.27 - 0.48
Activity Level	3.57 (0.72)	0.71	0.27 - 0.53
Attention	3.24 (0.57)	0.47	0.02 - 0.34
Fear	3.22 (0.69)	0.52	0.21 - 0.30
Inhibitory Control	3.29 (0.51)	0.56	0.09 - 0.33
Frustration	3.46 (0.59)	0.65	0.20 - 0.41
Pleasure Sensitivity	3.25 (0.79)	0.75	0.19 - 0.58
High Intensity Pleasure/Surgency	3.36 (0.61)	0.61	0.09 - 0.49
Perceptual Sensitivity	3.43 (0.66)	0.57	0.09 - 0.43
Shyness	2.95 (0.77)	0.70	0.16 - 0.69

Source: own work

corresponds to the original structure of the EATQ-R with the 86 items, 11 first-order factors and no second-order factors. The adjusted goodness indices, with the exception of RMSEA, show an insatisfactory fit. Consequently, items which presented corrected correlations with their latent variable below .35 were eliminated, as above that value they are statistically significant beyond the 1% level (Cohen & Manion, 1989). In this new model (model 2), a total of 40 items disappear, including all of the items on the scales of attention, fear, and inhibitory control. The internal consistency of the 8 scales remaining after eliminating 16 items ranges from 0.63 (perceptual sensitivity) to 0.77 (pleasure sensitivity). With the exception of the Comparative Fit Index (CFI), the other indices indicate a good fit for the model. Therefore, the scales of attention, fear and inhibitory control disappear. In the case of Inhibitory Control, if it was retained with items 21, 46, 12, 39 and 45 (with correlations corrected with the latent variable between 0.29 and 0.34), relatively acceptable fit indices would be obtained, χ^2 (1188) = 3272.78, p <0.001, χ^2/g.l. = 2.76, RMSEA = 0.03, SRMR = 0.07, GFI = 0.92, AGFI = 0.91 y CFI = 0.85. However, their internal consistency is 0.55.

Models 3, 4 and 5 represent tests of the theoretical models with first and second-order factors. Models 3 and 4 correspond to the original structure of 11 factors and 86 items, considering 4 and 3 second-order factors respectively. In model 5 (see Figure 1) the structure of the adjusted model is proposed (model 2) with three second-order factors. The adjusted goodness indices, with the exception of CFI, with a value close to but not exceeding 0.90, indicate a good fit for the model. The same model was tested with 4 second-order factors but rejected as it did not reach the minimum number of iterations.

Differences in EATQ-R by age and gender

Table 4 shows the means (and SD) for each of the first-order scales of the EATQ-R by age and gender. The results of a two-way ANOVA (gender x age group) for each of the scales indicate three main effects of age for activation control (F (4, 1481)=17.07, p <0.001), activity level (F (4,

Table 3. *Fit indices for factores of the EATQ-R*

Model	χ2	df	χ2/df	RMSEA	SRMR	GFI	AGFI	CFI
Model 1	11089.94	3514	3.16	0.038	0.09	0.82	0.81	0.67
Model 2	2718.31	961	2.83	0.035	0.07	0.92	0.91	0.86
Model 3	11413.26	3548	3.22	0.039	0.09	0.81	0.80	0.65
Model 4	11588.36	3553	3.26	0.039	0.09	0.81	0.80	0.65
Model 5	2911.45	977	2.98	0.037	0.07	0.92	0.91	0.85

Model 1. Original structure mantaining all items, 11 first-order factors and no second-order factors.
Model 2. Adjusted model. Items with correlations below .35 with the latent variable have been eliminated. The eliminated items are:
Voluntary control: 32 and 55.
Affiliation: 94
Activity Level: 100
Attention: the whole dimension disappears.
Fear: the whole dimension disappears.
Inhibitory Control: the whole dimension disappears
Frustration: 40 and 98
Pleasure sensitivity: 34
High Intensity Pleasure: 2, 8, 27, 29 and 103
Perceptual sensitivity: 41 and 92
Shyness: 43 and 69
Model 3. Original structure mantaining all items, 11 first-order factors and 4 second-order factors.
Model 4. Original structure mantaining all items, 11 first-order factors and 3 second-order factors.
Model 5. Adjusted model, 8 first-order factors and 3 second-order factors.
Source: own work

