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Psychometric Properties of the Trait Emotional Intelligence Questionnaire (TEIQue, Petrides & Furnham, 2003): Factor Structure, Reliability, Construct, and Incremental Validity in a French-Speaking Population.

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Abstract

The present research investigated the psychometrical properties of the Trait Emotional Intelligence Questionnaire (TEIQue, Petrides & Furnham, 2003) in a French-speaking population. In summary, we found that (1) TEIQue scores were globally normally distributed and reliable; (2) the UK four-factor structure (well-being, self-control, emotionality, sociability) replicated in our data; (3) TEIQue scores were dependent on gender but relatively independent of age; (4) there was preliminary evidence of convergent/discriminant validity, with TEIQue scores being independent of non-verbal reasoning (Raven's Matrices) but positively related to some personality dimensions (optimism, agreeableness, openness, conscientiousness), as well as inversely related to others (alexithymia, neuroticism); (5) there was also preliminary evidence of criterion validity, with TEIQue scores predicting depression, anxiety and social support as well as future state affectivity, and emotional reactivity in neutral and stressful situations (6) TEIQue scores were susceptible to socially desirable responding, however (7) TEIQue scores had incremental validity to predict emotional reactivity over and above social desirability, alexithymia, and the five-factor model of personality. Such results constitute encouraging preliminary findings in favour of the use of the TEIQue.

Few psychological constructs have grabbed more scientific and popular attention than the construct of emotional intelligence [EI]. Briefly, it aims to provide a scientific framework for the idea that individuals differ in the extent to which they attend to, process, and utilize affect-laden information of an *intra*-personal (e.g., managing one's own emotions) or *interpersonal* (e.g., managing others' emotions) nature (Petrides & Furnham, 2003). Research on the EI construct has grown immensely over the past decade and two conceptions of emotional intelligence currently co-exist: ability EI and trait EI. Both conceptions are based on the long-standing idea that cognitive abilities are not the unique predictor of successful adaptation and that emotional competencies or dispositions need to be considered. However, the two perspectives differ markedly with respect to their conceptualisation of such emotional competencies/dispositions and their measurement. The ability perspective conceives EI as a form of intelligence, best assessed via performance tests (Salovey & Mayer, 1990). In contrast, the trait perspective envisages it as a set of emotion-related dispositions, best assessed through self-reports (Petrides & Furnham, 2000). Whereas performance-based measures capture maximal performance, self-report measures capture typical performance (Cronbach, 1949).

This paper focuses on the latter perspective and presents the psychometrical properties of the French translation of the Trait Emotional Intelligence Questionnaire (TEIQue). The TEIQue provides an operationalization for Petrides (2001)'s model which conceptualizes EI in terms of personality. Basically, this model, whose initial sampling domain had been identified through a content analysis of early EI and related models, aims at organizing in a single framework all affect-related aspects of personality. The construct seems to encompass variance of two kinds: one portion that is scattered across the higher-order dimensions of established personality taxonomies (e.g., *Big Five*, *Giant Three*) and one portion of variance that lies outside these dimensions. Two recent studies (Petrides, 2004; Petrides, Pita and

Kokkinaki, revision under review) appear to support this conceptualization. Joint factor analyses (i.e., TEIQue/Big Five, TEIQue/Giant Three) conducted separately on British, Spanish, New-Zealand, and Greek samples consistently showed that trait EI formed a unique and composite construct that lies at lower levels of personality hierarchies. Namely, it could be isolated in both personality factor spaces (i.e., *Big Five*, *Giant Three*), it was partially determined by a cluster of traits across the existing personality taxonomies, and the trait EI factor was oblique rather than orthogonal to the Big Five and Giant Three. The benefit of gathering all affect-related personality traits under the same umbrella is twofold.

Theoretically, it offers an advantage in terms of *explanatory* power. As pointed out by Petrides et al. (revision under review), "*there are many constructs whose variance can be accounted for by some combination of the Giant three or the Big Five. Attempting to recast these constructs as blends of higher-order traits, however, fails to capture their essence and is not conducive to the development of personality theory (Funder, 2001)*". For instance, variance that can be straightforwardly explained by the trait EI framework, such as the propensity to decode other's emotions (high scores process facial expressions quicker than low scores and are able to decode emotions at a lower threshold of intensity; Austin, 2004, 2005; van Kan, Mikolajczak, & Luminet, unpublished data), requires a complex function of Big-Five factors to be predicted (e.g., low E, high N, low O and low A). Moreover, such combinations make things far less easily intelligible as their interpretation often involves to merge effects from four or five personality dimensions. Practically, it offers an advantage in terms of *predictive/incremental validity* in that trait EI predicts a number of affect-related outcomes over and above the established personality taxonomies (e.g., perseverance in musical training as well as performance of ballet students: Petrides, Niven & Mouskounti, in press; deviant behaviours at school: Petrides, Frederickson, & Furnham, 2004; sensitivity to

stress induction: Mikolajczak, Petrides, Luminet, & Coumans, under review; coaching aptitudes of top-managers: van der Zee & Wabeke, 2004).

Currently, the applications of the trait EI measures concern mostly the clinical/health, educational and organizational domains. Regarding health, evidence is accumulating that trait EI is associated, for instance, with better mental/physical resistance to stress (e.g., Salovey, Stroud, Woolery, & Epel, 2002, using the Trait Meta-Mood Scale). With respect to education, research suggests that trait EI is particularly relevant to both disadvantaged and gifted students. Regarding low IQ pupils, those with higher trait EI scores perform better at school and exhibit lesser deviant behaviours (unauthorized absences, exclusions due to antisocial behaviours) than their lower trait EI peers (Petrides et al. 2004). Regarding gifted pupils, those with higher trait EI use more functional strategies to cope with their "difference" compared to their lower trait EI counterparts (Chan, 2003). Finally, much has been said about the purported role of EI in organisational settings but few empirical studies have actually been carried out. However, research still suggests that trait EI is involved in job performance (see Van Rooy & Viswesvaran, 2004 for a meta-analysis), though not in the proportions that have been asserted in some popular publications. The variance of the correlations nevertheless suggests the presence of moderators. It is likely that trait EI is especially relevant to the professions having an affective component, such as service workers who have to perform emotional labour (e.g., Mikolajczak, Menil & Luminet, under review) and managers (e.g., Slaski & Cartwright, 2002). In all three domains, trait EI enables a better understanding and prediction of a number of phenomena. It is, however, open to question whether it is possible to improve trait EI and, should it be the case, whether its correlates would be thereby also modified.

The operationalization of the construct through a self-reported measure is consistent with (1) the subjective nature of emotional experience and (2) the conception of EI as a set of

dispositions, that is, preferences and typical - rather than maximal - performance. The TEIQue consists of 153 items rated on a 7-point scale, and encompasses 15 subscales organized under 4 factors: well-being, self-control, emotionality and sociability. A detailed description of the factors and subscales is provided in appendix A. The psychometric development of the instrument is described in Petrides (2001) and a full technical manual is currently in preparation. The studies presented in this paper were conducted using a French translation of the TEIQue. In line with the ICT guidelines for test adaptation (Hambleton, 2001), items were translated into French and then back-translated into English. Both translators were fully bilingual, having French as a mother tongue but having lived several years in England and being currently employed in American organizations. Items with problematic back-translations were thoroughly discussed and appropriately amended. Most discrepancies were minor, involving the choice between two synonyms. Eighteen months later, our translation was reviewed by a French colleague from France. She proposed to rephrase 8 items in order to remove Belgian-French expressions. These modifications were implemented as they did not change the meaning or readability of the items for Belgians.

### Overview

First and foremost, we will look at the distributional properties, the internal consistency and factor structure of the TEIQue. Next, we will examine the relationship between the TEIQue and demographic variables. Afterwards, we will focus on the TEIQue discriminant and convergent validity vis-à-vis non-verbal reasoning (i.e., an indicator of cognitive ability), alexithymia, optimism, and the five-factor model of personality. The liability of TEIQue responses to social desirability will also be examined. Subsequently, we will assess the criterion validity of the TEIQue regarding psychological distress, social support, state affectivity, and emotional responses to stressful situations. Finally, the

incremental validity of the TEIQue over and above social desirability, alexithymia and the big five factors of personality will be investigated.

