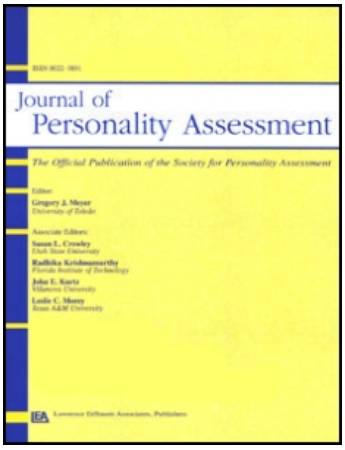

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A Psychometric Analysis of the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue–SF) Using Item Response Theory

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Trait emotional intelligence refers to a constellation of emotional self-perceptions located at the lower levels of personality hierarchies. In 2 studies, we sought to examine the psychometric properties of the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue–SF; Petrides, 2009) using item response theory (IRT). Study 1 ($N = 1{,}119$, 455 men) showed that most items had good discrimination and threshold parameters and high item information values. At the global level, the TEIQue–SF showed very good precision across most of the latent trait range. Study 2 ($N = 866$, 432 men) used similar IRT techniques in a new sample based on the latest version of the TEIQue–SF (version 1.50). Results replicated Study 1, with the instrument showing good psychometric properties at the item and global level. Overall, the 2 studies suggest the TEIQue-SF can be recommended when a rapid assessment of trait emotional intelligence is required.

The construct of trait emotional intelligence (trait EI or trait emotional self-efficacy) refers to a constellation of emotional self-perceptions located at the lower levels of personality hierarchies (Petrides, Pita, & Kokkinaki, 2007). The conceptualization of EI as a personality trait is in accordance with the subjective nature of emotional experience (Watson, 2000) and leads to a construct that lies wholly outside the taxonomy of human cognitive ability (Carroll, 1993).

The Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009) is a self-report questionnaire that has been developed to cover the trait EI sampling domain comprehensively (Petrides & Furnham, 2001). Questionnaire measures of EI have been proliferating over the past few years, and it is important to mention three advantages of the TEIQue over them to justify the focus of this research. First, the TEIQue is based on a psychological theory that integrates the construct into mainstream models of differential psychology. In contrast, other measures are based on the misconception that intelligence or competencies can be measured through self-report items such as "I'm good at understanding the way other people feel." Second, the TEIQue provides comprehensive coverage of the 15 facets of the trait EI sampling domain. In contrast, other measures typically overlook a large part of this domain and often include irrelevant facets. Several independent studies have demonstrated the ability of the TEIQue to predict criteria (outcomes) significantly better than other questionnaires (see Freudenthaler, Neubauer, Gabler, Scherl, & Rindermann, 2008; Gardner & Qualter, 2010; Martins, Ramalho, & Morin, in press). Third, the full TEIQue has excellent psychometric properties. In contrast, most other self-report measures tend to have problems affecting their reliability, their factor structure, or both. A scientifically less relevant, but practically important, advantage of all TEIQue forms and versions is that they are available to researchers free of charge (Petrides, 2009).

Hitherto, the TEIQue has been used in numerous studies wherein the assessment of affective aspects of personality was required. These include research in the areas of neuroscience (Mikolajczak, Bodarwe, Laloyaux, Hansenne, & Nelis, 2010), relationship satisfaction (Smith, Heaven, & Ciarrochi, 2008), psychopathology (Ali, Amorim, & Chamorro-Premuzic, 2009), addictions (Uva et al., 2010), reaction time (Austin, 2009), general health (Johnson, Batey, & Holdsworth, 2009), and behavioral genetics (Vernon, Villani, Schermer, & Petrides, 2008). Studies that have focused specifically on the psychometric properties of the TEIQue have been reported in Freudenthaler et al. (2008), Mikolajczak, Luminet, Leroy, and Roy (2007), and Petrides (2009). Up to this point, however, psychometric studies have relied exclusively on classical factor analytic approaches and have only examined the full form of the inventory.

The aim of the two studies in this article was to examine the psychometric properties of the TEIQue–Short Form (TEIQue–SF; Petrides, 2009) using item response theory (IRT). IRT offers some advantages over classical methods for analyzing self-report personality-oriented data (Embretson & Reise, 2000; Reise & Henson, 2003). In the field of EI, the application of advanced psychometric methods like IRT is so rare as to have given cause for concern (Matthews, Zeidner, & Roberts, 2007). IRT can provide information about measurement precision across the range of a latent trait at both the item and test level rather than providing only a single reliability estimate for all participants. This can assist greatly in the identification of items that may contribute little to measurement precision. In addition, IRT-based methods of scoring responses on a latent variable are not dependent on the particular set of items used in the assessment, and IRT models explicitly map the relations between person and item parameters on the same latent scale. IRT models can also facilitate important psychometric applications, such as examining differential item and test functioning across groups, and computerized adaptive testing (see Reise &

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Henson, 2003, for more detail on the use of IRT models in personality research). It should be noted, however, that most IRT models have an assumption of unidimensionality in the construct being measured, as further detailed following. In Study 1, we used a large sample to examine the psychometric properties of the original TEIQue–SF. In Study 2, we examined the psychometric properties in a different sample using the latest version of the instrument (version 1.50). Due to the very significant overlap between the two versions (all but four items are exactly the same), Study 2 can largely be seen as a replication of Study 1, although it also allowed us to specifically examine the four new items that have been incorporated in the new version.

