Measuring trait emotional intelligence: development and psychometric properties of the Greek Emotional Intelligence Scale (GEIS)

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ABSTRACT This article describes the development and validation of a new self report measure of emotional intelligence in the Greek language based on the theoretical framework proposed by Mayer and Salovey (1997). The Greek Emotional Intelligence Scale (GEIS) was developed to measure trait emotional intelligence, and consists of 52 items measuring four basic emotional skills: Expression and Recognition of Emotions, Control of Emotions, Use of Emotions for Facilitating Thinking, and Caring and Empathy. In this study, 1387 individuals participated in the various stages of the development and validation of the test. A principal component analysis was conducted on the data and four interpretable factors were rotated using direct oblimin procedure. The *Cronbach's a* coefficients for the four factors ranged between 0.80 and 0.92. The test-retest correlation coefficients ranged between 0.79 and 0.91. Results from five different studies supported also the convergent and discriminant validity of the GEIS scales, using for that goal twelve different measures from the cognitive as well as from the emotional/personality domain. For example, GEIS scales were found to be positively and significantly correlated with Extraversion, Agreeableness and Conscientiousness, and negatively and significantly correlated with Neuroticism. GEIS scales were also found not to be correlated with cognitive ability. We concluded that the psychometric features of the GEIS supported its feasibility as a research instrument to measure trait emotional intelligence in Greek population

Keywords: Emotional intelligence, Test construction, Information-processing EI, Trait EI.

1. Introduction

The recent and widespread interest in the construct of Emotional Intelligence (EI) has led researchers to focus on how this newly introduced concept has developed (Bar-On & Parker, 2000. Ciarrochi, Forgas & Mayer, 2001. Dulewicz & Higgs, 2003. Law, Wong & Song, 2004. Petrides & Furnham, 2003). However, besides the popularity of the construct, there is still some theoretical confusion regarding the exact meaning and domain of the concept. This

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confusion has resulted in the development of three alternative theoretical frameworks for conceptualizing the construct.

The first model has been developed by Salovey and Mayer (1990), who first introduced the term "Emotional Intelligence". According to them, EI is defined as "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (p. 189). The EI construct reflects a four-level hierarchy ranging from basic to more complex psychological processes. At the lowest level stands the ability to perceive, appraise, and express emotion; the next level up involves the ability to use emotions to facilitate cognition. The third level reflects the ability to understand and reason about emotions, and the fourth level involves the ability to regulate emotions to facilitate emotional and cognitive growth, which reflects the most complex level of EI. The above conceptual model is characterized by a two-component schema: at the higher level, there is a general processing of emotional information, and at the lower level there are specific skills that are involved in such processing. One could argue that this perspective perceives EI as a model of intelligence. This perspective is further enhanced by the recent work of Mayer, Carouso, and Salovey (1999), in which they explicitly declared that their model should be viewed within the context of mental ability, since it satisfies the three traditional classes of criteria for intelligence: conceptual, correlational, and developmental.

The second model has been introduced by Daniel Goleman (1998a), who was responsible for the popularization of the concept. He has defined EI as "the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships" (p. 317). He formulated his model in terms of a theory of performance since, as he suggested, his model has direct applicability to the domain of work and organisational effectiveness, particularly in predicting excellence (i.e. job performance) in jobs of all kinds, from sales to leadership (Goleman, 1998b).

Finally, Raven Bar-On (1997) has placed EI in the context of emotional and social competencies. His definition of EI described it as "an array of noncognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures" (p. 14). He proposed a model of noncognitive intelligences that includes five broad areas of skills or competencies from the personality domain, and within each, more specific skills that appear to contribute to success. These include (a) intrapersonal skills, (b) interpersonal skills, (c) adaptability, (d) stress management, and (e) general mood.

On the basis of the above described theoretical development, it seems that, at present, there are two approaches in studying EI. On the one hand, there is the *ability EI*, proposed by Mayer and Salovey (1997) and Mayer, Caruso and Salovey (1999), who argue that EI constitutes an additional aspect of crystallized intelligence. On the other hand, there is the *trait EI* which refers to "...a constellation of emotion-related self-perceptions and dispositions located at the lower levels of personality hierarchies" (Petrides, Pérez-González & Furnham, 2007). According to Carroll (1993), the conceptualisation of EI as a personality trait leads to a construct that lies wholly outside the taxonomy of human cognitive ability. Goleman (1988a), although he initially supported the latter approach, has recently tried to represent EI within the competence domain.

Extensive research work has been produced during the last few years on this debate, in an attempt to clarify and crystallize which of the two models best explains EI. Unfortunately, the outcome of this attempt, instead of empowering one or the other approach, has led to some degree of theoretical confusion since the results were contradictory. According to Petrides and Furnham

(2003), "these two are different constructs because the procedures used in their operational definitions are fundamentally different, even though their theoretical domains might overlap" (p. 40).

Almost simultaneously with the development of theoretical models of EI there was an inevitable interest in the development of tests to measure the concept. According to Mayer, Caruso, and Salovey (1999), the measurement of EI plays an important role in the conceptualization of the concept, since if it cannot adequately be measured then one could argue that it might not exist as a meaningful scientific construct. Existing measures of EI may be divided into two categories: (a) performance measures, and (b) self-report measures. The first category operationalizes the information-processing EI model while the second category operationalizes the trait EI model.

The most comprehensive performance measure of EI is the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT, V.2.0) developed by Mayer, Salovey, and Caruso (2002), which appears to be an improvement over its predecessor, the Multifactor Emotional Intelligence Scale (MEIS. Mayer et al., 1999), which in turn, was designed to measure four major hypothetical components (i.e. branches) that underlie the hierarchical model they proposed. Although the MSCEIT demonstrates acceptable psychometric properties (Mayer, Caruso & Salovey, 1999. Mayer et al., 2003), some researchers express concerns regarding the scoring technique used (i.e. consensus scoring) and its effectiveness to provide meaningful scores especially at the high end of the EI continuum (Conte, 2005. Matthews, Zeidner & Roberts, 2002). Other ability-based scales are the Emotional Accuracy Research Scale (EARS. Geher, Warner & Brown, 2001. Mayer & Geher, 1996), and the Levels of Emotional Awareness Scale (LEAS. Lane et al., 1990). Both measures, although they belong to performance EI measures, have not gained much scientific attention during the last years (especially after the emergence of the MEIS and MSCEIT) and are rarely used as typical EI measures.