## Method

### *Participants and Procedure*

The present data come from eight different samples. The data collection took place from September 2003 until May 2005. Altogether, 740 participants (mean age: 25.5, SD: 11.31) completed the TEIQue along with one or several other measures (during the same or separate sessions). There was 512 females, 217 males, and 11 unreported. 484 were students recruited on the campus (rewarded by lottery tickets or course credit) and 256 were lay people (snowball sample). Among the latter, 1 had no degree at all, 7 had a secondary school degree, 23 a college degree, 84 a bachelor degree, and 141 a master degree (or Ph.D.). The students completed the questionnaire on a paper and pencil form, whereas the lay people completed it online. Responses were anonymous because participants identified themselves with codes. As the results presented below involve either one or several samples (depending on the relationships under investigation) only the total sample size, mean age, and gender repartition will be given for each of the variables investigated (see Table 2).

One part of the paper (i.e., examination of emotional reactivity under neutral and stressful conditions) involved an experimental design that we describe hereafter. All participants were tested individually by a male experimenter. Upon arrival at the laboratory, they were invited to complete the TEIQue and subsequently underwent a short relaxation procedure (1 min; based on Schultz, 1965). Subsequently, participants were randomly allocated either to a stress condition or to a neutral condition. The stress condition was based on a failure experience (Krohne, Pieper, Knoll, & Breimer, 2002) which had been approved by the Faculty Ethical Committee before the launch of the study. Participants were told they would be tested on a recently developed test designed to predict occupational success. They

were informed that, as university students, they were expected to have a 75% success rate. They were subsequently presented with the 12 most difficult items from the Raven Advanced Progressive Matrices (Raven, 1976). The neutral condition involved reading a magazine article on the measurement of intelligence. Immediately after the mood induction (i.e., neutral versus stress), participants completed the Emotional Reactivity Index (see below).

### *Measures*

The means, standard deviations and internal consistencies of the measures are presented in Table 1 (TEIQue's subscales and factors) and Table 2 (all other measures).

*Trait EI* was appraised through the TEIQue described in the introduction.

*Professional sector* was measured via a single "multiple choice" item. Participants were invited to indicate which of the following twelve occupational categories they belonged to: social/healthcare, communication/medias, commerce, public service/administration, finance, transportation/tourism, telecommunications, agriculture/environment, justice, art, research and development, or currently unemployed.

*Optimism*, which is defined as a generalized tendency to believe that one will generally experience good instead of bad outcomes in life, was appraised through the Life Orientation Test –Revised (LOT-R; Scheier & Carver, 1985; French translation: Régner, 2002). It contains 6 items and 4 fillers, rated along a 5-point scale.

*Alexithymia* was assessed using the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994; French adaptation: Loas et al., 1996). This questionnaire consists of 20 items (rated on a 5-point scale) targeting the core dimensions of the construct: difficulty in identifying feelings, difficulty in describing feelings and externally oriented thinking.

*Non verbal reasoning* was evaluated by means of the well-known Raven's *Advanced Progressive Matrices* Test (Raven, 1976), which is one of the most robust predictors of the general cognitive ability score (supra-ordinate factor "g"; Spearman, 1927). This test consists

of 36 problem-series and is independent from language and formal schooling. Each problem consists of 9 figures (arranged as a square) with a missing piece. Below the problem are eight alternative pieces to complete the figure, only one of which is correct. Each set involves a different principle for obtaining the missing piece and problems are roughly arranged in increasing order of difficulty. The *Advanced* form of the test (originally designed for people having a university degree) spreads the scores of the top 20 percent of the population and was used here to increase the variance of the scores.

*The five-factor model of personality* was appraised through the "Description in Five Dimensions" system (D5D, Rolland & Mogenet, 2001) which is a widely used French personality inventory based on the Five Factor Model (FFM; Costa & McCrae, 1992). This questionnaire assesses the big five dimensions of emotional stability, introversion, openness, conscientiousness, and agreeableness through 55 adjectives (e.g., nervous, reserved, cultivated, compassionate, tidy) rated along a 6-point scale (-3 = does not describe me at all, +3 = describes me perfectly).

*Social desirability*, which refers to a tendency to present oneself in an overly positive manner, was evaluated using the Marlowe-Crowne Social Desirability Scale (1960; french translation: Blais & Lachance, 1992). It consists of 30 items rated on a dichotomous scale (true / false). Examples of items are "*I am always courteous, even to people who are disagreeable*", "*When I don't know something, I don't mind at all admitting it*".

*Trait anxiety* was measured through the Trait Anxiety Inventory (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; French adaptation by Bruchon-Schweitzer & Paulahan, 1990). This questionnaire consists in 20 items rated along 4-point scales.

*Depression* was evaluated via the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; French adaptation by Collet & Cottraux, 1986). The short version, which was used in the present study, encompasses 13 items consisting in four

statements each. Respondents are instructed to circle the one statement in each group that best describes how they felt the last week.

*Positive and negative state affectivity* were assessed through the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; French translation: Gaudreau, 2000). The PANAS is currently the most widely used measure of affectivity. It consists of 20 adjectives rated along 5-point scales, of which 10 measure positive affectivity (PA; e.g., inspired) and 10 measure negative affectivity (NA; e.g., guilty). It should be noted that the focus here was on state (current) rather than trait (general) affectivity.

*Perceived social support* was evaluated via the short form of the Social Support Questionnaire (SSQ; Sarason, Levine, Basham, & Sarason, 1983; French translation: Rasclé et al., 1997). Respondents are first asked to list up to 9 potential support providers for each of 12 hypothetical situations (e.g., “*On who can you really count to console you when you are very upset?*”). Then, they rate their overall satisfaction with support for each situation (rather than for each provider). The SSQ provides 2 scores: perceived *quantity* of social support and perceived *quality* of social support.

*Emotional reactivity* was estimated by means of the “Emotional Reactivity Index” (ERI; created for the purpose of the present study. The full questionnaire may be requested to the first author). The ERI is based on Frijda (1986)’s theory of emotions. According to this author, an emotion is a three-component system. Any emotional episode begins by an evaluation of the situation as either relevant or irrelevant regarding a number of goals, each of them being evaluated in terms of importance for the self (self-integrity and self-accomplishment). The more relevant the situation is with regards to one’s goals, the more intense the emotion will be. Then, the emotional episode leads to action readiness: actions in progress are interrupted and the individual prepares himself to respond to the situation (e.g., fight or flight in negative situations, to sing, to jump for joy in positive situations). Although

social constraints do not always allow to concretely realize these actions, individuals still experience them as action tendencies (i.e., *desire* to flee or to jump). Finally, emotional episodes are accompanied by a number of behavioural or expressive manifestations (e.g., tensed face, shaking hands) and bodily changes (e.g., sweat, palpitations, ...). The Emotional Reactivity Index measures the three facets of emotional experience: emotional intensity, bodily sensations and action tendencies. *Emotional intensity* was measured through 4 items adapted from Sonnemans and Frijda (1994). These items respectively referred to the emotion's duration, emotional intensity at the peak, emotional intensity out of the peak, and global intensity of the emotional experience. The emotion's duration item was rated along a 5-point scale from "1 to 5 minutes" to "20 to 25 minutes"; the other items were rated along a 5-point scale from "very weak" to "very strong". *Bodily sensations* were assessed via the Wallbot & Scherer's Bodily Sensations Checklist (1986). This questionnaire consist of 13 bodily sensations (e.g., to have a lump in one's throat, difficulty to breathe, palpitations) rated along a 7-point scale ("not at all" to "the strongest you can imagine"). Finally, *action tendencies* were evaluated using Frijda, Kuipers & ter Schure's questionnaire (1989). Respondents were required to rate the intensity to which they wished to accomplish 11 actions (e.g., to swear, to disappear, to cry) on a 7-point scale.

Although the questionnaire was originally intended to be three-factorial, principal axis-factoring revealed that it was unifactorial (all items loaded on the same factor). Reliability analyses as well as correlations among the facets ( $r_s > \text{than } .75$ ,  $p_s < .001$ ) fully supported this view: though facets' reliabilities were acceptable ( $\alpha_{EI} = .79$ ,  $\alpha_{BS} = .91$ ,  $\alpha_{AT} = .78$ ), internal consistency for the global scale was higher ( $\alpha = .90$ ), thereby supporting the validity of the construct as a whole. A total score of emotional reactivity was thus computed by summing the individual scores obtained to each of the three indicators. As findings were essentially the same across facets, results are presented for the global ERI score only.

