
International Journal of Psychology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/pijp20

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Nima Ghorbani , Mark N. Bing , P. J. Watson , H. Kristl Davison & Dan A. Mack
Published online: 21 Sep 2010.

To cite this article: Nima Ghorbani , Mark N. Bing , P. J. Watson , H. Kristl Davison & Dan A. Mack (2002) Self-reported emotional intelligence: Construct similarity and functional dissimilarity of higher-order processing in Iran and the United States, International Journal of Psychology, 37:5, 297-308, DOI: 10.1080/00207590244000098

To link to this article: http://dx.doi.org/10.1080/00207590244000098

# Self-reported emotional intelligence: Construct similarity and functional dissimilarity of higher-order processing in Iran and the United States

**Nima Ghorbani**
*University of Tehran, Iran*

**Mark N. Bing and P. J. Watson**
*University of Tennessee at Chattanooga, USA*

**H. Kristl Davison**
*University of Hartford, USA*

**Dan A. Mack†**
*University of Tennessee at Chattanooga, USA*



This study employed the Trait Meta-Mood Scale (TMMS) to assess self-reported emotional intelligence cross-culturally as an input (attention to emotions), process (clarity of emotions), and output (repair of emotions) information-processing system. Iranian (N = 231) and American ($N = 220$) university students responded to the TMMS along with measures of alexithymia, public and private self-consciousness, depression, anxiety, self-esteem, and perceived stress. Negative correlations with alexithymia and expected linkages with all other variables documented the validity of the TMMS in both cultures. Most of the other measures correlated similarly in the two samples. However, private and public self-consciousness displayed a stronger positive association in Iran. These two scales were also more predictive of adjustment in Iran and of maladjustment in the United States. This difference perhaps reflected a poorer integration of the two dimensions of self-consciousness within a presumably more individualistic American society. Confirmatory factor analyses and measurement invariance procedures revealed cross-cultural similarities in the fit of an a priori higher-order factor structure to the obtained data, but subsequent structural equation modelling techniques uncovered cross-cultural dissimilarities in the actual processing of emotional information. Specifically, the higher-order factors of emotional intelligence were similar, but the interrelationships among those higher-order factors were not. As expected, Iranians displayed positive relationships among the input, processing, and output activities of the information-processing model. For the Americans, however, greater input was associated with diminished processing and output. This unanticipated relative contrast seemed congruent with speculation that the historical American emphasis on the self and individualism promotes positive, optimistic thinking. Overall, these data most importantly suggested that subtle cultural differences might exist in the processing of emotional information.

Cette étude a utilisé l'Echelle Trait Meta-Mood (TMMS= Meta-Humeur Trait) pour évaluer l'intelligence émotionnelle auto-reportée et interculturelle comme un système d'information composé par une entrée (l'attention aux émotions), un processus (la clarté des émotions) et une sortie (la réparation des émotions). Des étudiants iraniens ($N = 231$) et américains ($N = 220$) ont répondu au TMMS avec des mesures d'alexithymia, auto-connaissance publique et privée, dépression, anxiété, auto-estime et stress perçu. La validité de la TMMS s'est documentée à travers les corrélations négatives avec l'alexithymia et les connexions espérées avec les autres variables. La plupart des autres mesures ont eu des corrélations similaires dans les deux échantillons. Cependant la conscience de soi privée et publique a montré une association plus forte en Iran. Ces deux échelles prévoyaient également une meilleure adaptation en Iran et une plus mauvaise aux Etats Unis. Cette différence reflétait peut-être une intégration plus pauvre des

†(deceased)

Requests for reprints should be addressed to P.J. Watson, Psychology Department #2803, 350 Holt Hall—615 McCallie Avenue, University of Tennessee at Chattanooga, Chattanooga, TN 37403, USA (E-mail: paul-watson@utc.edu).

The support of SABA, a human resource development corporation in Tehran, Iran, is gratefully acknowledged. This project is dedicated to the memory of Dan Mack. His untimely death deprived us of a valued friend and deprived the discipline of a talented young scientist.


http://www.tandf.co.uk/journals/pp/00207594.html DOI: 10.1080/00207590244000098

deux dimensions de la conscience de soi au sein de la société américaine, sans doute plus individualiste. Les analyses factorielles confirmatives et les procédures pour mesurer l'invariabilité ont révélé des similitudes entre les deux cultures dans l'ajustement d'une structure factorielle a priori de haut niveau en ce qui concerne les informations obtenues, bien que l'application subséquente des techniques de fabrication d'équations structurelles ait découvert des différences transculturelles dans le processus de l'information émotionnelle. Plus particulièrement les facteurs de haut niveau de l'intelligence émotionnelle ont résulté être similaires mais pas les interrelations entre eux. Comme on s'y attendait, les Iraniens ont montré des relations positives entre l'activité d'entrée, de processus et de sortie du modèle du processus de l'information. Dans le cas des américains, en revanche, la plus grande entrée est associée à une diminution dans le processus et la sortie. Ce contraste relatif non anticipé paraît congruent avec la spéculation que l'accentuation historique des Américains en soi et dans l'individualisme promeut des pensées positives, optimistes. En généra, ces informations suggèrent de manière importante la possible existence de différences culturelles subtiles dans le processus de l'information émotionnelle.

*E*ste estudio empleó la Escala Meta-Mood Rasgo (EMMR) para evaluar el auto informe de la inteligencia emocional entre culturas como un sistema de procesamiento de la información compuesto por una entrada (atención a las emociones), un proceso (claridad de las emociones) y una salida (reparación de las emociones). Estudiantes universitarios iraníes ($N$ = 231) y estadounidenses ($N$ = 220) contestaron la EMMR, junto con medidas de alexitimia, autoconciencia pública y privada, depresión, ansiedad, autoestima y estrés percibido. La validez de la EMMR se documentó mediante correlaciones negativas con la alexitimia y conexiones esperadas con otras variables. La mayoría de las demás medidas correlacionaron de manera similar en ambas muestras. No obstante, la autoconciencia privada y pública mostraron una asociación más fuerte en Irán. Estas dos escalas predijeron más el ajuste en Irán y el desajuste en los Estados Unidos. Esta diferencia posiblemente refleje una integración más débil de ambas dimensiones de autoconciencia en una sociedad supuestamente más individualista como la estadounidense. Los análisis factoriales confirmatorios y los procedimientos para medir invarianza revelaron similitudes entre ambas culturas en el ajuste de una estructura factorial a priori de alto orden a los datos obtenidos, sin embargo la aplicación subsiguiente de técnicas de modelamiento de ecuaciones estructurales descubrió diferencias trasculturales en el procesamiento de la información emocional. Específicamente, los factores de alto orden de la inteligencia emocional resultaron similares, pero las interrelaciones entre éstos no. Como se esperaba, los iraníes mostraron relaciones positivas entre las actividades de entrada, proceso y salida del modelo de procesamiento de la información. En el caso de los estadounidenses, sin embargo, la mayor entrada se asoció con una disminución en el proceso y la salida. Este contraste relativo no anticipado parece congruente con la especulación de que la prominencia estadounidense en el sí mismo y en el individualismo promueve pensamiento positivo, optimista. En general, estos datos sugieren de manera importante la posible existencia de diferencias culturales sutiles en el procesamiento de la información emocional.



