

ABSTRACT

This paper aims to investigate the reliability and validity of the Trait Emotional Intelligence Questionnaire-Adolescent Short Form score in a sample of 440 Greek adolescents. The instrument's score demonstrated good internal consistency and was significantly correlated with core self-evaluations as well with somatic complaints, self-report psychopathology and personal strengths. It also explained a statistically significant increase in the prediction of outcome variables beyond core self-evaluations. It is concluded that, the findings of the present study provide evidence that support the interpretation and use of the TEIQue-ASF score to assess the emotional self-perceptions of Greek adolescents.

Keywords: TEIQue-ASF, validity, reliability, SDQ, trait emotional self-efficacy

Introduction

Trait emotional intelligence (EI) is defined as a constellation of emotion-related self-perceptions assessed through questionnaires and rating scales (Petrides, Pita, & Kokkinaki, 2007). Essentially, it concerns people's perceptions of their emotional world.

The most widely used measures of trait EI are the Trait Emotional Intelligence Questionnaire (TEIQue) forms developed to measure emotional intelligence as a personality trait (Siegling, Saklofske, & Petrides, 2015). Research findings support the interpretation and use of scores from these TEIQue forms in numerous cultural contexts (Andrei, Siegling, Aloe, Baldaro, & Petrides, 2016; Andrei, Smith, Surcinelli, Baldaro, & Saklofske, 2015; Andrei, Mancini, Trombini, Baldaro & Russo, 2014; Freudenthaler, Neubauer, Gabler, Scherl, & Rindermann, 2008; Jacobs, Sim, & Zimmermann, 2015; Martskvishvili, Arutinovi, & Mestvirishvili, 2013; Mikolajczak, Luminet, Leroy, & Roy, 2007; Petrides et al., 2007; Siegling, Vesely, Saklofske, Frederickson, & Petrides, 2015; Stamatopoulou, Galanis, & Prezerakos, 2016; Alujaa, Blanca, & Petrides, 2016; Di Fabio, Saklofske, & Tremblay, 2016; Russo, Mancini, Trombini, Baldaro, Mavrovelli, & Petrides, 2012; Mavroveli & Siu, 2012). The Trait

Emotional Intelligence Questionnaire-Adolescent Short Form (TEIQue-ASF) is one of the few trait forms that has been specifically developed for adolescents. However, the adult forms of the TEIQue have received more attention in psychometric research compared with the adolescent forms. To deal with this imbalance, the present study aimed to examine the reliability and validity of the TEIQue-ASF score in a Greek sample of adolescents and address substantive questions about the nomological network of the trait EI construct. Emphasis was placed on aspects of internal consistency, convergent, criterion and incremental validity. Based on the previous studies (Siegling et al., 2015; Mavroveli, Petrides, Rieffe, & Baker, 2007; Frederickson, Petrides, & Simmonds, 2012) that have examined the interpretation and use of the TEIQue-ASF score, it was hypothesized that:

1. The TEIQue-ASF score would demonstrate satisfactory internal consistency.
2. A strong positive correlation would exist between the TEIQue-ASF score and core self-evaluations scale (CSES).
3. A strong negative correlation would exist between the TEIQue-ASF score and somatic complaints.
4. A strong negative correlation would exist between the TEIQue-ASF score and total difficulties as well as with all of its subscales: emotional symptoms, peer problems, hyperactivity and conduct problems.
5. A moderate positive correlation would exist between the TEIQue-ASF score and prosocial behavior.
6. The TEIQue-ASF score would explain a statistically significant increase in the prediction of outcome variables beyond CSES.

Method

Participants and procedure

A randomized stratified cluster sample of 550 students from 14 public schools, in the region of Laconia, Greece, was selected based on the class as the final sampling unit. Schools were stratified by prefecture and by school type (high schools and senior high schools). Nine percent of the students refused to participate and another 11% was absent on the day of the survey. A final sample of 440 students (56.4% attended high school) was drawn (response rate: 80%). Data collection was performed from March until April in 2016. Mean age was 15.13 years ($SD = 1.40$), and 58.9% ($n = 259$) of the sample were girls. Participants in urban areas comprised 39.3% of the sample, 39.5% resided in rural areas, and 21.1% in suburban areas. Ethical approval was obtained from the Pedagogical Institute of the Ministry of Education, Research and Religious Affairs. Written consents were also obtained from parents or guardians after the provision of detailed information regarding the study's aims and purposes. The surveys were group administered in classrooms under researcher supervision. The mean time to complete the questionnaires was 40 min.