The second major category involves a number of researchers who have attempted to develop self-report measures of EI. One of the earliest attempts was put forth by Schutte, Malouff, Hall, Haggerty, Cooper, Golden, and Dornheim (1998) who have developed a self-report measure of EI (The Schutte Self-Report Inventory-SSRI), based on Salovey and Mayer's (1990) initial EI model (expression and appraisal, regulation, and utilization of emotion). Although the SSRI demonstrates acceptable reliability indices, its main limitation is related to its dimensionality; according to Schutte et al. (1998), the test was designed to measure a general EI factor, however, later studies (Petrides & Furnham, 2000. Saklofske, Austin & Minski, 2003) using more powerful statistical techniques failed to replicate that general EI factor. Instead, they suggested a multi-dimensional model containing three distinct components (optimism/mood regulation, appraisal of emotions, social skills, and utilization of emotions), which does not map onto Salovey and Mayer's model of EI. Moreover, Austin, Saklofske, Huang, and McKenney (2004) added eight items into the original 33-item scale and found that a modified 41-item version had better psychometric characteristics.

Bar-On (1997), based on his theoretical framework of "noncognitive" factors, has developed the Emotional Quotient Inventory (EQ-i) to assess EI. This 133-item self-report measure consists of 15 distinct scales, including (a) intrapersonal EI (emotional self-awareness, assertiveness, self-regard, self-actualization, and independence), (b) interpersonal EI (empathy, relationship skills, and social responsibility), (c) adaptability (problem solving, reality testing, and flexibility), and (d) stress management (stress tolerance and impulse control). EQ-i has shown good internal consistency and test-retest reliability indices as well as evidence of convergent and divergent validity, mainly from the personality domain (Bar-On, 1996. Bar-On, Brown, Kirkcaldy & Thome,

2000, Dawda & Hart, 2000, Newsome, Day & Catano, 2000). The major critique regarding this EI measure comes from Mathews et al. (2002) who argue that the theory behind this measure is rather vague, and that further research is needed to prove that EQ-i's sub-scales are related to EI. Boyatzis, Goleman and Rhee (2000), working within the competencies domain, have developed the Emotional Competence Inventory (ECI), a 110-item instrument which has been designed to measure 20 competencies organized into four clusters: Self-Awareness, Self-Management, Social Awareness, and Social Skill. The internal consistency reliability of the ECI ranges from 0.61 to 0.85, while discriminant and predictive validity evidence comes only from the Self-Assessment Questionnaire (SAQ) which is the predecessor of the ECI. This lack of validity evidence prompted Conte (2005) to argue that, until peer-reviewed empirical studies using this measure are conducted, ECI does not deserve serious consideration.

Dulewicz and Higgs (2000) have also developed an instrument aiming to assess the concept of EI. The Emotional Intelligence Questionnaire (EIQ) has been designed to specifically assess through self-report seven elements of an individual's emotional intelligence: self-awareness, emotional resilience, motivation, inter-personal sensitivity, influence, intuitiveness, and conscientiousness. The authors present evidence which supports the reliability and the validity of their instrument (Dulewicz, Higgs & Slaski, 2003) and claim that EIQ is a parsimonious measure of EI, suitable for use within the working and organizational framework. Additionally, Petrides and his associates (2005, 2006, 2007) have developed the Trait Emotional Intelligence Questionnaire (TEIQue), a 153-item instrument of trait EI, which contains four components (well-being, self-control, emotionality, and sociability) and fifteen subscales (including optimism, emotion regulation, emotion management, social competence, adaptability, etc.). TEIQue has demonstrated adequate reliability and validity data (Mikolajczak et al., in press, Perez, Petrides & Furnham, 2005, Petrides & Furnham, 2006, Petrides, Perez-Gonzalez & Furnham, 2007) and has already been translated in many different languages (i.e. Spanish, Greek, Polish, Portuguese, Italian, French Dutch, Chinese, Norwegian, Croatian, Malay and German). The main limitation of both measures (EIQ and TEIQue) is that most of their scales either overlap with personality dimensions (e.g. conscientiousness, intuitiveness, sociability) and other psychological concepts (e.g. motivation, well-being) or might be best described as meta-cognitive constructs (e.g. self-awareness, self-control). Consequently, it seems plausible these instruments are not assessing a separate trait of emotional intelligence but rather a particular combination of existing person-specific characteristics that mostly appear unrelated to emotion.

Finally, there are two other self-report measures, namely the Wong and Law's Emotional Intelligence Scale (WLEIS, Wang & Law, 2002), and the Multidimensional Emotional Intelligence Assessment (MEIA, Tett, Fox & Wang, 2005) which are based on the original Salovey and Mayer (1990, 1997) EI model. Both instruments present evidence to support the theoretical framework introduced by Salovey and Mayer (1990), but this time from the trait perspective, enhancing the argument made by Schutte et al. (1998) that this model "seems to be an excellent process-oriented model that emphasizes stages of development in emotional intelligence, potential for growth and the contributions emotions make to intellectual growth" (p. 169).

The preceding review of EI measures indicates that although there are many measures –either performance or self-reports– that claim to measure the EI concept, there is still a need for validated measures that are based on a comprehensive and parsimonious model. As Schutte et al. (1998) suggest, this can be the model proposed by Mayer and Salovey (1997), since it "seems to be an excellent process-oriented model that emphasizes stages of

development in emotional intelligence, potential for growth and the contributions emotions make to intellectual growth" (p. 169). Furthermore, one could argue that most dimensions of all the other models can, more or less, be integrated into this model.