## INTRODUCTION

Researchers increasingly emphasize that the processing of emotional as well as cognitive information has an impact on adaptive functioning. Even pioneers in the measurement of intelligence have described intellectual functioning in terms of a general ability that was not always easy to differentiate from the affects and emotions. Piaget (1952), for instance, stressed the integrated operation of thoughts and affects, and Wechsler (1940) noted the inability of even the very best intelligence tests to record the influences of drives, energy, and impulsiveness on a person's capacity for intelligent behaviour. The need to operationalize such influences prompted the development of both self-report and skill measures of emotional intelligence. But do such instruments operate similarly in different cultures? That question was explored in the present project by analyzing the self-reported emotional intelligence of Iranian and American samples.

Salovey and Mayer (1990) coined the term "emotional intelligence," and their work led to diverse interpretations and measures of the construct that have attracted considerable and sometimes sceptical research attention (e.g., Davies, Stankov, & Roberts, 1998; Parker, Taylor, & Bagby, 2001). Mayer and Gaschke (1988), for example, devised a Trait Meta-Mood Scale (TMMS) to measure an ongoing process in which individuals continually reflect upon psychological states to monitor, discriminate, and regulate their emotions. The TMMS included three components: attending to feelings, clarifying feelings, and repairing feelings. These three scales operationalized a theoretically meaningful information-processing model in which *inputs* (attention to emotions) led to mental *processes* (clarity of emotions) that subsequently produced *outputs* (repair of emotions).

Salovey, Mayer, Goldman, Turvey, and Palfai (1995) later demonstrated that the TMMS was a reliable and valid measure of core individual differences in emotional

intelligence. Of particular importance for the current study was their empirical pursuit of an explanatory, higher-order factor structure to validate the information-processing perspective. They proposed that emotional processing could be placed into three higher-order categories that roughly corresponded to the three TMMS scales, and an exploratory factor analysis of the TMMS and other relevant measures supported their proposal. Specifically, a principal components analysis with an orthogonal, varimax rotation identified an input factor composed of attention (TMMS) and private and public self-consciousness. The process factor reflected clarity (TMMS) and ambivalence over emotional expression. The output factor was defined by repair (TMMS), depression, optimism, and negative mood regulation. These data revealed that the TMMS efficiently represented several extant "measures concerned with the processing of affect" along these fundamental factor domains (Salovey et al., 1995, p. 137). The strong, simple factor structure also provided evidence for the convergent and discriminant validity of all three TMMS scales (R.J. Cohen, Swerdlik, & Smith, 1992).

### A cross-cultural examination of the information-processing model

In general terms, the present study assessed whether emotional information was processed similarly in Iranian and American samples by using the information-processing model of self-reported emotional intelligence. This objective was pursued within the context of four additional considerations.

First, as in previous investigations (Davies et al., 1998; Parker et al., 2001), emotional intelligence was correlated with alexithymia. Literally meaning "without words for emotions," alexithymia represents an inability to identify and describe feelings (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994). The 20-item Toronto Alexithymia Scale (TAS-20: Bagby et al., 1994a) includes three factors: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT). The obvious expectation was that alexithymia would predict lower levels of emotional intelligence (e.g., Dawda & Hart, 2000), with EOT more relevant to the attentional input and with DIF and DDF more reflective of the processing clarity aspects of the information-processing model.

Second, the TMMS and alexithymia data were evaluated within the context of relationships with other variables, including self-consciousness, depression, anxiety, self-esteem, and perceived stress. Self-consciousness and self-esteem should presumably predict higher emotional intelligence and lower alexithymia, whereas opposite associations were expected for depression, anxiety, and perceived stress. Again, Salovey et al. (1995) observed that the Private and Public Self-Consciousness Scales (Fenigstein, Scheier, & Buss, 1975) helped define the input dimension of emotional intelligence and that depression loaded negatively on the output factor. Anxiety and perceived stress were presumed to parallel depression in reflecting a lack of emotional repair. For perceived stress, this hypothesis rested upon the further assumption that such perceptions were at least somewhat obverse manifestations of the optimism that Salovey et al. (1995) found to load positively on the output component of their model.

Third, confirmatory rather than exploratory factor analysis procedures were employed to examine the validity of the Salovey et al. (1995) input (attention), processing (clarity), and output (repair) model. In each sample separately, confirmatory procedures determined whether the three-factor model was in fact superior to a global, single factor model of emotional processing. In addition, a three-factor orthogonal model was compared to a three-factor oblique model. In their exploratory factor analysis, Salovey et al. utilized a varimax, orthogonal rotation, but the hypothesis of the present project was that these factors should correlate positively. Emotional intelligence would presumably be most adaptive if emotional processing were directly sensitive to current attentional inputs and if emotional repair were directly responsive to both the input and processing of emotional information (cf. Petrides & Furnham, 2000).

Finally, this study enabled a direct cross-cultural comparison of emotional processing. Results from the confirmatory factor analysis (CFA) within each sample provided a baseline model of emotional intelligence across both cultures. Measurement invariance (MI) procedures then made it possible to determine if the same higher-order emotional factors were indeed being measured cross-culturally prior to making direct comparisons of the relationships between the factors (e.g., Durvasula, Andrews, Lysonski, & Netemeyer, 1993; Little, 1997). Overall, this model was employed along with the MI procedures to answer two questions. First, did the Iranians and Americans display equivalent emotional factors? Second, were the relationships between the emotional factors also equivalent?

Contrasts between Iranian and American social life undoubtedly include many influences that have substantive implications for the processing of emotional information. Previous research, for instance, has suggested that Iranians might be more collectivistic and Westerners more individualistic (Bierbrauer, Meyer, & Wolfradt, 1994; Triandis, 1994). A recent investigation, nevertheless, observed no noteworthy differences between Iranians and Americans in the correlational implications of individualist and collectivist values (Ghorbani, Bing, Watson, Davison, & LeBreton, 2002a). Without compelling evidence to suggest otherwise, the hypothesis, therefore, was that relationships among the emotional intelligence factors would be the same across the two samples.

## METHOD

### Participants

Samples consisted of university students from the United States and Iran. The Americans included 86 females and

134 males with an average age of 20.30 ($SD$ = 3.81). These students were 68.2% Caucasian, 25.0% African-American, and 6.8% various other racial groups. Religious commitments were 41.4% Baptist, 11.8% Methodist, 9.5% Catholic, 9.5% Presbyterian, 5.0% Church of Christ, 2.3% Church of God, 7.3% "Other Protestant," and 13.2% simply "other." Of the Iranian students, 116 were females, 111 were males, and 4 failed to indicate their gender. All of the Iranians were Persian Muslims. The average age of the Iranian sample was 21.97 ($SD$ = 2.91). All participants were volunteers.

## Measures

All scales were presented in two questionnaire booklets that contained additional measures employed in a number of other projects. Booklets for the two samples were as identical as possible, with the Iranians being presented Persian versions of the English instruments. Translation of all measures was accomplished via extensive e-mail conversations between the first and third authors over an extended period of time. Care was taken to discuss fully the nuances of all English statements before settling upon an appropriate Persian translation. The adequacy of all translations was confirmed by having the Persian versions translated back into English by someone unfamiliar with the project.

Except for the Perceived Stress Scale, participants indicated the extent of their agreement with each item along a 5-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). For the Perceived Stress Scale, they responded on a 5-point Likert scale ranging from 0 (*never*) to 4 (*very often*). Table 1 presents the mean responses per scale item along with the standard deviations and alpha coefficients for all variables across both samples. Gender-specific descriptive statistics are also presented because of their relevance to later analyses.

