



Alexithymia Questionnaire for children (AQC): Psychometric properties, factor structure and initial validation in a Spanish sample

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Abstract

The objective of the present study was to examine the factor structure and concurrent validity of the alexithymia questionnaire for children –AQC (Rieffe et al., 2006) in a Spanish sample.

The Alexithymia Questionnaire for Children (Rieffe et al., 2006) was applied in a sample of 274 children with a mean age of 9.7 years ($SD=1.22$; range 8 to 12 years). The 53.6% were girls and 46.4% were boys. The participants were drawn from various primary schools in Madrid (Spain), of second and third cycle. An exploratory analysis was performed using SPSS 17.0 package, and confirmatory factorial using the AMOS 18.0 module. The factorial structure of alexithymia Questionnaire for Children showed an solution of the three (Difficulty Identifying & Describing Feeling, Externally Oriented Thinking and Positive Emotional Attitude) and four factor structure model (Difficulty Identifying Feeling, Difficulty Describing Feelings, Positive Emotional Attitude and Externally Oriented Thinking). The confirmatory factorial analysis demonstrated, with some limitations, an acceptable fit of both models. The Alexithymia Questionnaire for Children adaptation in Spanish children could be a tool to assess how children identify and describe their feelings. However, it seems necessary to evaluate the psychometric properties of this tool in other children sample in order to support or refuse the founded factor solution in this research with the previous literature.

Keywords: alexithymia, children, feelings, quality of life, emotions.

Introduction

Alexithymia is a multifaceted construct that was described by Sifneos (1973) as difficulty identifying and communicating feelings, differentiating feelings and somatic sensations of emotional arousal, a decrease of fantasy and imagination and an externally oriented cognitive style (Nemiah, Freyberger, & Sifneos, 1976). Although, there are different tools to evaluate the alexithymia construct, the 20-Item Toronto Alexithymia Scale (TAS-20), developed a decade ago (Bagby, Taylor, & Parker, 1994), has since become the most widely used instrument for assessing alexithymia in both research and clinical practice. The TAS-20 yields three factors (difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking). Items assessing fantasy and imaginable activity, which are reduced in alexithymia, were eliminated during the development of the scale primarily because they had high correlations with measures of social desirability. There is evidence to suggest that reduced fantasy and imaginable activity are assessed indirectly by the externally oriented thinking factor (Bagby, Taylor, & Parker, 1994). The reliability and validity of this three-factor structure have been established in several studies in clinical and

nonclinical adult populations, although there are also many studies in which only a two-factor structure was observed (Kooiman, Spinoven, & Trijsburg, 2002). Overall, Difficulty Identifying Feelings and Difficulty Describing Feelings factors show good psychometric properties, but Externally Oriented Thinking factor appears to be weak. The TAS-20 total scores and Difficulty Identifying Feelings and Difficulty Describing Feelings factors correlates positively with self-reported physical symptoms (Bach, Bach, & de Zwaan, 1996; Taylor & Bagby, 2000), while the correlation with the Externally-Oriented Thinking factor is not always evident (Grabe, Spitzer, & Freyberger, 2004; Lumley, Oviess, Stettner, Wehmer, & Lakey, 1996).

Alexithymia has been widely studied among adults, it has been related to the somatization disorders (Sifneos, 1973) as a personality trait hypothesised as risk factors for the development or persistence of medically unexplained symptoms, and later as a risk factor for a wide range of medical or health related problems (Bagby, Taylor, & Parker, 1994). Surprisingly, alexithymia in children has scarcely been investigated, even though it is assumed to be a personality trait that might be present in childhood (Joukamaa et

al., 2007). Most of researches are retrospective and have been conducted in adults. These studies analyses factors in childhood that could improve understanding of alexithymia during lifespan development, such as childhood emotional abuse and disturbances in the early parent-child relationship (Swannell et al., 2012; Thorberg et al., 2011). However, there are few researches performed in sample of children. These researches have shown, following the approach of adult samples, the relationship of alexithymia with physical complaints in both healthy children sample (Jellesma et al., 2009, Allen et al., 2011; Rieffe et al., 2010) and children with physical or mental pathology (Mishra et al., 2012; Loas et al., 2012). Likewise, several studies have shown an inverse relationship between alexithymia and quality of life (Fukunishi et al., 2001; Karwowski et al., 2009). Regarding the measure of alexithymia in children, most of them have been developed according to the original TAS 20 questionnaire (Bagby et al., 1994) because it is the most well-known applied tool in adults. The first adaptation of this questionnaire at children was conducted by Rieffe et al. (2006) in 740 children in the Netherlands of two age groups (primary schools -mean age 11 years- and secondary schools -mean age 13 years-). Consistent

