Psychometric properties of the Trait Meta-Mood Scale-24 in argentinian university students

Propiedades psicométricas del Trait Meta-Mood Scale-24 en estudiantes universitarios argentinos

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Abstract

Introduction: Perceived emotional intelligence (PEI) is conceptualized as people's attitude toward their emotional experience and their awareness of their emotional abilities. The Trait Meta-Mood Scale (TMMS) is one of the most widely used tools to evaluate PEI.

Objective: To assess the psychometric properties of TMMS-24 to provide evidence that guarantees the measurement's quality when adapting to the local context, so it can be implemented for university students in the city of Mar del Plata, Argentina.

Method: The sample included 316 students (71.5% women and 28.5% men) from the city of Mar del Plata. The participants answered a sociodemographic questionnaire, the TMMS-24, and the adjective checklist to assess personality.

Results: The exploratory factor analysis revealed that the data adjusted well to the model and presented a three-factor structure (attention, clarity, and emotional healing), describing 54.5% of the variance. The internal consistency was suitable, indicating Cronbach's alpha coefficients (between 0.82 and 0.85) and ordinal alpha (between 0.84 and 0.88) as good for the three subscales. Regarding the relationship between the sociodemographic variables, no differences were observed according to gender and age. In addition, the relation between PEI and personality was examined.

Conclusions: The TMMS-24 revealed suitable psychometric properties for PEI measurement among university students of Mar del Plata. The evidence found was apparent, with content based on the internal structure and relationship with other variables. This evidence was considered valid and reliable.

Keywords: Emotional Intelligence, TMMS-24, psychometric properties, university students.

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1. INTRODUCTION

1.1. Self-Perceived Emotional Intelligence

Currently, the scientific literature indicates a particular interest in the study of individual differences regarding the abilities to process and use emotional information (Graesser, 2019; Mayer, Roberts, & Barsade, 2008; Sosa-Correa, Rodríguez-Ake, Ayuso, Ponce, & Mestre, 2018). One of the essential reasons why research deepens the knowledge of these aspects lies in the importance of these skills in human experience and development, considering, in turn, their effect in certain areas such as, for instance, health and education (DeSteno, Gross, & Kubzansky, 2013).

The progress in theorizing about emotions is broad and diverse. Following Gardner's guidelines, based on intra and interpersonal intelligence, the emotional intelligence (EI) construct first appeared in the 1990s. From this perspective, emotion is considered a necessary component for the development of mental operations, together with motivation and cognition (Extremera-Pacheco & Fernández- Berrocal, 2016).

Since the appearance of this construct, a large number of theories have been elaborated that could be summarized in two ways of conceptualizing EI: those that consider EI as a trait, understanding it as an innate characteristic that combines emotional abilities and traits of personality, commonly called mixed models; and those who understand EI as a skill, that is, as a set of cognitive skills necessary for processing emotional information in intra- and interpersonal contexts, similar to verbal or mathematical skills (Elfenbein & MacCann, 2017; Fernández-Berrocal, Ruiz-Aranda, Salguero, Palomera, & Extremera-Pacheco, 2018; MacCann *et al*., 2020; Zafra, Martos, & Martos, 2014).

Among the most developed mixed models, we can cite the model of emotional competencies of Goleman (1995), the social EI model of Bar-On's (1997), and Petrides and Furnham's (2001) EI model. However, these perspectives have received strong criticism based on the insufficient empirical foundation of their postulates, on the relationships with other constructs belonging to the field of Personality Psychology, and on the way in which EI has been evaluated through self-report questionnaires (Brackett & Mayer, 2003; Mikulic, Crespi, & Caballero, 2018).

Moreover, the model of EI as a skill that currently has the greatest acceptance in the scientific literature is that of Mayer, Caruso, and Salovey (Elfenbein & MacCann, 2017; Fernández-Berrocal & Extremera-Pacheco, 2004; MacCann *et al*., 2020). These authors have conceptualized EI as the ability to identify, assess, and

differentiate one's own emotions from those of others, know how to use them in decision-making, understand them, and regulate positive and negative emotions in oneself and in others (Mayer, Caruso, & Salovey, 1999).

From 1997, Mayer and Salovey focused their studies on Interpersonal EI (reorganizing the construct into four dimensions ordered hierarchically: perception, facilitation, understanding, and emotional regulation). However, they focused on intrapersonal EI at the beginning of their work (MacCann *et al*., 2020; Mayer, Caruso, & Salovey, 2016). According to these authors, intrapersonal or self-perceived emotional intelligence (SEI) comprises people´s beliefs toward their emotional experience and awareness of their emotional abilities. Thus, this line of research studies the reflective cognitive processes through which mood states are constantly perceived, valued, and regulated, called the meta-humor experience (Fernández-Berrocal & Extremera-Pacheco, 2008; Mayer *et al*., 1999).