Based upon the recommendation of Salovey et al. (1995), the shorter 30-item version of the TMMS was employed in order to measure Attention (13 items: e.g., "I pay a lot of attention to how I feel"), Clarity (11 items: e.g., "I am usually very clear about my feelings"), and Repair (6 items: e.g., "I try to think good thoughts no matter how badly I feel"). Reliability analyses revealed that elimination of one item (i.e., "People would be better off if they felt less and thought more") would improve the internal consistency of the Attention Scale. This item, therefore, was removed from both samples, leaving a 12-item measure of attention.

Private and Public Self-consciousness Scales (Fenigstein, Scheier, & Buss, 1975) contained 10 and 7 items respectively. Again, the TAS-20 (Bagby et al., 1994) recorded EOT (8 items), DIF (7 items), and DDF (5 items). One statement from the EOT scale (i.e., "Looking for hidden meanings in movies or plays distracts from their enjoyment") was dropped from both samples to improve internal consistency, resulting in a 7-item measure. Depression and anxiety were assessed with the Costello and Comrey (1967) Scales. The 14-item depression and 9-item anxiety scales served as trait, rather than state, indices of these constructs. The 10-item Rosenberg (1965) scale was utilized to assess individual differences in global self-esteem. Last, perceived stress was recorded with the 14-item instrument of S. Cohen, Kamarack, and Mermelstein (1983). One item (i.e., "In the last month, how often have you found yourself thinking about things you have to accomplish") was eliminated from both samples to improve internal consistency, creating a 13-item Perceived Stress Scale.

## Procedure

All instruments were administered to both samples in the same order and with the same basic instructions. Administration of the questionnaire booklets occurred in groups of varying size, but with none being larger than approximately 50. The time needed to complete all measures was less than 1½ hours in virtually every instance.

**TABLE 1**
Means, standard deviations, and alpha coefficients for the study variables in the United States and Iran

| | *Country* | | | | | | *Gender* | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *United States* | | | *Iran* | | | *Female* | | *Male* | |
| *Variable* | $\alpha$ | *Mean* | *SD* | $\alpha$ | *Mean* | *SD* | *Mean* | *SD* | *Mean* | *SD* |
| Attention (TMMS) | .82 | 2.98 | 0.54 | .62 | 2.36 | 0.49 | 2.57 | 0.57 | 2.74 | 0.62 |
| Private self-consciousness | .55 | 2.55 | 0.47 | .74 | 2.56 | 0.64 | 2.56 | 0.54 | 2.56 | 0.57 |
| Public self-consciousness | .73 | 2.58 | 0.71 | .84 | 2.70 | 0.80 | 2.71 | 0.74 | 2.61 | 0.77 |
| Externally oriented attention | .67 | 1.31 | 0.60 | .50 | 1.57 | 0.59 | 1.51 | 0.63 | 1.38 | 0.57 |
| Clarity (TMMS) | .84 | 2.70 | 0.63 | .72 | 2.29 | 0.58 | 2.47 | 0.62 | 2.50 | 0.65 |
| Difficulty identify feelings | .82 | 1.25 | 0.83 | .74 | 1.59 | 0.77 | 1.44 | 0.79 | 1.40 | 0.84 |
| Difficulty describing feelings | .77 | 1.72 | 0.91 | .61 | 1.86 | 0.78 | 1.71 | 0.76 | 1.86 | 0.91 |
| Repair (TMMS) | .75 | 2.77 | 0.72 | .65 | 2.42 | 0.72 | 2.33 | 0.74 | 2.34 | 0.74 |
| Depression | .91 | 0.69 | 0.65 | .88 | 1.46 | 0.75 | 1.19 | 0.83 | 0.99 | 0.77 |
| Anxiety | .78 | 1.53 | 0.71 | .74 | 1.78 | 0.70 | 1.63 | 0.75 | 1.68 | 0.68 |
| Self-esteem | .86 | 3.16 | 0.68 | .80 | 2.46 | 0.77 | 2.78 | 0.83 | 2.83 | 0.79 |
| Perceived stress | .86 | 1.65 | 0.59 | .81 | 1.79 | 0.63 | 1.67 | 0.63 | 1.77 | 0.60 |

For American sample $N$ = 220. For Iranian sample $N$ = 231.

In the United States, participants entered responses on standardized answer sheets that were subsequently read by optical scanning equipment into a computer data file. Iranian subjects noted their responses on paper answer sheets that were later entered manually into a computer data file. Following creation of these two files, coefficient alphas were computed separately in each sample for all instruments to ensure that internal consistency reliabilities were maximized. Correlations among variables were computed separately for the Iranians and Americans, and possible sample differences in the observed relationships were examined as well. Culture, gender, and culture by gender interaction effects were assessed with a MANOVA followed by ANOVAs where appropriate.

Finally, CFA techniques were employed to verify the Salovey et al. input (attention), processing (clarity), and output (repair) model of self-reported emotional intelligence. In these analyses, summed scale scores rather than individual items were examined in order to minimize the negative effects on the confirmatory analyses of measurement error in the manifest variables (James, Mulaik, & Brett, 1982). Procedures for demonstrating measurement invariance (MI) and partial measurement invariance (PMI) first sought to confirm the superiority of the predicted oblique, three-factor model of emotional intelligence by analyzing data from each culture separately and then by testing the predicted model against alternative explanatory models (Byrne, Savelson, & Muthén, 1989; Chan, Schmitt, Sacco, & DeShon, 1998).

Without MI or PMI, comparisons between groups at a structural level could not be interpreted unambiguously (Byrne et al., 1989; Muthén & Christoffersson, 1981; Vandenberg & Lance, 2000). Only under conditions of MI or PMI could cultural contrasts, for instance, be attributed to actual differences in emotional processing rather than to the measurement of different emotional factors across samples (Horn & McArdle, 1992).

In more specific terms, these procedures began with a rejection of invariant variance-covariance matrices across the Iranian and American cultures. The model was fitted to the two (i.e., Iranian and American) observed variance-covariance matrices among the 12 scales simultaneously. This process provided the first and second steps of the MI procedure: (1) a test of invariant covariance (i.e., equal covariance matrices), and (2) a test of configural invariance (i.e., equal factor models). The test of invariant covariance matrices examines measurement and structural invariance concurrently, and if nonsignificant, further tests of measurement and structural invariance are not necessary (Vandenberg & Lance, 2000).

However, if this test is significant, then the source of the variance should be pursued via additional MI and PMI procedures prior to drawing conclusions regarding substantive differences between groups (Byrne, 1989). The test of configural invariance examines whether the same model or factor structure underlying a set of measures is equal across the groups in question, and typically provides the baseline model against which a series of nested models is compared via the chi-square difference test (Vandenberg & Lance, 2000). In other words, the test of configural invariance imposes upon the two groups the same number of factors with the same respective manifest indicators, and the same number and types, but not values, of relations (i.e., nonrecursive, recursive, regression path, covariance, etc.) between factors, between manifest indicators, and between factors and manifest indicators. In essence, the test of configural invariance imposes the same model structure on the two groups, but allows the parameters of the model to vary across groups. With the present data, the test of configural invariance was followed by a series of nested measurement and structural equation models via enforcing additional measurement and structural model constraints on the baseline model while simultaneously fitting these subsequent, nested models to both samples.

