

## Summary

# What Is Mainly Measured with Emotional and Multiple Intelligence Scales: A Psychometrically Investigation

Adnan ERKUŞ

Özge ENGİN<sup>1</sup>

Emotional intelligence was defined as an ability or feature to perceive, express, or regulate emotions of oneself and others (Salovey & Mayer, 1990). Also, multiple intelligences were suggested as 9 intelligence types (Spiritual, Linguistic, Logical/Mathematical, Spatial, Bodily-Kinesthetic, Musical, Interpersonal, Intrapersonal, and Naturalist) by Gardner (1983). Both emotional and multiple intelligence have been criticized in terms of conceptualizations and measurements of the terms (Daus & Ashkanasy, 2003; Zeidner et al., 2004).

First of all, emotional and multiple intelligences have been proposed on the following three arguments: 1) Decisions have been made based on a single score obtained from the intelligence scales (Bellanca, 1997), 2) Emotions have been ignored while being focused cognition in literature, 3) Scores obtained from the intelligence scales alone do not predict life success. The first argument is not correct, because the intelligence scales consist of subscales which could be inferred about general intelligence or specific intelligences (Arthur, 1949; Heberling, 1951; Sezgin et al., 2014; Silverstein, 1982; Terman, 1916; Uluç et al., 2011). The second argument is not true, because literature encompasses many scales aimed to measure emotion or emotion regulation (Araz & Erkuş, 2014; Garnefski & Kraaij, 2006; Gross & John, 1995; Gullone & Taffe, 2012; Hofmann et al., 2016; King & Emmons, 1990; Shields & Cicchetti, 1997; Ulaşan-Özgüle, 2011). Besides, emotion could not be considered as intelligence due to its' biological functioning. Moreover, the third argument is true, but no intelligence theorists or scale developers have asserted such a claim. Because life success is predicted by a large number of variable, such as hometown, gender, individual effort, and situational conditions (Gattiker & Larwood, 1988; Judge et al., 1995; Ng et al., 2005; Rode et al., 2008). That is, the single score alone cannot predict the life success of individuals. Based on these, these arguments can

be assessed as invalid.

The term emotional intelligence has been also criticized in terms of its' scope, randomly combination of unrelated characteristics and abilities which could predict success (Zeidner et al., 2004). Because emotional intelligence was asserted as the sum of positive characteristics (e.g. self-control, enthusiasm) (Goleman, 2004; Watkin, 2000), there was a suspicion that emotional intelligence might be an artificial term (Daus & Ashkanasy, 2003). Besides, definition of emotional intelligence as both ability and trait leads to several problems related to its conceptualization and so measurement (Davies et al., 1998; Landy, 2005; Locke, 2005; Zeidner et al., 2004). Emotional intelligence as an ability is required to be measured through performance tests (Kong et al., 2012), whereas emotional intelligence as a trait is required to be measured through self-report measurement tools (Petrides et al., 2007). In the study of Gohm, Corsier, and Dalsky (2005), a weak relationship between the two different measurement methods was revealed. That is, the term emotional intelligence could not be both a feature and ability at the same time. According to Armstrong (1994), the reason why emotional traits were conceptualized as an intelligence rather than an interest or ability could be the attempt to get attention or to address individual differences.

Intelligence is a maximum performance rather than a dispositional feature (Spearman, 1927). That is, intelligence can be measured through tasks in which individuals can display their maximum performances. Also, Wong and Law (2002) stated that the self-report measurement tools for emotional intelligence measure self-evaluations towards emotional skills rather than emotional intelligence level. Because self-report measurements are more likely to be affected with mood, self-esteem, or tendencies of individuals (Mayer et al., 2008). Also, a large number of studies have revealed that

emotional intelligence is highly and positively associated with self-esteem (Bibi et al., 2016; Ciarrochi et al., 2001; Tajpreet ve Maheshwari, 2015). Briefly, self-report measurements for emotional or multiple intelligence measure self-perceptions which is positively related to self-esteem (Petrides & Furnham, 2006; Dufner et al., 2012). Based on these, according to Davies et al. (1998), the measurement tools for emotional intelligence in literature cannot be assessed as reliable and valid.