According to this model, the SEI includes three dimensions: Emotional attention, emotional clarity, and emotional healing. Emotional attention refers to the degree to which people believe they pay attention to their emotions and feelings, that is, the ability to identify and recognize their feelings, as well as the physiological and cognitive states and sensations that these entail. It involves paying attention to and accurately decoding emotional signals. Emotional clarity refers to how people believe they perceive their emotions, that is, if they experience their feelings clearly and understand how they feel. It involves breaking down the broad and complex repertoire of emotional signals, differentiating and labeling emotions, and recognizing into which categories feelings are grouped. Finally, emotional healing refers to people's belief of their ability to interrupt and regulate negative emotional states as well as to prolong positive emotional states. This dimension includes the ability to be receptive to feelings and reflect on them to benefit from or dismiss the information that accompanies them based on its usefulness (Extremera-Pacheco & Fernández-Berrocal, 2005; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995).

This model is of great interest to Psychology since EI is conceived not as an internal trait or characteristic inheritable and unchangeable, but rather as the implementation of abilities and behaviors susceptible to learning and development, subject to then of training (Billings, Downey, Lomas, Lloyd, & Stough, 2014).

Throughout these years, various empirical investigations have been carried out not only to analyze the SEI but also the particular characteristics of this concept in different fields, such as education, work, family, and mental health (Cejudo, López-Delgado, & Rubio, 2016; Petrides et al., 2016; Rincón & Rodríguez, 2018). In general terms, most of these studies have indicated that emotionally intelligent people present an adequate psychological and social adjustment expressed based on the presence of a series of indicators. Among them, we can mention, for instance, adaptive responses to negative life situations; low-stress levels, negative emotionality, and alexithymia; low scores in psychological symptoms (especially

anxiety and depression); adequate levels of life satisfaction, empathy, and optimism; satisfactory interpersonal relationships; appropriate academic performance and satisfaction (Cejudo *et al*., 2016; Fernández-Berrocal & Extremera-Pacheco, 2008; Kotsou, Mikolajczak, Heeren, Grégoire, & Leys, 2019; MacCann *et al*., 2020; Sosa-Correa *et al*., 2018).

Specifically, in the educational field, it has been observed that EI is an important ability in students. As it is a noncognitive construct, it has predictive power in terms of academic performance and personal development (Barna & Brott, 2011; MacCann *et al*., 2020). Lacking certain EI skills affects students inside and outside the educational context. Having adequate emotional skills favors thinking, increases concentration and intrinsic motivation, allows the control of impulsive behavior, and enables educational adaptation and the development of coping strategies before studying. In turn, it helps establish interpersonal relationships and ensures adequate performance under stressful conditions. It is associated with well-being indicators (Belmonte-Lillo, 2013; Cejudo *et al*., 2016; Delgado, Martínez- Monteagudo, Rodríguez, & Escortell-Sánchez, 2019; Molero, *et al*., 2020).

In recent decades, EI has acquired great relevance due to the high levels of stress, anxiety, and school failure present in the educational field. Their training and development promote the psychological well-being of students, facilitating their understanding of the environment that surrounds them as well as providing them with the necessary skills to deal with the various situations that arise throughout their academic career (Molero, *et al*., 2020).

1.2. Measurement of Self-Perceived Emotional Intelligence

Among the several instruments that exist to measure SEI, the Trait Meta-Mood Scale (TMMS) stands out as one of the most used tools worldwide (Fernández-Berrocal, Berrios-Martos, Extremera- Pacheco, & Augusto, 2012; Mikulic *et al*., 2018; Rincón & Rodríguez, 2018). It allows to obtain an index that assesses the knowledge that each person possesses about their emotional states, providing a personal estimate of the reflective aspects of the emotional experience (Extremera- Pacheco & Fernández-Berrocal, 2005).

The TMMS, in its original version comprising 48 items, makes it possible to differentiate three dimensions for the SEI: a) Emotional attention, comprising 21 items (e.g., “I think about my state of mind constantly”); b) Emotional clarity with 15 items (e.g., “I am often wrong about my feelings”); and c) Emotional healing, comprising 12 items (e.g., “Although sometimes I feel sad, I usually have an optimistic vision”) (Salovey *et al*., 1995).

Fernández-Berrocal *et al*. (1998) adapted the Spanish version of the TMMS-48, finding psychometric properties very similar to those of the original scale. Years

later, Fernández-Berrocal, Extremera-Pacheco y Ramos (2004) developed a reduced version adapted to Spanish of this American scale, called Trait Meta-Mood Scale-24 (TMMS-24). This version maintains the three original dimensions of the scale but reduces the items by half, keeping those that maximize internal consistency. Thus, the final scale of this Spanish version constitutes 24 items, with 8 items per dimension. As it presents adequate psychometric properties, the use of this reduced version in Spanish is recommended (Extremera-Pacheco & Fernández-Berrocal, 2005).