These configural invariance procedures were followed by a third step in the MI procedures, a test of metric invariance (i.e., equal factor loadings), in which the loadings for each scale with its respective factor were constrained to be equal across the Iranian and American samples. Vandenberg and Lance (2000) and Byrne et al. (1989) have asserted that at least partial metric invariance must be obtained prior to proceeding to the test of invariant uniquenesses (i.e., equal error variances) and subsequent structural investigations. Muthén and Christoffersson (1981) and Byrne et al. (1989, p. 458) have also noted that further tests of measurement and structural invariance *are warranted* given a noninvariant pattern of factor loadings so long as "the model specification includes multiple indicators of a construct and at least one measure (other than the one that is fixed to 1.00 for identification purposes) is invariant." These qualifications were met in this study.

The fourth step in these analyses involved the test of invariant uniquenesses. This step constrained the unique variances of manifest indicators (i.e., scales) to be equal across the groups. With the establishment of at least partial invariance in the error variances, it was possible to proceed to tests of structural invariance.

Again, the ultimate purpose was to ascertain whether the same scales yielded the same factors of emotional processing across the two cultures, and, thus, whether cross-cultural comparisons of relationships among these factors could be justified. The test of structural invariance relevant to this purpose was one of invariant factor covariances (i.e., equal factor covariances). Establishment of full or at least partial measurement invariance, therefore, was followed by a fifth and final step in which it was possible to conclude whether interrelations among the factors were equivalent across cultures and whether any cultural differences moderated the processing of emotions.

## RESULTS

Relationships among the TMMS measures were similar across the two samples. In the United States, increases in TMMS-Attention predicted increases in TMMS-Clarity ($r = .36$, $p < .01$), and TMMS-Repair ($r = .27$, $p < .01$).

TMMS-Clarity and Repair also displayed a positive linkage ($r = .36$, $p < .01$). In Iran, increases in TMMS-Attention also were associated with increases in TMMS-Clarity ($r = .28$, $p < .01$) and Repair ($r = .27$, $p < .01$), with these latter two variables also correlating positively ($r = .44$, $p < .01$).

Correlations among all other variables are reviewed in Table 2. Most findings for the two samples were similar and largely congruent with expectations. Measures indicative of psychological disturbance (i.e., depression, anxiety, and perceived stress) correlated positively with each other while predicting lower self-esteem. Numerous outcomes confirmed that alexithymia measured psychological dysfunction. However, the alexithymia EOT factor had only modest implications for maladjustment in the Americans when compared to the Iranians, and data for self-consciousness presented the most noteworthy cross-cultural contrast. Private and public self-consciousness were more likely to predict unhealthy psychological functioning in the Americans. In the Iranians, public and especially private self-consciousness were more likely to predict adjustment. The correlation between private and public self-consciousness was also much more robust in the Iranians.

Table 3 presents the correlations of the TMMS with all other scales. Mostly slight differences appeared between the American and Iranian data, and in both samples all three TMMS measures were overwhelmingly confirmed as correlates of emotional well-being. Once again, the most obvious cultural contrasts occurred with the self-consciousness scales. For Americans, private self-consciousness failed to predict TMMS-Clarity and Repair, whereas public self-consciousness displayed inverse correlations with these two measures. In striking contrast were the positive associations of both private and public self-consciousness with all three TMMS scales in the Iranian sample.

The MANOVA uncovered significant Culture, $F(12, 432) = 28.06$, $p < .001$, Gender, $F(12, 432) = 2.93$, $p < .01$, but not Culture × Gender interaction, $F(12, 432) = 1.08$, $p > .35$, effects (see Table 1 for descriptive statistics). With regard to the cultural contrasts, Americans displayed higher means on the three TMMS variables and self-esteem and lower averages on the three alexithymia factors, depression, anxiety, and perceived stress, $F$s$(1, 443) \geq 4.58$, $p$s $< .05$. The greater public self-consciousness of the Iranians was of borderline significance, $F(1, 443) = 3.705$, $p = .055$. With regard to gender, females were lower on DDF, $F(1, 443) = 4.92$, $p < .05$. Male tendencies to be lower on EOT and higher on TMMS-Attention and perceived stress approached the conventional level of significance, $F$s$(1, 443) > 3.17$, $p$s $< .08$.

**TABLE 2**
Correlations among study variables in the United States (above diagonal) and Iran (below diagonal)

| *Variables* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* |
|---|---|---|---|---|---|---|---|---|---|
| 1. Private self-consciousness | – | .39*[a] | −.42* | .26*[a] | .10 | .08[a] | .24* | −.15[†a] | .07[a] |
| 2. Public self-consciousness | .68*[a] | – | −.08[a] | .23* | .14[†] | .09[a] | .21* | −.30*[a] | .23*[a] |
| 3. Externally oriented thinking | −.50[*] | −.30*[a] | – | .12[†] | .16* | .13[†a] | .02 | −.11[a] | .03[a] |
| 4. Difficulty identifying feelings | .00[a] | .18* | .19* | – | .53* | .30* | .34* | −.44* | .36* |
| 5. Difficulty describing feelings | .00 | .03 | .22* | .56* | – | .23* | .22* | −.33* | .32* |
| 6. Depression | −.31*[a] | −.12[†a] | .39*[a] | .42* | .29* | – | .47* | −.66*[a] | .52*[a] |
| 7. Anxiety | .06 | .22* | .19* | .37* | .32* | .55* | – | −.40* | .54* |
| 8. Self-esteem | .39*[a] | .21*[a] | −.37*[a] | −.46* | −.25* | −.77*[a] | −.47* | – | −.61*[a] |
| 9. Perceived stress | −.18*[a] | −.05[a] | .27*[a] | .43* | .29* | .71*[a] | .54* | −.72*[a] | – |

For American sample $N = 220$. For Iranian sample $N = 231$.
[†] $p < .05$ (one-tailed); * $p < .01$.
[a] A cross-cultural difference in the observed relationship.

**TABLE 3**
Correlations of TMMS scales with other study variables in the United States and Iran

| | *United States* | | | *Iran* | | |
|---|---|---|---|---|---|---|
| *Variable* | *Attention* | *Clarity* | *Repair* | *Attention* | *Clarity* | *Repair* |
| 1. Private self-consciousness | .25* | −.01[a] | −.03[a] | .41* | .34*[a] | .44*[a] |
| 2. Public self-consciousness | .05[a] | −.19*[a] | −.13[†a] | .39*[a] | .17*[a] | .30*[a] |
| 3. Externally oriented thinking | −.39* | −.28* | −.14[†a] | −.39* | −.35* | −.41*[a] |
| 4. Difficulty identifying feelings | −.16* | −.69*[a] | −.30* | −.10 | −.56*[a] | −.15[†] |
| 5. Difficulty describing feelings | −.25* | −.56* | −.29* | −.12[†] | −.49* | −.15[†] |
| 6. Depression | −.20* | −.31*[a] | −.57* | −.23* | −.49*[a] | −.57* |
| 7. Anxiety | .01 | −.30* | −.28* | −.03 | −.38* | −.36* |
| 8. Self-esteem | .11[†] | .43* | .57* | .19* | .55* | .55* |
| 9. Perceived stress | −.07 | −.45* | −.52* | −.09 | −.44* | −.51* |

For American sample $N = 220$. For Iranian sample $N = 231$.
† $p < .05$ (one-tailed); * $p < .01$.
[a] A cross-cultural difference in the observed relationship.

## Tests of fit for the emotion information-processing baseline model of emotional intelligence

Prior to the CFA procedures, covariance matrices for the male and female data were compared in each sample separately. No significant differences were observed in Iran, Box's M = 87.14, approximate $F(78, 159230.22) = 1.06$, $p = .348$, or in the United States, Box's M = 94.81, approximate $F(78, 105303.66) = 1.14$, $p = .186$. Correlational patterns among variables, therefore, were not influenced by gender in either sample.