To prevent improper usages of the emotional and multiple intelligence scales (Daus & Ashkanasy, 2005; Gohm, 2004), discrimination among the self-esteem, emotional intelligence or multiple intelligence scores is so essential. So, the purpose of the study is to reveal factor structures of the emotional intelligence, multiple intelligence, and self-esteem scales, as well as relations among these scales. If the correlation among scores from the self-esteem, emotional intelligence, and multiple intelligence scales is at the level of multicollinearity or close to it, the above claims will be supported. Also, if factor analysis demonstrates that one-factor structure, in which all the scales are collected as a single scale, indicates a dominant single factor as a result of factor analysis, the above claims will be supported. No psychometric study about this topic has been conducted in the literature.

## Method

### Participants

Sample of the study was composed of the voluntary participation of 246 individuals (182 females, 64 males) over 18 years of age. The Snowball sampling method was used to ensure the reliability of answers in considering complexity and length of the study (Erkuş, 2019). The research forms were completed face-to-face or via email by the participants, because of Covid-19 Pandemic. Also, the participants were asked to send the research forms to their acquaintances who would carefully fulfill them.

### Instruments

**Rosenberg Self-Esteem Scale (R-SES).** This scale was developed in 1963 by Rosenberg and adapted into Turkish by Çuhadaroğlu (1986). The first version of the scale consisted of 63 items and 12 subfactors. The first ten items of the 4-point Likert-type scale (1 = *Not very true of me*, 4 = *Very true of me*) measure self-esteem level. Five items (1, 2, 4, 6, 7) were reversely coded. Higher scores indicate lower levels of self-esteem, whereas lower scores indicate higher levels of self-esteem. Alpha reliabilities of the scale ranged from .77 to .88 (Rosenberg, 1965). The alpha reliability of the scale was found

to be .85 in the present sample. Also, there was no more information about factor structure of the scale.

**Self-Esteem Rating Scale- Short Form (SERS-SF).** The 7-point Likert scale (1 = *Never*, 7 = *Always*) was developed to measure self-esteem levels in 1982 by Hudson. The first form of the scale consists of 25 items. The short form of the scale proposed by Lecomte et al. (2006) consists of a total of 20 items (10 positives, 10 negatives). Higher scores indicate higher levels of self-esteem, whereas lower scores indicate lower levels of self-esteem. Cronbach alpha coefficients were found as .91 for positive items and .87 for negative items. As a Turkish adaptation study conducted by Tukuş (2010), Cronbach's alpha coefficients were found as .87 for positive items, .85 for negative items, and .90 for all the items. Five factors were revealed in the result of the factor analysis performed by Tukuş (2010), but three factors were presented for the scale with the help of the expert opinion.

**Schutte Emotional Intelligence Scale (SEIS).** This scale, developed to measure emotional intelligence levels by Schutte et al. (1998), consists of one factor containing 33 items. On the other hand, a revised study, conducted by Austin et al. (2004), revealed a total of 41 items (20 positives, 21 negatives). It was also revealed that the 5-point Likert scale (1 = *Strongly disagree*, 5 = *Strongly agree*) includes the following three factors: optimism/mood regulation, use of emotions, and evaluation of emotions. Higher scores indicate higher levels of emotional intelligence. Cronbach's alpha coefficient of the scale was .87. Eigenvalues were 9.20 for optimism/mood regulation factor, 2.72 for use of emotions factor, and 2.11 for evaluation of emotions factor. According to Turkish adaptation study for this scale conducted by Tatar et al. (2011), Cronbach alpha coefficients were found to be .75 for optimism/mood regulation factor, .39 for use of emotions factor, .76 for evaluation of emotions factor, and .82 for all the scale.

**Multiple Intelligences Scale (MIS).** This scale was developed to determine one or more dominant intelligence types for an individual among 8 intelligence types defined by Armstrong (1994). An adaptation study of the scale for Turkish culture was not accessed. Korkmaz (2010) stated that the scale was applied to the students within the context of the "Student-Centered Education Application Model" prepared by the Education Research and Development Department of the Ministry of Education. The 5-point Likert Scale (0 = *Completely inappropriate*, 4 = *Completely appropriate*) consists of 10 items for each intelligence type, 80 items in total. Higher scores on one intelligence type indicate higher frequencies of usage of the given intelligence type.