This brief version of the TMMS was translated and adapted to other languages and cultures (Fernández-Berrocal & Extremera-Pacheco, 2008): German (Otto, Döring-Seipel, Grebe, & Lantermann, 2001), Portuguese (Brito- Costa *et al*., 2016), French (Bourdier & Ringuenet, 2016), Tasque (Gorostiaga, Balluerka, Aritzeta, Haranburu, & Alonso-Arbiol, 2011), Turkish (Aksöz, Bugay, & Erdur-Baker, 2010), Chinese (Li, Yan, Yin, & Wu, 2002), Italian (Giromini, Colombarolli, Brusadelli, & Zennaro, 2017), and Mexican (Valdivia-Vázquez, Rubio-Sosa, & French, 2015).

In Argentina, to date, a preliminary psychometric study of the TMMS-48 has been developed (Mikulic, Crespi, Caballero, Aruanno, & Paolo, 2017). In addition, the construction and validation of an instrument to assess perceived emotional intelligence (PEI) in adults was carried out based on the Salovey and Mayer model but considering not only intrapersonal skills but also interpersonal ones (Mikulic *et al*., 2018). Furthermore, a 21-item version of the TMMS for adolescents has been published (Calero, 2013).

Considering the aforementioned, this study aims to examine the psychometric properties of the TMMS-24 to provide evidence that ensures the quality of the measure in its adaptation to the local context for its application to university students from the city of Mar del Plata, Argentina.

In summary, a series of reasons account for the relevance of this work:

1) EI at the university level facilitates both the training process and the achievement of the professional success expectations of future graduates. The work context demands of them, once they graduate, not only knowledge but also that they be bearers of socio-emotional skills that allow them to successfully face future labor problems (Rodríguez, Sánchez, Ochoa, Cruz, & Fonseca, 2019). For this reason, it is essential to have instruments to assess this construct.
2) In turn, it is highly relevant to carry out this type of study to examine the mode of presentation of this variable in our sociocultural context, since it could be a mediating factor of the subjective experience associated with emotions. The context can modify both the meaning of the emotional experience and the emotional expression, that is, the way in which emotions are communicated and manifested (Fernández, Carrera, & Sánchez, 2001). Each culture has its own

rules of emotional expression acquired through learning and modulating the meaning of emotions. Thus, culture crosses and influences the way in which emotions are interpreted, thus intensifying, diminishing, substituting, or neutralizing their appearance and/or expression (Ekman, Sorenson, & Friesen, 1969).

3) Having instruments properly adapted to our environment allows us to make valid comparisons with the results obtained in other countries.

4) This adds to the fact that few studies account for how this instrument works for Argentine university students. Having an adequate tool to assess SEI in this population would allow assessing, among other aspects, the impact of educational interventions aimed at promoting more functional emotional states to successfully face the demands that students go through to achieve academic goals (Domínguez-Lara & Medrano, 2016).

2. METHOD

2.1. Design

It is an instrumental study according to the classification criteria proposed by Ato, López y Benavente (2013). This is a psychometric study aimed at obtaining evidence of the validity and reliability of the local adaptation of the TMMS-24 in the university population.

2.2. Participants

A total of 323 students of both sexes from different careers from the Public University of the city of Mar del Plata (Buenos Aires, Argentina) collaborated and were selected through nonprobabilistic and intentional sampling. Seven individuals were eliminated in the preliminary analyses, so the final sample included 316 participants.

With regard to age, subjects between the ages of 18 and 54 who voluntarily agreed to participate in the research with prior authorization (Age: M = 21.02; SD = 3.71) were evaluated. Regarding gender, 71.5% of the sample comprised women, and the remaining 28.5% were men.

To achieve a heterogeneous sample, students from different majors were included. Furthermore, 23.4% of the students attended the School of Psychology, 19.9% attended the School of Economics and Social Sciences, 20.6% attended the School of Exact and Natural Sciences, 17.7% attended the School of Architecture, Urbanism and Design, and finally 18.4% attended the School of Law. Regarding the self-perceived socio-economic level, 0.9% of the students reported having a low level, 61.4% a medium level, and 31.7% a high level. Further, 6% of the sample omitted to answer this aspect.

2.3. Instruments

2.3.1. Sociodemographic Questionnaire

This self-administered questionnaire was built *ad hoc* to obtain sociodemographic data of the sample, such as gender, age, place of residence, and self-perceived socio-economic level.