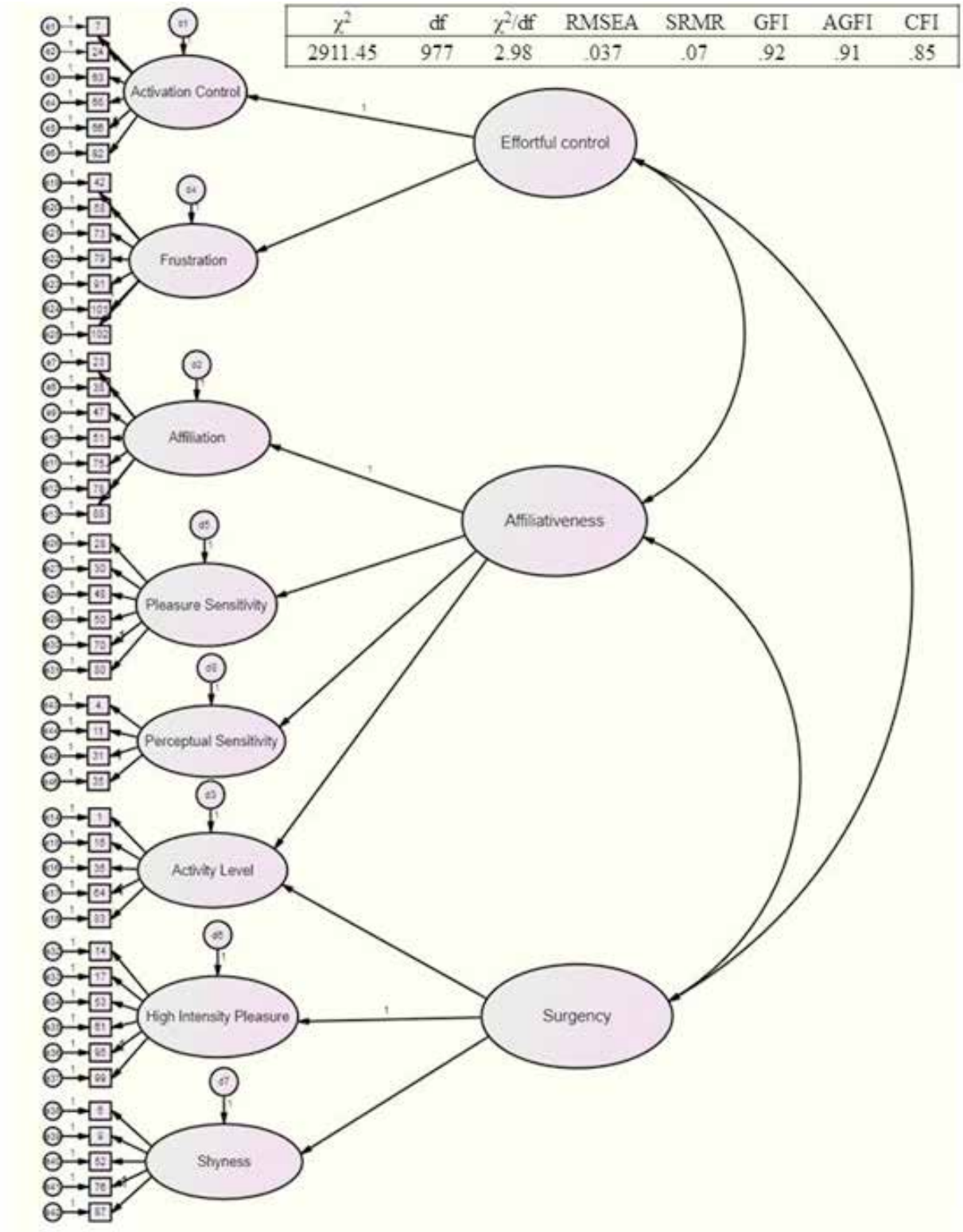

Fig. 1. Confirmatory factor analysis for the 46-item EATQ-R

Source: own work

1481)=6.16, p <0.001) and high intensity pleasure (F (4, 1481)=3.83, p =0.004), six principal effects of gender for activation control (F (1, 1481)=9.4, p =0.002), affiliation (F (1, 1481)=138.59, p <0.001), pleasure sensitivity (F (1, 1481)=47.26, p <0.001), activity level (F (1, 1481)=207.27, p <0.001), high intensity pleasure (F (1, 1481)=203.51, p <0.001) and shyness (F (1, 1481)=20.69, p <0.001) and two main effects of the interaction gender x age group for activation control (F (4, 1481)=2.76, p =0.03) and activity level (F(4, 1481)=2.45, p =0.04). Scores for activation control and activity level decrease progressively as age increases, especially in girls, while for high intensity pleasure they increase. With regard to gender, girls obtain higher scores in activation control, affiliation, pleasure sensitivity, and shyness, while boys score higher in activity level and high intensity pleasure.

Relationship between temperament and psychopathology

Table 5 shows the correlations between temperamental dimensions and psychopathological dimensions measured through the YI-4. The activation control dimension correlates negatively with the psychopathological dimensions of AD/HD, conduct, oppositional defiant, generalized anxiety and depression while frustration correlates positively with AD/HD, oppositional defiant, generalized anxiety, anxiety, depression and bipolar. Also, shyness correlates positively with anxiety and negatively with bipolar dimension.

Discussion

Confirmatory analysis with the first and second-order factors does not provide acceptable fit indices when considering the original structure, except for RMSEA. Eliminating the factors of attention, fear and inhibitory control considerably improves the fit of the model. What is more, if the factor inhibitory