Construct and concurrent validity of the short- and long-form versions of the trait emotional intelligence questionnaire

Sylvain Laborde [a,b,*], Mark S. Allen [c], Félix Guillén [d]

[a] German Sport University Cologne, Germany; Institute of Psychology, Department of Performance Psychology
[b] Université de Caen Basse-Normandie, France
[c] School of Psychology, University of Wollongong, Australia
[d] University of Las Palmas de Gran Canaria, Spain

ABSTRACT

This study tested the concurrent validity of the short-form version of the trait emotional intelligence questionnaire (TEIQue-SF) against the long-form version (TEIQue-LF), and the construct validity of each questionnaire. In total, 1889 Spanish adults (935 women, 954 men; mean age = 21.56 years, age range = 18–37 years) completed the TEIQue-SF and TEIQue-LF, the order of which was counterbalanced across participants. Confirmatory factor analysis supported the 4-factor structure of both the short-form and long-form versions, with marginally stronger factor loadings observed for the long-form. Bivariate correlations demonstrated a high degree of similarity in scoring on the TEIQue-SF and TEIQue-LF for each subscales and the global trait emotional intelligence (EI): well-being ($r = 0.76$), self-control ($r = 0.69$), emotionality ($r = 0.78$), sociability ($r = 0.71$), and global trait EI ($r = 0.83$). Overall, findings indicate that the TEIQue-SF is a viable alternative to the TEIQue-LF for research in time-restricted conditions where the completion of long questionnaires might be unfeasible.

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1. Introduction

Short versions of comprehensive questionnaires are important for research in practical settings where time restrictions can prohibit the use of longer versions. It is important that short questionnaires undergo the same rigorous validation as their long version counterparts in order to ascertain that the short version is capturing the same information. An independent validation of a revised (short) questionnaire is an important first step in the validation of a new measure. However, it is also important to test concurrently whether responses on a short version of a questionnaire parallel those provided on a long version in order to establish criterion (concurrent) validity. The aim of this study was to test the concurrent validity of the trait emotional intelligence questionnaire — short form (TEIQue-SF; Petrides, 2009b) through correlations with the trait emotional intelligence questionnaire — long form (TEIQue-LF; Petrides, 2009b). We also test the construct validity of the two questionnaires using confirmatory factor analysis (CFA).

Trait emotional intelligence is defined as a constellation of emotional self-perceptions situated at the lower levels of personality hierarchies (Petrides, Pita, & Kokkinaki, 2007). Trait emotional intelligence relates to outcomes including job performance, burnout, psychopathology,

health-related behaviors, relationship satisfaction, educational attainment, sport performance and group performance, to name a few (see, for example, Bell, 2007; Laborde, Dosseville & Allen, 2015; Laborde, Dosseville, & Scelles, 2010; Pena-Sarrionandia, Mikolajczak, & Gross, 2015; Petrides et al., in press). The TEIQue-LF is one of the most widely used measures of trait emotional intelligence and has demonstrated strong psychometric properties (Petrides, 2009a, 2009b). The predictive validity of the TEIQue-LF has been established through high correlations with objectively measured theoretical outcomes such as vagal tone measured with heart rate variability (Laborde, Brüll, Weber, & Anders, 2011; Laborde, Lautenbach & Allen, 2015) and the stress hormone cortisol (Laborde, Lautenbach, Allen, Herbert & Achtzehn, 2014; Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007).

The TEIQue-SF has also been subjected to independent validation and has demonstrated strong psychometric properties (e.g. Cooper & Petrides, 2010; Jacobs, Sim, & Zimmermann, 2015; Stamatopoulou, Galanis, & Prezerakos, 2016). Items in the TEIQue-SF are taken directly from the TEIQue-LF (Petrides, 2009b). There is growing evidence for the predictive validity of the TEIQue-SF through high correlations with theoretical outcomes including for example mental health and academic performance (Cooper & Petrides, 2010; Jacobs et al., 2015; Laborde, Guillen, Dosseville, & Allen, 2015; Perera & DiGiacomo, 2015; Petrides et al., 2010; Sevdalis, Petrides, & Harvey, 2007; Siegling, Vesely, Petrides, & Saklofske, 2015). The validation work conducted so far suggest that the TEIQue-SF and TEIQue-LF are valid measures of trait

* Corresponding author at: DSHS (Deutsche Sporthochschule), Institute of Psychology, Am. Sportpark Müngersdorf 6, 50933 Cologne, Germany.
E-mail address: s.laborde@dshs-koeln.de (S. Laborde).

emotional intelligence. However, concurrent validity has yet to be established through administration of the two questionnaires simultaneously and correlating corresponding subscales. In this study we test the concurrent validity of the Spanish versions of the TEIQue-SF and TEIQue-LF. We hypothesized strong ($r > 0.50$; Cohen, 1992) correlations between subscales of the TEIQue-SF and corresponding subscales of the TEIQue-LF (H_1). In addition, we explored correlations between common items on the two questionnaires, and again hypothesized strong ($r > 0.50$) correlations (H_2). Based on previous factor analytic research, we also hypothesized acceptable construct validity for both measures as established through confirmatory factor analysis (H_3).