Study 1

Method

Participants. The participants comprised 1,119 individuals, of whom 455 were men and 653 were women (11 participants did not record their gender). Participants were recruited both from university campuses and from the general community. We used a variety of recruitment methods and incentives, including word of mouth, advertising through social network sites, course credit, and course data collection. Most of the questionnaires were completed in participants' own time, although some were collected during supervised class sessions. Their age ranged from 15 to 89 years, with a mean age of 32.18 years ($SD = 11.52$). The sample was highly educated, with 21% holding high school diplomas, 41% undergraduate diplomas, 33% postgraduate diplomas, and 2% PhD (3% "other").

Measure. The TEIQue–SF consists of 30 items designed to measure global trait emotional intelligence (e.g., "I usually find it difficult to regulate my emotions"; "I'm usually able to influence the way other people feel"). The TEIQue–SF (e.g., Petrides & Furnham, 2006) is derived from the full form of the TEIQue, which covers 15 distinct facets. Based primarily on correlations with total facet scores, two items from each of the 15 facets were selected for inclusion in the short form, which uses a Likert-style response option format, ranging from 1 (*Completely Disagree*) to 7 (*Completely Agree*). A global trait EI score is calculated by summing up the item scores and dividing by the total number of items. The TEIQue–SF does not yield scores on the 15 trait EI facets. The latest version of the TEIQue–SF (version 1.50) is available, free of charge, for research purposes from www.psychometriclab.com.

Procedure. Most participants completed the TEIQue-SF in pen and paper form. Having provided their informed consent, participants were asked to read the instructions at the top of the form and to answer all questions. Typically, after completing the measure, participants were debriefed and thanked for their time.

Data analysis. The IRT analysis in this study was conducted using Multilog 7.0.3 (Thissen, 2003). As the TEIQue–SF has a polytomous response format, a potentially appropriate IRT model would be the graded response model (GRM; Samejima, 1969). The GRM has proven an appropriate model with other polytomous personality-type measures (e.g., Gomez, Cooper, & Gomez, 2005; Rubio, Aguado, Hontangas, & Hernandez, 2007). With the GRM, logistic curves called category response curves (CRCs) are generated for each response option within each item. CRCs represent the probability of responding in a particular response category, conditional on the value of the underlying latent trait, called theta (θ). The CRCs that result can be graphed and used to examine the properties of the item.

In the GRM, discrimination parameters (α) are constrained equal for the response options within an item but are free to vary across items. According to Baker (2001), α values 0.01 to 0.24 are very low, 0.25 to 0.64 are low, 0.65 to 1.34 are moderate, 1.35 to 1.69 are high, and more than 1.7 are very high. The threshold parameters (β) represent the point along θ where the response categories intersect. The GRM also provides information functions for each item and for the global test, called the item information function (IIF) and the test information function (TIF), respectively. The IIF indicates the measurement precision of an item across different levels of the trait, whereas the TIF indicates the measurement precision of the test across different levels of the trait. IRT also provides the standard error of measurement (*SEM*) of the IIFs and TIF. As the *SEM* of a TIF is the inverse of the square root of the TIF, *SEM* values can be viewed as indicators of the precision of the test at different trait levels (Embretson & Reise, 2000).

Certain assumptions must be met prior to using IRT, namely, unidimensionality and model-data fit. In the applied IRT literature, unidimensionality has been assessed in a number of ways. For example, both exploratory and confirmatory forms of factor analysis have commonly been used to assess the dimensionality of scales. The essential point is to decide whether a scale is sufficiently unidimensional to warrant the application of a unidimensional IRT model.

It has been noted that what have been termed *high bandwidth* constructs are unlikely to exhibit strict forms of unidimensionality (Reise, Morizot, & Hays, 2007). Higher level personality traits are often examples of constructs that cover a relatively diverse content domain (Morizot, Ainsworth, & Reise, 2007). Trait EI incorporates a wide range of affective personality traits and is therefore considered a high bandwidth construct. On this basis, we sought to ascertain whether a dominant global trait EI factor was present in the TEIQue–SF data as part of the assumption testing process.

In these studies, we used exploratory factor analysis (EFA) to assess the dimensionality of the TEIQue–SF. EFA may be particularly interesting in this context, as we are unaware of any previously published studies that have factor analyzed this measure. We extracted factors from the sample correlation matrix using principal axis factoring. The number of factors extracted was based on the results of the minimum average partial test (MAP; Velicer, 1976) and a visual inspection of the scree plot.

In terms of model-data fit, Multilog provides the observed and expected proportion of responses to each response option, with the expected proportion an estimated value based on the item parameters and latent trait distribution. Analysis of the residuals associated with the observed and expected proportions for each item response option can help illustrate model-data fit, with larger residuals indicating poorer fit. In addition, we examined model-data fit using the approach developed by Drasgow, Levine, Tsien, Williams, and Mead (1995). This was implemented using the MODFIT computer program (Stark, 2001). MODFIT provides chi squares, adjusted chi squares (adjusted

TABLE 1.—Study 1: Mean, standard deviation, Cronbach's α, skewness, and kurtosis values for the TEIQue–SF version 1.00.