2.3.2. Trait Meta-Mood Scale-24 (TMMS-24; Fernández-Berrocal *et al*., 2004)

This self-report measure assesses SEI based on the Salovey y Mayer (1990) model. This questionnaire comprised 24 items with 8 items for each subscale: a) Emotional attention, b) emotional clarity, and c) emotional healing. The response format comprised a Likert-type scale with five options (1. Totally disagree; 2. Disagree; 3. Neither agree nor disagree; 4. Agree; 5. Totally agree). The person was asked to indicate the level of agreement with each statement about his/her emotions and feelings. To obtain the score in each one of the factors, items from 1 to 8 for the emotional attention factor, items from 9 to 16 for the emotional clarity factor, and from 17 to 24 for the emotional healing factor were added (all in straight order). The psychometric properties of the Spanish version revealed that for each factor, internal consistency was acceptable (α = .90 for emotional attention; α = .90 for emotional clarity, and α = .86 for emotional healing). Test-retest reliability was adequate (emotional attention = .60; emotional clarity = .70, and emotional healing = .83). The three factors appropriately correlated with classic criteria variables such as depression, anxiety, rumination, and life satisfaction (Fernández-Berrocal et al., 2004).

2.3.3. List of Adjectives to Assess Personality (AEP; Ledesma, Sánchez, & Díaz-Lázaro, 2011)

It comprised a list of 67 adjectives with five response options (from 1. does not describe me at all to 5. describes me as I am) to evaluate the five dimensions of the Big Five personality model (extraversion, agreeableness, conscientiousness, neuroticism, and openness). This instrument was developed and validated in the city of Mar del Plata and had adequate psychometric properties. Cronbach's α values ranged from .75 to .84 for the different scales. In turn, the factorial structure was consistent with the dimensions proposed by the model.

2.4. Procedure

The procedure followed has contemplated international professional regulations for the adaptation and validation of tests used in clinical and institutional practice (American Educational Research Association, American Psychological Association and National Council on Measurement in Education, 2014; American Psychological Association, 2010) and, more specifically, in psychological research (International Test Commission, 2014). Moreover, the protocol was approved by the Responsible

Conduct Committee of the School of Psychology of Universidad de Buenos Aires, where one of the two research projects in which this study was framed (UBACyT2018 20020170200001BA) was carried out. The other research project corresponds to the Institute of Basic, Applied Psychology and Technology of the School of Psychology of Universidad Nacional de Mar del Plata.

Initially, the authorities of the intervening faculties were contacted, the goal of the study was explained to them, and authorization was obtained to carry out the investigation. Contact with the students was made through the Cognitive and Educational Psychology Research Group headquartered in the School of Psychology of Universidad Nacional de Mar del Plata (Buenos Aires, Argentina). Following the current ethical principles, the students were asked to sign the informed consent as an exclusive condition to participate in the study. In addition, they were informed about the goals of this work. The confidentiality of the data was ensured, and it was made clear to them that their participation was voluntary and that they could leave the research at any time they wished.

Next, the students responded to the protocols in a self-administered way, in groups, and in the classroom, before or after their regular class schedule. The administration was supervised by qualified professionals authorized for this purpose.

2.5. Data analysis

To obtain evidence of content validity, an expert judgment study was used to rule on the linguistic and conceptual adequacy of the Spanish version of the instrument (Fernández-Berrocal et al., 2004) when applied in the local context. The information obtained was complemented with a pilot study, which provided evidence of face validity to the adaptation.

After collecting the cases, a descriptive analysis of the 24 items was carried out. Notably, since the protocols were reviewed before being delivered, no lost data were identified, so it was not necessary to carry out imputations.

Next, a preliminary analysis of the data was carried out in an exploratory manner (Uriel & Aldas, 2005) to verify the statistical assumptions and also to detect atypical cases that could distort the results.

Next, an exploratory factor analysis (EFA) was carried out using the Factor 9.3 program (Lorenzo-Seva & Ferrando, 2015) to provide evidence of validity based on the internal structure. This analysis allowed to examine whether the internal structure of the original scale and the Spanish version were maintained. To carry out the EFA, the guidelines suggested by the current literature (Lloret-Segura, Ferreres-Traver, Hernández- Baeza, & Tomás-Marco, 2014) have been followed, which

recommend the use of polychoric correlations instead of Pearson's correlations in those variables that do not present a normal distribution (Abad, Olea, Ponsoda, & García, 2011). In addition, its use is suggested when the response format is that of the *Likert* type (ordinals). Regarding the sample size, it was considered to have at least 10 participants per item to reduce sampling error and avoid the instability of the factors (Tabachnick & Fidell, 2001).

Subsequently, reliability was analyzed through an internal consistency analysis of the items of each of the subscales by calculating Cronbach's α and ordinal α coefficients with their respective 95% confidence intervals. This analysis was performed with the R program using the *scaleReliability* function from the *userfriendlyscience* package (Peters, 2014).

Finally, the possible influence of sociodemographic variables was analyzed. For this, the existence of differences according to gender was evaluated using a Mann–Whitney U test, and the association with age was studied by means of the bivariate correlation.

