

Measuring Positive Emotional Memories in Adolescents: Psychometric Properties and Confirmatory Factor Analysis of the Early Memories of Warmth and Safeness Scale

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ABSTRACT

This paper presents the adaptation and validation of the Early Memories of Warmth and Safeness Scale for the Portuguese language in adolescents. The psychometric properties of EMWSS were analysed and its factorial structure was confirmed using a Portuguese community sample of 651 adolescents. Exploratory Factor Analysis supported a single-factor structure with 21-items and results from a Confirmatory Factor Analysis showed the goodness of fit of the model. The EMWSS for adolescents revealed excellent internal consistency, good test-retest reliability and negative correlations with depression, anxiety and stress symptoms. Overall, the results indicated that the EMWSS in its Portuguese version for adolescents is a reliable and valid self-report instrument to assess positive emotional memories in this age group.

Key words: EMWSS, adolescence, factor analysis, positive emotional memories.

Novelty and Significance

What is already known about the topic?

- Early experiences of warmth, love and affection in childhood have a positive impact on mental health.
- It seems important to assess the recall of how one felt in relation to others' behaviour (e.g., be loved, cared for), rather than just recalling their behaviour (e.g., parenting styles/practices).

What this paper adds?

- This paper is the first to analyse the psychometric properties of EMWSS in an adolescents' population.
- This study contributes to broaden the available measures for adolescents.
- The EMWSS-A is a useful and robust assessment tool for research and clinical practice with adolescents.

Literature has shown that early childhood experiences, especially those related to feelings of threat or safeness, play a key role on emotional and social subsequent development (Gilbert & Perris, 2000; Schore, 1998). The exposure to early threatening experiences, such as abuse, rejection, neglect, criticism and bullying, has been linked

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to greater vulnerability to psychopathology and maladjustment in adulthood (Gilbert, Baldwin, Irons, Baccus, & Palmer, 2006; Irons, Gilbert, Baldwin, Baccus, & Palmer, 2006). In contrast, experiences of safeness and soothing are not only associated with the absence of threat but also with the presence of affiliative signals (e.g., reassuring, warmth, care, affection) that may be key to regulating affective states (Baldwin & Dandeneau, 2005; Gilbert *et al.*, 2006; Richter, Gilbert, & McEwan, 2009).

Furthermore, when faced with stressful setbacks, recall of parental warmth was associated with the ability to be self-reassuring and self-soothing (Irons *et al.*, 2006). Also, this ability to self-reassurance is negatively related to depression symptoms (Gilbert *et al.*, 2006) and positively associated with good mental health outcomes (Cacioppo, Berston, Sheridan, & McClintock, 2000; Schore, 1994; Gilbert *et al.*, 2006).

Parental behaviour can thus provide crucial early environmental contexts for the quality of children's emotional and cognitive development, as well as represent a major source of childhood distress (Gilbert & Perris, 2000; Parker, 1983; Perris, 1994).

Several authors argue that feelings of safeness are central to the development of secure attachment bonds (Baldwin & Dandeneau, 2005; Bowlby, 1969). Studies have found that adolescents who grew up in warm and supportive families are more socially competent and report more positive friendships (Lieberman, Doyle, Markiewicz, 1999; Steinberg & Morris, 2001). In fact, securely attached individuals seem to be significantly more self-reassuring and warmth toward themselves, as well as more trusting of others, what can facilitate cooperative and affiliative behaviours (Gilbert & Irons, 2008; Irons *et al.*, 2006). In a group of adolescents, Irons and Gilbert (2005) found that insecure attachment was related to depression and anxiety through their effect upon negative social comparison (i.e., unfavorable social comparisons) and submissive behaviour (i.e., defensive emotions and behaviours).

There have been a number of measuring instruments, derived from attachment theory (Bowlby, 1980), that assess parenting styles/practices and ask people to recall parental behaviour in childhood. In the case of children and adolescents, there are also some self-report questionnaires measuring early parent-children interactions. For example, the EMBU for Children (EMBU-C; Castro, Toro, Arrindell, van der Ende, & Puig, 1990) assesses children's perceptions of the rearing style of their parents; the Inventory for Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) measures both parent and peer attachment in young people aged between 9 and 15 years.