Furthermore, the lack of a psychometric instrument measuring the construct of EI in the Greek language necessitated the construction of a reliable and valid measure in Greek. Between the two alternative methodologies; namely, adopting an imported measure by translating it into the Greek language ("*etic*" approach) or developing a new one taking into account the specific ethnic and cultural characteristics of the Greek population ("*emic*" approach), the latter was deemed more appropriate. Developing an altogether new measure provides several conceptual as well as methodological advantages (Benet-Martinez, 2006).

Under this perspective, the purpose of this study was to (a) develop a reliable and valid self-report measure of the construct of emotional intelligence, and (b) to provide validity evidence which justify that the newly developed instrument is a measure of the trait emotional intelligence, a theoretical perspective which assumes that EI is a dispositional tendency, closely related to personality domain.

2. Method

Participants

Four different samples were used in this study. Sample 1 was used to test the factor structure of the initial version of the GEIS, and consisted of 246 individuals of whom 94 (38.2%) were males. The mean age of the total sample was 31.76 (SD=10.42) years of age. All participants were employees from private companies who participated in emotional intelligence seminars. Sample 2 was used to replicate the factor structure as well as the convergent and discriminant validity of the final version of the GEIS. This sample consisted of 511 individuals of whom 156 (30.5%) were males and 346 (67.7%) were females (nine individuals did not report their gender). The mean age of the participants was 30.53 years (SD=9.97), and they were also employees from private companies who participated in emotional intelligence seminars. Sample 3 was used to investigate the latent structure as well as the convergent and discriminant validity of the final version of the GEIS, and consisted of 699 individuals. Of these, 251 (35.9%) were males (six participants did not report their gender). The mean age of the sample was 30.47 (SD=11.85). Finally, Sample 4 was used to examine the test-retest reliability coefficients of the GEIS scales, and consisted of 83 individuals (62 females; five individuals did not report their gender), being adults of mean age 27.17 years (SD=8.06), who completed the GEIS twice, with an interval of four weeks between administrations. All participants in Sample 4 were students.

Measures

Twelve different measures from the cognitive as well as from the emotional-personality domain were used in order to test the convergent and discriminant validity of the GEIS scales. Particularly:

Cognitive Ability Measures

Standard Progressive Matrices (Raven, Court & Raven, 1979). This is a 60-item test measuring fluid intelligence (Cattell, 1971). It consists of five sets of 12 matrices and deals with sequences of related patterns. The Raven Progressive Matrices test has very high internal consistency reliability (>0.90).

The AH4 (Heim, Watts & Simmonds, 1970). This group-administered intelligence test consists of two sets of 65-items, yielding three scores: verbal intelligence, perceptual intelligence, and a total intelligence score. According to Kline (1993), AH4's verbal and perceptual scores are typical measures of crystallized intelligence. All reliabilities reported for the AH4 are higher than 0.80.

Personality Measures

The Traits Personality Questionnaire - TPQue (Tsaousis, 2002). This is a comprehensive measure of the five major dimensions of personality (Extraversion, Neuroticism, Openness to Experience, Agreeableness, and Conscientiousness) as well as of the most important traits that define each domain in the Greek language. It consists of 206 items and is based on Costa and McCrae's (1992) definitions of the most acceptable factors in the five-factor theory. TPQue has indicated acceptable reliability and validity data (Tsaousis, 2002).

Locus of Control (Rotter, 1966). We used Rotter's I-E Scale to tap this variable in our study. Rotter's original scale consisted of 23 forced-choice LOC items and six filler items to obscure the purpose of the test. The 23 items yielded a *Cronbach a*=0.75

Emotional Intelligence Related Measures

The Schutte Self-Report Inventory - SSRI (Schutte et al., 1998). This self-report questionnaire comprises 33 self-referencing statements. According to the authors, all items load significantly on a single factor (Schutte et al., 1998), which called Overall EI. For the purposes of the present study, since our factor analytic results did not replicate the four-factor solution suggested by the previous researchers, we decided to use only the Overall EI score. Alpha reliability for the total scale was 0.85.

Toronto Alexithymia Scale - TAS (Taylor, Ryan & Bagby, 1985). This is a 26-item questionnaire, that measures a clinical syndrome known as alexithymia (Sifneos, 1973), which is defined as the difficulty of the individual (a) to identify and describe feelings, (b) to communicate with emotions, (c) to daydream, and (d) for externally oriented thinking. The alpha coefficient for TAS-20 total score was 0.92, while the alphas for the sub-scales ranged from 0.74 to 0.90.

The Trait Meta-Mood Scale - TMMS (Salovey et al., 1995). This instrument comprises 30 items. It contains three sub-scales: Attention (13 items), Repair (6 items), and Clarity (11 items). It also provides an overall meta-mood score. Alpha reliabilities for each sub-scale were very high ranging from 0.92 to 0.96. Alpha reliability for the total score was 0.97.

Social Skills Inventory - SSI (Riggio, 1989). The SSI is a 90-item questionnaire designed to assess basic communication skills. More specifically, it measures social skills in six domains (emotional expressivity, emotional sensitivity, emotional control, social expressivity, social sensitivity, and social control) and provides a total score that reflect a global level of social skill development indicative of overall social skill competence or social intelligence. Alpha reliability for the total scale is 0.98, while alpha for the six scales ranged between 0.89 to 0.92.

The Emotional Empathy Scale - EES (Caruso & Mayer, 1997). This scale consists of 30 items measuring the extent to which an individual is able to feel what the other person feels. The EES provides an overall score that represents the total empathy score. The alpha reliability index for this scale is very high (alpha=0.97).

Well-being Measures

The Satisfaction With Life Scale - SWLS (Diener, Emmons, Larsen & Griffin, 1985). This is 5-item questionnaire that is used to measure the participants' global, cognitive assessment of their life as a whole. The SWLS typically uses a 7-point response format. We changed the response format to a 5-point scale (1=strongly disagree, to 5=strongly agree) because a 5-point response format was used for most of the questionnaires in the survey. Diener et al. (1985) have reported evidence of discriminant and convergent validity for the scale, while the alpha reliability was 0.72 in this data set.