## Procedure

As mentioned before, the snowball sampling method was facilitated to obtain data of the study from the participants. Data were obtained from the participants face-to-face or via email (not online) due to the pandemic conditions. The research forms were sent to acquaintances of the researchers, and also, asked the participants to send their acquaintances who would carefully fulfill them. Because the four scales were used in the present study, the carry-over effect was tried to be minimized through balancing response order effects in the scales as A-B-C-D, B-C-D-A, C-D-A-B, D-A-B-C. First, the obtained data were reviewed and entered into SPSS. Afterward, necessary arrangements (e.g. detection of incomplete and outliers and reverse coding) on the data were made.

Explanatory Factor Analyses (EFA) were performed to reveal factor structures of the scales through the SPSS 11.5 package program. Also, One-Way Analysis of Variance (ANOVA) and correlation analysis were performed. Confirmatory Factor Analyses (CFA) were performed through the R 4.0.3 program.

## Results

### Results of Explanatory Factor Analyses (EFA)

The EFAs demonstrated that all the scales consist of one dominant factor. Even Multiple Intelligences Scale, aimed to measure distinctive interests and attitudes rather than intelligence, was found to consist of one dominant factor. According to Item Response Theory (IRT), a scale is required to be one-dimensional (dominant factor) as a precondition for the analysis (Hattie, 1985; Sünbül & Erkuş, 2013).

### Correlations among the Scales

Correlation analysis was performed on the revised scales in the result of EFAs. Also, total score in which all the scales are collected as a single scale was included in the analysis. Results of the analysis revealed that there were significantly positive relations among all the scales ( $p < .01$ ). The lowest correlation was found between Rosenberg Self-Esteem Scale and Multiple Intelligences Scale ( $r = .36, p < .01$ ). A moderate correlation between the Rosenberg Self-Esteem Scale and the Schutte Emotional Intelligence Scale was found ( $r = .55, p < .01$ ). A moderate correlation was found between Multiple Intelligences Scale and Schutte Emotional Intelligence Scale ( $r = .58, p < .01$ ). Also, the results demonstrated that total score, in which all scales are collected as a single scale, was highly and positively correlated with almost all the scales ( $p < .01$ ).

### Results of One-Factor CFAs

After AFA analyses for all the scales, one-factor CFAs were performed. According to Hooper et al. (2008), AGFI, GFI, RMSEA, SRMR should be .90 and above, .95 and above, below .08 and below .08 for the model fit, respectively. Accordingly, the results of CFAs were offered below.

1. One factor model, performed by taking (as if they were one scale) the Rosenberg Self-Esteem Scale and Schutte Emotional Intelligence Scale, indicated "good" fit of the model [ $\chi^2$  (860, N = 246) = 2271.43,  $\chi^2/sd = 2.64$ , AGFI = .95, GFI = .96, RMSEA = .07, SRMR = .09].
2. One factor model, performed by taking (as if they were one scale) by Multiple Intelligence Scale and Rosenberg Self-Esteem Scale, demonstrated acceptable fit level [ $\chi^2$  (3827, N = 246) = 8143.16,  $\chi^2/sd = 2.13$ , AGFI = .86, GFI = .87, RMSEA = .08, SRMR = .09]. -
3. One factor model, performed by taking (as if they were one scale) by Multiple Intelligence Scale, Rosenberg Self-Esteem Scale, and Schutte Emotional Intelligence Scale, demonstrated that the model's fit level was found within "acceptable" limits [ $\chi^2$  (7259, N = 246) = 14545.63,  $\chi^2/sd = 2.00$ , AGFI = .85, GFI = .85, RMSEA = .06, SRMR = .08].

The results of CFAs demonstrated that these scales measure common variable. Because all the models include Rosenberg Self-Esteem Scale, this variable could be 'self-esteem'/'smugness'/'pride'.

### Examination of Differences in terms of Self-Liking

To examine whether there is a difference in terms of total scores from the scales according to the extent to which participants are satisfied with themselves (never- somewhat- much- a great deal), One-Way ANOVA was performed. The results revealed that the main effect of self-satisfaction level was found to be significant for each scale and the total score ( $p < .05$ ). As Tukey post-hoc comparisons, the differences among self-satisfaction levels for all scales and total scores were found as a great deal > much > somewhat > never. This finding provides support that these scales measure the self-satisfaction (smugness/pride) levels.