	Global Trait EI	
Variable	Men	Women
M	5.02	5.18
SD	0.73	0.68
Range	2.47–6.73	2.80–6.80
Cronbach's α	0.89	0.88
Skewness	−0.43	−0.42
Kurtosis	0.10	−0.04

Note. TEIQue–SF = Trait Emotional Intelligence Questionnaire–Short Form; EI = emotional intelligence. To obtain the latest version of the TEIQue–SF, see the Method section in Study 1.

for a sample size of 3,000), and adjusted chi square to degree of freedom ratios for single items (singlets), pairs of items (doublets), and groups of three items (triplets), using the method described by Drasgow et al. (1995). Drasgow et al. have shown that good fitting models have adjusted chi square to degree of freedom ratios of less than 3 for singlets, doublets, and triplets.

Results

Descriptive statistics. Table 1 shows the mean, standard deviation, Cronbach's alpha, skewness, and kurtosis values for the global score of the TEIQue–SF, separately for men and women. An independent samples *t* test found that the women scored significantly higher on the TEIQue–SF than the men, $t(1106) = 3.67$, $p < .0001$, but with a small effect size ($d = 0.23$). Cronbach's alpha values were high for men and women alike. According to Curran, West, and Finch (1996), skewness and kurtosis absolute values of 0 to 2, and 0 to 7, respectively, can be taken as demonstrating sufficient univariate normality. The male and female skewness and kurtosis values for the global TEIQue–SF score can be seen in Table 1.

EFA. We used EFA to determine the appropriateness of implementing a unidimensional IRT model. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.89, indicating EFA was appropriate for this sample. The results of the MAP test suggested one factor should be extracted, and a visual inspection of the scree plot also suggested a one factor solution. The first five eigenvalues were 7.22, 1.94, 1.60, 1.55, and 1.44. The first eigenvalue accounted for 24.08% of the variance. Morizot et al. (2007) proposed as a rule of thumb that the ratio of the first to the second eigenvalue should be above 3 for unidimensionality to be considered appropriate. In this case, the ratio was 3.72. The extracted factor matrix showed that all items had factor loadings above 0.30, with the exception of Item 25 ("I tend to back down even if I know I'm right"), which had a factor loading of 0.28. In sum, the EFA analysis suggested that there was a sufficiently dominant trait EI factor present in the data, justifying the use of a unidimensional IRT model.

IRT analysis. Examination of the model-data fit residuals produced by Multilog showed that most residuals were .00 or .01, with no residuals higher than .04. This suggests a reasonably good model-data fit. The adjusted chi square to degrees of freedom ratio was 2.61 for single items and 3.15 for both doublets and triplets. These values too suggest a reasonably good model-data fit but also some multidimensionality, which is to be expected given the breadth of the construct. Overall, the EFA results and model-data fit suggest that use of the GRM is warranted.

Table 2 shows the discrimination and threshold parameters for each item in the TEIQue–SF. All of the items had at least moderate discrimination values, with the exception of Item 25 ("I tend to back down even if I know I'm right"). It should further be noted that a number of items had high discrimination parameters. The threshold parameters shown in Table 2 indicate that the values for the β_1 to β_4 parameters, in particular, were generally low for many items in the scale, indicating that individuals relatively low on the latent trait were still agreeing with them. In other words, these items tended to be relatively easy to endorse.

As an example, the left hand panels of Figure 1 show the CRCs for four items in the TEIQue–SF. The top two panels show items that have high discrimination across values of the latent trait and that have largely nonoverlapping response option categories. The bottom two left hand panels in Figure 1 show items that performed relatively poorly. It can be seen that in these items, the response categories substantially overlapped, particularly for the options indicating disagreement. Both items also had relatively poor discrimination values. It can be further noted that for all four items displayed, response Options 6 and 7 had a high probability of endorsement for individuals above the mean on the latent trait.

Table 3 shows item and test information values for the TEIQue–SF. It can be seen that a number of items had uniformly low IIF values across the latent trait range. An example of this would be Item 13 ("Those close to me often complain that I don't treat them right"). The IIF for this item can be seen in the bottom right panel of Figure 1. Despite this, many other items had moderate to high IIF values. In general, there was a tendency for the IIF values to decrease sharply for those higher than 2 *SD* units above the mean of the latent trait. This can be seen clearly in the top two right panels of Figure 1 and implies that the scale has relatively less measurement precision for those very high in global trait EI. Table 3 shows the TIF and *SEM* values for the TEIQue–SF. The TIF values are relatively high across most of the latent trait, with a decrease for those individuals higher than 2 *SD* units above the mean, as noted at the item level.

STUDY 2

Method

Participants. The participants comprised 866 individuals, of whom 432 were male and 416 were female (18 participants did not record their gender). Participants were recruited both from university campuses and from the general community using similar methods and incentives as described in Study 1. Their age ranged from 17 to 80 years, with a mean age of 26.97 years ($SD = 10.29$). The sample was highly educated, with 20% holding high school diplomas, 41% undergraduate diplomas, 26% postgraduate diplomas, and 3% PhDs (10% "other").