The Positive and Negative Affect Schedule - PANAS (Watson, Clark & Tellegen, 1988). The PANAS includes 10 positive (happy, joyful, pleased, etc.) and 10 negative (depressed, frustrated, angry, etc.) emotion adjectives. Scores on the ten positive emotion items are summed to

indicate the participant's general level of Positive Affect. while scores on the ten negative emotion items are summed to indicate a participant's general level of Negative Affect. Alpha reliabilities for both scales were high and acceptable (0.79 and 0.75 for positive and negative scales, respectively).

Work Stress Measure

The ASSET (Cartwright & Cooper, 2002). The ASSET is an effective tool in diagnosing occupational stress, combining both the sources and the effects of stress. ASSET conceptualizes occupational stress as influenced by a variety of sources, such as work relationships, work-life balance, overload, job security, etc. It also provides scores for organizational commitment as well as for physical health and psychological well-being, since these measures, according to the model, are recognized to be affected by occupational stress. All but one ASSET sub-scales (Work-Life Balance, which was excluded from the analysis) demonstrated satisfactorily internal consistency reliabilities ranging between 0.64 to 0.83.

Procedure

In this section only the procedure that was followed during the validation phase is presented, since it was the most complicated. Due to the large number of measures used during this phase (i.e. thirteen), participants from sample 3 (N=699), were divided into six different groups, each of which completed a limited number of measures. The first group, apart from the the GEIS was asked to complete additionally a questionnaire booklet containing four measures (TAS, TMMS, SSI and EES). The second group, apart from the GEIS was asked to complete additionally the two measures of cognitive ability (Raven and AH4) as well as the personality measure (TPQue). The third group, apart from the GEIS was asked to complete additionally only the ASSET work stress inventory. The fourth group, apart from the GEIS was asked to complete additionally the two measures of Well-being (SWLS and PANAS). The fifth group, apart from the GEIS was asked to complete additionally only the SSRI, and finally, the sixth group, apart from the GEIS was asked to complete additionally the Locus of Control questionnaire.

3. Results

Development of the Items

This stage focused on determining the basic dimensions of the Concept Model and on writing appropriate items to measure them. The conceptual model adopted in this study is the one suggested by Mayer and Salovey (1997). Based on this model, 250 items were generated, which formed the initial item pool from which items for the four scales were developed. From them, the best 180 items were selected in order to form the initial version of GEIS. The first step in item selection was the development of a *marker set of items* for each scale. Markers form a core cluster of items that is closely related to other items of the scale, but not closely related to items of other scales. The advantage of using a marker set in this initial stage of item selection is that overlap between items from various scales is controlled. Two stages can be distinguished in the development of each set of *scale markers*. First, all the items relating to each scale were collected and factor analyzed using Principal Component Analysis (unrotated solution). Second, four items (two with the highest positive and two with the highest negative loadings, to control for the acquiescence effect) from the generated factor analytic solutions were chosen, and a marker set of items for each of the four scales was composed. In the final step, each item was correlated with every scale. Items were only selected if they were highly correlated with the scale under construction, and of low correlation with the other scales. At the end of this phase, the total number of items composing this first version of GEIS was 82.

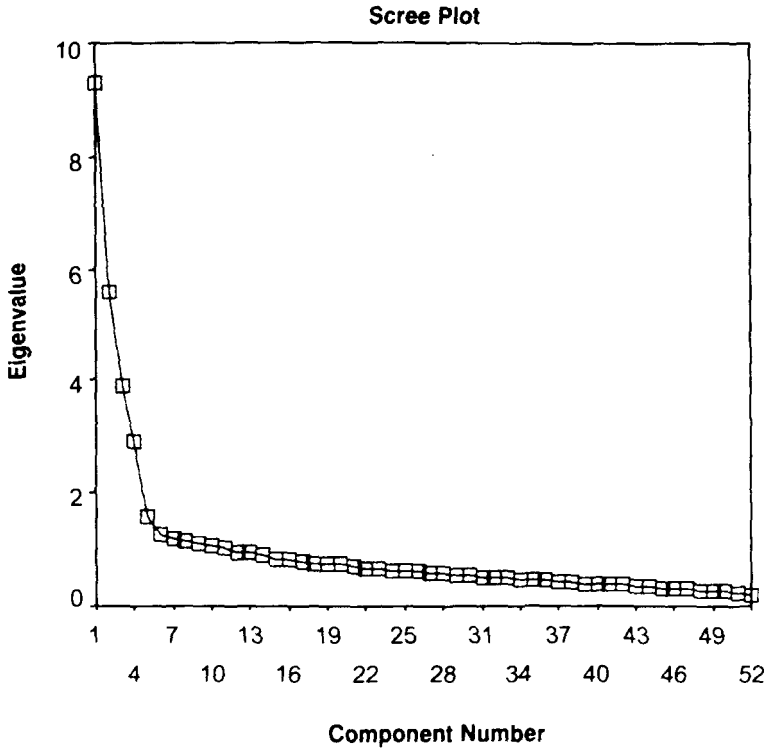

Figure 1
Scree plot of the GEIS (N=511)

Factor Structure

To define the factor structure of the initial version of the questionnaire, the data were subjected to a principal components analysis with oblique direct oblimin rotation; an oblique rotation was selected since all four sub-scales were positively and significantly intercorrelated. Items were retained only if they had a factor loading of 0.40 or higher on a factor and if they had not a high secondary loading on another factor (<0.40). After rotating the solution and eliminating any items that met the above criteria, 52 items were retained, accounting for 40% of the total variance.