Several studies show an association between early parenting behaviours (specially, those characterized by criticism, over protection/control and rejection) and a range of psychological, interpersonal and emotional difficulties (Parker, 1983; Perris, 1994). However, Gilbert and colleagues (2003) suggested that is important to focus on recall of how one felt in relation to others' behaviour, rather than just recalling their behaviour. Consequently, these authors, based on social rank theory, developed a scale (Early Life Experiences Scale-ELES) to measure adult recall of how frightened/threatened they felt as a child, by adopting various submissive and "low rank" defensive behaviours (e.g., by submitting, appeasing, avoiding). In turn, Richter and colleagues (2009) developed a measure of recall of positive feelings and experiences of safeness, contentment and warmth in childhood, entitled the Early Memories of Warmth and Safeness Scale (EMWSS).

In the psychometric study of the EMWSS, in a sample of adults aged between 18 and 49 years, results showed good psychometric properties with a one-factor solution of personal emotional memories (i.e., recall feelings of being soothed, safe, connected and warm in childhood; Richter *et al.*, 2009). The EMWSS also revealed adequate reliability ($\alpha = .91$; Richter *et al.*, 2009). Richter and colleagues (2009) found strong correlations between recall of parental behaviour (as measured by EMBU) and recall of positive emotional memories (as measured by EMWSS). Moreover, the recall of positive emotional memories was a better predictor of psychopathology, forms of self-criticism/self-reassurance and positive affect, than recall of parental behaviour. Additionally, a mediator analysis showed that early memories of warmth and safeness fully mediated the relationship between recall of parental behaviour (focused on emotional warmth) and self-reassurance (Richter *et al.*, 2009).

Even though the EMWSS seems to be a pertinent and valid measure of positive emotional memories, it has only been used in studies with adult samples (Matos, Pinto-Gouveia, & Duarte, 2013, 2014; Richter *et al.*, 2009). Further validation of its psychometric properties in other populations is needed. Moreover, given the crucial role of positive emotional memories (e.g., early experiences of warmth and safeness from others towards the self) plays in the ability to generate feelings of self-warmth, self-soothing, self-reassurance and self-compassion (Gilbert & Procter, 2006), one should expect that it would have a significant impact on psychological adjustment indicators in the developmental period of adolescence.

Adolescence is a transitional period between childhood and adulthood of rapid developmental changes and tasks, involving physical, intellectual, social and emotional areas (Wolfe & Mash, 2006). Therefore, adolescence can be a period of increased risk for mental health problems, including internalizing (e.g., depression, anxiety) and externalizing disorders (e.g., conduct problems; Steinberg, 2002; Wolfe & Mash, 2006).

During this critical period, there is an increased need to regulate affect and behaviour (Steinberg, 2005). Emotional development involves establishing a realistic and coherent sense of identity in the context of relating to others (e.g., peers) and learning to cope with stress and emotions (Collins & Steinberg, 2006).

Early adverse experiences within the family and in peer relationships, especially those involving threat, shame and bullying, may trigger defeat and threat-related negative emotional states and defensive behaviours, and may have detrimental effects on the experience of the self and others (i.e., see self as inferior to others, believe that others are hostile and look down on the self; Cunha, Matos, Faria, & Zagalo, 2012; Gilbert, 2003). These negative rearing experiences can act as conditioned emotional memories (Gilbert & Irons, 2008) and impact on self-identity, relational schema and relationships with others, and emotional regulation (Baldwin & Dandeneau, 2005; Matos & Pinto-Gouveia, 2010; Mikulincer & Shaver, 2005; Pinto-Gouveia & Matos, 2011; Schore, 2001). In a recent study, Cunha and colleagues (2012) explored shame memories, current feelings of shame and psychopathology in adolescents. Path analysis results demonstrated that current feelings of shame (internal and external shame) fully mediated the effect of centrality of shame memory on depression and anxiety symptoms and partially mediated the effect of shame traumatic memory on these psychopathological

indicators in adolescents (Cunha *et al.*, 2012). These findings emphasise the impact of shame experiences, particularly those are traumatic and central to self-identity, on psychopathology in adolescence.

On the other hand, in safe and supportive environments, children and adolescents can learn to be self-reassuring/self-soothing and trusting of others and experience more prosocial and peaceful social interactions (Gilbert *et al.*, 2006; Irons & Gilbert, 2005). So, recall of emotional memories, characterized by reassuring, warmth, soothing, caring and safeness, seems to facilitate the access to self-reassuring/self-warmth as a way to handle setbacks and cope with failures (Gilbert *et al.*, 2006; Gilbert & Procter, 2006).