In addition, to provide evidence of validity based on the relationship with other variables, the correlations between the scores of the TMMS-24 subscales (emotional attention, emotional clarity, and emotional healing) and the AEP (extraversion, agreeableness, conscientiousness, neuroticism and openness), were studied by means of Spearman's correlation.

3. RESULTS

3.1. Linguistic adaptation and pilot study: content and face validity

The adaptation process was carried out taking into account the guidelines of the International Tests Commission (2014). Although the adaptation and validation of the TMMS-48 for its use in adults in Buenos Aires has been carried out (Mikulic *et al*., 2017), the psychometric properties of the TMMS-24 in our environment were not known, since no studies have been carried out locally. However, since there already exists a version of the TMMS-24 in Spanish, in addition to the original version (Salovey *et al*., 1995), it was decided to make linguistic adjustments to the Spanish version of the instrument (Fernández-Berrocal *et al*., 2004).

To locally achieve appropriate sentences, in item 4 ("I think it is worth paying attention to my emotions and state of mind"), the word "worthwhile" was replaced with the word "worth." In item 24 ("When I am angry I try to change my state of mind"), it was resolved to change the word "upset" and replace it with "angry." In

the rest of the items, the wording of the Spanish version was preserved because regionalisms that led to comprehension difficulties were not used.

The instrument was sent to five expert judges to blindly assess the adequacy at the formal level (syntactic and semantic) of each one of the items, as well as the belonging of each item to the sub-scales referred to by the authors. For this last aspect, the degree of agreement between judges was evaluated by calculating the Aiken V index and its 90% confidence interval. A lower limit of the confidence interval of Aiken's V ≥ .60 was adopted as acceptance criteria, a value that was not exceeded by any of the items (Table 1).

Finally, the final version of the instrument underwent a pilot test with 10 university students, men and women of different ages, to assess the understanding and adequacy of the items, the instructions, and the response format. Thus, a linguistic and conceptual adaptation of the instrument was reached, which allowed evidence of face validity and content to be provided.

3.2. Preliminary data analysis

The Mahalanobis distance was calculated considering p ≤ .001 as the cut-off point (Tabachnick & Fidell, 2001) to explore the presence of multivariate anomalous cases. Furthermore, 7 outliers were detected that had to be eliminated for subsequent analysis. Therefore, the final sample size was 316 participants. Univariate outliers were also analyzed based on the calculation of a Z score for each of the items. Further, 33 data with values outside the range Z ± 3 were observed (Tabachnick & Fidell, 2001). These cases corresponded to items 1 ("I pay close attention to feelings"), 4 ("I think it is worth paying attention to my emotions and state of mind"), 13 ("I am often aware of my feelings in different situations"), and 23 ("I have a lot of energy when I feel happy"). Since it was decided not to eliminate them, caution was exercised when interpreting them (Hair, Black, Babin, & Anderson, 2009).

Then, a descriptive analysis of the 24 items was performed, calculating their means, standard deviations, and skewness and kurtosis indices. Table 1 presents that 7 items exceeded the values ± 1 of asymmetry and/or kurtosis recommended by George y Mallery (2016) as criteria to accept the normality of the variables. Particularly noteworthy is the distribution of item 23, whose content reflects a basic and essential indicator of the emotional healing dimension. As a consequence, most of the subjects evaluated tended to focus on category 5.

Finally, the scatter diagrams were examined using visual analysis to assess the

existence of linear relationships between the variables analyzed, and a study of multicollinearity between the items was carried out to identify excessively high or redundant correlations (Tabachnick & Fidell, 2001). No inter-item correlations were equal to or greater than ± .90.

Table 1.
Agreement between judges and descriptive statisticians of the TMMS-24 items

SEI SUBSCALE	ITEMS	AIKEN V [90IC]	M	SD	ASYMMETRY	KURTOSIS
Emotional Attention	IE1	1[.79-1]	4.15	0.94	-1.20	1.26
	IE2	.90[.65-.97]	3.96	1.06	-0.97	0.43
	IE3	.90[.65-.97]	3.62	1.18	-0.67	-0.36
	IE4	1[.79-1]	4.19	0.96	-1.30	1.61
	IE5	.90[.65-.97]	3.28	1.33	-0.33	-1.03
	IE6	.90[.65-.97]	2.92	1.34	0.02	-1.17
Emotional Clarity	IE7	1[.79-1]	3.53	1.13	-0.60	-0.35
	IE8	1[.79-1]	3.60	1.11	-0.58	-0.36
	IE9	1[.79-1]	3.38	1.20	-0.35	-0.75
	IE10	1[.79-1]	3.39	1.17	-0.52	-0.60
	IE11	1[.79-1]	3.56	1.08	-0.55	-0.34
	IE12	.90[.65-.97]	3.96	1.00	-0.93	0.55
	IE13	1[.79-1]	3.98	0.94	-1.03	1.09
Emotional Healing	IE14	1[.79-1]	3.20	1.26	-0.17	-0.97
	IE15	.90[.65-.97]	3.66	1.08	-0.69	-0.02
	IE16	1[.79-1]	3.62	1.02	-0.62	-0.01
	IE17	.90[.65-.97]	3.70	1.34	-0.81	-0.54
	IE18	.90[.65-.97]	3.65	1.27	-0.70	-0.52
	IE19	1[.79-1]	3.03	1.40	-0.12	-1.23
	IE20	1[.79-1]	3.68	1.28	-0.72	-0.54
	IE21	.90[.65-.97]	3.76	1.25	-0.77	-0.46
	IE22	1[.79-1]	3.92	1.03	-0.84	0.22
	IE23	.90[.65-.97]	4.66	0.77	-2.86	8.73
	IE24	1[.79-1]	3.41	1.25	-0.48	-0.71