The goodness-of-fit of the oblique three-factor model then was evaluated against the unidimensional and the orthogonal three-factor models via the chi-square difference test. The chi-square difference test was also used for model comparisons in the MI and PMI procedures. Additional fit indices were employed because the chi-square statistic is greatly affected by sample size (Marsh, Balla, & McDonald, 1988), and any deviation from perfect model fit is likely to result in a rejection of the hypothesized model (Jöreskog, 1969). The comparative fit index (CFI; Bentler, 1990) and the nonnormed fit index (TLI: Tucker & Lewis, 1973) were used following the recommendations of Vandenberg and Lance (2000). By convention, CFI and TLI values of .90 and above indicate a good model fit. Vandenberg and Lance (2000, p. 44) also note that the TLI, unlike the CFI, rewards model parsimony, a quality that is especially advantageous in examinations of nested models when an imposition of equality constraints is utilized to assess the invariance of solutions across groups (cf. Marsh, 1995). In other words, the TLI appropriately rewards a model that obtains additional parsimony by forcing equality constraints across groups, whereas the CFI does not. The TLI, therefore, seemed particularly favourable as an indicator of model fit for tests of measurement invariance in cross-cultural studies.

As Table 4 makes clear, the three-factor oblique model provided the best fit to the data in both samples, and was statistically superior in fit when compared to the next best model, that of an orthogonal three-factor structure. Both the CFI and TLI were greater than .95 for the oblique three-factor model in both samples, indicating that the hypothesized model provided a good fit to the data. Figure 1 illustrates the standardized results of the oblique, three-factor model in each sample. The oblique three-factor model of emotional intelligence, therefore, provided the baseline, configural model for subsequent tests of measurement invariance.

Full measurement invariance (MI) across the two samples was examined next, and the results of steps 1 through 5 for examining full MI (see procedures) are presented in Table 5. As this table makes clear, a case of full MI did not hold. The chi-square difference test indicated that the

**TABLE 4**
Confirmation of the oblique three-factor model of emotional intelligence

| *Competing models* | $\chi^2$ | *df* | $\Delta\chi^2$ | $\Delta df$ | *CFI* | *TLI* |
|---|---|---|---|---|---|---|
| *United States* | | | | | | |
| 0 Null model | 7061.651* | 78 | — | — | — | — |
| 1 Unidimensional model | 408.876* | 54 | — | — | .95 | .93 |
| 2 Three-factor orthogonal model | 284.002* | 54 | — | — | .97 | .95 |
| 3 Three-factor oblique model | 214.986* | 51 | 69.02* | 3 | .98 | .96 |
| *Iran* | | | | | | |
| 0 Null model | 7794.100* | 78 | — | — | — | — |
| 1 Unidimensional model | 525.967* | 54 | — | — | .94 | .91 |
| 2 Three-factor orthogonal model | 362.486* | 54 | — | — | .96 | .94 |
| 3 Three-factor oblique model | 251.288* | 51 | 111.20* | 3 | .97 | .96 |

For American sample $N = 220$. For Iranian sample $N = 231$.
CFI = comparative fit index (Bentler, 1990); TLI = Tucker and Lewis (1973) nonnormed fit index. Dashes indicate not applicable.
* $p < .01$.

**TABLE 5**
Tests of full measurement invariance in higher-order emotional factors and processing across the United States and Iran

| *Competing models* | $\chi^2$ | *df* | $\Delta\chi^2$ | $\Delta df$ | *CFI* | *TLI* |
|---|---|---|---|---|---|---|
| 1. Invariant covariance matrices | 210.022* | 78 | — | — | .99 | .98 |
| 2. Configural invariance | 465.800* | 102 | — | — | .98 | .96 |
| 2 versus 3 | — | — | 43.73* | 12 | — | — |
| 3. Metric invariance | 509.527* | 114 | — | — | .97 | .96 |
| 3 versus 4 | — | — | 22.22 | 12 | — | — |
| 4. Invariant uniquenesses | 531.747* | 126 | — | — | .97 | .97 |
| 4 versus 5 | — | — | 22.30* | 3 | — | — |
| 5. Invariant factor covariances | 554.042* | 129 | — | — | .97 | .97 |

CFI = comparative fit index (Bentler, 1990); TLI = Tucker and Lewis (1973) nonnormed fit index. Dashes indicate not applicable.
* $p < .01$.

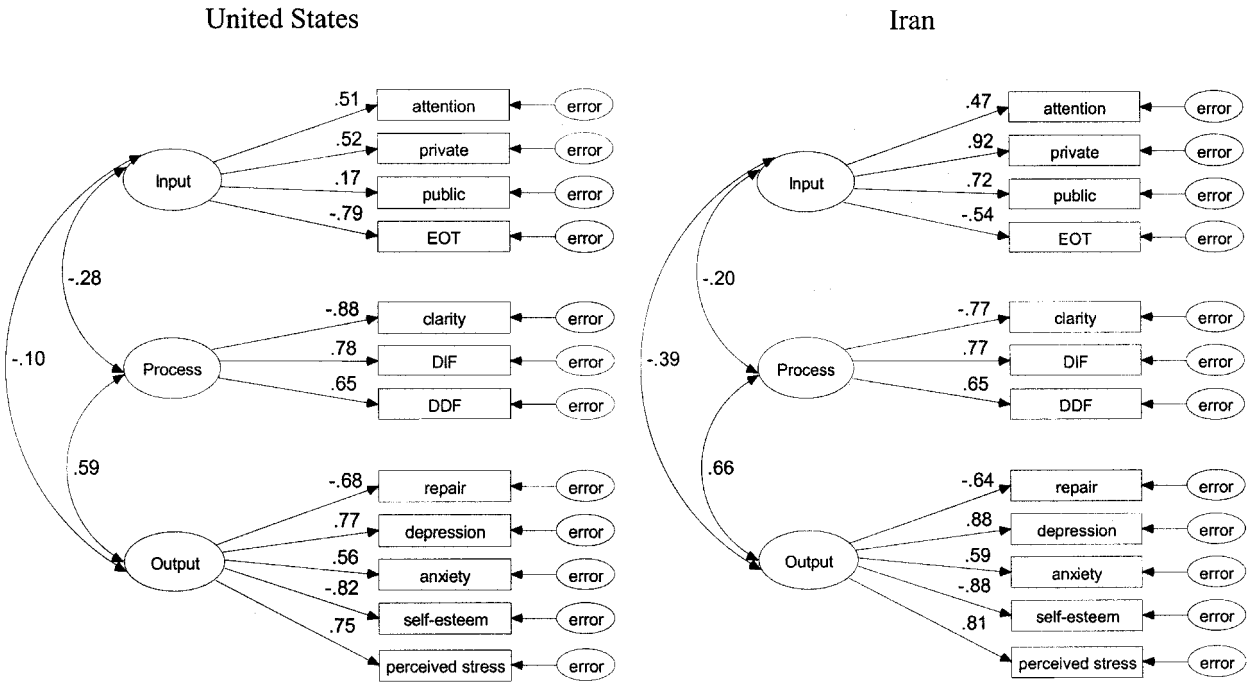


**Figure 1.** The oblique, configural factor models of emotional information processing along with their associated standardized model parameters for the American and Iranian samples when analyzed separately. The TMMS-Attention, private self-consciousness, and public self-consciousness scales combined with the externally oriented thinking (EOT) dimension of alexithymia to define the input factor. The TMMS-Clarity scale along with the difficulty identifying feelings (DIF) and the difficulty describing feelings (DDF) aspects of alexithymia delimited the process factor. The TMMS-Repair, depression, anxiety, self-esteem, and perceived stress scales described the output factor.



imposition of full metric invariance on the baseline model of configural invariance resulted in a significant decrease in fit, $\Delta\chi^2(12) = 43.73$, $p < .01$. However, the imposition of full invariant uniquenesses on the full metric invariance model did not significantly decrease the fit, $\Delta\chi^2(12) = 22.22$, $p > .01$. Finally, the imposition of full invariant factor covariances on the full invariant uniquenesses model also resulted in a significant decrease in fit, $\Delta\chi^2(3) = 22.30$, $p < .01$. Although this final result provided evidence of cross-cultural dissimilarities in the information processing of emotion, the origin of this difference could be attributed to the measurement of different emotional factors across cultures, in addition to or instead of differences in actual emotional processes. Consequently, PMI procedures were pursued in order to draw stronger conclusions regarding the similarity of the emotional processing factors measured across the two cultures and thus the meaning of the relationships among them.