control is retained, the fit indices are relatively acceptable. Although it was necessary to eliminate 40 items, a significant number of items have been identified which allow us to have a new version of the EATQ-R adjusted to the Catalan-speaking Spanish population. Considering first-order factors, the results obtained resemble those of other studies in that the 11 or 10 scales of the EATQ-R are not identified (with either the long or short version). In addition, very low internal consistency is observed

Table 4. *Mean and standard deviation of the first-order scales from the adjusted model, by age and gender.*

Temperamental Scale		11-12 Mean (SD)	13 Mean (SD)	14 Mean (SD)	15 Mean (SD)	16-17 Mean (SD)
Activation Control	Male	3.39 (0.75)	3.37 (0.77)	3.20 (0.73)	3.10 (0.69)	2.98 (0.70)
	Female	3.71 (0.65)	3.39 (0.79)	3.19 (0.78)	3.15 (0.73)	3.23 (0.77)
Affiliation	Male	3.71 (0.64)	3.76 (0.69)	3.85 (0.65)	3.88 (0.58)	3.80 (0.57)
	Female	4.16 (0.51)	4.20 (0.50)	4.16 (0.55)	4.19 (0.50)	4.18 (0.50)
Activity Level	Male	3.86 (0.75)	3.82 (0.68)	3.80 (0.79)	3.77 (0.66)	3.73 (0.73)
	Female	3.49 (0.67)	3.29 (0.75)	3.19 (0.71)	3.06 (0.74)	3.04 (0.81)
Frustration	Male	3.57 (0.68)	3.53 (0.65)	3.55 (0.68)	3.53 (0.66)	3.40 (0.56)
	Female	3.47 (0.66)	3.72 (0.56)	3.60 (0.68)	3.63 (0.59)	3.47 (0.76)
Pleasure Sensitivity	Male	2.98 (0.85)	2.97 (0.89)	2.83 (0.90)	2.97 (0.74)	2.88 (0.85)
	Female	3.29 (0.84)	3.23 (0.89)	3.23 (0.86)	3.23 (0.88)	3.28 (0.80)
High Intensity Pleasure	Male	3.49 (0.87)	3.56 (0.80)	3.78 (0.77)	3.72 (0.81)	3.70 (0.81)
	Female	2.85 (0.94)	3.07 (0.92)	3.04 (0.86)	3.07 (0.85)	2.88 (0.87)
Perceptual Sensitivity	Male	3.35 (0.76)	3.26 (0.86)	3.19 (0.82)	3.19 (0.78)	3.20 (0.87)
	Female	3.28 (0.80)	3.26 (0.83)	3.25 (0.81)	3.37 (0.85)	3.29 (0.71)
Shyness	Male	2.73 (0.86)	2.79 (0.89)	2.82 (0.90)	2.76 (0.83)	2.74 (0.94)
	Female	2.94 (0.95)	3.04 (0.99)	3.05 (0.94)	2.97 (0.93)	2.99 (0.92)