## Results

### *Distributional Properties*

Minima, maxima, means, standard deviations, skewness and kurtosis of the 15 subscales, 4 factors and global trait EI score are given in Table 1, for males and females respectively. Kolmogorov-Smirnov test revealed that normality was achieved for the global score [KS(740) = respectively 0.036 and 0.033,  $ps \geq 0.05$  for males and females], *self-control* [KS(740) = respectively 0.056 and 0.034,  $ps \geq 0.05$ ], *emotionality* [KS(740) = respectively 0.032 and 0.030,  $ps \geq 0.05$ ] and *sociability* [KS(740) = respectively 0.036 and 0.033,  $ps \geq 0.05$ ]. Only the factor *well-being* was significantly negatively skewed [KS(740) = respectively 0.091 and 0.062,  $ps \geq 0.05$ ]. It is noteworthy that the non-normal distribution of the factor *well-being* constitutes an element of construct validity rather than a weakness. Indeed, research has shown that people are characteristically rather happy than neutral. Only in the very poor countries does the number of unhappy citizens equal the number of happy ones (for a review of the overwhelming dominance of happiness, see Veenhoven, 1984).

### *Internal Consistency*

Cronbach's alphas of the TEIQue subscales and factors are given in Table 1. Among the 15 subscales, 10 have acceptable to excellent reliability (varying between .71 and .91) among both males and females. Two subscales, namely self-motivation and empathy, have acceptable reliability among males but lower reliability among females. Finally, three subscales have Cronbach alpha's below .70 for both males and females: impulsiveness, relationship skills and adaptability. Internal consistencies at the factor level are excellent, for both males and females, and so is the case for the global score.

### *Factor Structure of the TEIQue in the Belgian Data Set*

The 15 TEIQue scales were subjected to a principal axis factor analysis. The Scree plot and Kaiser eigenvalue extraction criteria suggested the presence of between two and five

factors (the first six eigenvalues were respectively: 5.261, 1.735, 1.378, 1.217, 1.025, 0.812). We applied Parallel Analysis<sup>1</sup> (PA) to our data set, a method which is currently considered the most reliable procedure to determine the correct number of factors (see Zwick & Velicer, 1986 for a comparison of factor retention decision methods, and Hayton, Allen and Scarpellowick, 2004 for methodological issues in PA). The eigenvalues and standard deviations generated from completely random data (and necessary to perform PA) were obtained through the "Marley Watkins Monte Carlo PCA for Parallel Analysis" program (Watkins, 2002a) using the following parameters: 15 variables, 740 participants, 1000 replications. We then compared our observed eigenvalues to the 95<sup>th</sup> percentile of the eigenvalues generated from these random data, in order to reject factors that are most certainly artificial (at  $p \leq .05$ ). Results supported our theoretical expectations in that 4 factors were retained. We thus rotated a four-factor solution via the PROMAX algorithm ( $\kappa = 4$ ). The factor pattern matrix and factor intercorrelations are presented in Tables 3-5. Despite some cross-loadings, the four factors were substantively identical to the original British structure (Petrides, 2001, at the origin of the scoring key) and were thus labelled accordingly: "well-being," "sociability," "self-control," and "emotionality". This solution accounted for 63.95% of the total variance and the strength of the intercorrelations was fully in line with the conceptualization as a multifactorial construct (Table 4).

#### *Comparison of the Factor Structure in the Belgian and English Data Sets*

The Belgian and British factor structures were then compared at three levels: (1) congruence between Belgian factors scores independently derived from Belgian and British factor scores coefficients, (2) congruence — in the Belgian data set — between Belgian and British factor pattern matrices and (3) congruence between factors scores derived theoretically (i.e., from the British scoring key) and factors scores derived from Belgian factor scores coefficients. The first two comparisons were made possible thanks to the contribution of the

author of the TEIQue (Dr. K. V. Petrides) who granted us access to the complete UK data set. His sample consisted of 1139 participants (mean age: 31.59, SD: 11.36) of which 49% were male and 51% female.

We first generated and correlated, in our own data set, the factor scores derived from the Belgian factor score coefficients with the factor scores derived from the English factor score coefficients (the latter being independently obtained on the British data set). The Pearson correlations between the factors were .997 for *well-being*, .995 for *sociability*, .987 for *self-control* and .984 for *emotionality* (the whole matrix of correlations between these two sets of factors is presented in table 4). Next, we computed coefficients of congruence<sup>2</sup> between Belgian and English factor Pattern Matrices (using Marley Watkins' Coefficient of Congruence Program, 2002b). Results indicated that congruence coefficients were .98 for *well-being*, .99 for *sociability*, .96 for *self-control* and .97 for *emotionality*. Then, as it is still possible that the factor structure in Belgian and English data sets are highly similar, though different from the theoretical factor structure (on which the scoring key is based), we also decided to correlate the factor scores obtained according to the UK scoring key (see Appendix) with the factor scores based on the factor score coefficients derived from the factor analysis of the Belgian data set. Such analysis was imperative as there were small discrepancies between our factor structure (see Table 3) and the British theoretical structure (see Appendix). Thus *Self-motivation* — which theoretically does not load on any factor — loaded on the factor Well-being; *self-esteem* (factor well-being) cross-loaded on the factor sociability; *adaptability* — which theoretically does not load on any factor — loaded on the factor “self-control”; and *impulsivity (low)* cross-loaded on the factor emotionality. The foregoing correlations permit to evaluate the implications of these changes as well as the suitability of the UK factor scoring key (see Appendix) for the data at hand. The Pearson correlations were .97 for *well-being*, .97 for *sociability*, .95 for *self-control*, and .94 for

*emotionality* (see Table 5). These values suggest a high level of compatibility between the UK scoring key and Belgian factor solutions and demonstrate that, at least in this case, there is little to be gained by a purely data-driven scoring of the TEIQue-LF factors (i.e., scoring as a function of the factor structure emerging from this particular data set).

#### *Relationship with demographic variables*

*Trait EI and age.* Both linear and curvilinear associations were tested, as a curvilinear relationship between age and the scores on the Bar-On EQi (with a peak around forty) has sometimes been observed (e.g., Bar-On, 1997). Because there was no evidence of a curvilinear relationship in our data, linear correlation coefficients are reported. Trait EI as a whole is weakly correlated with age ( $r = .19, p \leq .005$ ). At the factor level, correlations with age are quasi null regarding well-being ( $r = .07, p \leq .10$ ) or sociability ( $r = .06, p \leq .05$ ) and weak regarding emotionality ( $r = .13, p \leq .05$ ). The only factor meaningfully correlated to age was self-control ( $r = .27, p \leq .005$ ).

*Trait EI and gender.* With the exception of the factor *well-being*, findings revealed significant gender differences (see Table 1). Females scored significantly higher on *emotionality* whereas men scored significantly higher on *self-control* and *sociability*. As a result, men were found to score higher on global trait EI than women.

*Trait EI and occupational sector.* Only the lay people (not the students) were asked to report their occupation. The number of individuals belonging to each sector is reported in Table 2. As some sectors were not chosen by enough individuals to permit valuable analyses, only the sectors selected by more than 20 individuals were retained and compared (i.e., social/healthcare, communication/medias, commerce, public service, finance, research and development, and unemployed people). Results are in Table 6.

Individuals belonging to social/healthcare as well as finance-related occupations had the highest mean global trait EI score whereas, as expected, unemployed individuals had the

lowest mean scores. The former differed significantly from the latter. Individuals in other occupations had mean trait EI scores situated between these extremes, but did not statistically differ from either social/healthcare and finance occupations or unemployed.

As far as the factors are concerned, financiers exhibited the highest well-being scores while unemployed people exhibited the lowest scores. The former differed marginally from the latter. Other occupations' means were in between and did not differ statistically from either financiers or unemployed.

Regarding the factor self-control, individuals in social/healthcare as well as in finance-related occupations had the highest scores whereas individuals in commerce-related occupations and those who were unemployed had the lowest scores. The mean in social/healthcare occupations differed marginally from the mean in unemployed people and in commercial occupations. Other occupations' means were between the highest and lowest groups and did not differ statistically from any of them.

Concerning emotionality, individuals in social/healthcare as well as in commercial occupations exhibited the highest scores whereas those in public service and financial occupations exhibited the lowest scores. The mean in social/health occupations (but not in commercial ones) differed significantly from the mean in financial occupations and marginally from the mean in public service. Other occupations' means were in between and did not differ statistically from either social/health, commercial or financial occupations.

With respect to sociability, commercial occupations had, as expected, the highest scores while unemployed people had the lowest scores; the mean in these occupations were found to differ significantly from each other. It is noteworthy that the mean scores in commercial occupations were significantly higher than the mean scores in all other occupations (which did not differ significantly from each other).