with the original adult questionnaire for alexithymia (TAS-20) developed by Bagby et al. (1994), their alexithymia questionnaire for children (AQC) consisted of 20 items, representing 3 factors (Difficulty Identifying Feelings, Difficulty Describing Feelings and Externally-Oriented Thinking). Item 6, 13 and 14 are identical to the items of the original TAS-20, but the other items were reformulated in order to get a better understanding by the children, but maintaining the same meaning. Children were instructed to score each item on a three-point response scale (0 = not true; 1 = a bit true; 2 = true), instead of the five-point scale that is used for the TAS-20, in order to simplify the response scale for children. Rieffe et al. (2006) identified the three-factor structure of alexithymia, although the factor Externally-Oriented Thinking showed low factor loadings and a low reliability. The predictive value of the questionnaire was also satisfactory. Difficulty Identifying Feelings and Difficulty Describing Feelings factors contributed to the prediction of self-reported somatic complaints in children, but the factor Externally-Oriented Thinking failed to do so.

Recently, these authors (Rieffe et al., 2010) translated into farsi and applied the AQC to an Iranian sample of 579 children and young

adolescents (mean age 12 years). Due to the Externally-Oriented Thinking factor showed poor psychometric properties and predictive validity, it was omitted in Iranian study. The two remaining factors Difficulty Identifying Feelings and Difficulty Describing Feelings were taken together. A principal component analysis on the remaining 12 items with the factor count limited to one factor, instead for two, showed, indeed, that all items loaded higher than .35 on this factor, except for item 12 with a loading of .28. The item 12 was not omitted from the questionnaire, however, because the combined scale still showed good internal consistency with all 12 items included. According to these authors (Rieffe et al., 2010), many studies report that the two first factors of this questionnaire show a relatively high inter-correlation (Kooiman et al., 2002).

On the other hand, French version of the AQC (Loas et al., 2010) was applied to eighty children with a mean age of 11.81 (range: 9-16). The psychometric properties of the Confirmatory Factor Analysis showed that the 3-factor solution of the AQC was adequate although the Externally-Oriented Thinking factor had low factor loadings.

Moreover, Italian version of the AQC (Di Trani et al., 2009), was applied to 576 children recruited from primary and

secondary schools (age mean: 10.78, SD=1.67). Exploratory factor analysis revealed preliminary evidence of a four factor structure: Difficulty Identifying Feelings and Difficulty Describing Feelings, Confusion and physical Sensations and Externally-Oriented Thinking. The Cronbach's alpha indicated adequate internal consistency, and significant correlations were observed among the total score and the four factors.

Methods

The objective of the present study was to examine the factor structure and concurrent validity of the Alexithymia Questionnaire for Children (AQC; Rieffe et al., 2006) in a Spanish sample. In this study, 274 children (mean age 9.7 years; SD=1.22; range 8 to 12 years), 53.6% girls, were asked during class to fill out the questionnaires. Participants were drawn from various primary schools in Madrid (Spain), of second and third cycle. The second cycle (third and fourth grade) group comprised 142 children (62 boys, 80 girls, mean age 8.72; SD=.65 years; range 8 to 10 years). The third cycle (fifth and sixth grade) group comprised 132 children (65 boys and 67 girls, mean age 10.74 years, SD=.72, range 10 to 12 years). Parental consent was obtained for all participants.

Alexithymia questionnaire for children (AQC; Rieffe et al., 2006)

In this study, it has applied the Alexithymia Questionnaire for Children (AQC; Rieffe et al., 2006), consistent with the original adult questionnaire for alexithymia (TAS-20; Bagby et al., 1994). The authors identified three factors: a) Difficulty Identifying Feelings (DIF, 7 items), Difficulty Describing Feelings (DDF, 5 items) and Externally-Oriented Thinking (EOT, 8 items). The internal consistency coefficient (Cronbach's Alpha) was .71. In this sense, Cronbach's Alpha was .73 for DIF and .75 for the DDF meanwhile for the EOT was .29. The fit measures for this model was: $X^2 = 408$; $X^2/\text{degree freedom} = 2.44$; Goodness of Fit Index (GFI) = .95; Ad-adjusted Goodness-of-Fit Index (AFGI) = .93; Root Mean Square Error of Approximation (RMSEA) = .04 (Rieffe et al, 2006).