The configural model depicted in Figure 1 included multiple indicators for each construct, specifically four, three, and five indicators (i.e., scales) for the input, process, and output factors, respectively. This model, therefore, met the first criterion of Byrne et al. (1989) for proceeding with additional tests of measurement and structural invariance in the presence of metric variance (i.e., a nonequivalent pattern of factor loadings). The second criterion involved having at least one invariant measure for each latent factor in addition to the measure for each factor that is fixed at 1.0 for identification purposes. This requirement was met in the current study by applying a strict procedure of allowing only one scale per factor to vary freely across the cultures. In other words, only one loading per factor was freely estimated across the cultures, and all other loadings were fixed as invariant (i.e., equivalent) across the two samples.

Because the focus was on the Salovey et al. (1995) model of emotional intelligence, the decision was made to fix as invariant the three TMMS scales. With regard to the input factor, public self-consciousness was freed because of clear cross-cultural differences in the relationships of this variable with other measures. The process and output factor loadings for the DIF and depression scales, respectively, were chosen for free estimation on empirical bases (i.e., differences in loadings across the cultures indicated that they served as sources of metric variance). As Table 1 also makes clear, these two measures in the American sample displayed the lowest averages of all variables measured in both samples and were associated with an apparent positive skew.

The freeing of the loadings for these three scales on their respective factors formed the PMI model (see Model 4 in Table 6). The freeing of the uniquenesses of these three scales, as well as the uniquenesses of the scales that corresponded to the same factor and to the same overall instrument to which the initial three scales belonged (i.e., private self-consciousness, DDF, and anxiety) formed the partial invariant uniqueness model that was created after obtaining partial metric invariance (see Model 6 in Table 6). The results of the chi-square difference tests and the model fit indices for this procedure of PMI are presented in Table 6.

Once Model 6 was obtained, tests of structural moderation followed in four basic steps (see Table 6). Model 7

**TABLE 6**
Tests of partial measurement invariance in higher-order emotional factors and processing across the United States and Iran

| *Competing models* | $\chi^2$ | *df* | $\Delta\chi^2$ | $\Delta df$ | *CFI* | *TLI* |
|---|---|---|---|---|---|---|
| 1. Invariant covariance matrices | 210.022* | 78 | — | — | .99 | .98 |
| 2. Configural invariance | 465.800* | 102 | — | — | .98 | .96 |
| 2 versus 3 | — | — | 43.73* | 12 | — | — |
| 3. Full (F) metric invariance | 509.527* | 114 | — | — | .97 | .96 |
| 2 versus 4 | — | — | 21.12 | 9 | — | — |
| 4. Partial (P) metric invariance | 486.921* | 111 | — | — | .97 | .96 |
| 4 versus 5 | — | — | 33.66* | 12 | — | — |
| 5. P metric invariance & F invariant uniqueness | 520.578* | 123 | — | — | .97 | .97 |
| 4 versus 6 | — | — | 11.00 | 6 | — | — |
| 6. P metric invariance & P invariant uniqueness | 497.923* | 117 | — | — | .97 | .97 |
| 6 versus 7 | — | — | 25.85* | 3 | — | — |
| 7. P metric invariance & P invariant uniqueness & F invariant factor covariances | 523.769* | 120 | — | — | .97 | .96 |
| 6 versus 8 | — | — | 11.22* | 1 | — | — |
| 8. P metric invariance & P invariant uniqueness & P invariant factor covariances (I-P Fixed) | 509.143* | 118 | — | — | .97 | .97 |
| 6 versus 9 | — | — | 24.39* | 1 | — | — |
| 9. P metric invariance & P invariant uniqueness & P invariant factor covariances (I-O Fixed) | 522.312* | 118 | — | — | .97 | .96 |
| 6 versus 10 | — | — | 1.18 | 2 | — | — |
| 10. P metric invariance & P invariant uniqueness & P invariant factor covariances (P-O Fixed) | 499.104* | 119 | — | — | .97 | .97 |

CFI = comparative fit index (Bentler, 1990); TLI = Tucker and Lewis (1973) nonnormed fit index. Dashes indicate not applicable. I-P, I-O, and P-O represent input-to-process, input-to-output, and process-to-output structural covariances, respectively.
* $p < .01$.



fixed all three structural covariances between the input, process, and output factors as invariant across the cultures. Model 7, with full invariant factor covariances, produced a significant decrease in fit, as did Models 8 and 9, in which the input-to-process and input-to-output covariances were fixed as invariant across the cultures, whereas the other two structural covariances were freely estimated. Model 10, the fourth step of invariant factor covariances, in which the process-to-output covariance was fixed as invariant across the cultures, did not produce a significant decrease in fit when compared to Model 6. In order to avoid a greater than 1.0 loading of private self-consciousness on the American input factor (i.e., a Heywood case), the variance in the error term for this scale was set at zero. Model 10, therefore, revealed that differences in culture moderated the processing of emotional information between the input and process, and between the input and output emotional factors, but not between the process and output factors.

Figure 2 presents the results of Model 10 for both samples and clearly illustrates moderation at the structural level in terms of relations between the input and process and between the input and output factors. Specifically, the standardized structural covariance estimate between input and process factors was .18 ($p = .05$) for the American sample and $-.18$ ($p = .056$) for the Iranian sample. The standardized structural covariance estimate between input and output factors was .17 ($p < .10$) for the American sample and $-.35$ ($p < .01$) for the Iranian sample. The standardized structural covariance estimate of .63 ($p < .01$) between process and output factors did not change across cultures.

## DISCUSSION

In the present investigation, the TMMS was administered to Iranian and American university students in an effort to assess whether self-reported emotional intelligence was processed similarly across the two cultures. Correlational data first revealed that all three TMMS measures were associated with greater self-esteem and lower levels of depression, anxiety, and/or perceived stress in both cultures. TMMS-Attention, Clarity, and Repair scores also displayed the expected negative correlations with at least two of the three alexithymia factors.

More importantly, as a preliminary step to comparing the emotional processing of Iranians and Americans directly, CFA results in each sample upheld an information-processing model of emotional intelligence. In interpreting these data, it was essential to notice that attention loaded positively on the input factor, whereas clarity and repair loaded negatively on the process and output dimensions, respectively. The process factor thus was defined as a *lack* of clarity and output was described as a *lack* of repair. Hence, the observed negative relationships of input with process and of input with output conformed to the information-processing model. Specifically, input did indeed predict greater processing and higher output (as defined by *inverse* relationships of attention with a lack of clarity and with a lack of repair), and processing did in turn predict more activity in the output system (as defined by a *positive* relationships between a lack of clarity and a lack of repair).