*Discriminant validity<sup>3</sup> with Cognitive Ability (IQ)*

Neither global trait EI nor any of its factors was related to non-verbal reasoning (Table 7).

#### *Convergent Validity<sup>4</sup>*

Means, standard deviations and reliability coefficients (Cronbach's alpha) of variables under examination are reported in Table 2.

*Trait EI and optimism.* Trait EI was highly associated with optimism (see Table 7). However, as expected, this association seemed mostly attributable to the factor *well-being* which conceptually overlaps with the construct of optimism.

*Trait EI and alexithymia.* As shown in Table 7, Alexithymia and trait EI were found significantly associated. At the factor level, the trait EI factor that is the most highly associated with alexithymia is *emotionality*. Such overlap was expected as the trait EI factor *emotionality* conceptually overlaps with the Alexithymia construct.

*Trait EI and the five-factor model of personality (FFM).* In line with the theoretical conceptualization of EI as a personality trait, several correlations were observed between trait EI and the FFM (Table 7). Trait EI was positively associated with emotional stability, openness, agreeableness and conscientiousness. At the factor level, TEIQue and FFM factors which were theoretically expected to correlate with one another did correlate (e.g., self-control and emotional stability, sociability and introversion) whereas factors which were not expected to correlate did not correlate (e.g., self-control and openness).

#### *Susceptibility to socially desirable responding*

Overall, trait EI is moderately associated with social desirability scores but the various factors do not contribute equally to this relationship (see Table 7). Additionally, it is of note that gender differences need to be considered regarding the factors *emotionality* and *sociability*. Indeed, separate analyses checking for gender differences revealed that

*emotionality* was related to social desirability among *women* but not among men, whereas *sociability* was related to social desirability among *men* but not among women.

*Criterion validity*<sup>5</sup>

*Trait EI and psychopathology.* As expected, trait EI was negatively correlated with indicators of anxiety and depression (see Table 7).

*Trait EI and social support.* As shown in Table 7, trait EI was more associated with perceived *quality* of social support than with perceived *quantity* of social support. Whereas all trait EI factors were associated with the perceived *quality* of social support, only *well-being* and *emotionality* were associated with perceived *quantity* of social support.

*Trait EI and Positive and Negative State Affectivity.* Trait EI and positive and negative state affectivity were assessed several weeks from one another using data from experimental studies on stress resistance in which participants completed the PANAS before and after a mood induction procedure, in order to check the manipulation effectiveness. In the present study, we only use the "before manipulation" data (measured upon arrival at the laboratory) and examine whether the TEIQue, measured several weeks later, is able to predict state affectivity. These data have never been presented as such. In the other studies involving those data (Mikolajczak et al., under review<sub>b</sub>), a "before-after manipulation" difference score had been computed and subsequently used to test the success of our manipulation. The correlation between state PA and state NA was only  $-.17$  ( $p \leq .01$ ), thereby supporting the current view of PA and NA as distinct dimensions (for a review, see Cropanzano, Weiss, Hale, & Reb, 2003), and this explains why results might be different according to the dimension considered.

As shown in Table 7, trait EI is a significant predictor of both positive and negative *state* affectivity, though it is more related to NA than to PA. The factors which best predicted state-NA were [trait] *well-being* and *self-control*, and the factor which best predicted state-PA was [trait] *well-being*.

*Trait EI and Emotional Reactivity.* Trait EI and emotional reactivity were assessed several weeks apart. Emotional reactivity was assessed during the individual session of an experimental study (i.e., mood induction: stress or neutral) whereas trait EI was assessed during a collective session several weeks later. Although these data are part of a larger research program of which some portion has been presented (Mikolajczak et al., under review<sup>b</sup>, study 2 and 3) or will be presented (Mikolajczak, Roy, de Timary, & Luminet, in preparation), analyses involving emotional reactivity have never been presented.

Correlations (i.e., effect sizes) between trait EI and emotional reactivity are reported separately for the two conditions in Table 7. Multiple regression analyses (reported in Table 8) revealed (1) a main effect of condition indicating that emotional reactivity was higher in stressful than in neutral condition; (2) a main effect of trait EI indicating that higher trait EI scores reported less emotional reactivity than lower scores in both conditions; and (3) an interaction effect between trait EI and condition indicating that the effect of trait EI was even more pronounced in the stressful condition (i.e., higher scores reporting lower reactivity). All trait EI factors had a main effect on emotional reactivity (though it is only marginal in the case of *emotionality*). However, in accordance with theoretical expectations, *self-control* was the factor which had the strongest main effect; it was also the only factor having a moderating effect (i.e., having a stronger effect in stressful condition than in neutral condition).

#### *Incremental Validity*

One study provided the necessary data to test the incremental validity of trait EI to predict emotional reactivity over and above social desirability, the three factors of alexithymia and the five-factor model of personality. According to Judd (statistical course based on Judd & McClelland, 1989), only the constructs that have previously been shown to be valid predictors of the dependent variable (DV) should be included in the multiple regression (principle of economy). Therefore, the first step consisted of performing independent

regressions in order to identify the various predictors of our DV. In order to be as strict as possible in subsequent incremental analyses, any variable whose relation with the DV was significant or marginally significant was considered as a predictor. These preliminary analyses revealed that *emotional reactivity* was predicted by condition (neutral/stress), global trait EI, its factors of well-being and self-control, social desirability, and two dimensions of personality (i.e., agreeability and emotional stability). No interaction effect reached significance, which is not surprising as this sample is smaller than the aggregated sample used to test predictive validity, and that interactions are notoriously difficult to detect on small samples (e.g., Cohen, Cohen, West, & Aiken, 2003).

In a second step, we tested the incremental validity of EI over social desirability, agreeableness and emotional stability using a partially stepwise procedure (Hunsely & Meyer, 2003). Condition was entered as the first block, social desirability, agreeableness and emotional stability were entered in a stepwise fashion as the second block, and well-being and self-control were entered in a stepwise fashion as the third block.

As depicted in Table 9, trait EI significantly predicted the level of emotional reactivity over and above the effects of condition, social desirability, agreeableness and emotional stability. Among the predictors, the stepwise procedure only retained emotional stability as a significant predictor in the second block and self-control in the third block. It is noteworthy that complementary analyses entering all the predictors (condition, social desirability, agreeableness, emotional stability, self-control and well-being) together in the equation showed that only condition ( $\beta = -.532, p \leq .001$ ) and self-control ( $\beta = -.413, p \leq .005$ ) remained significant when the influence of all others was controlled (that is, self-control has incremental validity over and above the FFM but the opposite is not true).

## Discussion

The number of findings involved in the present paper prevents us from discussing all of them in detail. As most of the results speak for themselves, we have chosen to devote this section to three findings which deserve a more extended discussion: the gender differences on TEIQue scores, the issue of social desirability, and the impact of trait EI on emotional reactivity.

#### *Gender Differences on Trait EI Scores*

Significant gender differences were found in the results, with women scoring higher on emotionality, and men scoring higher on self-control, sociability, and the global score. Such results are consistent with those obtained with the English version of the TEIQue (Petrides & Furnham, 2000). They also echo those of Feingold (1994), who meta-analysed gender differences in personality and found that women were more agreeable (more sensitive etc.) and men more emotionally stable. Theoretically, the fact that women scored higher on *emotionality* is coherent with Western norms according to which expressing emotions is generally viewed as “unmanly (Brody, 2000, p. 26). Empirically, it is in line with findings obtained using the EQ-I (Slaski, 2001) and with data showing that men score slightly higher on alexithymia than women (Parker, Taylor, & Bagby, 2003). In the same vein, the fact that men scored higher than women on *self-control* is on the one hand consistent with the divergent socialization of emotion as a function of gender (e.g., “*Boys don’t cry*”) and on the other hand in line with findings obtained using the EQ-I (i.e., men > women on stress management; Bar-On, Brown, Kirkcaldy, & Thome, 2000). On the other hand, the finding that men scored higher than women on *sociability* could seem odd at first sight, especially as women are commonly thought to have higher social skills than men (Pease & Pease, 2001); however, a closer look at the subscales that compose the “sociability” factor revealed that this factor does not refer to dimensions such as empathy or ability to initiate/maintain close relationships (which abilities are part of the *emotionality* factor) but rather to dimensions such

as the ability to assert oneself, or to influence other's emotions and decisions, which are more easily attributed to males (Kray & Thompson, 2005). Finally, although consistent with findings using the original version of the TEIQue, the fact that men scored higher than women on the global trait EI score is at odds with findings obtained using other trait EI measures such as the Bar-On EQ-I (no gender diff.: Slaski, 2001) or the Schutte EIS (no gender diff.: Chan, 2003; women > men: Ciarrochi, Chan, & Bajgar, 2001, and Schutte, Malouff, Hall, Haggerty, Cooper, Golden et al., 1998). Future studies are thus sorely needed to determine to what extent these differences in self-perceptions (1) are attributable to biases in the test/questionnaire construction, (2) objectify real differences between men and women, (3) are due to women being less confident in their capabilities than men, or (4) are attributable to women being more demanding vis-à-vis themselves than men in the emotional domain. In the meanwhile, such gender differences have to be taken into account in the establishment of norms and in the interpretation of scores, especially when women and men have to be compared (e.g., organizational or educational settings).