The original English AQC version was translated into Spanish by a bilingual psychologist. Then, it was sent to a co-operating primary school, where one teacher reviewed the items in a way appropriate for primary school-aged children. This version was discussed with the teaching staff until consensus was reached. This newly version was then sent back to the other bilingual

psychologist who backtranslated the items and compared them with the original English version. If the content of an item had changed, additional revisions were made. The last version was sent to the co-operating school again for their approval. Children were instructed to score each item on a three-point response scale (0 = not true; 1 = a bit true; 2 = true), the same of the AQC (Rieffe et al., 2006), in order to simplify the response scale for children and provide clear verbal labels with each answer category.

Health-Related Quality of Life Questionnaires for Children and Adolescents (Kidscreen questionnaire; Ravens-Sieberer et al., 2005)

As a criterion of validity it has used the spanish version (Aymerich et al., 2005) of the Kidscreen 52 items HRQOL Health Questionnaire for Children and Adolescents. This questionnaire was developed as a self-report measure applicable for healthy and chronically ill children and adolescents aged between 8 and 18 years. The instrument is composed by ten dimensions: physical well-being, 5 items (Cronbach's Alpha = .80); psychological well-being, 6 items (Cronbach's Alpha = .89) moods and

emotions, 7 items (Cronbach's Alpha = .86), self-perception, 5 items (Cronbach's Alpha = .79), autonomy, 5 items (Cronbach's Alpha = .84), parent relation and home life, 6 items (Cronbach's Alpha = .89), financial resources, 3 items (Cronbach's Alpha = .89), social support and peers, 6 items (Cronbach's Alpha = .85), school environment, 6 items (Cronbach's Alpha = .87) and social acceptance, 3 items (Cronbach's Alpha = .80). The Kidscreen 52 items instrument has been used simultaneously in 13 European countries in the cross-cultural harmonisation and development of the measure (Ravens et al, 2005).

The answer scale of this ranged from 1 = never to 5 = always or from 1 = nothing to 5 = very much. Concurrent validity of AQC has been tested using information on Kidscreen 52 items edition.

Procedure

Firstly, we developed a pilot study with a group of 4 children ages 8 to 12 years to see the difficulties of management and the adequacy of the design of each of the items of the instrument. No changes were done after piloting the instrument. The questionnaire was handed out one for each participant per class. After the researcher gave them the instructions in class, children

were instructed to complete the questionnaire, which took them about 30 minutes per class.

Analysis

It has applied an exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) through SPSS 17 and Amos. 18.0. Previously to the analysis assumptions were checked to ensure the realization of a factor analysis: large sample size, multivariate normality, linearity and correlation between variables. The following criteria were used in order to fit the model:

- a) χ^2 statistic (Ullman, 1996)
- b) Comparative fit Index (CFI; Bentler, 1990) and AGFI = Adjusted Goodness-of-Fit Index (AGFI, Jöreskog y Sorbom, 1979); the good index should be more than .90, and ideally, greater than .95 (Hu & Bentler, 1999).
- c) The root mean squared error of approximation (RMSEA; Steiger & Lind, 1980) and
- d) NFI = Normative Fit Index (NFI, Bentler y Bonett, 1980) as CFI and GFI the greater would be over .90; it increases with the size of the sample.

Results

The table 1 shows the means, standard deviations and inter-item correlations for the Alexithymia Questionnaire for Children.