Note. M: Mean; SD: Standard Deviation.

3.3. Evidence of validity based on internal structure: exploratory factor analysis

An EFA was performed to provide evidence of validity based on the internal structure of the instrument. Previously, indicators were calculated to support the feasibility of this multivariate study: Bartlett's test of sphericity and the Kaiser–Mayer–Olikin (KMO) sample adequacy measure. Both a satisfactory KMO of .85

and the Bartlett test (X2= 3081.3; df = 276; p < 0.001) suggested the possibility of applying a factor analysis to the data matrix.

The optimal implementation of Horn's parallel analysis (based on the unweighted least squares extraction method), performed on the polychoric correlation matrix of the 24 items, suggested the extraction of three factors. Other objective criteria, such as GFI = .98, RMSEA = .04, and RMSR= 0.055, indicated a good fit of the model to the data, complementing the decision to retain three factors (Abad *et al.*, 2011; Lloret-Segura et al.,2014).

Since the isolated factors showed a significant correlation (greater than .32), the application of an oblique rotation method (Promin) was decided. The 24 items were distributed, as expected at a theoretical level, in a balanced way in three factors that described 54.5% of the variance. The Bentler factorial simplicity index reached an adequate value (S = 0.99). As presented in Table 2, each factor presented at least 4 items and, in turn, all the items presented factor loads greater than .30.

The items that saturated in the first factor are indicative of the Emotional Clarity sub-dimension (being able to adequately understand emotional states). The second factor was made up of items proposed for the Emotional Attention sub-dimension (being able to give attention to feelings adequately). Finally, the elements that make up the third factor operationalize the Emotional Healing sub-dimension (being able to regulate emotional states appropriately). Only the correlation between the Emotional Clarity and Emotional Healing factors was moderate (r = .45). Emotional Attention, on the other hand, showed a low association with Emotional Clarity (r = .17) as well as with Emotional Healing (r = .07).

Table 2.
Factor loadings of the TMMS-24 items (rotated matrix) and internal consistency

ITEMS	FACTOR		
	I	II	III
IE1		.72	
IE2		.79	
IE3		.68	
IE4		.62	
IE5		.51	
IE6		.67	
IE7		.68	
IE8		.76	
IE9	.59		
IE10	.73		
IE11	.79		

ITEMS	FACTOR		
	I	II	III
IE12	.60		
IE13	.59		
IE14	.75		
IE15	.50		
IE16	.57		
IE17			.83
IE18			.91
IE19			.75
IE20			.90
IE21			.60
IE22			.62
IE23			.33
IE24			.60
α Cronbach [95 IC]	.82 [.79, .85]	.84 [.81, .86]	.85 [.83, .88]
α ordinal [95 IC]	.84 [.81, .87]	.87 [.85, .89]	.88 [.86, .90]

Note. loads less than .30 were dismissed.

3.4. Reliability analysis

When studying reliability through an analysis of the internal consistency of the items, good Cronbach's alpha coefficients were verified for the three subscales of the instrument (Table 2): emotional attention = .82; emotional clarity = .84; emotional healing = .85. The indices were slightly higher if the polytomous nature of the response categories to the items was respected by calculating the ordinal alpha.

3.5. Relationship with sociodemographic characteristics

A Mann–Whitney U test was performed, comparing the scores obtained by men and women in each of the subscales. A nonparametric test was chosen since the assumptions of normality and homoscedasticity were not met. No statistically significant differences were observed in any of them based on gender (Table 3).

Table 3.
Differences based on gender

SUBSCALE	GENDER AVERAGE RANGE			
	MEN (N = 90)	WOMEN (N = 226)	U MANN WHITNEY	P
Emotional Clarity (F1)	145.84	163.54	11309.50	.12
Emotional Attention (F2)	173.97	152.34	8777.50	.06
Emotional Healing (F3)	164.54	156.09	9626	.46

Note. *p< .05; ** p< .01; *** p < .001 (bilateral)

In addition, to identify whether there was an association between the age of the participants and the TMMS-24 subscales, the variables were correlated using Spearman's Rho coefficient. A nonparametric test was used given the asymmetry of the variables. No statistically significant associations were found with any of the three subscales (emotional attention: r =.08, p = .15; emotional clarity: r = .05, p = .39; emotional healing: r=.04, p = .51).