*Susceptibility to socially desirable responding*

Our findings suggest that, like most self-reports, responses to the TEIQue are not independent of social desirability. The various factors are, however, not equally subject to desirable responding. The weight of the factors as well as the magnitude of the correlations echoes previous findings obtained using the EQ-I (Bar-on et al., 2000; Hemmati, Mills, & Kroner, 2004) and the Tett, Fox, and Wang's trait EI measure (2005). It is noteworthy, however, that the association between social desirability and TEIQue scores does not seem to pose serious threats to the validity of the findings obtained using the latter, as predictions remain fully significant after controlling for social desirability in both the present (this paper) and others' (e.g., Coumans, 2005) studies.

The association between trait EI and social desirability appears mainly attributable to factors *well-being* and *self-control*. With respect to *well-being*, its relationship with social desirability may be underlain by two reasons. Firstly, it is possible that social desirability influenced self-reported well-being, with individuals higher in social desirability reporting higher levels of well-being. However, there was no apparent reason to present oneself as happier than one really was, especially as (1) the study was totally anonymous, and (2) participants were psychology students, that is, individuals who should have a priori no prejudice vis-à-vis the experience of psychological distress. Therefore, the hypothesis according to which *well-being* may influence responses to social desirability measures should also be considered. Indeed, several studies have shown that positive mood biases judgement positively (e.g., Isen, Shalke, Clark, & Karp, 1978) and promotes a heuristic processing of information (e.g., Chaiken, 1980). Thus, people scoring high in *well-being* may, on the one hand perceive themselves more positively than they actually are and, on the other hand, process information in a heuristic way (not going into much details) with the result that they will probably fail to consider a number of isolated events when responding to the desirability items. Considering for instance the item about “*I can remember playing sick to get out of something*”, the afore-mentioned bias associated with positive mood may lead people high in *well-being* reporting that they have never played sick. In fact, they did probably play sick once or twice but and as they *usually* do not do it and as their judgement is based on a heuristic examination of the episodic information, they may conclude that they never did.

Regarding the factor *self-control* (SC), its relationship with social desirability is more surprising, especially as additional hierarchical regression analyses revealed that this relationship was neither mediated by conscientiousness, nor by self-esteem, nor by anxiety nor by a fear of a negative evaluation. Studies that shed light on this association are thus sorely needed. In the meanwhile, it is of note that, notwithstanding this partial overlap

between SC and social desirability, SC was found to remain entirely predictive of all indicators of resistance to stress (the dependent variable under consideration in our studies) when controlling for social desirability (e.g., Mikolajczak et al., under review<sub>b</sub>). In addition, previous studies also showed that *self-control* is underlain by clearly identifiable neuroendocrine (i.e., salivary cortisol secretion; Mikolajczak et al., in preparation) and cognitive processes (including unconscious ones such as early attentional processes; Mikolajczak, Luminet, Roy, & Vestrynge, under revision) which would not have been the case if self-control scores were only the product of social desirability (especially as the association between self-control and these cognitive processes remained totally significant when social desirability is partialled out).

#### *Trait EI and Emotional Reactivity*

Although measured several weeks apart, Trait EI constitutes a significant predictor of lesser emotional reactivity (and this effect holds when the effect of social desirability and the FFM is partialled out). This finding is congruent with other analyses performed on the same data set, showing that trait EI moderates mood deterioration subsequent to mood induction (higher trait EI scores are associated with smaller difference between affectivity at time 1 and 2; see Mikolajczak et al., under review<sub>b</sub>, studies 2 and 3 as well as Mikolajczak et al., in preparation).

At first sight, the result that trait EI is associated with less emotional reactivity contrasts with conclusions of Engelberg & Sjöberg (2004) according to which EI would “draw on a disposition to experience more intense affect in response to emotional stimuli”. However, their study was cross-sectional and required participants to forecast their emotional intensity in a number of *fictional* situations (in brief, they correlated trait EI with the AIM = Affect Intensity Measure by Larsen, Diener, & Emmons, 1986) whereas ours is quasi-experimental, meaning that people were put in *real-life* situations. Our findings appear also at

odds with a study by Petrides & Furnham (2003) showing that high trait EI participants exhibited *greater* sensitivity to mood induction than their low trait EI counterparts. However, it is noteworthy that Petrides & Furnham were not interested in resistance to stress but in sensitivity to emotion-laden stimuli. Accordingly, they manipulated mood through disturbing and cheerful video segments. As Petrides & Furnham's mood induction procedure clearly targets another reality than the present one, their findings are not necessarily incompatible with ours. It is theoretically conceivable that higher trait EI scores might be more resistant to stress than lower scores and, at the same time, be more responsive to emotion-eliciting movies (which do not represent a threat to one's integrity). In favour of this view, it is of note that the present findings are in accordance with findings of an experimental study by Schutte, Malouff, Simunek, McKenley, & Hollander (2002) showing that higher trait EI individuals lose less PA and self-esteem after a negative mood-induction through the Velten method (sentences meant to provoke a drop in self-esteem) than do lower trait EI individuals. Our findings are also in line with other experimental studies showing that high trait EI individuals present lesser mood deterioration and lesser cortisol secretion after an experimentally induced stress than their lower counterparts (e.g., Mikolajczak et al., under review<sup>b</sup>, study 1; Mikolajczak et al., in preparation).

The finding that the factor *self-control* was the best predictor of emotional reactivity is in accordance with theoretical expectations (this factor specifically targets the ability to manage one's emotions, stress included). The effect size of its association with emotional reactivity in neutral condition ( $r = -.30$ ) and in stressful conditions ( $r = -.48$ ) is meaningful and warrants mention, especially as the design is prospective. It is also noteworthy that self-control had incremental validity to predict emotional reactivity over and above the other trait EI factors, social desirability and the five factors of personality. The increment in prediction is not only statistically significant but it is substantial (semipartial  $r = .32$ ) according to Hunsley

& Meyer's proposed norms for social sciences (2003), which is all the more interesting as the dependent variables were measured several weeks apart from trait EI.

### General Discussion

The present set of studies represents the most systematic published psychometric investigation of a test/questionnaire within the EI research field. It also constitutes the first rigorous investigation of the psychometric properties of the TEIQue since its introduction by Petrides & Furnham in 2003. Neither the psychometric properties of the original British TEIQue nor those of any other translations have ever been published. Thus, beyond their interest for French-speaking researchers and practitioners, the present findings may be of interest to any researcher/practitioner using the TEIQue: they provide both a point of comparison, as well as a first indication of what psychometric properties of other versions may look like (though cultural differences are possible).

Results lend preliminary support to the validity of the TEIQue. First and foremost, internal consistencies were generally good. Although they should be improved for five subscales (i.e., impulsiveness, empathy, relationship skills, adaptability and self-motivation), they were satisfactory as far as the ten others were concerned. Most importantly, internal consistencies of all factors and global scores were excellent.

Then, the British's four factor structure was globally replicated, confirming previous findings according to which the factor structure is relatively stable across languages (Petrides, personal communication, August 2005). Congruence coefficients between Belgian and English factor structures were excellent according to the norms provided by MacCallum, Widaman, Zhang, & Hong (1999) and reflected "*a practical identity of the factors*" across countries (values greater than .95; Jensen, 1998, p. 99). It shows that a very similar structure of affect-related personality traits can be found in French and English (as well as in Spanish, New-Zealand, and Greek; see intro). Although there may be cultural differences between

these countries with respect to the way a trait is expressed, such cultural differences do not seem to affect the *structure of traits* in the individual. It thus appears that the TEIQue captures quite well the structure of affect-related traits. This finding is of particular importance as it is the first EI test/questionnaire to show stability across studies and languages.