Table 1. Means, standard deviation and inter-item correlations for the Alexithymia

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Item 1	.76	.62																			
Item 2	1.00	.76	.281**																		
Item 3	.37	.65	.231**	.064																	
Item 4	1.06	.75	-.079	-.292**	-.064																
Item 5	1.20	.70	.051	-.008	.001	.088															
Item 6	.86	.75	.223**	.169**	.030	-.123*	.052														
Item 7	.64	.74	.433**	.256**	.295**	-.100	-.028	.266**													
Item 8	.90	.73	.106	-.019	.212**	-.091	.058	.072	.063												
Item 9	1.15	.74	.360**	.387**	.130*	-.238**	.075	.258**	.347**	-.015											
Item 10	1.54	.63	.139*	.034	-.007	.108	.154*	.014	.125*	-.029	.020										
Item 11	1.10	.79	.123*	.345**	.207**	-.183**	.042	.048	.222**	.098	.330**	-.051									
Item 12	.51	.74	.164**	.127*	.084	-.032	-.011	.100	.334**	-.007	.216**	.061	.201**								
Item 13	.54	.75	.420**	.201**	.450**	-.152*	-.023	.217**	.408**	.072	.283**	.092	.174**	.220**							
Item 14	.73	.79	.247**	.185**	.120*	-.066	-.058	.282**	.315**	.029	.295**	-.036	.147*	.111	.301**						
Item 15	1.00	.76	.017	-.006	.152*	-.020	-.022	.001	.113	.166**	.045	.057	.024	.029	.092	.130*					
Item 16	1.17	.78	-.014	.111	.044	-.037	.091	.046	.046	.067	.088	.043	.078	-.053	.057	.120*	.198**				
Item 17	.90	.79	.271**	.341**	.199**	-.175**	.009	.188**	.246**	.067	.477**	.055	.410**	.180**	.225**	.204**	.061	-.026			
Item 18	1.07	.76	.152*	.075	.149*	.075	.123*	.011	.186**	.064	.110	.154*	.204**	.081	.133*	.104	.018	.071	.186**		
Item 19	1.18	.75	.062	.083	-.030	.065	.202**	.077	-.004	.111	.062	.141*	.030	.113	.016	.105	.025	.040	.104	.111	
Item 20	.54	.73	.055	.003	.241**	-.049	-.066	.003	.204**	.060	.128*	-.016	.047	.079	.229**	.209**	.088	.174**	.024	.019	-.097

** < .01 * < .05

Exploratory and Confirmatory Factor Analysis

To evaluate the factor structure of Alexithymia Questionnaire for Children, exploratory factor analysis (EFA) was used through SPSS 17.0 software program. The Bartlett's Test of Sphericity was 775.859 ($df = 190$) at $p < .00$ and Kaiser Meyer Olkin Index (KMO) was .77.

The initial factor structure identified a pattern of 6 factors incompatible with the conceptual framework. Two models, according to the previous literature, were proposed. One with three factors (M1) based on the results found by Rieffe et al. (2006) and Loa et al. (2010), and the second with four factors (M2), based on the results found by Di Trani et al. (2009). On the one hand, for the first model (M1), the factor structure

was composed by three factors: the first one was defined by 10 items: item 9 “sometimes I can’t find the words to say how I feel inside; item 2 “I find it difficult to say how I feel inside”; item 17, “It is difficult for me to say how I really feel inside, even to my best friend”; item 11 “I find it hard to say how I feel about other people”, item 7 “I am often puzzled by things that I feel in my body”, item 1 “I am often confused about the way I am feeling inside”, item 4 “I can easily say how I feel inside”, item 6 “When I am upset, I don’t know if I am sad, scared or angry”, item 14 “I often don’t know why I am angry” e item 12 “Other people tell me that I should talk more about how I feel inside”. This factor could be defined as Difficulty Identifying & Describing Feeling (DIDF). The standardized factor loadings were within a minimum of -.42 (item 4) and a maximum of .73 (item 9); the item 4 also loaded at the third factor .40 and the item 7 and 14 also loaded at the second factor (.45 and .34 respectively). The variance explained for this factor was 19.93%.

The second one was composed by 6 items: item 3 “I feel things in my body that even doctors don’t understand”, item 20 “When I have to concentrate on a film to understand the story, I enjoy the film much less”, item 13 “I don’t know what’s going on inside

me”, item 15 “I prefer talking to people about everyday things, rather than about how they feel”, item 16 “I prefer watching funny television programs, rather than films that tell a story about other people’s problems” and the item 8 “I’d rather wait and see what happens, instead of thinking about why things happen”; in this sense, the standardized factor loadings were within a minimum of .31 (item 8) and a maximum of .64 (item 3). The item 13 also loaded at the first factor .43. This factor could be called as Externally Oriented Thinking (EOT). The variance explained for this factor was 7.84%.