This may be particularly important in adolescence, since this period is marked by major changes in physical, cognitive, interpersonal and social areas, which can entail new sources of stress that may place adolescents at higher risk for concurrent and later difficulties (Wolfe & Mash, 2006). Therefore, interactions with significant others (e.g., parents and peers) characterized by warmth, care, affection and soothing, may help to cope with physical, psychological, emotional and social adolescence developmental tasks and facilitate the transition into this life period (Gilbert & Irons, 2008; Irons & Gilbert, 2005).

The aim of this study was to adapt and validate the Early Memories of Warmth and Safeness Scale (EMWSS; Ritcher *et al.*, 2009) for adolescents. We intend to analyse its underlying factor structure through an exploratory factor analysis and confirmatory procedures in a community sample of adolescents. Additionally, we aim at examining the psychometric properties of the obtained factor structure, specifically items' analysis and internal consistency, test-retest reliability and discriminant validity, by comparing the EMWSS to measures of depression, anxiety and stress symptom.

METHOD

Participants

The sample was composed by 651 adolescents, 330 boys (50.7%) and 321 girls (49.3%), from 7th to 12th grade (years of education' $M= 9.89$, $SD= 1.64$). The mean age was 15.89 ($SD= 1.99$) years old, ranging from 12 to 19. No gender differences were found concerning age, $t(649)= 1.19$, $p= .236$, and years of education, $t(649)= -1.37$, $p= .171$.

Prior to analyses, the total sample ($N= 651$) was randomly divided in two different subsamples: a learning sample for Exploratory Factor Analysis (EFA) and item reliability (Study I; $n= 320$), and a cross-validation sample for Confirmatory Factor Analysis (CFA; Study II; $n= 331$). The criterion-related and discriminant validity (Study III) was examined in the full sample.

Exploratory Factor Analysis (EFA) was conducted in a randomized subsample composed of 320 adolescents, 150 boys (46.9%) and 170 girls (53.1%). In this subsample, subjects were aged 12-19 years ($M= 15.77$, $SD= 2.00$), with a years of education mean of 9.95 ($SD= 1.62$). There were no significant differences between gender, regarding age, $t(301.719) = -.458$, $p= .647$, and years of education, $t(305.207)= -1.728$, $p= .085$.

The other randomized subsample was used to perform a Confirmatory Factor Analysis, and was composed of 331 adolescents, 173 boys (52.3%) and 158 girls (47.7%). Participants were aged 12-19 years ($M= 15.79$; $SD= 1.95$), with a years of education mean of 9.98 ($SD= 1.64$). There were no significant differences between gender, regarding age, $t(329)= .606$, $p= .545$, and years of education, $t(329)= -.727$, $p= .468$.

Instruments

Early Memories of Warmth and Safeness Scale (EMWSS; Richter, Gilbert, & McEwan, 2009; Portuguese version by Matos, Pinto-Gouveia, & Duarte, 2012) is a self-report questionnaire that measures recall of feeling warm, safe and cared for in childhood, i.e., early positive memories of warmth and affect (e.g., "I felt secure and safe"; "I felt that I was a cherished member of my family"). This is a 21-item scale rated on a 5-point Likert scale (0= No, never; 1= Yes, but rarely; 2= Yes, sometimes; 3= Yes, often; 4= Yes, most of the time). On the original version, Richter and colleagues (2009) found a single factor solution and a high Cronbach's alpha of .97. In the Portuguese version, Matos *et al.* (2012) found similar results for psychometric properties in a Portuguese adult population, with an excellent internal consistency ($\alpha= .97$).

Depression, Anxiety and Stress Scales (DASS-21; Lovibond & Lovibond, 1995; Pais-Ribeiro, Honrado, & Leal, 2004) is a self-report measure composed of 21 items and designed to assess three dimensions of psychopathological symptoms: depression, anxiety and stress. The items indicate negative emotional symptoms and are rated on a 4-point Likert scale (0-3). On the original version, Lovibond and Lovibond (1995) found the subscales to have high internal consistency (Depression subscale Cronbach's $\alpha= .91$; Anxiety subscale Cronbach's $\alpha= .84$; Stress subscale Cronbach's $\alpha= .90$). On the Portuguese version (Pais-Ribeiro *et al.*, 2004), the subscales have Cronbach's α of .85 for depression, .74 for anxiety, and .81 for stress. In this study, the Cronbach's α for subscales were .90 for depression, .86 for anxiety and .88 for stress.