2. Method

2.1. Participants

In total, 1889 Spanish university students agreed to take part in the study (935 women, 954 men; mean age = 21.56 years, age range = 18–37 years).

2.2. Measures

We used the Spanish versions of the TEIQue-SF and TEIQue-LF (Petrides, 2009b). The TEIQue-SF contains 30 items, taken in pairs from each of the 15 facets of the TEIQue-LF. The TEIQue-LF contains 153 items, 15 facets, and four factors. For both measures, the four factors are *well-being* (e.g., "I feel that I have a number of good qualities"), *self-control* (e.g., "I usually find it difficult to regulate my emotions"), *emotionality* (e.g., "Expressing my emotions with words is not a problem for me"), and *sociability* (e.g., "I'm usually able to influence the way other people feel"). The four factors can be combined to create a composite (global) emotional intelligence score. Items are scored on a scale from 1 (*completely disagree*) to 7 (*completely agree*). Cronbach α reliability coefficients for the TEIQue-LF (coefficients for the TEIQue-SF in parentheses) were: 0.83 (0.83) for well-being, 0.78 (0.72) for self-control, 0.74 (0.74) for emotionality, 0.73 (0.70) for sociability, and 0.80 (0.84) for global trait emotional intelligence.

2.3. Procedure

A university research ethics committee provided ethical clearance for the study prior to data collection. Participants were recruited from a university campus by research assistants. Participation was not part of a course requirement, and participants did not receive any payment in exchange of participation. Participants were presented with a brief description of the study objective and were then given the opportunity to participate. Written informed consent was obtained from all study participants. Questionnaires were completed in a quiet classroom setting and took between 25 and 40 min to complete. The order of the two questionnaires was counterbalanced across participants.

2.4. Data analysis

The data for subscale and global scores for both the TEIQue-SF and TEIQue-LF demonstrated a normal distribution (skewness values were lower than 2.00). Concurrent validity was tested through bivariate correlations between the four factors of the TEIQue-LF and corresponding factors of the TEIQue-SF. We also correlate the global trait emotional intelligence scores of the two measures, as well as the common items in the TEIQue-SF and TEIQue-LF. To test the construct validity of the two measures we performed a confirmatory factor analysis using the software Amos 17.0, based on the composite indicators of the factors to enable a direct comparison between the TEIQue-SF and TEIQue-LF. Goodness of fit was established using common indexes including the $\chi^2 (df)$ statistic, the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Incremental Fit Index (IFI), the root mean square error of approximation (RMSEA), and the standardized root mean square index (SRMR). Values below 0.08 for the SRMR, below 0.06 for the RMSEA, and above 0.95 for the CFI, TLI, and IFI indicate an acceptable model fit (Hu & Bentler, 1999). In addition, we computed squared standardized factor loadings, that represent the proportion of variance in the indicator that is explained by the latent factor (Brown, 2006), and compared the differences in squared standardized factor loadings between the TEIQue-SF and TEIQue-LF.

3. Results

Means, standard deviations and bivariate correlations for the four factors and the global trait emotional intelligence score are presented in Table 1. Bivariate correlations between common items of the TEIQue-SF and TEIQue-LF are presented in Table 2. Strong correlations were observed between subscales of the TEIQue-SF and corresponding subscales of the TEIQue-LF providing evidence of concurrent validity: well-being ($r = 0.76$, $p < 0.001$), self-control ($r = 0.69$, $p < 0.001$), emotionality ($r = 0.78$, $p < 0.001$), and sociability ($r = 0.71$, $p < 0.001$), and global trait EI ($r = 0.83$, $p < 0.001$). Correlations between common items of the TEIQue-SF and TEIQue-LF ranged from 0.36 to 0.65 (all $p < 0.001$), with 13 items showing a moderate correlation and 17 items showing a strong correlation.

Confirmatory factor analysis provided support for the construct validity of the TEIQue-SF and TEIQue-LF. The TEIQue-SF showed an excellent fit to the theoretically expected four factor structure, $\chi^2(2) = 6.29$, $p = 0.002$, CFI = 0.99, TLI = 0.98, IFI = 0.99, RMSEA = 0.05 [90% CI: 0.03; 0.08], and SRMR = 0.02. The TEIQue-LF also showed an excellent fit to the four factor structure, $\chi^2(2) = 14.41$, $p < 0.001$, CFI = 0.99, TLI = 0.97, IFI = 0.99, RMSEA = 0.06 [90% CI: 0.04; 0.09], and SRMR = 0.02. Standardized factor loadings are depicted in Fig. 1. The squared standardized factor loadings and their differences are reported in Table 3. The differences ranged from 0.05 to 0.20.