And finally, the third one was composed by 4 items: item 19 “Thinking about how I feel, helps me when I want to do something about my problems”, item 10, “It is important to understand how you feel inside” item 5 “When I have a problem, I want to know where it comes from and not just talk about it” and item 18 “I can feel close to someone, even when we are sitting still and not saying anything”. For the third factor the standardized factor loadings were within a minimum of .46 (item 18) and a maximum of .60 (item 19). This factor could be defined as Positive Emotional Attitude (PEA). The variance explained for this factor was 7.74% and the total variance

explained for the model was 34.52%. On the other hand, for the second model, the factor structure was composed by four factors: the first one was defined by 7 items, with the following standardized factor loadings: item 7 = .73; item 13 = .72; item 1 = .64; item 3 = .48 and .45 for the third factor; item 14 = .46; item 12 = .44 and item 6 = .34. This factor can be identified with the original Difficulty Identifying Feelings factor (DIF). The variance explained for this factor was 18.93%. The second one was composed by 5 items: item 2 = .69, item 11 = .63, item 17 = .63, item 9 = .62 and .38 at the first factor, item 4 = -.56 and .33 at the third factor. This factor could be defined as Difficulty Describing Feelings (DDF). The explained

variance for this factor was 7.84%. The third one was composed by 4 items: item 5 = .62, item 19 = .61, item 10 = .54 and item 18 = .46. This factor can be identified with the factor Positive Emotional Attitude (PEA). The variance explained for this factor was 7.74%. Finally, the fourth one was composed by 4 items: item 15 = .59, item 16 = .58, item 8 = .54 y item 20 = .42; this item also loaded at the first factor (.36). This factor was identified as Externally Oriented Thinking (EOT). The variance explained for this factor was 6.54%. All factor loadings were well above the values considered indicative of an adequate consistency. The total variance explained for this model was 41.06 %.

Table 2. Factor loading for the M1 (Three-factor model) and M2 (Four-factor model) of the Alexithymia Questionnaire for Children.

Item(*)	1	2	3	Item(*)	1	2	3	4
9 (DIF)	.73			7(DIF)	.73			
2 (DDF)	.68			13(DIF)	.72			
17(DDF)	.68			1(DIF)	.64			
11(DDF)	.57			3(DIF)	.48			.45
7(DIF)	.52	.45		14(DIF)	.46			
1(DIF)	.52			12(DDF)	.44			
4(DDF)	-.42		.40	6(DIF)	.34			
6(DIF)	.41			2(DDF)		.69		
14(DIF)	.40	.34		11(DDF)		.63		
12(DDF)	.37			17(DDF)		.63		
3(DIF)		.64		9(DIF)	.38	.62		
20(EOT)		.58		4(DDF)		-.56	.33	
13(DIF)	.43	.56		5(EOT)			.62	
15(EOT)		.47		19(EOT)			.61	
16(EOT)		.35		10(EOT)			.54	
8(EOT)		.31		18((EOT)			.46	
19(EOT)			.60	15(EOT)				.59
10(EOT)			.58	16(EOT)				.58
5 (EOT)			.57	8 (EOT)				.54
18 (EOT)			.46	20 (EOT)	.36			.42

Note: Factors loadings below .30 were excluded.

()Factor Loading regarding the original validation by Rieffe et al. (2006): DIF: Difficulty Identifying Feelings, DDF: Difficulty Describing Feelings, EOT: External Oriented Thinking*

In order to test the fit of a three-factor model (M1) and the four-factor model (M2), CFA was developed using the AMOS 18.0 structural equation modeling software program (Arbuckle & Wothke, 1999). The M1 was an acceptable fit for the observed data: $X^2 = 231.05$; $X^2/\text{degree freedom} = 1.42$; Goodness of Fit Index = .925; Ad-adjusted Goodness-of-Fit Index = .903; Normative Fit Index = .735; Comparative Fit Index .896; RMSEA = .04; secondly, the

M2 was also a good fit for the observed data: $X^2 = 215.03$; $X^2/\text{degree freedom} = 1.34$; Goodness of Fit Index = .930; Ad-adjusted Goodness-of-Fit Index = .908; Normative Fit Index = .756; in both cases the Normative Fit index was not between .90 and .95, acceptable range according to the previous literature; Comparative Fit Index .920; RMSEA = .03; and in this sense, all the X^2 differences between the models were statistically significant at $*p < .001$.