Procedure

Given that the EMWSS was originally designed for adults, it was necessary to perform small alterations in order to improve the verbal comprehension for adolescents. Minor changes of the verbal content, vocabulary and presentation format of the original scale were performed in order to make it easier for adolescents to complete. This resultant version was applied in a pilot test in a small group of adolescents ($N= 15$), to assess the accessibility and comprehensibility of the questions and vocabulary used and the average time spent. This procedure allowed us to verify the facial validity of the scale. In this pre-test, participants presented no difficulty in filling out the questionnaire and no further changes were thus made. Therefore, the scale seemed appropriate to use with adolescents.

This adolescents sample was collected from public schools in the district of Castelo Branco, Portugal. Ethics approval was granted by the Head Teacher of the school and parents were informed about the goals of the research and gave their consent. All students voluntarily participated and filled out the instrument in the classroom. It took on average 15 minutes to complete the questionnaire pack. The teacher and a research

assistant were present to provide clarification if necessary and to ensure confidential and independent responding.

Data Analysis

Statistical analyses were carried out using PASW Software (Predictive Analytics Software, version 20, SPSS, Chicago, IL, USA) for PCs and AMOS (Analysis of Moment Structures) version 18 (Amos Development Corporation, Crawfordville, FL, USA).

Descriptive statistics were computed to explore demographic variables and gender differences were tested using independent samples *t* tests. Additionally, age groups and academic grade differences were tested using one-way Anova's.

An Exploratory Factor Analysis (EFA) with the Principal Component Analysis (PCA) method of parameter estimation was conducted to explore the dimensional structure of the EMWSS-A (Costello & Osborne, 2005). The internal reliability was analyzed through Cronbach's alpha coefficient and corrected item-total correlations (Nunnally, 1978). Test-retest reliability (Pearson *r*) was calculated for a subsample of participants who completed the 21-items of EMWSS-A 3 weeks later.

Pearson correlation coefficients were performed to explore the relationships between EMWSS-A and depression, anxiety and stress symptoms (Cohen, Cohen, West, & Aiken, 2003; Tabachnick & Fidell, 2007).

The discriminant validity was analyzed through the comparison of two groups with high and lower levels of positive emotional memories, using independent samples *t* tests.

A Confirmatory Factorial Analysis (CFA) was performed in a different randomized subsample (*N*= 331), according to Maroco's (2010) recommendations. A Maximum Likelihood (ML) parameter estimation was chosen over other estimation methods because ML has been found to be relatively robust (e.g., to violations of the multivariate normality assumption; Iacobucci, 2010; Kline, 2005) and because it is one of most frequently used estimation methods in this statistical procedure (Brown, 2006).

Data were tested for univariate and multivariate normality, and all items showed acceptable values of asymmetry and univariate and multivariate kurtosis in both samples (skewness (*Sk*) > |3| and kurtosis (*Ku*) > |10|; Finney & DiStefano, 2006; Kline, 2005). To inspect for possible outliers Mahalanobis Distance squared (*MD*²) were used.

The following statistics and recommended cut-points (Maroco, 2010) were used to evaluate overall model fit: Normed Chi-square ($\chi^2/df < 5$ = acceptable; Arbuckle, 2008), Goodness-of-fit Index (GFI $\geq .90$ = good; Jöreskog & Sörbom, 1996), Comparative Fit Index (CFI $\geq .90$ = good; Bentler, 1990), Root Mean Square Error of Approximation (RMSEA $\leq .05$ = very good, $\leq .08$ = acceptable; $\leq .10$ = poor; Browne & Cudeck, 1993).

We conducted model modifications to the original hypothesized model to have a better fitting or more parsimonious model. The improvement of model fit was based on Modification Indexes (MI; values greater than 11; *p* < .001) and according theoretical content of each item. In order to compare both models (original model versus parsimony model; Maroco, 2010), each of the models was evaluated using the chi-square difference test. This test allows one to decide whether a given model is significantly better or worse than a competing model (Maroco, 2010). The Comparative fit index was also used,

namely Modified expected cross-validation index (MECVI), in which smaller values indicate better model fit and more stable for the population under study.

In regard to local adjustment, we analyzed items' standardized loadings (λ) and individual reliability (R^2). Usually, it is expected that all items of the factor present values of $\lambda \geq .50$, indicating the factorial validity of the model, and $R^2 \geq .25$ suggesting item's individual reliability (Maroco, 2010).