Measures

TEIQue-ASF.

The TEIQue-ASF (Petrides, Sangareau, Furnham, & Frederickson, 2006) is a simplified version of the adult short form of the TEIQue (Petrides, 2009). It consists of 30 multiple choice questions based on a 7-point Likert-type scale. The questionnaire has been translated to Greek (Petrides et al., 2007) and is available, free of charge for academic research purposes, from <http://www.psychometriclab.com/>.

Core Self-Evaluations Scale (CSES)

The CSES (Judge, Erez, Bono, & Thoresen, 2003) consists of 12 items, which are a composite of four specific traits (self-esteem, self-efficacy, locus of control, and neuroticism) which load on a single factor. Research findings from Greece support the interpretation and use of the CSES score to assess core self-evaluations in adolescence

and adults (Koumoundourou, Tsaousis, & Koumenou, 2011; Tsaousis, Karademas, & Kalatzi, 2013; Tsaousis, Nikolaou, Serdaris, & Judge, 2007; Koumoundourou, Kounenou, & Siavara, 2012; Koumenou, 2014; Nikolaou, & Judge, 2007; Nikolaou, Gouras, Vakola, & Bourantas, 2007). The internal consistency of the scale is reported in Table 1.

Strengths and Difficulties Questionnaire (SDQ)

The SDQ (Goodman, 1997) consists of 25 items, which are divided between 5 scales: emotional symptoms (5 items), conduct problems (5 items), hyperactivity/inattention (5 items), peer relationship problems (5 items) and prosocial behavior (5 items). With the exception of the prosocial scale a total difficulties score is calculated by adding together the other four scales. The factor structure of the SDQ has already been confirmed in a sample of Greek adolescents (Giannakopoulos et al., 2009). The internal consistencies of the SDQ are reported in Table 1.

Somatic Complaints List (SCL)

The SCL (Riefte, Meerum-Terwogt, & Bosch, 2004) is an 11 item scale developed in order to identify how often children and adolescents experience and feel pain. Participants are required to report the frequency of their somatic symptoms (such as headache and stomach ache) on a three-point scale. SCL score has demonstrated acceptable validity and reliability (Jellesma, Riefte, & Meerum Terwogt, 2007; Riefte et al., 2010; Riefte, Villanueva, Adrián, & Górriz, 2009). The Greek translation of the SCL is available from the Institute of Psychology, Leiden University. The internal consistency of the scale is reported in Table 1.

Results

Internal reliability

The internal consistency of TEIQue-ASF, as measured by Cronbach's alpha coefficient, was good (Table 1).

Correlations

Correlations between the key variables in the study are presented in Table 1. The TEIQue-ASF was negatively correlated with SCL ($r = -.59, p = .01$). In contrast, there was a positive correlation between the TEIQue-ASF and CSES ($r = .79, p = .01$). The TEIQue-ASF was also negatively correlated with total SDQ difficulties ratings ($r = .73, p = .01$) as well as with all of its subscales: emotional symptoms ($r = -.66, p = .01$), peer problems ($r = -.59, p = .01$), hyperactivity ($r = -.51, p = .01$) and conduct problems ($r = -.41, p = .01$). In addition, trait EI correlated positively with prosocial behavior ($r = .38, p = .01$). A two-step hierarchical regression was performed in order to investigate the direct and incremental influence of the TEIQue-ASF score on each outcome variable in the study (Table 2). CSES was entered at step 1, while the TEIQue-ASF score followed at step 2. In addition, in order to develop general estimates of incremental validity magnitude of the TEIQue-ASF score, we followed the recommendation of Hunsley and Meyer (2003) by evaluating the size of the validity increment that is based on the semipartial r .