Altogether, the indices assessed the model 1 and 2 as an adequate representation of the observed data, although in both models normative Fit Index was a score under the

adequate index. The table 3 shows a data summary of the M1 (three-factor model) and M2 (four-factor model).

Table 3. Confirmatory Factor Analysis (n = 242).

	χ^2	χ^2/df	GFI	AGFI	NFI	CFI	RMSEA	$\Delta\chi^2$	Δdf
M1	231.05	1.42	.925	.903	.735	.896	.04		
M2	215.03	1.34	.930	.908	.756	.920	.03	M1-M2 = 41.1*	2

Note. χ^2 = Chi-square; df = degrees of freedom; χ^2/df = ratio Chi-square/ degrees of freedom; GFI = Goodness-of-Fit Index; AGFI = Ad-adjusted Goodness-of-Fit Index; NFI = Normative Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; All the χ^2 differences between the models were statistically significant at * $p < .001$.
M1 = Three-factor model; M2 = Four-factor model

Internal Consistency

The Cronbach's alpha reliability was .70. According to the result of the M1, the Cronbach's alpha for the first factor was .68, for the second factor .51 and for the third factor .22. However, at the M2 (four factor structure) the Cronbach's alpha was .70 for the first factor, .46 for the second one, .50 for the third factor and .36 for the fourth factor.

Validity

Criterion-related validity was established by correlating with constructs theoretically linked to Alexithymia in the literature. In fact, alexithymia was inversely related with quality of life measures. The table 4 shows the zero-order correlations between the M1 and M2 factor structure and all dimensions of Kidscreen questionnaire: physical well-being, psychological well-being, mood and emotions, self-perception, autonomy, parent relation and home life, financial resources, social support and peers, school environment, social acceptance. According

to the findings of the M1, individual with higher scores on the DIF factor reported lower scores of physical well-being, psychological well-being, moods and emotions, self-perception, autonomy, relatives, financial resources, social support and peers, school environment and social acceptance. There were negative and significant correlations among EOT factor and physical well-being, moods and emotions, parent relation and home life, school environment and social acceptance. And finally, with the PEA factor there were positive and significant correlation respect to physical well-being, parent relation and

home life, financial resources and school environment.

On the other hand, at the M2 individual with higher levels of DIF reported lower level of physical well-being and social support and peers ($p < .05$) and in the rest of Kidscreen dimensions ($p < .01$). Likewise, DDF was correlated negatively at the $p < .01$ with all Kidscreen dimensions except for physical well-being. The PEA factor showed positive and significant correlation at the $p < .05$ with physical welfare and at the $p < .01$ with economy. The EOT factor wasn't correlated with any factor of Kidscreen questionnaire.

Table 4. Zero order correlations of the Alexithymia Questionnaire for Children with measures of Kidscreen questionnaire (Health-Related Quality of Life Questionnaires for Children and Adolescents).

	M1			M2			
	DIDF	EOT	PEA	DIF	DDF	PEA	EOT
Physical well-being	-.130*	.029	.136*	-.150*	.009	.128*	-.004
Psychological well-being	-.301**	-.144*	.088	-.243**	-.239**	.077	.004
Moods and emotions	-.416**	-.248**	-.040	-.345**	-.323**	-.055	-.099
Self-perception	-.335**	-.122	-.019	-.285**	-.214**	-.033	-.012
Autonomy	-.264**	-.105	.093	-.199**	-.225**	.082	.065
Parent relation and home life	-.327**	-.175**	.136*	-.252**	-.293**	.124	.022
Financial resources	-.269**	-.099	.204**	-.223**	-.200**	.193**	.039
Social support and peers	-.178**	-.109	.094	-.133*	-.173**	.087	.009
School environment	-.243**	-.168**	.127*	-.189**	-.234**	.118	-.027
Social acceptance	-.281**	-.165**	-.055	-.242**	-.199**	-.065	-.091

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2 tailed)*

M1 = Three-factor model; M2 = Four-factor model.

DIDF: Difficulty Identifying & Describing Feeling,

DIF: Difficulty Identifying Feeling, DDF: Difficulty Describing Feeling,

EOT: Externally Oriented Thinking, PEA: Positive Emotional Attitude.