## Discussion

The present study examined relationships among the emotional intelligence, the multiple intelligence, and the self-esteem scales and factor structures of the scales. Also, it was investigated the single-factor structure in double, triple, and all scale combinations which include

these scales. The results have indicated that emotional and multiple intelligences mainly measure “self-liking” (self-esteem) levels rather than intelligence.

The EFAs demonstrated that all the scales consist of one dominant factor or one dominant factor with multiple components. Even Multiple Intelligences Scale, aimed to measure distinctive interests and attitudes rather than intelligence, was found to consist of one dominant factor. Even if some scales were found to encompass more than one factor, the one dominant factor was presented through first factor which was positively loaded by all items for all the scales, two times more difference between eigenvalues of the first factor and the second factor, and high internal consistency coefficients of the scales. So, it could be inferred that these scales do not measure features aimed to be measured.

High positive correlations among the Emotional Intelligence Scale, the Multiple Intelligence Scale, and the Self-Esteem Scale were revealed in the present study. The lowest correlation between Rosenberg Self-Esteem Scale and Multiple Intelligences Scale might derived from eight-factor structure of the Multiple Intelligence Scale which reflect several intelligences indicating different interest and attitudes. Also, this structure is not likely to demonstrate high internal consistency coefficient. Thus, this finding might be expected. A moderate correlation between the Rosenberg Self-Esteem Scale and the Schutte Emotional Intelligence Scale was found as lots of study in literature (Bibi et al., 2016; Ciarrochi et al., 2001; Mergler et al., 2007; Mesmer-Magnus et al., 2005; Nehra et al., 2012; Sillick & Schutte, 2006; Tajpreet & Maheshwari, 2015). This finding, which may be derived from self-affirmation (Brackett et al., 2006), is consistent with several studies (Rabiee et al., 2017; Sahay, 2019). A positive correlation between the Emotional Intelligence Scale and the Multiple Intelligence Scale might be explained that perception of emotion and emotion regulation, components of emotional intelligence, were constituted based on multiple intelligence (Gardner, 1988). So, emotional intelligence is related to multiple intelligence. This finding is paralleled to the study of Lam and Kirby (2002). But, some studies were demonstrated that no relationship was between subfactors of emotional intelligence and multiple intelligence scales (Bay & Lim, 2006; Lam & Kirby, 2002). According to Bay and Lim (2006), emotional intelligence might not be related to all the subfactors of multiple intelligence, because multiple intelligence encompasses distinctive subfactors, such as social, intrapersonal, and linguistic intelligences. In addition to these, there was positive and high correlation between each variable and general total, which indicates one factor model, performed by taking by Multiple Intelligence Scale, Rosenberg Self-Esteem

Scale, and Schutte Emotional Intelligence Scale. Also, it can be anticipated that these correlation coefficients would increase as the sample size increases. This finding provides strong support that all the scales measure similar variable.

Based on the CFAs for the scales, it could be concluded that the three different scales measure a common structure which can be stated as ‘self-worth’/‘smugness/pride’. As mentioned before, the self-report measurement tools for emotional intelligence and multiple intelligences leads to be revealed self-evaluations rather than competencies, in contrast to the performance test (Dufner et al., 2012; Petrides & Furnham, 2006). In other words, the present study has demonstrated that the emotional and multiple intelligence scales measure the extent to which individuals perceive themselves as worthy rather than performance.

Differences among total scores of the scales were examined in terms of self-liking. The results demonstrated that scores obtained from the emotional or the multiple scales increase as self-liking level increases. This finding provides support that these scales measure the self-satisfaction (smugness/pride) levels.

To sum up, the results have indicated that there is a serious problem for the conceptualization and measurement of “emotional” and “multiple” intelligence. Therefore, further studies about emotional and multiple intelligence should be questioned. Although the snowball sampling method was facilitated to provide the reliability of answers in this present study, the completion of all the scales in a single session may have diminished the reliability of answers. Also, considering the fact that sufficient sample size could not be reached due to the pandemic conditions, this study could be replicated with larger samples, in using fewer scales, or completion of the scales through face-to-face communication.