RESULTS

Study I: Psychometric characteristics

First, an Exploratory Factor Analysis (EFA) was performed following the procedures used by the authors of the original version for adults (Ritcher *et al.*, 2009). Thus, a Principal Components Analysis (PCA) forced to one factor was conducted. A single-factor solution emerged with good matrices indicators (Kaiser-Meyer-Olkin-KMO= .955; Bartlett' sphericity $\chi^2(210) = 4125.025, p < .001$) and all items revealed communality' values higher than .36 and factor loadings between .60 and .79. Therefore, results of the PCA yielded a one-factor solution accounting for 51% of the total variance (see Table 1).

Regarding item reliability, all items show item-total correlations ranging between moderate to higher (.56 to .76), and positively contributing for the global measure of early memories of warmth and safeness. The scale presented an excellent internal consistency ($\alpha = .95$), very similar to that reported in the original study ($\alpha = .97$) and in the Portuguese version ($\alpha = .97$). Additionally, all items positively contributed to the internal consistency of the Portuguese EMWSS adolescents' version, since the overall reliability did not improve if any item was deleted (Table 1).

In the test-retest reliability (Pearson r), 30 adolescents completed a retest of the EMWSS-A after a 3-week interval. The scale showed good retest reliability with a correlation coefficient of $r = .92$.

Study II: Confirmatory Factor Analysis

A CFA was performed to test the latent one-dimensional structure of the Portuguese version of EMWSS found using EFA in Study 1. This scale comprised one latent variable (in this case, Early Memories of Warmth and Safeness) and 21 observed variables (21-items).

The EMWSS items did not present any serious violation of normality. Although, several cases presented MD² values suggesting possible outliers, these were retained since their elimination did not alter the results and excluding those cases would decrease factor's variability.

The one-factor confirmatory model of EMWSS revealed marginal/poor values of fit statistics ($\chi^2/df = 3.567$; CFI= .896; GFI= .827; RMSEA= .088; $p[\text{rmsea} \leq 0.05] = .000$; MECVI= 2.316) (Table 2).

Table 1. Factorial loadings, means, standard deviations, corrected item-total correlations and internal consistency coefficients for Portuguese version of EMWSS-A ($n=320$)

EMWSS Items	Factor Loadings		<i>M</i>	<i>SD</i>	Corrected Item-total correlation	α if item deleted
	Factor 1	h^2				
1. I felt secure and safe.	.65	.42	3.49	0.79	.62	.95
2. I felt appreciated the way I was.	.73	.53	3.08	0.90	.70	.95
3. I felt understood.	.68	.46	2.90	0.98	.65	.95
4. I felt a sense of warmth with those around me.	.72	.51	3.28	0.94	.68	.95
5. I felt comfortable sharing my feelings and thoughts with those around me.	.68	.46	2.63	1.07	.64	.95
6. I felt people enjoyed my company.	.76	.58	3.20	0.93	.73	.95
7. I knew that I could count on empathy and understanding from people close to me when I was unhappy.	.70	.49	3.23	0.95	.67	.95
8. I felt peaceful and calm.	.70	.49	3.20	0.95	.66	.95
9. I felt that I was a cherished member of my family.	.65	.42	3.43	0.92	.62	.95
10. I could easily be soothed by people close to me when I was unhappy.	.75	.56	3.20	0.94	.72	.95
11. I felt loved.	.60	.36	3.47	0.83	.56	.95
12. I felt comfortable turning to people important to me for help and advice.	.72	.51	3.04	0.99	.68	.95
13. I felt part to those around me.	.74	.54	3.19	0.96	.70	.95
14. I felt loved even when people were upset about something I had done.	.66	.44	2.91	1.04	.62	.95
15. I felt happy.	.75	.56	3.44	0.79	.71	.95
16. I had feelings of connectedness.	.77	.59	3.25	0.87	.73	.95
17. I knew I could rely on people close to me to console me when I was upset.	.78	.61	3.30	0.87	.75	.95
18. I felt cared about.	.77	.59	3.27	0.89	.74	.95
19. I had a sense of belonging.	.75	.56	3.23	0.85	.71	.95
20. I knew that I could count on help from people close to me when I was unhappy.	.79	.62	3.30	0.83	.76	.95
21. I felt at ease.	.69	.47	3.23	0.91	.65	.95
EMWSS Total			67.2	13.7		.95
Eigenvalues			7	0		
			10.78			

Notes: h^2 = communality coefficient; *M* = Mean values; *SD* = standard deviations.