Discussion

According to the suggested outcomes of this study, the features of alexithymia can be identified, with some limitations, in a sample of Spanish children. The three forced factor structure has showed several differences according to the Rieffe et al. (2006) and also with the French validation (Loas et al., 2010). These authors identified clearly two factors: Difficulty Identifying Feelings and Difficulty Describing Feelings.

In this sense, the first factor of our three-factor model was composed by the items 1, 6, 7, 9, 13 and 14 (from the original Difficulty Identifying Feelings) and moreover the items 2, 4, 11, 12 and 17 (from the original Difficulty Describing Feeling). The previous literature of Alexithymia has showed that the factors Difficulty Identifying Feeling and Difficulty Describing Feeling are two concepts that can be clearly distinguished from each other, and

both show a high reliability and validity. Nevertheless, in our factorial solution of the M1 (three forced factor structure) we have identified only a factor, Difficulty Identifying & Describing Feeling. This fact was also found by Rieffe et al. (2010) when they applied a Principal Component Analysis and DIF and DDF were taken together. According to these authors, all items loaded higher than .35 on this factor, except for item 12 with a loading of .28. The factor showed good internal consistency with all 12 items included ($\alpha = .71$). Thus, many studies report that the first two factors of this questionnaire show a relatively high inter-correlation (Kooiman et al., 2002). These authors also found out that this measure of Alexithymia joint on one factor has good external validity regarding emotional states and symptoms (Rieffe et al., 2010). In our case, the items loaded of this unique factor (DIF+DDF) were between .37 and .73 and the item 4 = -.42 with a Cronbach's Alpha = .68.

Finally, the third factor (Externally-Oriented Thinking) found in the model of Rieffe et al. (2006) was appeared in our solution in two factors (Externally Oriented Thinking, according to the same label of Rieffe's study, and Positive Emotional Attitude); the first one with the items 8, 15, 16 and 20 and

the second one with the items 5, 10, 18 and 19. In both cases the reliability and validity were low. On the other hand, the M2 model (four forced factor model) has showed the first factor, Difficulty Identifying Feeling, almost with the same structure of the original DIF in AQC (Rieffe et al., 2006) (items 1, 3, 6, 7, 9, 13 and 14). Also the second factor was identified according to the original, Difficulty Describing Feeling, with the following items: 2, 4, 11 and 17. Only, there are variations from the structure found out by Rieffe et al. (2006) regard to the item 12 "Other people tell me that I should talk more about how I feel inside" than in the original structure appears in the factor Difficulty Describing Feelings (DDF) and in our research appears in the factor Difficulty Identifying Feelings (DIF). Similarly, item 9 "Sometimes I can't find the words to say how I feel inside" appears saturated on two factors, Difficulty Identifying Feelings (DIF), according to the original structure showed by Rieffe et al. (2006) but also in the factor Difficulty Describing Feelings (DDF), with a higher factorial loading at the second factor (.62). Curiously, the item 12 showed factorial loadings below .35 in DDF at the Iranian validation by Rieffe et al. (2010), and at the Italian validation (four factor model) by Di Trani et al. (2009);

likewise item 9 also loaded with similar weights in both factors (DIF and DDF) at Italian validation (three factor and four factor models) (Di Trani et al., 2009), as in our research.

The standardized factor loadings solution for the items 9 and 12 could be explained according to the distinction between the subjective and physiological component of emotion. Rieffe's team (2007) in a later research aimed at the development of the Emotion Awareness Questionnaire for Children (Rieffe et al., 2007), taking some of the scales of AQC (Rieffe et al., 2006) distinguished between identification of the subjective feeling state (usually termed "emotion" in daily use; Scherer, 2000) and the identification of physiological emotion phenomena, calling this dimension as "Bodily Awareness". Bucci's (1997) 'multiple code theory' holds that children develop non-verbal emotional schemata based on sensory, visceral, and kinaesthetic sensations before they can label these experiences in emotional terms. Thus, the items structure of the DIF factor would be doing reference to the identification of physiological emotion phenomena and the DDF to the identification of the subjective feeling state, and carrying an implicit