4. Discussion

This study tested the construct and concurrent validity of the Spanish versions of the TEIQue-SF and TEIQue-LF in an undergraduate population.

Table 1
Means, standard deviations, and correlations between the TEIQue-SF and TEIQue-LF for the full sample.

	TEIQue-SF		TEIQue-LF		Correlations
	M	SD	M	SD	
Well-being	5.33	0.98	5.10	0.81	0.76***
Self-control	4.44	0.82	4.34	0.66	0.69***
Emotionality	4.86	0.84	4.71	0.66	0.78***
Sociability	4.61	0.83	4.52	0.64	0.71***
Global EI	4.83	0.65	4.65	0.55	0.83***

Note: ***$p < 0.001$; TEIQue: trait emotional intelligence questionnaire; SF: short-form; LF: long-form.

Table 2
Correlations between items of the TEIQue-SF and the corresponding items from the TEIQue-LF.

Item TEIQue-SF	Item TEIQue-LF	Factor	Correlation (r)
1	133	Emotionality	0.44***
2	42	Emotionality	0.44***
3	73	None	0.56***
4	84	Self-control	0.40***
5	89	Well-being	0.46***
6	72	Sociability	0.56***
7	56	Self-control	0.59***
8	9	Emotionality	0.37***
9	28	Well-being	0.44***
10	144	Sociability	0.45***
11	18	Sociability	0.57***
12	5	Well-being	0.63***
13	44	Emotionality	0.57***
14	70	None	0.44***
15	148	Self-control	0.48***
16	62	Emotionality	0.50***
17	24	Emotionality	0.43***
18	35	None	0.45***
19	140	Self-control	0.36***
20	75	Well-being	0.53***
21	71	Sociability	0.55***
22	16	Self-control	0.57***
23	40	Emotionality	0.57***
24	88	Well-being	0.54***
25	151	Sociability	0.59***
26	52	Sociability	0.41***
27	8	Well-being	0.51***
28	120	Emotionality	0.52***
29	69	None	0.50***
30	12	Self-control	0.65***

Note: ***$p < 0.001$; TEIQue: trait emotional intelligence questionnaire; SF: short-form; LF: long-form.

Concurrent validity of the TEIQue-SF was established through strong correlations between subscales of the TEIQue-SF and corresponding subscales of the TEIQue-LF, providing support for our first hypothesis. Our second hypothesis was partially supported, with 17 items common to the TEIQue-SF and TEIQue-LF showing strong correlations, but 13 items showed moderate correlations. For our third hypothesis, construct validity of the TEIQue-SF and TEIQue-LF was established through confirmatory factor analysis, with both questionnaires showing an excellent fit to the theoretically expected four factor structure. These findings suggest that the TEIQue-SF is a viable alternative to the TEIQue-LF for research in time-restricted conditions where the completion of long questionnaires might be unfeasible.

The finding that subscales of the TEIQue-SF correlated strongly with corresponding subscales of the TEIQue-LF is an important development as past research has tended to explore the validity of the TEIQue-SF independent to the TEIQue-LF. Correlations were between 0.69 and 0.78 for the subscales and the global index showed a correlation of 0.83. These findings give confidence in past results obtained using the TEIQue-SF as an alternative to the TEIQue-LF. However, correlations between common items were in the moderate — strong range suggesting that test-retest reliability might be an issue for some items and we recommend further research explore this possibility. The finding that both the TEIQue-SF and TEIQue-LF had excellent model fit statistics is in line with previous work testing the psychometric properties of English, Spanish, and other non-English versions of these scales (Freudenthaler, Neubauer, Gabler, Scherl, & Rindermann, 2008; Laborde, Dosseville, Guillén & Chávez, 2014; Petrides, 2009b; Stamatopoulou et al., 2016).

The (somewhat) higher standardized factor loadings for the TEIQue-LF, that was reflected in a difference in squared standardized factor loadings of between 5% and 20%, indicate that the TEIQue-LF might provide more reliable estimates of global trait emotional intelligence. Thus, when time pressure is not an issue in research design, researchers might select to use the TEIQue-LF in preference to the TEIQue-SF. The TEIQue-LF also has the added benefit of assessing trait emotional intelligence at the facet-level that is not captured using the TEIQue-SF. Assessing trait emotional intelligence at the facet-level can provide important information for researchers and clinicians aiming to make more refined predictions about the function of this trait and, in turn, more targeted interventions (e.g. Austin & Vahle, 2016; Campo, Laborde & Mosley, in press).