3.6. Evidence of validity based on the relationship with other variables

Correlations were made between the subscales of the TMMS-24 and the AEP. In Table 4, all the correlations turned out to be significant, except responsibility/emotional healing, responsibility/emotional clarity, and extraversion/emotional clarity. Significant correlations were positive in all cases, except neuroticism/emotional attention and neuroticism/emotional healing.

Table 4.
Correlations between subscales of the TMMS-24 and subscales of the AEP

		PERSONALITY				
		EXTRAVERSION	**AGREEABLENES**	**CONSCIENTIOUSNESS**	**NEUROTICISM**	**OPENNESS**
PEI	Emotional Attention	.30**	.26**	.17**	-.33**	.19**
	Emotional Clarity	.08	.23**	-.07	.24**	.13*
	Emotional healing	.37**	.34**	.09	-.43**	.21**

Note. *p< .05; ** p< .01; *** p < .001 (bilateral)

4. DISCUSSION

The aim of this study was to examine the psychometric properties of the TMMS-24 to provide evidence to ensure the quality of the measure in its adaptation to the local context for its application to university students in the city of Mar del Plata, Argentina.

First, evidence of face and content validity was reported, in addition to evidence of validity based on the internal structure of the instrument. Indeed, using the EFA, an adequate adjustment of the model to the data and to a structure of three factors (attention, clarity, and emotional healing) was observed, which described 54.5% of the variance. Each factor presented at least 4 items and, in turn, all the items presented factor loads greater than .30. These results agree with those reported by Salovey *et al*. (1995) in the original version of the scale, with those of the Spanish version (Fernández-Berrocal *et al*., 2004) and with the results of the preliminary psychometric study of the TMMS-48 carried out by Mikulic *et al*. (2017).

Regarding the correlations among the three factors, the results indicated that only the correlation between clarity and emotional healing was moderate. Emotional attention indicated a weak association with both clarity and emotional healing.

These results not only are consistent with those found in the Spanish version (Fernández-Berrocal *et al*., 2004) but are also in line with the expectations. Thus, unlike the case of clarity and emotional healing (where high scores would be indicators of an adequate emotional adjustment), regarding emotional attention, very high scores could eventually account for a process of rumination or hypervigilance of emotions and sensations, which would lead to an emotional imbalance, perpetuating negative emotional states (Extremera-Pacheco & Fernández-Berrocal, 2005; Fernández- Berrocal, Salovey, Vera, Ramos & Extremera, 2017).

Regarding internal consistency, Cronbach's alpha and ordinal alpha coefficients were verified to be very good for the three subscales (attention: α = .82 and α = .84; clarity: α = .84 and α = .87, and healing: α = .85 and α = .88). These results are consistent with what was evidenced in the original scale (attention: α = .86; clarity: α = .88; and healing: α = .82) and in the spanish version (attention: α = .90 clarity: α = .90, and healing: α = .86) (Fernández-Berrocal *et al*., 2004; Salovey *et al*., 1995).

Regarding the relationship with sociodemographic characteristics, no statistically significant differences were observed in any of the subscales based on gender and age. This result is consistent not only with the original version and the validation study of the Spanish version (Fernández-Berrocal *et al*., 2004; Salovey *et al*., 1995) but also with studies carried out in other cultural contexts (Bonet & Guillén, 2017; Cazalla-Luna & Molero, 2016; Colorado, García, Alfonso, & Ospino, 2012; del Carmen-Giménez-Espert & Prado- Gascó, 2018; Gartzia, Aritzeta, Balluerka, & Barberá, 2012). However, several studies have reported significant differences based on gender (Gómez-Núñez *et al*., 2018; López, Maciá, & Juan, 2018; Rodríguez *et al*., 2019; Villacreces & Achi, 2017). Generally, higher levels of emotional attention have been observed in women and higher levels of emotional regulation have been observed in men (Merchán-Clavellino, Morales-Sánchez, Martínez- García, & Gil-Olarte, 2018). Therefore, given that to date there are conflicting results in this regard, it continues to be a controversial aspect in the EI field of study, both in the general population and in student samples. It is necessary for future studies to address and deepen this issue (Bonet & Guillén, 2017; Rodríguez *et al*., 2019).

To obtain evidence of validity based on the relationship with other variables and because several studies have reported the relation between emotional intelligence and personality (van der Linden *et al*., 2017), correlations were made between the subscales of SEI of the TMMS-24 and the sub-scales of the AEP personality questionnaire. These correlations were statistically significant (except for responsibility/emotional healing, responsibility/emotional clarity, and extraversion/emotional clarity).