When the two cultures were compared directly, the Iranian input factor displayed the predicted relationship

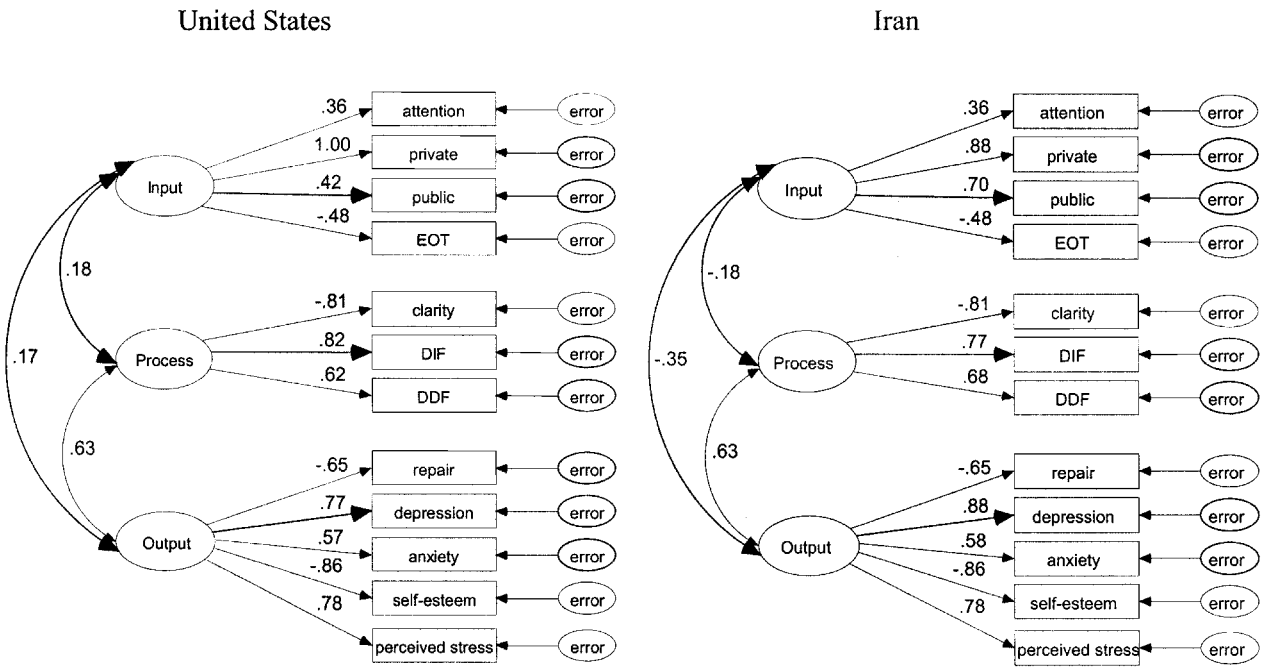


**Figure 2.** The 10th emotional information-processing model (see Table 6) and the associated standardized parameters obtained for each sample when analyzed simultaneously with the other under the imposed, partially invariant, model constraints (i.e., with TMMS and most other factor loadings set as equivalent across the samples, but with the public self-consciousness, DIF, and depression factor loadings allowed to vary across samples). Thicker lines and arrows represent parameters that were freely estimated across the samples.



with processing, although this outcome was only of borderline significance. The Iranian sample also displayed the hypothesized relationship between input and output. Surprisingly, however, the American input factor was associated with tendencies to predict less rather than more processing and output. This unexpected contrast with the Iranian data pointed toward three most important considerations. First, the input-to-processing associations of both samples were of only borderline significance. These effects, nevertheless, were opposite in sign and thus opposite in their conceptual implications, suggesting that an important mediator of these relationships remained unmeasured.

Second, the final cross-cultural comparisons should be evaluated within the context of CFA results obtained for each sample separately. In these separate analyses, the American and Iranian data both conformed to the predicted information-processing model. Greater input led directly to greater processing and output. A reasonable interpretation of the cross-cultural contrast, therefore, was that the observed differences were relative rather than absolute.

Finally, the unexpected American results perhaps reflected historical factors in the United States. Positive, optimistic thinking has been identified as one aspect of the social history that underlies the American cultural emphasis on the self and individualism (e.g., Cushman, 1995). Within the context of mild tendencies of attentional inputs to correlate negatively with the other aspects of emotional processing, the robust relationship between processing-clarity and output-repair might be one way in which the relatively positive, optimistic thinking of Americans was made manifest. Such an interpretation also may help explain why EOT was less predictive of maladjustment in the Americans than in the Iranians.

The most striking cross-cultural contrast in the correlational results appeared in the self-consciousness data. The association between private and public self-consciousness was more robust in Iran. Private self-consciousness also tended to predict adjustment in Iran (e.g., greater self-esteem and lower depression), but maladjustment in America (e.g., lower self-esteem and greater anxiety). Public self-consciousness correlated directly with anxiety and DIF in both cultures, but other relationships revealed public self-consciousness to be more indicative of psychological dysfunction in America and of mental health in Iran. Public self-consciousness, for example, predicted lower self-esteem in America and greater self-esteem in Iran. With regard to the TMMS, both forms of self-consciousness correlated directly with all three dimensions of emotional intelligence in Iran. In the American sample, however, private self-consciousness was associated only with slightly higher attention, and public self-consciousness correlated inversely, rather than positively, with clarity and repair.

These cultural contrasts in self-consciousness perhaps reflected the fact that Americans were more individualistic and Iranians more collectivistic (Bierbrauer et al., 1994; Triandis, 1994). Again, Iranians and Americans do not always differ in the correlational implications of their individualism and collectivism (Ghorbani et al., 2002a), so differences in the expression of these characteristics may occur at more subtle levels of psychological functioning. Private and public self-consciousness might not be as strongly integrated within individualistic personality

structures, and public self-consciousness might be more incompatible with individualistic (i.e., American) norms of psychosocial adjustment.

Only one reliable contrast was observed between males and females, with women scoring lower on DDF. No culture by gender interactions appeared, and the two sexes in each sample exhibited similar patterns of correlations. Gender, therefore, seemed unlikely as a contributor to the observed cultural contrasts in the information-processing model. Numerous other variables could have been influential, however. The American sample displayed a racial diversity that was not evident in the Iranians. Religious differences were obvious as well and these can affect emotional processes (e.g., Loewenthal, Cinnirella, Evdoka, & Murphy, 2001). Generally higher levels of mental health also characterized the Americans. This finding has been observed previously and could reflect all kinds of social differences, with the economically more privileged opportunities of the Americans being only one possibility (Ghorbani, Watson, Ghramaleki, Morris, & Hood, 2002b). In short, the present study uncovered cross-cultural contrasts in the relationships among higher-order factors of self-reported emotional intelligence, but more research is necessary before the causes of those differences can be identified definitively.

The information-processing model made it possible to conduct a broad, integrative analysis of variables, such as private and public self-consciousness, that are not typically viewed in terms of emotional intelligence. Indeed, private self-consciousness rather than the TMMS-Attention scale was principally important in defining the input factor in both samples. At a more general level, this result suggested that conceptualizations other than an information-processing model might deserve further research attention. More specifically, they suggested that such models might focus on constructs that emphasize the self more explicitly.