Regarding demographic data, TEIQue scores were found independent of age but influenced by gender, suggesting that separated norms for men and women would be useful. Although a proper multitrait-multimethod matrix could not be constructed for this investigation, the TEIQue displayed preliminary evidence of convergent and discriminant validity. Firstly, the various TEIQue factors correlated in meaningful and theoretically congruent ways with alexithymia, optimism, and the big five factors of personality. It is noteworthy that trait EI can, however, not be reduced to these constructs since (1) it has demonstrated incremental validity over them in the prediction of a number of variables (e.g., Mikolajczak, Luminet, & Menil, 2006; Mikolajczak et al., under revision<sub>a</sub>; Mikolajczak et al., under revision<sub>b</sub>) and (2) it predicts variables that they do not predict (id.).

Conversely, TEIQue scores were unrelated to non-verbal reasoning, which is consistent with theoretical considerations according to which trait EI is a personality trait instead of a form of intelligence (Petrides & Furnham, 2001, 2003). These results echo previous findings according to which trait EI is related to personality but not to indicators of IQ, 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.

Although the foregoing findings are necessary conditions for a construct to be said valid, they are not sufficient. Ultimately, it is the construct's ability to predict outcomes of interest that will determine its utility. It is vital here to understand that "to predict" does not

equal "to cause". Saying that an instrument *A* is a good predictor of a variable *B* means that when you know the score of an individual on *A*, you have a good idea of what his/her score/behaviour on *B* may be. This does not mean that *A* caused *B* (e.g., height and weight are related but they are both the product of a third variable).

The prediction of "objective" life outcomes such as professional success or medical status was beyond the scope of the present study. All criteria examined in the present study were self-reported and pertained to subjective emotional adjustment. These are, however, not trivial criteria, especially as emotional welfare is a major goal in life for most people. Furthermore, examining such criteria was essential to ensure construct validity (i.e., if trait EI is a valid construct, it has to predict a higher emotional adjustment). In this respect, the TEIQue predicted a substantial and meaningful part of variance of depression and anxiety, perceived quality and quantity of social support, future positive and negative state affectivity, and emotional reactivity in stressful conditions. These findings, far from isolated, are consistent with previous studies conducted with the French version of the TEIQue: TEIQue scores were found to predict students' resistance to examination's stress (Mikolajczak *et al.*, 2006), mood deterioration and neuroendocrine reactivity following a laboratory stressor (Mikolajczak *et al.*, under review<sub>b</sub>; Mikolajczak *et al.*, in preparation), as well as the level of burnout and somatic complaints among nursing and call center employees (Mikolajczak *et al.*, under review<sub>a</sub>; van Kan, 2004). In conjunction with the findings accumulated using the original (English) version of the TEIQue regarding the prediction of both "subjective" and "objective" criteria (see introduction), the capacity for French TEIQue scores to predict resistance to stress in both applied and experimental settings constitutes evidence in favour of its validity and practical utility.

Although such evidence of predictive validity is a necessary condition for a test to be claimed useful, it is, however and once again, not sufficient. To be deemed useful, the

TEIQue should also demonstrate that (1) findings are not attributable to social desirability, and (2) that other tests/questionnaires cannot do the job, at least not as efficiently. This condition is of particular importance here, since TEIQue scores were precisely found to be associated with social desirability. By showing that the TEIQue predicts emotional reactivity over and above social desirability, alexithymia, and the five-factor model of personality, the present paper adds to the growing body of literature showing that the TEIQue does indeed predict variance over and above the Giant Three, the Big Five, and other cognate constructs (for examples in French, see Mikolajczak et al., in press, under review<sub>a</sub>, under review<sub>b</sub>; for examples in other languages, see Furnham & Petrides, 2003; Petrides & Furnham, 2003; Petrides et al., 2004; Petrides et al., in press; Petrides, et al., revision under review).

The foregoing represents modest but promising findings in favour of the validity and usefulness of the TEIQue. However, several limitations have to be acknowledged. Firstly, most of these studies involve students, thus raising concerns about the generalizability of the findings to other population' strata. It also restricts range, especially regarding "age", for which results have to be interpreted with caution. Secondly, all study variables were measured through self-reports, which potentially introduced a "shared method covariance" bias. In this respect, it cannot be excluded that the absence of relationship between trait EI and non-verbal reasoning (indicator of IQ) 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). Thirdly, the results of the investigation of mean trait EI differences across occupational sectors should be interpreted with caution as only a limited sample of occupations was included in the analysis (i.e., those which were under-represented in our sample were excluded). Furthermore, albeit their appealing character, it should be mentioned that the cross-sectional methodology adopted does not allow to draw conclusions in terms of causality. However, it is striking that

most mean differences were in line with expectations. It is especially noteworthy that unemployed people had the lowest EI scores, which is in accordance with the current idea that EI is a necessary (although not sufficient) condition for professional success. Finally, in addition to addressing these issues, future studies would certainly benefit from considering other types of criterions, such as behavioural (e.g., pro-social behaviours, performance) or medical ones (e.g., health status, cortisol secretion).

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Appendix

*Factorial and Subscale Structure of the TEIQue (Petrides & Furnham, 2003b).*

<b>Factors &amp; facets</b>	<b>High scorers perceive themselves as...</b>
<b>Well-being</b>	
<i>Self-esteem</i>	...successful and self-confident.
<i>Trait happiness</i>	...cheerful and satisfied with their lives.
<i>Trait optimism</i>	...confident and likely to “look on the bright side” of life.
<b>Self-control</b>	
<i>Emotion regulation</i>	...capable of controlling their emotions.
<i>Stress management</i>	...capable of withstanding pressure and regulating stress.
<i>Impulsiveness (low)</i>	...reflective and less likely to give in to their urges.
<b>Emotionality</b>	
<i>Emotion perception (self and others)</i>	...clear about their own and other people’s feelings.
<i>Emotion expression</i>	...capable of communicating their feelings to others.
<i>Relationship skills</i>	...capable of having fulfilling personal relationships.
<i>Empathy</i>	...capable of taking someone else’s perspective.
<b>Sociability</b>	
<i>Social competence</i>	...accomplished networkers with excellent social skills.
<i>Emotion management (others)</i>	...capable of influencing other people’s feelings.
<i>Assertiveness</i>	...forthright, frank, and willing to stand up for their rights.
<i>The following subscales do not belong to any particular factor and are directly included in the total score</i>	
<i>Adaptability</i>	...flexible and willing to adapt to new conditions.
<i>Self-motivation</i>	...driven and unlikely to give up in the face of adversity.

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Footnotes

1. The rationale underlying PA is that non-trivial components from real data with a valid underlying structure should have larger eigenvalues than parallel components derived from random data having the same sample size and number of variables (Hayton et al., 2004). The Marley Watkins program generates completely random data sets having the same sample size and containing the same number of variables than the real data set (up to 1000 replications possible). Then it generates the correlations matrices for these data sets and provides their average eigenvalues. The researcher can then compare the eigenvalues generated from these random data sets to the real data set in order to ensure that the former are significantly lower than the latter.

2. The congruence coefficient ( $r_c$ ) is an index of factor similarity. It is typically used to determine the factorial invariance of solutions across samples or studies.

3. *Discriminant validity* refers to the degree to which scores on a test do not correlate with (are “independent of” or “orthogonal to”) variables they are not supposed to correlate with, given the nature of the construct.

4. *Convergent validity* refers to the degree to which scores on a test correlate with those on a test that is believed to measure a closely related construct (i.e., the two tests should end up ranking people in pretty much the same way).

5. *Criterion validity* refers to the ability of a test to predict some criterion it should theoretically be able to predict. Criterion-related validity can either be concurrent or predictive. Concurrent validity refers to the correlation between the predictor and criterion scores obtained at approximately the same time. Predictive validity refers to the degree to which scores on a test predict future behaviour on a criterion variable.

Table 1.