In a significant number of previous investigations, attention positively correlated

with all personality dimensions, while clarity and healing positively correlated with extraversion, agreeableness, responsibility, and openness and negatively with neuroticism (Salguero, Fernández-Berrocal, Balluerka, & Aritzeta, 2010; Leible & Snell, 2004; Salovey *et al*., 1990). In this study, attention and healing presented negative correlations with neuroticism, while clarity presented a positive correlation with neuroticism.

As a hypothesis, it could be assumed that in this population of university students, high levels of attention accompanied by a sufficient capacity for healing could be associated with low levels of neuroticism. Furthermore, high levels of clarity, especially when not accompanied by sufficient capacity for attention and emotional healing, could be associated with psychological discomfort, negative emotions, and emotional instability.

In fact, given that neuroticism implies a trend to experience negative emotions (such as anger, sadness, anxiety) intensely and frequently, high levels in this variable could lead to university students seeing their ability to experience and understand clearly their emotions (clarity). However, this does not necessarily imply that they can adequately interrupt and regulate their negative emotional states and prolong the positive ones (healing).

Furthermore, it is necessary to highlight some issues in relation to the intensity of the correlations between SEI and personality. They lead to a debate about the overlap-independence between both concepts, discussing whether the dimensions of the SEI are closer to the concept of personality than to intelligence (Davies, Stankov, & Roberts, 1998).

A series of investigations have indicated moderate and high correlations between both constructs, which is interpreted as evidence of overlap (Mestre-Navas & Guil-Bozal, 2006; van der Linden *et al*., 2017). These studies hold that the so-called emotional abilities are actually personality traits and question the applied utility of the SEI measures (van Rooy, Viswesvaran, & Pluta, 2005). In this line of work, there are, for instance, the studies by Pérez-González y Sánchez-Ruiz (2014) as well as those by van der Linden, Tsaousis y Petrides (2012), and Veselka, Schermer, Martin y Vernon (2010) who obtained correlations around r = .70.

However, there are other investigations that, like this study, have reported low and moderate correlations between the SEI and personality dimensions, providing evidence in favor of the independence of both constructs, highlighting the existence of relationships between them and, even noting that certain personality variables could operate as predictors of the SEI global index (Arias-Gallegos, Infantes-Chávez,& Ceballos-Canaza, 2016; James, Bore, & Zito, 2012; Mayer *et al*. 2016). In fact, maximum levels of correlation have been established to account for the independence between concepts (r between .40 and .50). Correlations above these

values would indicate an overlap between the theoretical constructs (Mestre-Navas & Guil-Bozal, 2006). Consequently, by presenting correlations lower than r = .43, this study would be an important contribution to the aforementioned debate, providing evidence in favor of the independence of the SEI.

From a theoretical point of view, the EI model of Mayer, Caruso, and Salovey places special emphasis on conceptually differentiating EI from personality, considering that personality traits imply dispositions for behavior, while intelligence entails organismic abilities to behave. That is, although a trait, such as extraversion, may depend on or result in social skills, it is a behavioral preference rather than a skill. Knowing what another person feels is a mental ability. Such knowledge may come from the g factor, or be independent from it (Mayer & Salovey, 1993). Therefore, this model dispenses with concepts close to personality (Billings *et al*., 2014), which are necessary to consider EI as a new type of intelligence (Mayer, Salovey, Caruso, & Sitarenios, 2001).

5. LIMITATIONS AND FUTURE LINES OF RESEARCH

Among the limitations of this study, it can be mentioned, on a methodological level, having used an incidental sample in which the population is represented only by university students, with a greater number of women compared to men. For this reason, the possibility to generalize the results is limited. Future studies will seek to expand the socio-educational characteristics of the sample.

In addition, although the factorial structure obtained is consistent with the proposal in the original scale and with most of the versions adapted to other cultures, it would be convenient to carry out a confirmatory factorial analysis to assess the fit of the model and analyze its invariance in different groups that may be of interest, such as, for example, one based on the gender of those evaluated. However, the psychometric properties examined so far have shown to be satisfactory; thus, the TMMS-24 turns out to be a valid and reliable instrument to measure SEI from an intrapersonal approach in the Mar del Plata university population. The results obtained add to those evidenced by several studies verifying the robust functioning of the TMMS-24 in different cultures. That is, the psychometric properties of the instrument remain stable in the different cultural groups that have been examined (Fernández-Berrocal *et al*., 2004).

Developing psychometric studies is extremely important given the scarcity of instruments properly adapted to our environment. Local adaptations allow, among other things, valid comparisons with results obtained in other countries. Only in this way is it possible to determine the extent to which the skills of emotions come to be shaped by sociocultural influence.

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