Table 2. Goodness-of-fit Indicators of the Models for the Early Memories of Warmth and Safeness Scale for Adolescents ($n=331$)

Model	<i>df</i>	χ^2	χ^2/df	CFI	GFI	MECVI	RMSEA
Original model	189	674.129	3.567	.896	.827	2.316	.088
Modified model	184	521.488***	2.834	.928	.865	1.885	.075

Notes: CFI = Comparative Fit Index; GFI = Goodness of Fit Index; MECVI = Modified Expected Cross-Validation Index; RMSEA = Root Mean Square Error of Approximation; *** = $p < .001$.

In order to improve model fit, measurement errors between some similar items were sequentially correlated, namely between items 9 and 11, items 6 and 20, items 2 and 3, items 8 and 21. This step of correlational measurement errors is theoretically justified, based on item content. These modifications and re-specifications led to hone the model to better fit the data. The final simplified model (Figure 1) showed an adequate factorial validity and better fit to the data. Specifically, some fit indexes indicated a good fit to the data ($\chi^2/df= 2.834$; CFI = .928; RMSEA = .075, $p[\text{rmsea} \leq .05] = .000$), with the exception of GFI that suggested a marginal fit (GFI = .865) (Table 2).

Moreover, this modified model was statistically superior to the original model in our sample (chi-square difference test: $\chi^2(5) = 152.641$, $p < .05$) and presented a lower value of MECVI (1.885 versus 2.316) than the original model (Table 2).

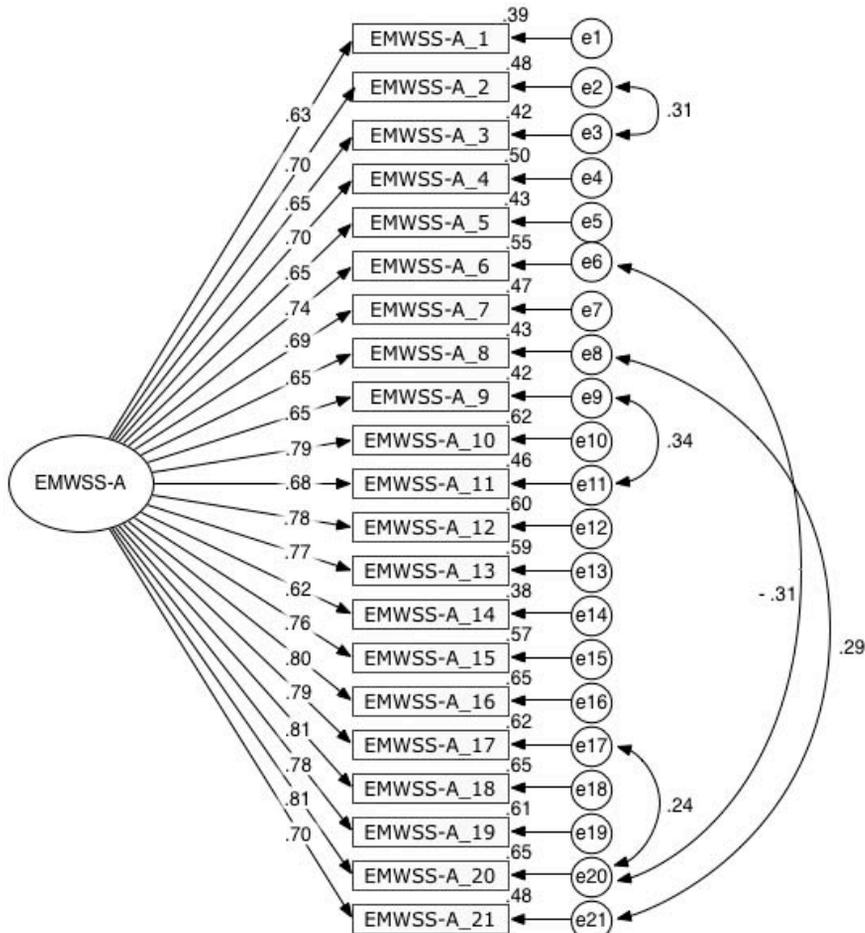


Figure 1. Final simplified model of Early Memories of Warmth and Safeness Scale for Adolescents (EMWSS-A). Standardized coefficients and measurement errors are shown. Latent constructs are shown in eclipses, and observed variables are shown in rectangles.

All items presented standardized loadings greater than .50 (ranging between $\lambda = .618$ and $\lambda = .809$), indicating a good factorial validity. Also, all items showed $R^2 \geq .50$, clearly above the cut point of .25 (ranging between $R^2 = .382$ and $R^2 = .655$; Figure 1).