Source: own work

Table 5. *Correlations between the scales of the EATQ-R and the YI-4 scales*

Dimension	AD/HD	Conduct	Oppositional defiant	Generalized Anxiety	Anxiety	Separation Anxiety	Schizoid Personality	Schizophrenia	Major Depression/ Dysthymia	Bipolar	Anorexia	Bulimia	Substance use
Activation Control	-0.418**	-0.248**	-0.281**	-0.192**	-0.045	0.041	-0.089**	-0.164**	-0.297**	-0.181**	-0.065*	-0.122**	-0.129**
Affiliation	0.038	-0.105**	-0.060*	0.112*	0.134**	0.045	-0.074**	0.006	0.039	0.164**	0.132**	0.095**	0.005
Activity Level	-0.057	0.035	-0.093**	-0.142**	-0.071*	0.061	-0.004	0.054	-0.171**	0.102*	-0.122**	0.007	0.026
Frustration	0.298**	0.093**0	0.218**	0.258**	0.235**	0.108**	0.076*	0.177**	0.218**	0.231**	0.149**	0.139**	0.071*
Pleasure Sensitivity	-0.052	-0.218**	-0.161**	0.033	0.118**	-0.021	0.001	0.035	0.014	-0.031	-0.007	0.037	-0.085**
High Intensity Pleasure/Surgency	0.108**	0.190**	0.088**	-0.079**	-0.172**	-0.072*	0.031	-0.027	-0.027	0.153**	-0.078**	0.030	0.153**
Perceptual Sensitivity	0.017	-0.034	0.002	0.101**	0.161**	0.057	0.005	0.085**	0.041	0.052	0.063*	0.054	-0.028
Shyness	-0.114*	-0.189**	-0.099*	0.125**	0.201**	0.063	0.000	0.052	0.112**	-0.218**	0.042	-0.025	-0.172**

* p <0.05
** p <0.01
Source: own work

in some dimensions when the original structure is considered, particularly attention, fear and inhibitory control. Thus, for example, Chang (2005) and Visser *et al.* (2007) identify seven first-order factors, Muris and Meesters (2009), with the long Dutch version, obtain a structure of nine factors, and Hsu (2011), with the short version for the Taiwanese population, identifies only four first-order factors. With regard to the second-order structure, the theoretical model that best fits the data is the one which proposes a factorial structure with three factors: affiliativeness (affiliation, pleasure sensitivity, perceptual sensitivity and activity level, all with positive loadings), effortful control (activation control and frustration, the latter with negative loading) and surgency (high intensity pleasure, activity level and shyness, the latter with negative loading). Furthermore, the three second-order dimensions proposed significantly coincide with the results obtained by Muris and Meesters (2009). Therefore, these results in a non-US population seem to indicate that the items of the EATQ-R are grouped differently when applied to other cultural and linguistic contexts. As Muris and Meesters (2009) point out, it might be appropriate to add new items, given the low number of items in some scales, and eliminate or reformulate inverse items, as adolescents may have comprehension difficulties, particularly with those formulated with a double negative. By contrast with this, however, our study focuses on older adolescents (12 to 17), indicating that psychometric properties do not improve with greater reading ability.