Each factor is described below. Factor 1 was named *Use of Emotions for Facilitating Thinking* (UF). The fifteen items that compose this factor are related to the ability of the individual to harness their own emotions in order to solve problems via optimism and self-assurance, two emotional states that facilitate inductive reasoning and creativity. The content of the items in this factor resembles Mayer and Salovey's (1997) "Emotional Facilitation of Thinking" scale. Factor 2 was termed *Caring and Empathy* (CEmp); this factor consists of fifteen items that are related to the willingness of the individual to help other people and his/her ability to comprehend another's feelings and to re-experience them. This factor taps characteristics that are similar to those included into Mayer and Salovey's "Understanding and Analyzing Emotions" scale. Factor 3 was termed *Control of Emotions* (CE); it consists of

twelve items that are related to the ability of the individual to control and regulate emotions in themselves and others, and seems to correspond to Mayer and Salovey's "Reflective Regulation of Emotions" scale. Factor 4 was named *Expression and Recognition of Emotions* (ER); the ten items that compose this factor are related to the ability of the individual to express and recognize accurately their own emotional reactions, and taps characteristics that correspond to Mayer and Salovey's "Perception, Appraisal and Expression of Emotion" scale. A sample of items in each sub-scale appears in the Appendix.

Verification of the factor structure

To explore the factor structure of the final version of GEIS items, a principal component analysis with oblique direct oblimin rotation was performed in a new sample (Sample 2). According to the results, a four-factor solution emerged (see Figure 1). The first factor explained 17.83% of the total variance; the second factor explained 10.76%, and the third and fourth factors, an additional 7.53% and 5.58%, respectively (a total of 42% of the explained variance). The corresponding results are presented in Table 1. Finally, separate factor analyses were conducted for males and females in order to investigate the stability of the factor structure across gender. The results indicated that, with very few exceptions, all items were loaded on the same factors in both cases.

Reliability Analysis

Internal Consistency. The coefficient alpha reliability index for each scale of the final version of the GEIS was as follows: 0.80 for ER scale, 0.83 for CE scale, 0.92 for UF scale, and 0.83 for CEmp scale. These results indicate that GEIS is a reliable test, since all scales meet the minimum criterion of >0.70 (Nunnally & Bernstein, 1994). The corresponding reliability index for the total test was also high (0.89).

Test-retest reliability. The Pearson product-moment correlation coefficients testing the test-retest reliability of the four scales of the final version of the GEIS were also above the minimum requirement value of 0.70. Particularly, it was 0.78 for ER scale, 0.83 for CE scale, 0.92 for UF scale, and 0.76 for CEmp scale. The test-retest reliability coefficient for the total test was also high (0.90).

Convergent and Discriminant Validity

Table 2 presents the correlations between the GEIS scales and all cognitive and emotional variables used in this study. In the top section of the table are the intercorrelations among the four scales of the GEIS. As can be seen, all scales are intercorrelated to each other, a result which suggests that the conceptual model comprises constructs which are related to each other. This result also explains why the percentage of variance explained by the four factors is moderate (42%).

The next section of the table presents the correlations between GEIS scales and the Big Five dimensions of personality (TPQue). All correlations were consistent with those anticipated according to the results from other studies. More specifically, Neuroticism shares a considerable amount of variance with most of the GEIS scores, particularly with the CE scale (-0.60) and the UF scale (-0.58). Furthermore, Extraversion is correlated positively with the UF scale (0.39) and the CEmp scale (0.34). Both personality dimensions are also correlated with GEIS overall score (-0.54 and 0.38, respectively). Finally, Agreeableness is correlated positively with CEmp scale (0.35) as well as with the GEIS overall score (0.24). The remaining two personality dimensions (Conscientiousness and Openness to Experience) demonstrated either low or no significant correlation with GEIS scales.

In terms of cognitive ability measures, the results in Table 2 (top) indicate that either fluid intelligence (as measured by Raven Progressive Matrices) or crystallized intelligence (as measured

Table 1
Factor structure of the GEIS Scales

Item No	Use of Emotion	Caring and Empathy	Control of Emotion	Expression and Recognition
22	**0.82**	0.08	0.20	0.05
39	**0.81**	0.04	0.18	0.03
8	**0.80**	0.03	0.25	0.00
40	**0.79**	0.05	0.16	0.01
12	**0.73**	0.06	0.11	0.04
32	**0.72**	0.00	0.19	-0.03
48	**0.71**	0.14	0.21	-0.05
45	**0.69**	0.05	0.23	0.02
44	**0.67**	0.06	0.28	0.25
3	**0.65**	0.03	0.34	0.25
27	**0.64**	0.11	0.20	-0.02
29	**0.64**	0.29	0.19	-0.03
42	**0.60**	-0.01	0.19	0.19
16	**0.53**	0.10	0.17	0.01
25	**0.50**	0.09	0.21	-0.20
41	0.12	**0.71**	0.14	0.09
24	0.10	**0.71**	0.07	0.04
34	0.08	**0.68**	0.00	0.15
21	0.14	**0.67**	0.10	0.10
46	0.09	**0.64**	0.05	0.21
10	0.11	**0.62**	0.14	0.10
19	0.01	**0.61**	0.17	0.08
37	0.05	**0.59**	0.13	0.22
5	0.09	**0.55**	0.16	0.22
28	0.19	**0.55**	0.30	0.12
50	0.05	**0.51**	0.06	0.10
51	-0.03	**0.50**	-0.04	-0.12
33	-0.03	**0.46**	-0.13	0.05
14	0.03	**0.45**	0.14	0.26
36	0.24	**0.40**	-0.04	0.14
15	0.15	0.12	**0.75**	0.23
35	0.21	0.21	**0.69**	0.18
7	0.24	0.04	**0.69**	0.14
31	0.22	0.29	**0.63**	-0.03
17	0.21	0.08	**0.63**	0.21
6	0.29	0.08	**0.61**	0.17
47	0.33	-0.05	**0.59**	0.02
2	0.21	0.02	**0.58**	0.20
1	0.07	0.02	**0.58**	0.07
38	0.17	0.01	**0.52**	-0.08
52	0.00	0.18	**0.43**	0.21
49	0.30	-0.21	**0.40**	0.10
20	0.12	0.24	0.21	**0.72**
13	0.11	0.18	0.29	**0.66**
11	-0.09	0.12	-0.04	**0.64**
23	-0.16	0.15	-0.11	**0.62**
18	0.06	-0.02	0.20	**0.59**
43	0.20	0.19	0.33	**0.58**
4	0.06	0.05	0.21	**0.55**
26	-0.03	0.30	0.10	**0.53**
9	0.25	-0.07	0.14	**0.49**
30	-0.03	0.13	0.01	**0.45**
% Variance	17.83	10.76	7.53	5.58