Measure. The TEIQue–SF was fully described in Study 1. The participants in Study 2 completed the latest version of the instrument (version 1.50; Petrides et al., 2010), which rewrites

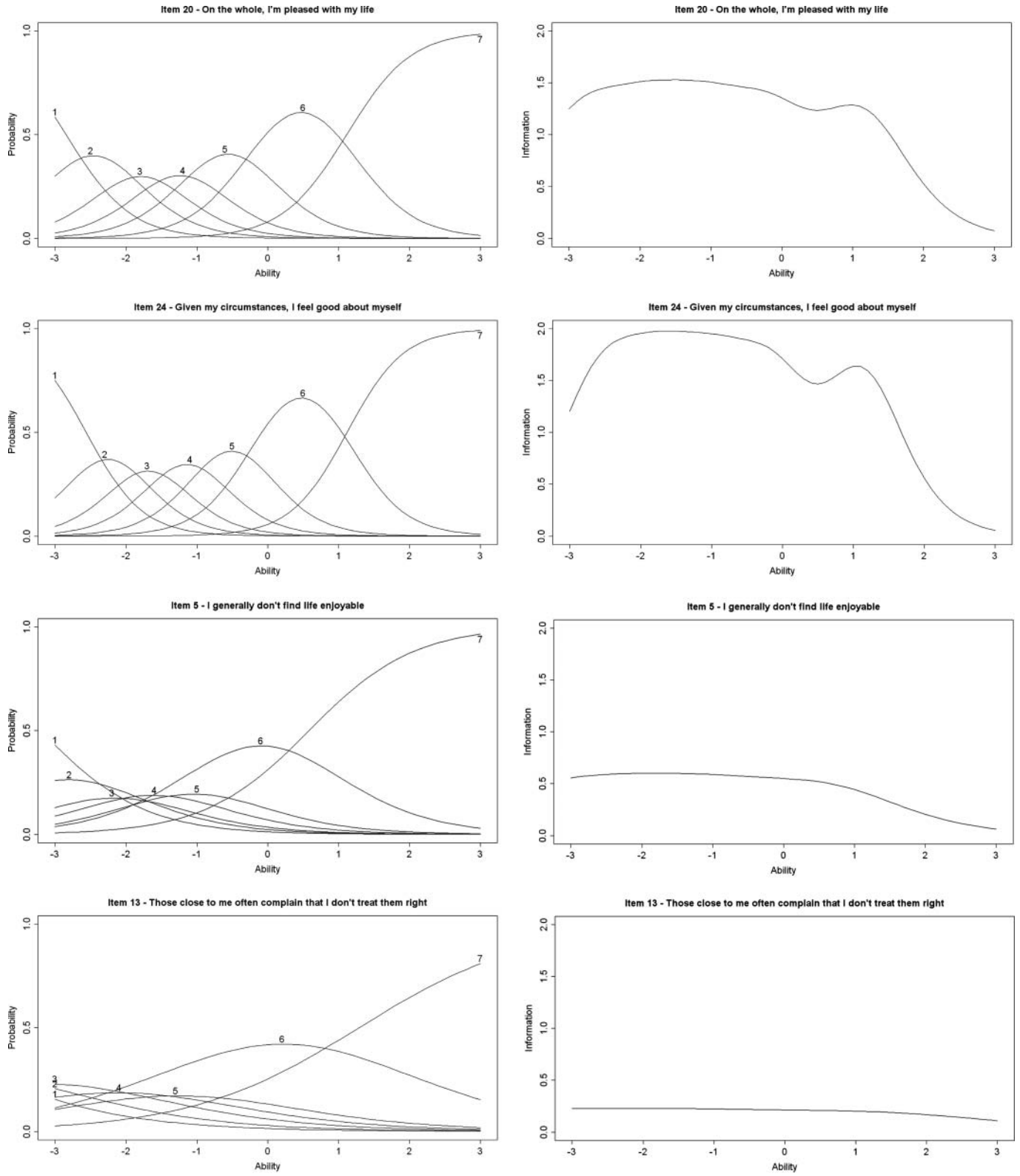

FIGURE 1.—Study 1: Category response curves and item information function curves for four items (5, 13, 20, and 24) in the Trait Emotional Intelligence Questionnaire–Short Form.

TABLE 2.—Study 1: IRT parameter estimates (and standard errors) for the TEIQue-SF version 1.00.