*Male and Female Univariate Statistics of TEIQue Subscales, Factors and Global Score (N = 740: 217 males 512 females, 11 unknown).*

	Num-ber of items	Minimum		Maximum		Mean and SDs		Effect-size ( <i>r</i> )	Skewness <sup>a</sup>		Kurtoses <sup>b</sup>		Cronbach's alpha	
		Males	Females	Males	Females	Males	Females		Males	Females	Males	Females	Males	Females
Self-esteem	11	2.73	1.73	6.55	6.73	4.86 (0.74)	4.54 (0.87) <sup>***c</sup>	-0.19	-0.217	-0.279	-0.023	0.171	.79	.71
Emotion expression	10	1.00	1.00	6.90	7.00	4.02 (1.27)	4.30 (1.23) <sup>**</sup>	0.11	0.104	-0.241	-0.525	-0.537	.86	.89
Self-motivation	10	2.20	2.10	6.90	6.90	4.70 (0.83)	4.67 (0.80)	-0.02	-0.082	-0.175	0.041	0.137	.66	.74
Emotion regulation	12	1.50	1.08	6.67	6.42	4.40 (0.87)	3.80 (0.89) <sup>***</sup>	-0.32	-0.147	0.094	0.141	0.011	.77	.79
Happiness	8	1.25	1.00	7.00	7.00	5.47 (1.16)	5.55 (1.15)	0.03	-1.205	-1.260	1.268	1.726	.91	.91
Empathy	9	2.44	2.22	6.89	6.89	4.78 (0.89)	4.91 (0.76) <sup>†</sup>	0.08	-0.111	-0.203	0.035	0.101	.59	.73
Social competence	11	2.36	2.36	6.73	6.55	4.85 (0.81)	4.74 (0.80) <sup>†</sup>	-0.07	-0.212	-0.214	0.043	-0.468	.75	.75
Impulsiveness (low)	9	2.00	1.89	6.44	7.00	4.50 (0.86)	4.45 (0.89)	-0.03	-0.147	-0.111	-0.319	-0.105	.66	.64
Emotion perception	10	2.30	1.80	7.00	7.00	4.68 (0.95)	4.67 (0.87)	-0.01	-0.073	-0.027	-0.480	-0.176	.74	.80
Stress management	10	1.60	1.40	7.00	6.60	4.52 (1.02)	3.90 (1.02) <sup>***</sup>	-0.29	-0.302	0.121	-0.114	-0.299	.77	.81
Emotion management	9	2.44	1.67	6.89	6.56	4.83 (0.86)	4.52 (0.87) <sup>***</sup>	-0.18	-0.334	-0.266	-0.121	-0.040	.72	.75
Optimism	8	1.63	1.13	7.00	7.00	4.86 (1.03)	4.80 (1.10)	-0.03	-0.433	-0.525	0.038	0.096	.83	.81
Relationship skills	9	3.22	2.56	7.00	7.00	5.46 (0.72)	5.64 (0.78) <sup>**</sup>	0.12	-0.537	-0.730	0.378	0.535	.68	.59
Adaptability	9	2.22	1.44	6.78	6.78	4.55 (0.81)	4.26 (0.85) <sup>***</sup>	-0.17	-0.116	-0.125	0.278	0.528	.69	.67

Assertiveness	9	2.22	1.00	6.44	7.00	4.70 (0.92)	4.41 (0.97)***	-0.15	-0.265	-0.221	-0.577	-0.217	.75	.74
Well-being	27	2.08	1.62	6.63	6.78	5.06 (0.85)	4.96 (0.89)	-0.06	-0.892	-0.759	0.845	0.744	.91	.91
Self-control	31	2.36	2.26	6.41	6.32	4.47 (0.75)	4.05 (0.73)***	-0.27	-0.161	0.195	-0.067	0.068	.85	.87
Emotionality	38	2.91	2.79	6.59	6.49	4.74 (0.73)	4.88 (0.64)**	0.10	0.173	-0.054	-0.213	-0.245	.86	.90
Sociability	29	2.86	2.47	6.48	6.34	4.80 (0.72)	4.56 (0.72)***	-0.16	-0.212	-0.316	-0.063	-0.020	.86	.87
Global trait EI		3.05	3.06	6.12	6.20	4.75 (0.56)	4.61 (0.53)**	-0.13	-0.007	-0.180	-0.051	-0.041	.94	.95

*Note.* <sup>a</sup> = standard error of skewness estimations is 0.17 for males and 0.11 for females. <sup>b</sup> = standard error of kurtosis estimations is 0.33 for males and 0.22 for females. <sup>c</sup> Asterisks correspond to p-values for gender differences t-tests. \*\*\* p < 0.001; \*\* p < 0.01 ; \* p < 0.05; †p < 0.1.

Table 2.

*Means, Standard deviations, and Internal Consistencies for the Scales Examined.*

	N	Number of items	Cronbach's alphas	Means and SDs (Frequencies for sex and occupation)
Occupational sector	251	1 (choice between 12 sectors)	—	Social/health (58), Communication/medias (25), Commerce (21), Public utility/administration (56), Finance (20), Transportation/tourism (2), Telecommunications (6), Agriculture/environment (2), Justice (4), Art (4), Research and Development (29), unemployed (19)
Sex	740	1	—	512 females; 217 males; 11 unreported
Age	740	1	—	25.5 (11.31)
<b>Convergent/discriminant validity</b>				
Optimism	91	6	.82	19.84 (4.81)
Alexithymia	457	20	.79	47.25 (10.17)
Difficulty in identifying feelings	403	7	.78	16.81 (5.45)
Difficulty in describing feelings	403	5	.76	13.96 (4.65)
Externally oriented thinking	403	8	.43	16.28 (3.95)
Emotional stability	80	11	.84	38.62 (8.24)
Introversion	80	11	.79	39.65 (8.89)
Openness	80	11	.74	45.61 (6.27)
Agreeableness	80	11	.71	48.24 (5.58)
Conscientiousness	80	11	.77	44.92 (9.73)
Cognitive ability (IQ)	109	36	— <sup>a</sup>	24.20 (4.37)
Timed: 30 min.				
Social desirability	131	33	.67	15.51 (4.46)
<b>Criterion validity</b>				
Anxiety	82	20	.92	42.77 (10.33)
Depression	82	13	.85	4.63 (4.60)
Perceived <i>quantity</i> of social	93	6	.87	33.30 (10.80)

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support				
Family members	93	6	.93	13.23 (10.81)
Friends	93	6	.87	16.53 (8.36)
Perceived <i>quality</i> of social support	93	6	.88	30.91 (3.93)
Positive affectivity	306	10	.84	2.87 (0.60)
Negative affectivity	306	10	.82	1.42 (0.47)
Emotional reactivity	187	30	.90	51.16 (13.61) <sup>b</sup> , 72.39 (21.35) <sup>c</sup>

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*Note.* <sup>a</sup> As Raven's matrices are of increasing difficulty, calculating internal consistencies does not make sense. <sup>b</sup> measured in the neutral condition, <sup>c</sup> measured in the stressful condition.

Table 3.

*Factor Pattern Matrix for the TEIQue Subscales (Promax Principal Axis Factoring Four-Factor Solution) (N = 740)*

	Well-being	Sociability	Self-control	Emotionality
Subscales				
Happiness	<b>.99</b>	-.07	-.15	-.01
Optimism	<b>.86</b>	.04	.07	-.12
Self-Motivation	.38	.07	.14	.24
Emotion management (others)	-.18	<b>.79</b>	-.06	-.02
Assertiveness	.18	<b>.69</b>	.06	-.08
Social competence	.02	<b>.60</b>	.07	.26
Self-esteem	<b>.33</b>	.40	.11	.03
Emotion control	-.19	.00	<b>.92</b>	.02
Stress management	.14	.02	<b>.76</b>	-.10
Adaptability	.12	.15	.35	.04
Emotion Perception	-.13	.17	.00	<b>.74</b>
Emotion expression	.05	.21	-.23	<b>.58</b>
Relationship skills	.32	-.28	.00	<b>.52</b>
Empathy	-.11	.02	.08	<b>.50</b>
Impulsiveness (low)	.03	-.24	<b>.35</b>	.41

*Note.* Factor Pattern Matrix: Coefficients that should theoretically define each factor are in boldface.

Table 4.

*Factor Correlation Matrix between Belgian factor scores and English factor scores (N = 740)*

	Well-being <sup>b</sup>	Sociability <sup>b</sup>	Self-control <sup>b</sup>	Emotionality <sup>b</sup>
Well-being <sup>a</sup>	.997 [.982]			
Sociability <sup>a</sup>	.544	.995 [.991]		
Self-control <sup>a</sup>	.650	.495	.987 [.964]	
Emotionality <sup>a</sup>	.519	.626	.350	.984 [.969]

*Note.* <sup>a</sup> = Factor scores derived from the Belgian factor score coefficients, <sup>b</sup> = factor scores derived from the English factor score coefficients, Coefficients in brackets [ ] refer to congruence coefficients between factor structure (pattern matrix) in Belgian and English data set (computed with Marley W. Watkins coefficient of congruence program, 2002).