Note: values in boldface indicate the items that load on the corresponding factor

Table 2
Correlation coefficients of the GEIS scales with various criterion scales

Criterion Scales	ER	CE	UF	CEmp	Overall EI
The GEIS Scales (*N*=1210)					
Expression & Recognition of Emotions		0.16**	0.15**	0.24**	0.53**
Control of Emotions			0.39**	0.14**	0.68**
Use of Emotions for Facilitating Thinking				0.22**	0.78**
Caring & Empathy					0.56**
The TPQue (*N*=180)					
Neuroticism	-0.01	-0.60**	-0.58**	-0.01	-0.54**
Extraversion	0.16*	0.04	0.39**	0.34**	0.38**
Agreeableness	0.06	0.03	0.16*	0.35**	0.24**
Conscientiousness	-0.14	0.21**	0.18*	-0.01	0.13
Openness to Experience	-0.09	-0.04	0.08	0.12	0.04
Raven Progressive Matrices (*N*=70)					
Total Score	-0.11	-0.02	-0.10	-0.17	-0.14
AH4 (*N*=105)					
Verbal Reasoning	-0.17	0.01	0.01	-0.02	-0.06
Perceptual Reasoning	-0.15	0.09	0.09	-0.11	-0.01
Total IQ Score	-0.17	0.05	0.05	-0.07	-0.03
The SSRI (*N*=152)					
Overall EI	0.30**	0.15**	0.57**	0.49**	0.61**
The TAS (*N*=236)					
Identify & Describe Feelings	0.29**	0.21**	0.29**	0.56**	0.41**
Communicate with Emotions	0.28**	0.39**	0.34**	0.60**	0.49**
Limited Daydreaming	0.63**	0.43**	0.46**	0.70**	0.65**
Difficulty for Externally Thinking	0.68**	0.79**	0.86**	0.73**	0.91**
Overall TAS Score	0.52**	0.43**	0.47**	0.74**	0.64**
The TMMS (*N*=236)					
Attention	0.75**	0.59**	0.62**	0.86**	0.83**
Repair	0.75**	0.70**	0.74**	0.80**	0.89**
Clarity	0.57**	0.58**	0.86**	0.73**	0.83**
Overall TMMS Score	0.78**	0.69**	0.78**	0.89**	0.94**
The SSI (*N*=236)					
Emotional Expressivity	0.77**	0.40**	0.59**	0.78**	0.75**
Emotional Sensitivity	0.62**	0.55**	0.67**	0.85**	0.81**

Table 2 Continued

Criterion Scales	ER	CE	UF	CEmp	Overall EI
Emotional Control	0.44**	0.70**	0.65**	0.69**	0.74**
Social Expressivity	0.68**	0.46**	0.63**	0.71**	0.74**
Social Sensitivity	0.60**	0.42**	0.45**	0.82**	0.68**
Social Control	0.71**	0.67**	0.75**	0.79**	0.87**
Overall SSI Score	0.74**	0.61**	0.71**	0.89**	0.88**
The EES (*N*=236)					
Overall Empathy Score	0.70**	0.59**	0.63**	0.90**	0.84**
The SWLS (*N*=226)	0.14*	0.10	0.33**	0.09	0.29**
The PANAS (*N*=226)					
Positive Affect	0.19**	0.02	0.51**	0.27**	0.44**
Negative Affect	−0.18**	−0.47**	−0.30**	−0.24**	−0.48**
Locus of Control (*N*=213)					
LOC Total	−0.12	−0.035**	−0.41**	0.00	−0.39**
The ASSET (*N*=212)					
Work Relationships	−0.21**	−0.36**	−0.48**	−0.10	−0.48**
Overload	−0.22**	−0.45**	−0.40**	−0.15*	−0.49**
Control	−0.23**	−0.38**	−0.51**	−0.15*	−0.53**
Ressources & Communication	−0.27**	−0.37**	−0.32**	−0.10	−0.42**
Pay & Benefits	−0.33**	−0.26*	−0.10	−0.28**	−0.34**
Your Job	−0.11	−0.28**	−0.37**	0.04	−0.34**
Commitment of the Employee to the Organisation	0.04	0.32**	0.56**	0.21**	0.49**
Commitment of the Organisation to the Employee	−0.10	0.29**	0.52**	0.23**	0.42**
Physical well-being	−0.08	−0.43**	−0.44**	0.02	−0.41**
Psychological Well-being	−0.09	−0.57**	−0.63**	−0.13	−0.61**

Note. **ER**= Expression & Recognition, **CE**= Control of Emotions, **UF**= Use of Emotion for Facilitating Thinking, **CEmp**= Caring & Empathy, **TPQue**= Traits Personality Questionnaire, **SSRI** = Schutte Self-Report Inventory, **TAS**= Toronto Alexithymia Scale, **TMMS**= Traits Meta-Mood Scale. **SSI**= Social Skills Inventory. **EES**= Emotion Empathy Scale, **SWLS**= Satisfaction with Life Scale, **PANAS**= Positive and Negative Affect Schedule

* $p < 0.05$, ** $p < 0.01$

by AH4) showed no correlation with the GEIS scales, suggesting that EI, at least as measured by the GEIS, is independent of the standard cognitive ability construct.

With respect to the emotional intelligence constructs, the correlations were in the expected direction and significant. Particularly, all GEIS scales exhibited positive correlations with the TAS sub-scales (mean r=0.54), the TMMS sub-scales (mean r=0.76), and the Schutte Self-Report Inventory Overall scale (mean r=0.42). Furthermore, they exhibited strong positive correlations with the SSI sub-scales (mean r =0.68), and the EES scale (correlations ranged from 0.59 to 0.90).