Items	Item Parameter Estimates						
	α	β_1	β_2	β_3	β_4	β_5	β_6
1. Expressing my emotions with words is not a problem for me.	0.90 (0.08)	−4.46 (0.51)	−2.70 (0.28)	−1.58 (0.18)	−0.78 (0.13)	0.40 (0.10)	1.94 (0.18)
2. I often find it difficult to see things from another person's viewpoint.	0.77 (0.08)	−5.94 (0.87)	−3.87 (0.50)	−2.36 (0.30)	−1.44 (0.21)	−0.24 (0.12)	2.23 (0.24)
3. On the whole, I'm a highly motivated person.	1.32 (0.09)	−4.08 (0.46)	−2.70 (0.23)	−1.74 (0.14)	−0.89 (0.09)	0.03 (0.07)	1.57 (0.11)
4. I usually find it difficult to regulate my emotions.	0.69 (0.08)	−4.78 (0.61)	−2.86 (0.37)	−1.39 (0.22)	−0.25 (0.13)	0.95 (0.14)	3.56 (0.38)
5. I generally don't find life enjoyable.	1.36 (0.11)	−3.21 (0.35)	−2.42 (0.23)	−1.90 (0.17)	−1.34 (0.13)	−0.76 (0.09)	0.58 (0.08)
6. I can deal effectively with people.	1.34 (0.09)	−3.87 (0.42)	−2.69 (0.23)	−1.91 (0.15)	−1.05 (0.10)	0.01 (0.07)	1.91 (0.13)
7. I tend to change my mind frequently.	0.65 (0.08)	−4.76 (0.64)	−2.91 (0.39)	−1.34 (0.22)	−0.06 (0.13)	1.32 (0.18)	4.21 (0.51)
8. Generally, I find it difficult to know exactly what emotion I'm feeling.	1.17 (0.09)	−4.09 (0.45)	−2.56 (0.23)	−1.50 (0.15)	−0.96 (0.11)	−0.14 (0.08)	1.54 (0.13)
9. On the whole, I'm comfortable with the way I look.	1.10 (0.09)	−3.74 (0.39)	−2.33 (0.22)	−1.38 (0.14)	−0.58 (0.10)	0.55 (0.09)	2.48 (0.19)
10. I often find it difficult to stand up for my rights.	0.83 (0.08)	−5.41 (0.70)	−2.98 (0.34)	−1.48 (0.19)	−0.77 (0.14)	0.16 (0.11)	2.22 (0.21)
11. I'm usually able to influence the way other people feel.	0.83 (0.08)	−5.99 (0.79)	−3.19 (0.35)	−1.83 (0.22)	−0.20 (0.11)	1.58 (0.16)	4.34 (0.43)
12. On the whole, I have a gloomy perspective on most things.	1.47 (0.10)	−3.17 (0.30)	−2.26 (0.19)	−1.46 (0.12)	−0.90 (0.09)	−0.33 (0.07)	0.71 (0.07)
13. Those close to me often complain that I don't treat them right.	0.84 (0.08)	−5.02 (0.65)	−3.68 (0.43)	−2.57 (0.29)	−1.67 (0.21)	−0.85 (0.14)	1.29 (0.15)
14. I often find it difficult to adjust my life according to the circumstances.	1.31 (0.09)	−4.22 (0.47)	−2.48 (0.21)	−1.54 (0.13)	−0.85 (0.09)	−0.08 (0.07)	1.50 (0.11)
15. On the whole, I'm able to deal with stress.	1.19 (0.09)	−3.44 (0.34)	−2.24 (0.20)	−1.39 (0.13)	−0.65 (0.09)	0.49 (0.08)	2.46 (0.13)
16. I often find it difficult to show my affection to those close to me.	0.95 (0.09)	−3.78 (0.41)	−2.34 (0.25)	−1.15 (0.15)	−0.62 (0.12)	−0.05 (0.10)	1.31 (0.14)
17. I'm normally able to "get into someone's shoes" and experience their emotions.	0.82 (0.08)	−4.72 (0.60)	−2.93 (0.35)	−1.84 (0.23)	−0.86 (0.15)	0.54 (0.11)	2.88 (0.28)
18. I normally find it difficult to keep myself motivated.	1.37 (0.09)	−3.21 (0.29)	−1.98 (0.16)	−1.23 (0.11)	−0.69 (0.08)	0.07 (0.07)	1.58 (0.11)
19. I'm usually able to find ways to control my emotions when I want to.	0.91 (0.08)	−4.42 (0.49)	−2.85 (0.29)	−1.67 (0.19)	−0.75 (0.12)	0.54 (0.10)	2.63 (0.23)
20. On the whole, I'm pleased with my life.	2.20 (0.12)	−2.85 (0.24)	−2.08 (0.13)	−1.52 (0.09)	−0.95 (0.07)	−0.17 (0.05)	1.11 (0.06)
21. I would describe myself as a good negotiator.	0.98 (0.08)	−4.66 (0.55)	−3.20 (0.32)	−1.88 (0.19)	−0.70 (0.11)	0.82 (0.10)	2.96 (0.25)
22. I tend to get involved in things I later wish I could get out of.	0.70 (0.08)	−4.76 (0.60)	−2.43 (0.31)	−0.86 (0.16)	0.13 (0.12)	1.44 (0.18)	4.17 (0.34)
23. I'm generally aware of my emotions as I experience them.	1.22 (0.09)	−4.50 (0.56)	−2.96 (0.26)	−1.96 (0.17)	−1.02 (0.11)	0.16 (0.08)	1.84 (0.14)
24. Given my circumstances, I feel good about myself.	2.51 (0.13)	−2.56 (0.19)	−1.94 (0.11)	−1.43 (0.08)	−0.85 (0.06)	−0.16 (0.05)	1.12 (0.06)
25. I tend to "back down" even if I know I'm right.	0.61 (0.07)	−6.43 (0.91)	−3.58 (0.47)	−1.83 (0.28)	−0.67 (0.17)	0.53 (0.14)	3.02 (0.32)
26. I don't seem to have any power at all over other people's feelings.	0.99 (0.08)	−4.80 (0.58)	−3.25 (0.34)	−1.96 (0.20)	−0.86 (0.12)	0.38 (0.09)	2.28 (0.19)
27. I generally believe that things will work out fine in my life.	1.62 (0.10)	−3.10 (0.28)	−2.31 (0.17)	−1.62 (0.12)	−0.87 (0.08)	−0.05 (0.06)	1.30 (0.09)
28. I find it difficult to bond well even with those close to me.	1.26 (0.10)	−3.59 (0.36)	−2.46 (0.22)	−1.63 (0.15)	−1.08 (0.11)	−0.50 (0.09)	0.95 (0.09)
29. Generally, I'm able to adapt to new environments.	1.31 (0.09)	−4.04 (0.45)	−2.89 (0.25)	−2.00 (0.16)	−1.33 (0.12)	−0.45 (0.08)	1.35 (0.11)
30. Others admire me for being relaxed.	0.73 (0.08)	−4.19 (0.51)	−2.45 (0.30)	−1.34 (0.19)	0.00 (0.12)	1.34 (0.17)	3.40 (0.36)