The first regression was performed with 'somatic complaints' as the criterion. At step 1, $R^2_{adj} = .32, F(1,438) = 203.72; p < .001$, CSES was negatively related to 'somatic complaints' ($\beta = -.56; t = -14.27; p < .001$). At step 2, the TEIQue-ASF was found to be a significant negative predictor of 'somatic complaints' ($\beta = -.40; t = -6.50; p < .001$), accounting for a significant 6% of unique variance after controlling for CSES ($F_{change}(1,437) = 42.25, p < .001$). The correlation of the TEIQue-ASF with 'somatic complaints' after controlling for effects of CSES was $-.25 (p < .001)$.

The second regression was performed with 'total difficulties' as the criterion. At step 1, the model predicted 48% of the variance in 'total difficulties' ($F(1,438) = 407.22, p < .001$) and CSES was negatively related to 'total difficulties' ($\beta = -.69; t = -20.18; p < .001$). At step 2, the TEIQue-ASF was found to be a significant negative predictor of 'total difficulties' ($\beta = -.49; t = -9.70; p < .001$), accounting for a significant 9% of unique variance after controlling for CSES ($F_{change}(1,437) = 94.09, p < .001$). The correlation of the TEIQue-ASF with 'total difficulties' after controlling for effects of CSES was $-.30 (p < .001)$.

The third regression was performed with 'emotional symptoms' as the criterion. At step 1, the model predicted 41% of the variance ($F(1,438)=301.70$, $p<.001$) and CSES was a negative predictor ($\beta=-.64$; $t=-17.37$; $p<.001$). At step 2, the TEIQue-ASF was found to be a significant negative predictor of 'emotional symptoms' ($\beta=-.41$; $t=7.21$; $p<.001$), accounting for a significant 6% of unique variance after controlling for CSES ($F_{change}(1,437)=51.96$, $p<.001$). The correlation of the TEIQue-ASF with 'emotional symptoms' after controlling for effects of CSES was $-.25$ ($p<.001$).

When 'conduct problems' were modeled as the criterion the model at step one predicted 10% of the variance ($F(1,438)=51.98$, $p<.001$) and CSES was a negative predictor ($\beta=-.33$; $t=-7.21$; $p<.001$). At step 2, the TEIQue-ASF was found to be a significant negative predictor of 'conduct problems' ($\beta=-.41$; $t=-5.84$; $p<.001$), accounting for a significant 6% of unique variance after controlling for CSES ($F_{change}(1,437)=34.07$, $p<.001$). The correlation of the TEIQue-ASF with 'conduct problems' after controlling for effects of CSE was $-.27$ ($p<.001$).

When 'hyperactivity' was modeled as the criterion, the model at step one predicted 28% of the variance ($F(1,438)=171.27$, $p<.001$) and CSES was a negative predictor ($\beta=.53$; $t=-13.09$; $p<.001$). At step 2, the TEIQue-ASF was found to be a significant negative predictor of 'hyperactivity' ($\beta=-.25$; $t=-3.89$; $p<.001$), accounting for a significant 2% of unique variance after controlling for CSES ($F_{change}(1,437)=15.04$, $p<.001$). The correlation of the TEIQue-ASF with 'hyperactivity' after controlling for effects of CSES was $-.15$ ($p<.001$).

The next regression was performed with 'peer problems' as the criterion. At step 1, the model predicted 29% of the variance ($F(1,438)=179.19$, $p<.001$) and CSES was a negative predictor ($\beta=-.54$; $t=-13.39$; $p<.001$). At step 2, the TEIQue-ASF was found to be a significant negative predictor of 'peer problems' ($\beta=-.43$; $t=-6.92$; $p<.001$), accounting for a significant 7% of unique variance after controlling for CSES ($F_{change}(1,437)=47.89$, $p<.001$). The correlation of the TEIQue-ASF with 'peer problems' after controlling for effects of CSES was $-.26$ ($p<.001$).