Strengths of this study include the large sample size and the use of counterbalancing protocols for questionnaire completion. However, there are some important limitations that readers must consider when interpreting study findings. First, our sample population consisted largely of undergraduate students and therefore might be considered somewhat WEIRD (Western, educated, industrialized, rich, and democratic;
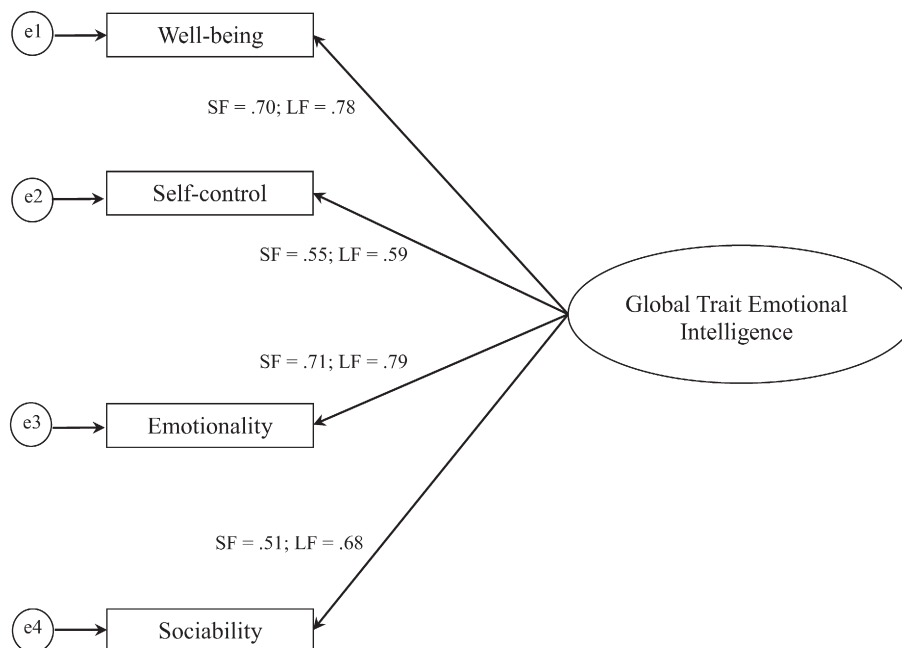

Fig. 1. Standardized factor loadings for the trait emotional intelligence questionnaire (TEIQue) short-form (SF) and long-form (LF).

Table 3
Differences in squared standardized factor loadings.

	Standardized factor loadings		Squared standardized factor loadings		Difference in squared standardized loadings (TEIQue-LF–TEIQue-SF)
	TEIQue-SF	TEIQue-LF	TEIQue-SF	TEIQue-LF	
Well-being	0.70	0.78	0.49	0.61	0.12
Self-control	0.55	0.59	0.30	0.35	0.05
Emotionality	0.71	0.79	0.50	0.62	0.12
Sociability	0.51	0.68	0.26	0.46	0.20

Note: TEIQue: trait emotional intelligence questionnaire; SF: short-form; LF: long-form.

Henrich, Heine, & Norenzayan, 2010). Our findings cannot be generalized beyond this sample and whether findings are transferrable to alternative populations such as elderly or clinical samples remains unknown. Second, the two measures were completed at a single time-point and whether the TEIQue-SF and TEIQue-LF show test-retest reliability is unknown. Last, we used a single sample rather than multiple samples meaning we cannot ascertain the replicability of the correlation values observed in the current study. Further research is needed to determine whether strong correlations consistently emerge between subscales of the TEIQue-SF and corresponding subscales of the TEIQue-LF.

5. Conclusion

Short-form versions of questionnaires are important for research in practical settings where time restrictions can prohibit the use of longer versions. This study demonstrates that the TEIQue-SF produces similar scores to the TEIQue-LF (concurrent validity) suggesting that the TEIQue-SF can be used as an alternative to the TEIQue-LF in time-restricted research conditions. This study also confirmed the factor structure of the Spanish versions of both the TEIQue-SF and TEIQue-LF (construct validity) suggesting that these measures offer a valid assessment of trait emotional intelligence in samples that match the current study population. These findings are important for researchers wanting to locate questionnaires (for use in their research and practice) that have been demonstrated as valid and reliable. Further validation studies are needed to ascertain whether the TEIQue-SF and TEIQue-LF provide a valid assessment of trait emotional intelligence in particular contexts (e.g., sport, academia, the military), in alternative cultures (non-Western samples), and in alternative populations such as adolescents and older adults.

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