Note. IRT = item response theory; TEIQue–SF = Trait Emotional Intelligence Questionnaire–Short Form; α = discrimination parameter; $\beta_1, \beta_2, \beta_3$, β_4, β_5, and β_6 = threshold parameters.

four of the items from the original version used in Study 1. The revision was carried out to align the short form with the current full form of the inventory. The details of the item revisions can be seen in Table 4. All other aspects of the measure were the same across both studies.

Procedure and data analysis. These were the same as in Study 1.

Results

Descriptive statistics. Table 5 shows the mean, standard deviation, Cronbach's alpha, skewness, and kurtosis values for global trait EI, separately for men and women. An independent samples t test found that men scored significantly higher than women, $t(846) = 2.35$, $p < .05$, but with a small effect size ($d = 0.16$). Cronbach's alpha values were high for both men and women.

TABLE 3.—Study 1: Item and test information functions for the TEIQue–SF version 1.00.

Items	Estimated Trait						
	−3.0	−2.0	−1.0	0	1.0	2.0	3.0
1. Expressing my emotions with words is not a problem for me.	0.25	0.26	0.26	0.26	0.25	0.23	0.17
2. I often find it difficult to see things from another person's viewpoint.	0.19	0.19	0.19	0.18	0.17	0.17	0.14
3. On the whole, I'm a highly motivated person.	0.53	0.55	0.55	0.54	0.50	0.42	0.20
4. I usually find it difficult to regulate my emotions.	0.15	0.15	0.16	0.15	0.15	0.15	0.14
5. I generally don't find life enjoyable.	0.56	0.60	0.59	0.55	0.44	0.21	0.06
6. I can deal effectively with people.	0.55	0.57	0.56	0.53	0.48	0.47	0.28
7. I tend to change my mind frequently.	0.14	0.14	0.14	0.14	0.13	0.13	0.13
8. Generally, I find it difficult to know exactly what emotion I'm feeling.	0.42	0.43	0.44	0.42	0.40	0.33	0.18
9. On the whole, I'm comfortable with the way I look.	0.37	0.39	0.39	0.38	0.36	0.35	0.29
10. I often find it difficult to stand up for my rights.	0.21	0.22	0.22	0.22	0.21	0.20	0.16
11. I'm usually able to influence the way other people feel.	0.21	0.22	0.22	0.21	0.21	0.20	0.19
12. On the whole, I have a gloomy perspective on most things.	0.64	0.69	0.70	0.67	0.55	0.25	0.07
13. Those close to me often complain that I don't treat them right.	0.23	0.23	0.22	0.21	0.20	0.17	0.11
14. I often find it difficult to adjust my life according to the circumstances.	0.50	0.54	0.55	0.53	0.49	0.40	0.19
15. On the whole, I'm able to deal with stress.	0.42	0.45	0.45	0.44	0.40	0.39	0.33
16. I often find it difficult to show my affection to those close to me.	0.28	0.29	0.29	0.29	0.27	0.21	0.13
17. I'm normally able to "get into someone's shoes" and experience their emotions.	0.21	0.22	0.22	0.21	0.20	0.20	0.18
18. I normally find it difficult to keep myself motivated.	0.54	0.59	0.60	0.58	0.54	0.45	0.21
19. I'm usually able to find ways to control my emotions when I want to.	0.26	0.27	0.27	0.26	0.25	0.24	0.21
20. On the whole, I'm pleased with my life.	1.24	1.51	1.50	1.35	1.28	0.53	0.07
21. I would describe myself as a good negotiator.	0.30	0.31	0.31	0.30	0.29	0.28	0.26
22. I tend to get involved in things I later wish I could get out of.	0.15	0.16	0.16	0.16	0.15	0.15	0.14
23. I'm generally aware of my emotions as I experience them.	0.46	0.47	0.47	0.45	0.43	0.39	0.23
24. Given my circumstances, I feel good about myself.	1.20	1.95	1.95	1.71	1.64	0.56	0.06
25. I tend to "back down" even if I know I'm right.	0.12	0.12	0.12	0.12	0.12	0.11	0.11
26. I don't seem to have any power at all over other people's feelings.	0.31	0.31	0.31	0.31	0.29	0.28	0.22
27. I generally believe that things will work out fine in my life.	0.76	0.83	0.83	0.79	0.74	0.49	0.15
28. I find it difficult to bond well even with those close to me.	0.49	0.51	0.51	0.48	0.44	0.27	0.10
29. Generally, I'm able to adapt to new environments.	0.53	0.55	0.54	0.49	0.47	0.36	0.16
30. Others admire me for being relaxed.	0.17	0.17	0.17	0.17	0.17	0.16	0.16
TIF	13.38	14.86	14.89	14.11	13.24	9.70	6.01
SEM	0.19	0.16	0.16	0.17	0.19	0.26	0.41
R	0.93	0.93	0.93	0.93	0.93	0.90	0.83