Table 5.

*Factor Correlation Matrix between theoretical factors and factor scores from the Belgian factor analysis (N = 740)*

	Well-being	Sociability	Self-control	Emotionality
Well-being	<b>.974</b>	.502	.606	.545
Sociability	.438	<b>.973</b>	.449	.624
Self-control	.549	.376	<b>.945</b>	.432
Emotionality	.479	.507	.364	<b>.941</b>

*Note.* The lower diagonal corresponds to the correlations among the theoretical factors scores (data scored according to the theoretical factor structure); the upper diagonal corresponds to the correlations among the factors scores derived from Belgian factor scores coefficients. The diagonal [**boldface**] corresponds to the correlations between the two types of factor scores (theoretically and factorially derived).

Table 6.

*Comparison of mean trait EI scores as a function of the professional sector.*

Trait EI factor	Occupation(s) having the highest mean scores (+ Means; SD's)	Occupation(s) having the lowest mean scores (+ Means; SD's)	Differences reaching statistical significance
Global trait EI	- Social/health care (4.86; 0.63) - Finance (4.88; 0.37)	- Unemployed (4.52; 0.60)	social/healthcare versus unemployed: $t_{(75)} = 2.06, p \leq .05, r_{effect\ size} = .26$ financiers versus unemployed : $t_{(37)} = 2.26, p \leq .05, r_{effect\ size} = .34$
Well-being	- Financiers (5.36; 0.65)	- Unemployed (4.78; 1.10)	financiers versus unemployed: $t_{(37)} = 2.00, p \leq .055, r_{effect\ size} = .31$
Self-control	- Social/health care (4.51; 0.82) - Finance (4.49; 0.81)	- Commerce (4.10; 0.83) - Unemployed (4.06; 1.00)	Social/healthcare versus unemployed: $t_{(75)} = 1.97, p \leq .055, r_{effect\ size} = .25$ Social/healthcare versus commerce: $t_{(77)} = 1.96, p \leq .055, r_{effect\ size} = .24$
Emotionality	- Social/healthcare (5.13; 0.66) - Commerce (5.13; 0.63)	- Public service (4.87; 0.73) - Finance (4.83; 0.50)	Social/healthcare versus finance: $t_{(43,76)} = 2.074, p \leq .05, r_{effect\ size} = .23$ Social/healthcare versus public service: $t_{(112)} = 1.95, p \leq .055, r_{effect\ size} = .18$
Sociability	- Commerce (5.11; 0.74)	- Unemployed (4.40; 0.74)	Commerce versus unemployed: $t_{(38)} = 2.97, p \leq .005, r_{effect\ size} = .43$

Table 7.

*Convergent, Discriminant and Criterion Validity of the TEIQue*

	N	Mean age (SD)	Balance females/ males (in %)	Total trait EI	Well-being	Self-control	Emotionality	Sociability
<b>Convergent/discriminant validity</b>								
Optimism	91	18.36 (1.52)	85 /15	.68***	.81***	.48***	.36***	.36***
Alexithymia	457	19.53 (2.04)	77 /23	-.60***	-.36***	-.32***	-.66***	-.39***
F1: DIF	403	19.26 (1.90)	80 /20	-.55***	-.41***	-.44***	-.43***	-.33***
F2: DDF	403	19.26 (1.90)	80 /20	-.49***	-.29***	-.15**	-.67***	-.34***
F3: EOT	403	19.26 (1.90)	80 /202	-.22***	-.07	-.02	-.30***	-.25***
Emotional stability	80	18.57 (1.00)	77 /23	.42***	.35***	.66***	.01	.15
Introversion	80	18.57 (1.00)	77 /23	-.17	-.24*	.27*	-.16	-.38***
Openness	80	18.57 (1.00)	77 /23	.41***	.34**	.01	.31**	.43***
Agreeability	80	18.57 (1.00)	77 /23	.47***	.48***	.33**	.26*	.15
Conscientiousness	80	18.57 (1.00)	77 /23	.41***	.19†	.31**	.40***	.28*
Cognitive ability	109	19.73 (2.20)	87 /13	.04	.05	.13	.04	.00
Social desirability	131	19.43 (1.98)	68 /32	.44***	.32***	.46***	.23**	.12
<b>Criterion validity</b>								
Anxiety	82	18.68 (1.03)	78 /22	-.74***	-.72***	-.59***	-.30**	-.45***
Depression	82	18.68 (1.03)	78 /22	-.55***	-.67***	-.31**	-.28*	-.24*
P <sub>Quant</sub> SS	93	18.36 (1.52)	85 /15	.23*	.34***	.01	.25*	.09
P <sub>Qual</sub> SS	93	18.36 (1.52)	85 /15	.39***	.40***	.17†	.38***	.22*
State positive affectivity	306	20.01 (1.90)	67 /33	.25***	.30***	.12*	.10†	.15**
State negative affectivity	306	20.01 (1.90)	67 /33	-.37***	-.33***	-.37***	-.23***	-.12*
Emotional reactivity (N)	91	19.42 (1.96)	48/52	-.26*	-.25*	-.30**	-.11	-.09
Emotional reactivity (S)	96	20.11 (2.17)	40/60	-.41***	-.33***	-.48***	-.15	-.24*

*Note:* DIF = Difficulty in identifying feelings, DDF = Difficulty in describing feelings, EOT = Externally oriented thinking, FNE = Fear of Negative Evaluation, PQ<sub>quant</sub>SS = Perceived quantity of social support, P<sub>Qual</sub>SS = Perceived quality of social support, (S) = measured in stressful conditions. \*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$ ; † $p < 0.1$

Table 8.

*Hierarchical Regression Analyses Predicting Emotional Reactivity by Condition, Trait EI and their Interaction (N = 185).*

<i>EI Factor considered</i>	<i>Criterion variable</i>	<i>Hierarchical order</i>	<i>Predictor variable</i>	<i>R</i>	<i>F change</i>	<i>Semi-partial correlations<sup>a</sup></i>
Trait EI	ERI	1	Condition	.525	69.87***	-.56
		2	Trait EI	.601	24.78***	-.29
		3	Condition x trait EI	.614	4.41*	.12
Well-being	ERI	1	Condition	.525	69.87***	-.55
		2	Well-being	.581	17.35***	-.25
		3	Condition x well-being	.589	2.57	.10
Self-control	ERI	1	Condition	.525	69.87***	-.55
		2	Self-control	.621	32.84***	-.32
		3	Condition x self-control	.633	4.64*	.12
Emotionality	ERI	1	Condition	.525	69.87***	-.53
		2	Emotionality	.538	3.63 <sup>†</sup>	-.13
		3	Condition x emotionality	.541	0.88	.06
Sociability	ERI	1	Condition	.525	69.87***	-.54
		2	Sociability	.552	7.70**	-.15
		3	Condition x sociability	.558	1.91	.09

*Note.* ERI = Emotional Reactivity Index. <sup>a</sup> These correlations are the semi-partial correlations, controlling at each step for the effects of the two others. \*\*\*  $p \leq 0.001$ ; \*\*  $p \leq 0.005$ ; \*  $p \leq 0.05$ ; <sup>†</sup>  $p \leq 0.10$ .

Table 9.

*Hierarchical Regression Analyses testing the Incremental Validity of Trait EI over Social Desirability, Agreeableness and Emotional Stability, to Predict Emotional Reactivity (N = 60).*

<i>Criterion variable</i>	<i>Forced hierarchical order</i>	<i>Predictor variable</i>	<i>R</i>	<i>F change</i>	<i>Semipartial r<sup>a</sup></i>
Emotional reactivity	1	Condition (neutral vs stress)	.519	22.084 <sup>***</sup>	-.520
	2	Emotional stability	.614	10.156 <sup>**</sup>	-.053
	3	Self-control	.709	11.530 <sup>***</sup>	-.322

*Note.* Procedure: Condition was entered as a first block, social desirability, agreeableness and emotional stability were entered in a stepwise fashion as a second block, well-being and self-control were entered in a stepwise fashion as a third block.. <sup>a</sup> these are the semipartial *rs* when all variables are considered together (step 3) \*\*\* $p \leq 0.001$ ; \*\* $p \leq 0.01$ ; \* $p \leq 0.05$ ; † $p < 0.1$ .