The last regression was performed with 'prosocial behavior' as the criterion. At step 1, the model predicted 8% of the variance ($F(1,438)=37.91$, $p<.001$) and CSES was a

positive predictor ($\beta=.28$; $t=6.16$; $p<.001$). At step 2, the TEIQue-ASF was found to be a significant positive predictor of 'prosocial behavior' ($\beta=.41$; $t=5.71$; $p<.001$), accounting for a significant 6% of unique variance after controlling for CSES ($F_{change}(1,437)= 32.64$, $p<.001$). The correlation of the TEIQue-ASF with 'peer problems' after controlling for effects of CSES was .25 ($p <.001$).

Discussion

The aim of the present study was to examine the reliability and validity of the TEIQue-ASF score in a Greek sample of adolescents. The TEIQue-ASF score demonstrated good alpha reliability (George & Mallery, 2003) similar to other published versions in different countries (e.g. Frederickson, Petrides, & Simmonds, 2012; Petrides et al., 2006; Mavroveli et al., 2007).

Trait EI was negatively correlated with somatic complaints and self-reported psychopathology. Specifically, adolescents with high emotional functioning experience less pain and were less likely to present emotional and behavioral difficulties, such as hyperactivity, peer problems, conduct problems and emotional symptoms. In addition, high trait EI students were more likely to demonstrate prosocial behavior. These results are consistent with the findings of relevant studies (Rieffe, Oosterveld, Miers, Terwogt, & Ly, 2008; Mavroveli et al., 2007; Mavroveli & Sanchez-Ruiz, 2011; Poulou, 2014) and provide some evidence for the convergent validity of the TEIQue-ASF score.

The TEIQue-ASF score also showed a very strong positive correlation with CSES. The relationship between trait EI and core self-evaluations, a higher-order personality construct, is consistent with the theoretical conceptualization of emotional intelligence as a personality trait located at the lower levels of personality taxonomies (Petrides & Furnham, 2006). This link has been confirmed in related studies (Kluemper, 2008; Ahmetoglu, Leutner, & Chamorro-Premuzic, 2011; Özer, Hamarta, & Deniz, 2016), which have revealed that higher levels of trait EI affect positively the way in which the person appraises his worthiness, effectiveness, and capability. The strong

theoretical and empirical relationship between the TEIQue-ASF and CSES, makes the latter a big hurdle beyond which the TEIQue-ASF score should demonstrate incremental validity. Many researchers have criticized trait EI measures for a lack of discriminant validity due to their overlap with established personality constructs (e.g., Davies, Stankov, & Roberts, 1998). In order to deal with the problem of overlapping a growing number of studies have examined the incremental validity of TEIQue scores. Incremental validity is defined as the degree to which “a measure add to the prediction of a criterion above what can be predicted by other sources of data” (Hunsley & Meyer, 2003, p. 446). In the present study the TEIQue-ASF score explained a statistically significant increase in the prediction of somatic complaints, self-report psychopathology and personal strengths beyond CSES, addressing the questions about the weak utility of trait EI construct. In adolescents and preadolescents, TEIQue scores have also shown incremental validity in relation to a wide range of outcome variables (such as depression, disruptive behavior, academic performance, somatic complaints and social competence) beyond Big Five (Davis & Humphrey, 2012; Andrei et al., 2014), cognitive ability (Frederickson et al., 2012; Davis & Humphrey, 2012; Siegling et al., 2015), coping strategies (Siegling et al., 2015), IQ (Andrei et al., 2014; Ferrando et al., 2011) and self-concept (Ferrando et al. 2011).

Collectively, these findings provide evidence that support the interpretation and use of the TEIQue-ASF score to assess the emotional self-perceptions of Greek adolescents.