Note. TEIQue–SF = Trait Emotional Intelligence Questionnaire–Short Form; TIF = test information function; SEM = standard error of measurement; R = reliability.

EFA. We used EFA to determine the suitability of implementing a unidimensional IRT model. The KMO measure of sampling adequacy was 0.89, confirming that EFA was appropriate for this sample. The results of the MAP test suggested a two-factor solution, although a visual inspection of the scree plot pointed to the presence of one dominant factor. The first five eigenvalues were 6.91, 2.11, 1.63, 1.52, and 1.40. The first eigenvalue accounted for 23.05% of the variance. Using Morizot et al.'s (2007) rule of thumb, the ratio of the first to second eigenvalue was 3.27, indicating the presence of a sufficiently strong single factor for an IRT analysis. When extracting one factor, the factor matrix showed that all items had factor loadings above 0.30, with the exception of Item 23 ("I often pause and think about my feelings."), which had a very low factor loading of 0.09. We also examined a two-factor solution. In this case, a number of items loaded strongly in a negative direction on the second factor. There were also several items that cross-loaded on both factors. Item 23 did not load on either factor. Overall, as in Study 1, there was a sufficiently strong unidimensional trait EI factor present in the data.

IRT analysis. Examination of the model-data fit residuals produced by Multilog showed that most residuals were .00 or .01, with no residuals higher than .02. This suggests good model-data fit. The adjusted chi square to degrees of freedom ratio for single items was 1.05, for doublets 3.71, and for triplets 3.96.

TABLE 4.—Differences between TEIQue versions 1.00 and 1.50.

Item No.	Item	
	Version 1.00	Version 1.50
8	Generally, I find it difficult to know exactly what emotion I'm feeling.	Many times, I can't figure out what emotion I'm feeling.
9	On the whole, I'm comfortable with the way I look.	I feel that I have a number of good qualities.
23	I'm generally aware of my emotions as I experience them.	I often pause and think about my feelings.
24	Given my circumstances, I feel good about myself.	I believe I'm full of personal strengths.

Note. TEIQue = Trait Emotional Intelligence Questionnaire.

TABLE 5.—Study 2: Mean, standard deviation, Cronbach's α, skewness, and kurtosis values for the TEIQue–SF version 1.50.

	Global Trait EI	
	Men	Women
M	5.05	4.94
SD	0.69	0.67
Range	2.80–7	2.00–7
Cronbach's α	0.88	0.87
Skewness	−0.20	−0.06
Kurtosis	−0.02	0.48

Note. TEIQue–SF = Trait Emotional Intelligence Questionnaire–Short Form; EI = emotional intelligence.

These figures suggest that model-data fit is reasonable, although the figures for doublets and triplets indicate some multidimensionality in the data. As in Study 1, results from the EFA and the model-data fit supported the use of the GRM.

We calculated the discrimination and threshold parameters for each item in the TEIQue–SF version 1.50. All items had at least moderate discrimination values, with the exception of Item 23 ("I often pause and think about my feelings"), which had a low item discrimination value (0.50). The three other revised items (8, 9, and 24) had moderate to high discrimination values. Overall, the item discrimination parameters in this sample were very similar to those obtained in Study 1. Also similarly to Study 1, the β_1 to β_4 threshold parameters were generally low for many items in the scale, indicating that individuals relatively low on the latent trait were still agreeing with them. Analysis of the item CRC plots revealed that, for some items, there was overlap in the response categories, especially below the mean of the latent trait. In addition, for a number of items, the highest two response options tended to cover most of the latent trait range above the mean. As regards the revised items, Items 8 and 24 had similar threshold parameters and CRC plots to those found in Study 1. Items 9 and 23 had more substantial overlap of response categories in Study 2 compared to Study 1, particularly for the lowest three response options. Overall, the threshold parameters for most items were similar across the samples in Study 1 and 2.

The pattern of IIF values for most items in Study 2 tended to be similar to that in Study 1. With the four revised items, only Item 8 had similar IIF values across both studies. Item 9 had higher IIF values in Study 2, whereas Items 23 and 24 had lower IIF values in Study 2. Similarly to Study 1, the TIF and *SEM* values for the TEIQue–SF version 1.50 were relatively high across most of the latent trait, with a decrease for those individuals scoring higher than 2 *SD* above the mean. A plot of the TIF and SEM values is shown in Figure 2. This figure indicates that, at the test level, the TEIQue–SF shows good measurement precision across most of the latent trait range.