Regarding the well-being measures used in this study (SWLS, PANAS, and two measures from the ASSET test), the results (Table 2, bottom) showed correlations moderate in magnitude and in the predicted direction. For example, it was found that SLWS was positively correlated with UF (0.33) and Overall EI score (0.29). Moreover, GEIS scales were positively correlated with PANAS Positive Affect scale (mean r=0.35), and negatively with PANAS Negative Affect scale (mean r=0.33). Finally, the ASSET physical and psychological well-being scales were negatively correlated with CE (-0.43 and -0.57, respectively), UF (-0.44 and -0.63, respectively), and Overall EI score (-0.41 and -0.61, respectively). Additionally, it was found that Locus of Control scale was negatively correlated with both CE (-0.35) and UF (-0.41) scales, as well as with EI overall score (-0.39). There was no correlation between locus of control and either ER or CEmp scales.

Finally, the correlation coefficients between GEIS scales and ASSET's occupational stress indicators were almost all negative and significant (only one was positive but it was not significant). Similarly, in terms of ASSET's two Job Commitment scales, significant positive correlations ranging from 0.21 to 0.56 with four of the five GEIS scales were found, the exception being the ER scale (0.04 and -0.11, both *ns*.).

4. Discussion

The purpose of this study was to (a) develop a reliable and valid self-report measure of the construct of emotional intelligence, and (b) to provide validity evidence which justify that the newly developed instrument is a measure of the trait emotional intelligence, a theoretical perspective which argues that EI can be viewed within the context of the personality domain.

In terms of the first goal, the GEIS demonstrated acceptable psychometric properties, which justify its use as a reliable and valid measure of EI. More specifically, the factor analytic data suggest a four-factor solution, which bears a close resemblance to Mayer and Salovey's (1997) theoretical framework. It should be reminded at this point, that this theoretical model is based on Mayer and Salovey's (1997) early work, where EI is not treated exclusively as an ability model, as it was suggested in their later work (Mayer et al., 1999). All scales demonstrated high internal consistency, indicating that they are homogeneous in their measurements. Furthermore, test-retest data covering a four-week period indicates the temporal reliability of the GEIS.

One of the main goals during the development of this instrument was the demonstration of the convergent as well as the discriminant validation of the GEIS scales. The data from the studies reported herein provide support for good convergent and discriminant validity of the GEIS scales, suggesting that the test taps a fairly broad range of related emotional constructs. On the one hand, all the GEIS scales demonstrated moderate to high positive correlation coefficients with constructs such as empathy, social skills (social intelligence), emotional expressiveness, and well-being. On the other hand, the GEIS scales were correlated negatively with constructs such as locus of control, negative affect, low physical and psychological well-being and work stress. Moreover, the GEIS scales evidenced moderate to high positive correlation coefficients with two instruments, which directly

or indirectly are used as measures of EI: the Trait Meta-Mood Scale (Salovey et al., 1995) and the Schutte Self-Report Inventory (Schutte et al., 1998). These results justify the concurrent validation of the newly developed instrument.

To investigate the second goal, namely whether the GEIS is a measure based on the trait emotional intelligence tradition, the GEIS scales were correlated with a personality measure as well as with both types of intelligence (fluid and crystallized). The results from the analysis showed that GEIS scales were correlated negatively with Neuroticism and positively with Extraversion. Low but significant correlations were also reported with Agreeableness and Conscientiousness dimensions. The order of magnitude of these correlations was comparable to that found previously in the literature (e.g. Davies, Stankov & Roberts, 1998. Dawda & Hart, 2000. Friedman et al., 1980. Newsome, Day & Catano, 2000. Roger & Najiarian, 1989. Van Der Zee, Thijs & Schakel, 2002). The only dimension not correlated with GEIS scales was the Openness to Experience, a scale which, in any case, has previously been related to cognitive abilities (Costa & McCrae, 1992).

Conversely, GEIS scores were unrelated to both fluid intelligence (measured by Raven Progressive Matrices) and crystallized intelligence (measured by AH4 test), a result which is consistent with theoretical considerations according to which trait EI is related to personality but not to indicators of IQ (Carroll, 1993. Newsome et al., 2000. Petrides, Pérez-Pérez-González & Furnham, 2007. Saklofske, Austin & Minski, 2003), while the opposite has been found with ability EI (e.g., for a meta-analytic review of personality and ability correlates of EI, see Van Rooy, Viswesvaran & Pluta, 2005). Once again, such results stress the necessity of changing trait EI's label in order that it does not contain the notion of "intelligence" anymore (Mikolajczak et al., in press).

This close relationship between trait EI and personality has brought up the issue of distinctiveness between the two constructs. On the one hand, some researchers argue that trait EI is nothing more than a blend of well-established personality traits, and as a consequence, its measurement does not offer something new to the study of individual differences (Matthews, Zeidner & Roberts, 2002. Schutte et al., 1998). On the other hand, there are studies which support the incremental validity of the trait EI over personality in the prediction of various life outcomes. For example, Palmer, Donaldson, and Stough (2002) have shown that trait EI explains a considerable amount of variance of life satisfaction even after controlling for personality variance. Additionally, Saklofske, Austin, and Minski (2003) have found that trait EI explains life satisfaction (positively) and depression-proneness (negatively) over and above the basic personality dimensions. Finally, Petrides, Pérez-Pérez-González & Furnham (2007) have reported that trait EI was incrementally associated with rumination, life satisfaction, depression, dysfunctional attitudes, and coping after the effects of personality have been controlled for. The results from this study provide further supporting to the argument that trait EI is mainly related to characteristics in the affective/personality domain, and less with skills in the cognitive domain.