communication component to another. Perhaps, the meaningful correlation found between the two factors (DIF and DDF) may be explained, specially in children, to the high relationship between identification and emotional communication. The inclusion of variables related to communication skills, assertiveness, shyness, extroversion/introversion should be considered in future work to test this type of influences. According to the M2, our results are similar with the findings of Di Trani et al. (2009) who found a solution of four factors: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), Confusion and Physical Sensations (CPS) and Externally-Oriented Thinking (EOT). The founded factor by Di Trani et al. (2009) in relation to Externally Oriented Thinking was the same according to our exploratory solution. On the other hand, Confusion and Physical Sensations was broadly different according to the founded factor by us. Thus, while in the case of factor found by Di Trani et al. (2009) refers to confusion regarding emotional physiological signs (comprising items from Difficulty Identifying Feelings, Difficulty Describing Feelings and others from Externally-Oriented Thinking factors in its initial release), in our case it is composed by

four items from the Externally-Oriented Thinking factor in its initial version, and it refers to a positive attitude toward emotional focusing. On the other hand, the factor defined as Confusion and physical Sensation found by Di Trani et al. (2009) could be understood as a distinction recognized by Frijda (1991) between moods (global affective states without a cause, object or onset) and emotions (affective states that are directly linked to a specific event or situation). It is assumed that people with alexithymia can identify their own mood states, but fail to identify emotions, because they do not link their affective condition to specific situations, memories or expectations (Taylor, 1999). It is assumed that alexithymic people fail to analyse the situation in a way that helps them to deal with their emotions adaptively, which could explain the predominantly negative mood states and increased self-reported physical symptoms that characterise alexithymic people. Therefore, Di Trani et al (2009) found a distinction between the difficulty in order to put names to emotions and the confusion created by the sensations of the body. In addition, in our exploratory analysis appears a factor called Positive Emotional Attitude (PEA) that hadn't appeared in previous validations. Judging by

the concurrent external validity data (positive relations with quality of life), this factor could move away from the concept of alexithymia. The Positive Emotional Attitude refers to the importance attached to the positive attitude of considering the emotional signs in appropriate conduct in coping with different situations. It could be defined as a positive predisposition towards the use of emotional signs. The fourth factor (EOT) found in the model M4, regard to Externally-Oriented Thinking of the structure found by Di Trani et al. (2009) had no significant relations with our measure of quality of life used as concurrent validity, consistent with the results in other studies (Grabe, Spitzer, & Freyberger, 2004; Lumley, Oviess, Stettner, Wehmer, & Lakey, 1996). It should be noted that both, the EOT and PEA factors, are already present, with a very similar configuration, at the model M3. However, in this model both factors showed negative correlations with five quality of life dimensions for EOT, and positive correlations with four quality of life dimensions for EAP).

Conclusion

This paper presents some limitations that should be better highlighted. Firstly, the presence of bias in the sample with regard to

its universe can be explained by the use of non-probability accidental sampling. This circumstance can alter the findings of the investigation as a result of homogeneity of profile of children in our sample. Secondly, the translation of the original research into Spanish should have been accomplished through simultaneous translation of several researchers and subsequent analysis of convergence among them, and not through a process of reverse translation of native language experts. However, it should be noted that the wording and syntax of the original items, as well as the vocabulary used, are extremely simple and easily understandable, which can greatly reduce the potential biases in Spanish adaptation performed by this procedure. And finally, several factors at the M1 and specially at the M2 had a low reliability ($\alpha = .51$ or $.36$). We recommend applying again a factor analysis in order to try to adjust these factors to the phenomenon of Alexithymia. In sum, the factorial structure of the alexithymia construct has showed a significance differences regard to its application in several samples with difference ages (adolescents and children). In general, the psychometric properties have been acceptable on the first and second factor, DIF and DDF (Bagdy et al, 1994; Rieffe et

al, 2006) while the third factor has showed low validity and reliability. In addition, some authors have identified a solution with four factors, again with high validity and reliability with the two first factors (DIF and DDF) but with a low Cronbach's alphas and low validity in the rest of the factors. In this sense, the data have showed that the first two factors DIF and DDF are the best indicators of the concept of alexithymia especially as regards their relationship to disease states positive and negative quality of life. The low predictive capacity and internal consistency of the Oriented Thinking External factor can be explained by the possibility that this factor is not one-dimensional and includes other dimensions. Although more researches are needed, the data suggest that DIF and DDF factors are a good measure of alexithymia well together or separately. This fact could be an advantage for the use of shorter questionnaires in children. In the case of keeping the two factors separately DIF and DDF should be addressed equally to the conceptualization of the distinction between the subjective and physiological component of emotion as a possible additional criterion for classifying the items.

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