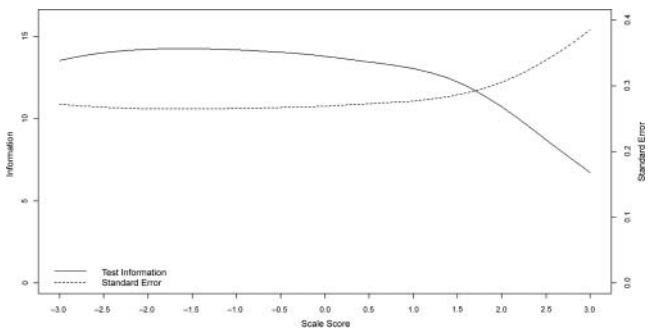

FIGURE 2.—Study 2: Test information function curve and standard error of measurement for the Trait Emotional Intelligence Questionnaire–Short Form.

DISCUSSION

The aim of this research was to use IRT to examine the psychometric properties of the TEIQue–SF across two large samples of participants. The two studies represent the most thorough psychometric investigation of the TEIQue–SF to date and also the first IRT modeling effort in the general field of EI. As such, they help address the criticism that "a good deal of EI research has been conducted without particularly advanced psychometrics" (Matthews et al., 2007, p. 24). It has been argued that using IRT can potentially add much to the analysis of personality-oriented measures (Reise & Henson, 2003). IRT methods can be especially helpful in the context of developing and evaluating short forms of existing measures, as is the case in these studies.

Taken together, the results of the IRT analysis suggest the TEIQue–SF has good psychometric properties. Many of the items have high discrimination parameters, indicating they are effective at discriminating individuals across the range of the latent trait. It is clear from Table 2 that most items had low threshold parameters, suggesting that they are relatively easy to endorse. Nonetheless, with a few exceptions, most items had high item information values across most of the latent trait range, with values tending to decrease sharply for those scoring higher than 2 *SD* above the mean of the latent trait. Crucially, the test information values showed that the instrument as a whole has good measurement precision across most of the latent trait range. As was the case at the item level, the test information values decreased at 2 *SD* above the mean, indicating less measurement precision for those with very high global trait EI.

Despite the positive outcomes of the IRT analysis, there are some potential issues that could be addressed in future revisions of the scale. There were some items that had relatively poor psychometric properties. For example, Items 4 ("I usually find it difficult to regulate my emotions"), 7 ("I tend to change my mind frequently"), and 25 ("I tend to 'back down' even if I know I'm right") had low discrimination parameters and low information values across the entire range of the latent trait. Similarly, Item 23 ("I often pause and think about my feelings") in Study 2 had a low discrimination parameter and substantial response overlap across the latent trait range.

On examination of the CRC plots, we observed that response Options 6 and 7 tended to subsume many of the lower response options across much of the latent trait range. For some items, there was substantial overlap across the response options. This may be indicative of response option redundancy, particularly for those low to very low in global trait EI. That is to say, the level of specificity implied in the number of response options available may not match the ability of individuals to use them. Certainly, for those above the mean on global trait EI, response Options 6 and 7 would seem to account for much of the variance between individuals. Future development of the scale should consider reducing the number of response options

available. Last, the TIF plots indicate the TEIQue–SF has relatively lower measurement precision at very high levels of the latent trait.

At this point, one might sensibly ask what the concrete impact might be of the specific limitations identified in these studies. First, we note that many of the shortcomings highlighted previously, such as relatively low threshold parameters and relatively low test information at very high levels of the latent trait, are typical in personality and clinical inventories (Gomez et al., 2005; Reise & Waller, 2009). In this respect, personality measures may differ substantively from measures of cognitive ability that assess relatively homogeneous latent traits. One implication from these studies might be that the number of response categories should be reduced substantially. This suggestion would certainly be amenable to future empirical work with the scale. Balanced against this, however, is the fact that personality scales with few response options (e.g., a yes–no response format) tend to have relatively peaked item and test information functions and limited precision beyond a relatively small area of the latent trait distribution (see Cooper & Gomez, 2008, for an example of this in the context of personality measurement).

Removing items with relatively low item discrimination parameters, or otherwise displaying poor psychometric properties, may also be another implication of the findings. It should be emphasized, however, that the TEIQue–SF is a short form of a larger scale that measures 15 different facets. A short form that is culled from a larger measure, and includes item content from across all of its facets, will thus tend to be somewhat heterogeneous. In other words, maintaining adequate domain coverage in a short form may come at the expense of ideal item psychometric properties.

In more general terms, the desirability of specific improvements has to be evaluated in the context of the effort required to implement them. Given that the two studies converged to show that the TEIQue–SF yields precise measurement across most of the latent trait range and that most items show fair to good psychometric properties (in addition to the conceptual advantages and comprehensive coverage of the construct's sampling domain), it is unclear whether minor gains in simplicity and efficiency would justify the development of new norms and translations, particularly in view of the validity evidence rapidly mounting in the scientific literature. Overall, the findings of the two studies suggest clearly that the TEIQue–SF can be recommended for the rapid assessment of individual differences in trait EI.

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