With regard to gender and age, girls score higher in affiliation, pleasure sensitivity, shyness and activation control, while boys obtain higher scores in activity level and high intensity pleasure. These results agree with previous studies, which reveal that girls have higher scores in effortful control (Sooyeon, Brody & Murry, 2003, Veenstra et al.. 2008), affability and shyness, while boys score higher in high intensity pleasure/surgency (Sooyeon, Brody, & Murry, 2003; Zhang, Shen, & Gao, 2008). When it comes to age, differences are also observed in the dimensions of activation control and activity level, with higher scores at lower ages, while older

adolescents score higher in high intensity pleasure/surgency. Similar results were found by Zhang, Shen & Gao (2008). This progressive decrease in activation control with age is more pronounced in boys, whereas a decrease in activity level is found more in girls.

Generally speaking, the tridimensional structure of Rothbart's temperament model is confirmed: positive emotionality or extraversion, negative emotionality and effortful control. However, as our results suggest, the factors of fear, attention, and inhibitory control are not fully robust, at least in our version.

The correlations obtained between the dimensions of the EATQ-R and the psychopathological dimensions of the YI-4 confirm results from previous studies in which a relationship was detected between negative emotionality (emotionality/neuroticism), effortful control and psychopathology (Muris & Meesters, 2009). Specifically, activation control and frustration are related to conduct disorders (AD/HD, conduct and oppositional defiant) while shyness and frustration are related to anxiety or depression. Various studies (Huey & Weisz, 1997; Ehrler, Evans, & McGhee, 1999; Oldehinkel, Hartman, De Winter, Veenstra, & Ormel, 2004; Laredo *et al.*, 2007; Visser *et al.*, 2007) point to a relationship between emotional reactivity with internalizing symptomatology (anxiety and depression), as indicated by the correlations between shyness and frustration with anxiety and depression. To cite some examples, Visser *et al.* (2007) found negative correlations between effortful control and internalizing symptomatology, but also with externalizing symptomatology. In the same way, frustration correlates with both psychopathological dimensions while shyness only correlates positively with internalizing symptomatology. In the case of depression, negative relationships were observed with activation control. Similar results were observed when relating depression with measures of temperament, such as emotional instability or conscientiousness (Carrasco & del Barrio, 2007). As concluded by Compas, Coonor-Smith and Jaser (2004), the temperament characteristics of positive and negative emotionality, and to a lesser extent attentional control, are related with depressive symptomatology in children and adolescents. It is worth noting the relationship between all of the evaluated psychopathological dimensions and low scores in activation control, which is the dimension that correlates most strongly. This confirms the negative relationship between effortful control and psychopathology (Oldehinkel *et al.*, 2004; Muris & Meesters, 2009). Similarly, in general terms, the results of this study confirm the relationship of emotional reactivity with both emotional and behavioural disorders, as has already been revealed in various studies, including those in which the EATQ-R was used (Muris, Meesters & Blijlevens, 2007).

Limitations

Studies conducted on the adolescent population in the context of the school classroom have the advantage of reaching a higher number of subjects, but the limitation, despite the best efforts of researchers, of not guaranteeing a reliable and valid response from subjects.

Furthermore, comparing information contributed by parents with that of their children would have allowed us to determine the degree of concordance in the temperament dimensions evaluated and verify psychometric properties. Equally, repeating measurements would have provided us with information regarding the stability of temperamental characteristics.

Despite these limitations, the results of this study demonstrate that the self-administered version of the EATQ can be a useful instrument in evaluating the temperament dimensions proposed in Rothbart's model.

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