This use of the information-processing model occurred within the context of concerns over the incremental validity of self-reported emotional intelligence, over the contribution of psychometric factors to the observation of the input-processing-output factors, and over the need to operationalize emotional intelligence as a skill rather than as a self-report variable (e.g., Davies et al., 1998; Mayer, Caruso, & Salovey, 1999). Interpretations of the present findings should, of course, remain sensitive to such concerns. With regard to incremental validity issues, for example, the present sole reliance upon self-report measures of emotional intelligence and all other variables presumably inflated the magnitude of observed correlations. The TMMS and Toronto Alexithymia scale, in particular, included items with a similar content, and item overlap undoubtedly strengthened relationships between these two sets of constructs.

On the other hand, recent research has shown that the TMMS can display significant though weak correlations with at least some skill measures of emotional intelligence (Salovey, Mayer, Caruso, & Lopes, in press), and that self-reported emotional intelligence can exhibit incremental validity (Ciarrochi, Dean, & Anderson, 2002). Moreover, none of these previous concerns challenged the most noteworthy finding of this investigation. CFA procedures revealed that the higher-order factors of self-reported emotional intelligence were similar in Iran and the United States, but relationships among those higher-order factors were not. Such results suggested the need for additional research into cross-cultural similarities and differences in the processing of emotional information.

Manuscript received May 2001
Revised manuscript accepted May 2002

## REFERENCES

Bagby, R.M., Parker, J.D.A., & Taylor, G.J. (1994a). The twenty-item Toronto Alexithymia Scale — I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research*, *38*, 23–32.

Bagby, R.M., Taylor, G.J., & Parker, D.D. (1994b). The twenty-item Toronto Alexithymia Scale — II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, *38*, 33–40.

Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238–246.

Bierbrauer, G., Meyer, H., & Wolfradt, U. (1994). Measurement of normative and evaluative aspects in individualistic and collectivistic orientations: The Cultural Orientation Scale (COS). In U. Kim, H.C. Triandis, C. Kagitcibasi, S.-C. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 189–199). Thousand Oaks, CA: Sage Publications.

Byrne, B. (1989). *A primer of LISREL: Basic applications and programming for confirmatory factor analytic models*. New York: Springer Verlag.

Byrne, B., Savelson, R., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin*, *105*, 456–466.

Chan, D., Schmitt, N., Sacco, J.M., & DeShon, R.P. (1998). Understanding pre-test and post-test reactions to cognitive ability and personality tests. *Journal of Applied Psychology*, *83*, 471–485.

Ciarrochi, J., Dean, F.P., & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences*, *31*, 197–209.

Cohen, R.J., Swerdlik, M.E., & Smith, D.K. (1992). *Psychological testing and assessment: An introduction to tests and measurement* (2nd ed.). Mountain View, CA: Mayfield Publishing Company.

Cohen, S., Kamarack, T., & Mermelstein, R.A. (1983). A global measure of perceived stress. *Journal of Health and Social Psychology*, *24*, 355–396.

Costello, C.G., & Comrey, A.L. (1967). Scales for measuring depression and anxiety. *Journal of Psychology*, *66*, 303–313.

Cushman, P. (1995). *Constructing the self, constructing America*. Reading, MA: Addison-Wesley Publishing.

Davies, M., Stankov, L., & Roberts, R.D. (1998). Emotional intelligence: In search of an elusive concept. *Journal of Personality and Social Psychology*, *75*, 989–1015.

Dawda, D., & Hart, S.D. (2000). Assessing emotional intelligence: Reliability and validity of the Bar-On Emotional Quotient Inventory (EQ-I) in university students. *Personality and Individuals*, *28*, 797–812.

Durvasula, S., Andrews, J.C., Lysonski, S., & Netemeyer, R.G. (1993). Assessing the cross-national applicability of consumer behavior models: A model of attitude toward advertising in general. *Journal of Consumer Research*, *19*, 626–636.

Fenigstein, A., Scheier, M.F., & Buss, A.H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, *43*, 522–527.

Ghorbani, N., Bing, M.N., Watson, P.J., Davison, H.K., & LeBreton, D.L. (2002a). *Individualist and collectivist values: Evidence of compatibility in Iran and the United States*. Manuscript under review.

Ghorbani, N., Watson, P.J., Ghramaleki, A.F., Morris, R.J., & Hood, R.W., Jr (2002b). Muslim-Christian Religious Orientation Scales: Distinctions, correlations, and cross-cultural analysis in Iran and the United States. *International Journal for the Psychology of Religion*, *12*, 73–95.

Horn, J.L., & McArdle, J.J. (1992). A practical and theoretical guide to measurement invariance and aging research. *Experimental Aging Research*, *18*, 117–144.

Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55.

James, L.R., Mulaik, S.A., & Brett, J.M. (1982). *Causal analysis: Assumptions, models, and data*. Beverly Hills, CA: Sage.

Jöreskog, K.G. (1969). A general approach to confirmatory maximum likelihood factor analysis. *Psychometrika*, *34*, 183–202.

Little, T.D. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. *Multivariate Behavioral Research*, *32*, 53–76.

Loewenthal, K.M., Cinnirella, M., Evdoka, G., & Murphy, P. (2001). Faith conquers all? Beliefs about the role of religious factors in coping with depression among different cultural-religious groups in the UK. *British Journal of Medical Psychology*, *74*, 293–303.

Marsh, H.W. (1995). The $\Delta^2$ and $\chi^2$I2 fit indices for structural equation models: A brief note of clarification. *Structural Equation Modeling*, *2*, 246–254.

Marsh, H.W., Balla, J.R., & McDonald, R.P. (1988). Goodness-of-fit indices in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin*, *103*, 391–410.

Mayer, J.D., Caruso, D.R., & Salovey, P. (1999). Emotional intelligence meets traditional standards of an intelligence. *Intelligence*, *27*, 267–298.

Mayer, J.D., & Gaschke, Y.N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology*, *55*, 102–111.

Muthén, B., & Christoffersson, A. (1981). Simultaneous factor analysis of dichotomous variables in several groups. *Psychometrika*, *46*, 407–419.

Parker, J.D.A., Taylor, G.J., & Bagby, M. (2001). The relationship between emotional intelligence and alexithymia. *Personality and Individual Differences*, *30*, 107–115.

Petrides, K.V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, *29*, 313–320.

Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.

Rosenberg, M. (1965). *Society and adolescent self-image*. Princeton, NJ: Princeton University.

Salovey, P., & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, *9*, 185–211.

Salovey, P., Mayer, J.D., Caruso, D., & Lopes, P.N. (in press). Measuring emotional intelligence as a set of abilities with the MSCEIT. In S.J. Lopez & C.R. Snyder (Eds.), *Handbook of positive psychology assessment*. Washington, DC: American Psychological Association.

Salovey, P., Mayer, J.D., Goldman, S.L., Turvey, C., & Palfai, T.P. (1995). Emotional attention, clarity, and repair: Exploring emotional intelligence using the trait meta-mood scale. In J.W. Pennebaker (Ed.), *Emotion, disclosure, and health* (pp. 125–154). Washington, DC: American Psychological Association.

Triandis, H.C. (1994). Theoretical and methodological approaches to the study of collectivism and individualism. In U. Kim, H.C. Triandis, C. Kagitcibasi, S.-C. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 31–51). Thousand Oaks, CA: Sage Publications.

Tucker, L.R., & Lewis, C. (1973). The reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, *38*, 1–10.

Vandenberg, R.J., & Lance, C.E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, *3*, 4–69.

Wechsler, D. (1940). Non-intellective factors in general intelligence. *Psychological Bulletin*, *37*, 444–445.