Overall, the modified model demonstrated an acceptable global adjustment and an adequate local adjustment.

Study III: Convergent and Discriminant Validity

Total scores of the EMWSS-A were computed by summing up the responses to the 21 items, yielding a possible score range of 0-84. Means and standard deviations are shown in Table 3. Mean differences for sex ($t = -.391, p = .996$) and grade in school were not significant, $F(2, 648) = 2.230, p = .108$.

Concerning age, there were significant differences between age groups, $F(3, 647) = 3.217, p = .022$. Results of the *post hoc* Tukey's test showed that participants in the younger group (12-13 years old) reported significantly more memories of warmth and safeness, than those in the older group with 17-18 years old ($p = .037$) and 18-19 years old ($p = .027$). The other age groups did not differ between them.

The criterion-related validity of the EMWSS-A was investigated through an examination of the relationships between EMWSS-A and the depressive, anxiety and stress scales of DASS-21. Consistent with findings in adult clinical and community samples (Matos *et al.*, 2012; Richter *et al.*, 2009), it was expected that scores on the EMWSS-A would be negatively correlated with psychopathological indicators (e.g., anxiety, depressive and stress symptoms). In fact, results indicated that the EMWSS-A was negatively associated with depression ($r = -.37, p < .001$), anxiety ($r = -.26, p < .001$) and stress ($r = -.29, p < .001$). These relationships were weak to moderate by Cohen's (1992) standards, suggesting that the EMWSS-A is related to but not redundant with these variables.

In addition, we sought out to investigate whether EMWSS-A would discriminate between individuals with low and high levels of positive emotional memories regarding depressive, anxiety and stress symptoms.

Table 3. Means and Standard Deviations for the EMWSS-A by Sex, Age, and Grade in School.

		<i>n</i>	<i>M</i>	<i>SD</i>	<i>t/ F</i>	<i>p</i>
Sex	Boys	330	66.55	13.08	-.391	.696
	Girls	321	66.98	14.71		
Age	12-13	104	70.19	12.28	3.217	.002
	14-15	147	67.39	14.98		
	16-17	270	65.90	13.97		
	18-19	130	65.09	13.33		
	7-8	150	68.31	13.32		
Grade	9-10	211	67.33	14.34	2.230	.108
	11-12	290	65.54	13.81		
Total		651	66.77	13.90		

Table 4. Independent sample student *t* tests for differences between low and high positive emotional memories individuals in relation to depression, anxiety and stress.

	Low EMWSS-A (<i>n</i> = 325)		High EMWSS-A (<i>n</i> = 326)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
	Depression	7.12	5.79	4.09		
Anxiety	6.15	5.46	4.13	4.15	5.13	.000
Stress	8.70	4.65	6.30	5.45	5.71	.000

Notes: Low EMWSS-A: scores <cut point (Median= 70); High EMWSS-A: scores >cut point (Median= 70); EMWSS-A= Early Memories of Warmth and Safeness Scale for adolescents.

In order to compare participants with high and low scores, two groups were created (high EMWSS-A and low EMWSS-A) using the median value (70). Independent samples *t*-tests results (see Table 4) indicated that individuals with high scores on EMWSS-A present significantly lower levels of depression, $t(649)= 7.14, p <.001$, anxiety, $t(649)= 5.13, p <.001$, and stress symptoms, $t(649)= 5.45, p <.001$, in comparison to those with low scores on the EMWSS-A. Thus, adolescents who recall more positive emotional memories, characterized by warmth, soothing, caring and safeness tend to present decreased levels of depressive, anxiety and stress symptoms, comparatively to those with low levels of positive emotional memories.

DISCUSSION

The purpose of this paper was to adapt and validate the Portuguese version of the Early Memories of Warmth and Safeness Scale for adolescents (EMWSS-A; Richter *et al.*, 2009). This scale was originally developed to assess the recall of feeling soothed, safe, connected and warm in childhood, and was originally designed for adult samples. In the present study, we sought out to analyse the psychometric properties of the EMWSS-A and confirm its factorial structure using a sample of Portuguese adolescents from the 7th through 12th grade, with age between 12 and 19 years old.