A possible limitation of this study could be that convergent and discriminant validity results are based on cross-sectional self-reports, resulting in possible contamination from common method variance. In this case, one could argue that the correlation between the measures will be higher than it ideally should be because participants will apply the same biases to each task. Similarly, it cannot be excluded that the absence of relationship between trait EI and intelligence tests was simply the product of divergent measurement methods (self-report versus performance), just like the quasi null relationship between ability and trait EI, which are uncorrelated although their sampling domains are closely related. For that reason, future research should be focused on the validation of the GEIS scales via experimental rather correlational

studies. For example, it could be examined whether there is any correspondence between people's self-perceptions of their ability to recognize, process, and utilize emotion-laden information and their specific actual ability to identify facial expressions.

To sum up, the results from this study justify the GEIS as a reliable and valid measure of trait emotional intelligence. Furthermore, they provide evidence which support a basic premise of trait EI theory, that self-report questionnaires of EI operationalise a construct that is unrelated to capabilities, competencies, and skills. Rather, these questionnaires can be used as the measurement vehicle of a constellation of emotion-related self-perceptions and dispositions that is located at the lower levels of personality hierarchies.

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Appendix

Examples of items for GEIQ Scales

Scales	Items
Expression & Recognition of Emotions	Most people find it difficult to understand what I really feel (R) I find it difficult to express my feelings to the others (R) I rarely analyze my feelings (R) I tend to disregard my feelings. People can usually understand how I feel by just looking my face
Control of Emotions	I get mad easily but this does not last long. I usually control my anger When I am in an emergency situation, I usually lose self-control (R) When I experience unpleasant emotions, I usually react intensely (R) Before important events, I usually feel tense (R)
Use of Emotion for Facilitating Thinking	It is very difficult for me to be optimistic (R) I tend to focus on the negative side of a situation (R) I easily find alternatives when things are getting bad Most of the time my problems do not affect my performance I feel confident before important life events
Caring & Empathy	I believe that I am a person who cares and helps others I like to talk with others for their problems I respect other people's feelings I do not care about other people's problems (R) I am interested in other people's motives

Note: items marked with (R) are reverse scored

Η μέτρηση της συναισθηματικής νοημοσύνης ως χαρακτηριστικού γνωρίσματος: ανάπτυξη και ψυχομετρικές ιδιότητες της Ελληνικής Κλίμακας Συναισθηματικής Νοημοσύνης (ΕΚΣΥΝ)

ΙΩΑΝΝΗΣ ΤΣΑΟΥΣΗΣ[1]

ΠΕΡΙΛΗΨΗ

Το συγκεκριμένο άρθρο περιγράφει την ανάπτυξη και την ψυχομετρική τεκμηρίωση ενός νέου εργαλείου αυτοαναφοράς για τη μέτρηση της συναισθηματικής νοημοσύνης στην ελληνική γλώσσα, το οποίο βασίζεται στο θεωρητικό μοντέλο που προτάθηκε από τους Mayer και Salovey (1997). Η Ελληνική Κλίμακα Συναισθηματικής Νοημοσύνης (ΕΚΣΥΝ) κατασκευάστηκε για να μετρά τη συναισθηματική νοημοσύνη ως χαρακτηριστικό γνώρισμα (trait emotional intelligence) και αποτελείται από 52 στοιχεία τα οποία μετρούν τέσσερις βασικές διαστάσεις (υποκλίμακες): Έκφραση και Αναγνώριση των Συναισθημάτων, Έλεγχος των Συναισθημάτων, Χρήση των Συναισθημάτων για τη Διευκόλυνση της Σκέψης, και Ενδιαφέρον για τους άλλους – Ενσυναίσθηση. Στα διαφορετικά στάδια ανάπτυξης αυτού του εργαλείου συμμετείχαν 1387 άτομα. Για τη διερεύνηση της παραγοντικής δομής της ΕΚΣΥΝ χρησιμοποιήθηκε η ανάλυση των κυρίων συνιστωσών και μετά την πλάγια περιστροφή των αξόνων με τη μέθοδο direct oblimin εντοπίστηκαν τέσσερις διαστάσεις, οι οποίες αντιστοιχούν στις τέσσερις υποκλίμακές της. Ο δείκτης εσωτερικής συνοχής *Cronbach's a* κυμάνθηκε από 0,80 έως 0,92, ενώ ο δείκτης επαναληπτικών μετρήσεων από 0,79 έως 0,91. Επιπρόσθετα, τα αποτελέσματα από πέντε διαφορετικές έρευνες εγκυρότητας επιβεβαίωσαν τόσο τη συγχρονική όσο και τη συγκλίνουσα και αποκλίνουσα εγκυρότητα των υποκλιμάκων της ΕΚΣΥΝ, χρησιμοποιώντας γι' αυτό το σκοπό δώδεκα διαφορετικές μετρήσεις τόσο από το χώρο της νοημοσύνης όσο και από το χώρο της προσωπικότητας. Για παράδειγμα, οι υποκλίμακες της ΕΚΣΥΝ βρέθηκαν ότι συσχετίζονται θετικά με την Εξωστρέφεια, την Προσήνεια και την Ευσυνειδησία, καθώς και αρνητικά με το Νευρωτισμό. Ταυτόχρονα, διαπιστώθηκε ότι δεν υπάρχει καμιά συσχέτιση ανάμεσα στις υποκλίμακες της ΕΚΣΥΝ με τη νοημοσύνη. Συνοψίζοντας, τα ψυχομετρικά χαρακτηριστικά που διέπουν την ΕΚΣΥΝ, έτσι όπως αναδεικνύονται από τα αποτελέσματα που παρουσιάζονται σε αυτό το άρθρο, φαίνεται να την τεκμηριώνουν ως ένα έγκυρο και αξιόπιστο ερευνητικό εργαλείο για τη μέτρηση της συναισθηματικής νοημοσύνης ως χαρακτηριστικού γνωρίσματος.

Λέξεις Κλειδιά: Συναισθηματική νοημοσύνη, Κατασκευή τεστ, Συναισθηματική νοημοσύνη ως γνωστική διεργασία, Συναισθηματική νοημοσύνη ως χαρακτηριστικό γνώρισμα.

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