Declaration of Conflicting Interests

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Table 1. Internal Consistencies, Means, Standard Deviations and Intercorrelation Matrix for Key Variables in the study

	1	2	3	4	5	6	7	8	9	Means	SD	Cronbach's alpha
1. TEIQue-ASF	-									4.85	0.77	.87
2. CSES	.79*	-								41.72	7.45	.84
3. SCL	-.59*	-.56*	-							5.60	3.95	.81
4. ESS- SDQ	-.66*	-.64*	.68*	-						3.15	2.53	.74
5. CPS- SDQ	-.41*	-.33*	.31*	.36*	-					2.86	1.73	.47
6. HS - SDQ	-.51*	-.53*	.32*	.42*	.44*	-				3.37	2.36	.70
7. PPS- SDQ	-.59*	-.54*	.46*	.54*	.39*	.35*	-			2.08	1.97	.64
8. PBS- SDQ	.38*	.28*	-.15*	-.09	-.43*	-.32*	-.32*	-		7.78	1.99	.68
9. TDS- SDQ	-.73*	-.69*	.61*	.81*	.68*	.75*	.75*	-.36*	-	11.47	6.47	.83

Note. TEIQue-ASF = Trait Emotional Intelligence Questionnaire-Adolescent Short Form; CSES = Core Self-Evaluations Scale; SCL = Somatic Complaints ESS = Emotional Symptoms Scale; SDQ = Strengths and Difficulties Questionnaire; CPS = Conduct Problems Scale; HS = Hyperactivity Scale; PPS = Peer Problems Scale; PBS = Prosocial Behavior Scale; TDS = Total Difficulties Scale.

*p= .01, two- tailed.

Table 2. Two-step Hierarchical Regressions with the Core Self-Evaluations Entered at Step 1 and Trait EI Entered at Step 2 as Predictors of Somatic Complaints and the SDQ

	Somatic complaints			Total difficulties			Emotional symptoms			Conduct problems			Hyperactivity			Peer problems			Prosocial behavior			
Step 1	$F(1,438)=203.72^{***}$			$F(1,438)=407.22^{***}$			$F(1,438)=301.70^{***}$			$F(1,438)=51.98^{***}$			$F(1,438)=171.27^{***}$			$F(1,438)=179.19^{***}$			$F(1,438)=37.91^{***}$			
	$R^2_{Adj}=.32$			$R^2_{Adj}=.48$			$R^2_{Adj}=.41$			$R^2_{Adj}=.10$			$R^2_{Adj}=.28$			$R^2_{Adj}=.29$			$R^2_{Adj}=.08$			
Step 2	$\Delta F(1,437)=42.25^{***}$			$\Delta F(1,437)=94.09^{***}$			$\Delta F(1,437)=51.96^{***}$			$\Delta F(1,437)=34.07^{***}$			$\Delta F(1,437)=15.04^{***}$			$\Delta F(1,437)=47.89^{***}$			$\Delta F(1,437)=32.64^{***}$			
	$R^2_{Adj}=.37$			$R^2_{Adj}=.57$			$R^2_{Adj}=.47$			$R^2_{Adj}=.17$			$R^2_{Adj}=.30$			$R^2_{Adj}=.36$			$R^2_{Adj}=.14$			
	$\Delta R^2=.06^{***}$			$\Delta R^2=.09^{***}$			$\Delta R^2=.06^{***}$			$\Delta R^2=.06^{***}$			$\Delta R^2=.02^{***}$			$\Delta R^2=.07^{***}$			$\Delta R^2=.06^{***}$			
	β	t	sr	β	t	sr	β	t	sr	β	t	sr	β	t	sr	β	t	sr	β	t	sr	
Step 1																						
Core self-evaluations	-.56	-14.27***	-.56	-.69	-20.18***	-.69	-.64	-17.37***	-.64	-.33	-7.21***	.33	-.53	-13.09***	-.53	-.54	-13.39***	-.54	.28	6.16***	.28	
Step 2																						
Core self-evaluations	-.25	-4.11***	-.16	-.31	-6.10***	-.19	-.32	-5.67***	-.20	-.00	-0.03	-.00	-.33	-5.16***	-.21	-.20	-3.26**	-.12	.04	-0.56	-.02	
Trait EI	-.40	-6.50***	-.25	-.49	-9.70***	-.30	-.41	-7.21***	-.25	-.41	-5.84***	-.27	-.25	-3.89***	-.15	-.43	-6.92***	-.26	.41	5.71***	.25	

** $p=.001$. *** $p<.001$.