Results from EFA showed good psychometric characteristics. Similarly to the original and the Portuguese versions (Matos *et al.*, 2012; Richter *et al.*, 2009), the EMWSS for adolescents presented a single factor solution, accounting for 51% of the total variance. Results also indicated a high internal consistency and good test-retest reliability for a one month time interval. A CFA was conducted to confirm the one-dimensional factorial structure that emerged in the EFA. Using a different randomized subsample, an adjusted model was found by sequentially correlating measurement errors between some similar items. The modified model evidenced a good fit to the data, with an acceptable global adjustment and an adequate local adjustment.

Overall, results from both factorial analysis procedures indicate that the EMWSS for adolescents presents a one-dimensional structure, composed of 21 items, assessing emotional memories of warmth and safeness in early interactions with caregivers.

Regarding sociodemographic variables of our total sample, there were no differences for gender and grade in school. Significant differences were found for age, with younger adolescents reporting more emotional memories of being soothed, safe, warmth and cared for, than older participants. This finding may be understood from a developmental point of view. Age differences studies recognize that some developmental tasks vary along age stages (i.e., early adolescence, middle adolescence and late adolescence), where multiple developmental changes and tasks gradually occur, including physical appearance, cognitive and intellectual advances, identity formation, establishing friendships, group identification and emotional independence (Steinberg, 2002; Wolfe & Mash, 2006). These developmental acquisitions have multidirectional influences among environmental context (Steinberg, 2002, 2005; Spear, 2000). Social interactions take on particular importance during adolescence, with a gradually declining dependence on parents and increasing closeness with peers (Spear, 2000; Lerner & Steinberg, 2009).

Therefore, it is possible that, as part of the task of individual autonomy and progressive separation from and re-framing of the family environment, the positive emotional memories involving parents or the family environment (e.g., to be loved, supported, nurtured, protected, to feel safe) are less recalled or accessible in older adolescents (17 to 19 years old). In younger adolescents (12 to 13 years old) these memories are more recent and congruent with the warmth and safeness/protection behaviours of the parents, which are also frequent in this age period. As children grow older, parents tend to become less protective and spend less time in direct contact with them. This idea is also supported by studies on adolescents' perception of parenting styles, showing that age is negatively associated with different dimensions, namely with the emotional support scale (Canavarro & Pereira, 2007; Castro, Toro, Van Der Ende, & Arrindell, 1993; Conceição, 2012; Cunha, 2005).

Regarding validity analysis, and similarly to research in adult samples, scores on the EMWSS-A were significantly and negatively associated with depression, anxiety and stress symptoms. So, adolescents who report more memories of warmth and safeness tend to present lower levels of depression, anxiety and stress symptoms, comparatively with participants who report lower positive emotional memories. These findings are in accordance with empirical evidence demonstrating that recollections of feeling soothed, reassured, warmth, safe, and cared for as a child are negatively associated with psychopathology in adults (Matos *et al.*, 2013, 2014; Richter *et al.*, 2009). Moreover, a growing body of research has shown that experiences of warmth, love and affection in childhood have a positive impact on emotional maturation, well-being and mental health, and facilitate the development of self-accepting and self-reassuring abilities (Bowlby, 1969; Cacioppo *et al.*, 2000; Schore, 1994; Gilbert *et al.*, 2006).

In conclusion, our findings provide good indication that the EMWSS for Portuguese adolescents is a sound psychometric tool for the measurement of one's feelings of being soothed, safe, connected and warm in childhood.

Some methodological limitations should be considered when interpreting our findings. Even though our results confirmed the one-dimensional factorial structure of the EMWSS in a Portuguese sample of adolescents and indicate the adequacy of the proposed model to assess positive emotional memories, future studies should seek to ensure the plausibility and parsimony of the model testing its invariance in other samples.

Since a community sample was used, future research should replicate the scale structure, using a more representative sample from others geographic regions, and using a clinical population.

Although our data are constrained by the limitations linked to the use self-report questionnaires, specifically retrospective reports, some studies have shown that memories of early parenting are generally accurate and remain reasonably stable over time, even in the face of considerable changes in mood and emotional states (e.g., anxiety, depression, and hostility; Brewin, Andrews, & Gotlib, 2000; Gerlsma, Kramer, Scholing, & Emmelkamp, 1994). In the future, however, research should seek to replicate the present findings using other instruments, such as face-to-face interviews or observational instruments.

Nonetheless, this study contributes to broaden the available measures for this age group, specifically measures that assess one's warmth and safeness feelings in relation to others' behaviour, rather than just recall others' behaviours (e.g., parenting styles/practices). Furthermore, our findings confirm that the EMWSS in its Portuguese version for adolescents is a useful and robust assessment tool for research and clinical practice with adolescents.

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