

## Social Intelligence and Language Proficiency: Are They Related?

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### Abstract

This study explored the relationship between social intelligence and English language proficiency by employing Reading the Mind in the Eyes Test (RMET) developed by Baron-Cohen *et al.* (2001) and cloze multiple choice item test (CMCIT) designed by Hale *et al.* (1988) as their representative measures, respectively. The administration of the two tests to 181 undergraduate university students of English Language and Literature and Theology and correlating the scores obtained on the two tests showed that social intelligence is significantly related to language proficiency. When the participants were, however, classified into low, middle and high proficiency groups on the basis of their z-scores on the CMCIT and the social intelligence of these three groups were compared with each other, the mean score of middle and high proficiency groups did not show any significant difference on the RMET and were thus collapsed into one, i.e., middle-high group. The correlational analysis of the scores obtained by low and middle-high proficiency groups on the RMET and CMCIT showed that there is only a significant relationship between the social intelligence and language proficiency of middle-high group. The results are discussed and suggestions are made for future research.

**Keywords:** Social intelligence, language proficiency, mental states, close multiple choice items

### 1. Introduction

Following Darwin (1872/1965), Ekman and Friesen (1971, 1975) showed that humans do recognize the basic emotions of *happiness*, *sadness*, *anger*, being *afraid*, *surprise*, and *disgust*. Based on this recognition Baron-Cohen and Cross (1992) concluded that cognitive mental states could also be observed in people's faces in general and in their eyes in particular to fulfill social needs. For example, they argued that when a given person directs his eyes away from viewer without having a direct object to direct their gaze at, it can be concluded that the person is thinking about something and must not, therefore, be approached or interrupted.

In order to revise their original Reading the Mind in the Eyes Test (RMET) consisting of 25 two-choice items into a 36 four-choice RMET, Baron-Cohen *et al.* (2001) resorted to a theory of mind (Premack & Woodruff, 1978), which explains how humans make sense or predict others' behaviour by identifying their mental states. According to Baron-Cohen *et al.* (2001) the theory is variously referred to as "mentalizing" (Morton, Frith & Leslie, 1991), "mind reading" (Whiten, 1991) and "social intelligence" (Baron-Cohen, et al., 1997). In the present study, the RMET is considered to be a

measure of social intelligence or “the ability to decode others’ mental states on the basis of observable information, such as facial expressions” (Sabbagh, Moulson, & Harkness, 2004, p. 1).

For validating the adult RMET, Baron-Cohen *et al.* (2001) required four groups of people to read or consult regularly a list of 93 words whose definitions are given first and then contextualised linguistically in sentences appearing below the definitions. (The groups consisted of adults with Asperger syndrome or high functioning autism, normal adults, normal adult students and randomly selected individuals from general population.) The first word, “accusing”, is, for example, defined as “blaming” and used in the sentence “the policeman was *accusing* the man of stealing a wallet”. The test takers are then provided with 17 female (47.2%) and 18 male (52.8%) photos taken from their facial area around their eyes as shown in Figure 1.

**Figure 1:** An example male photo given as practice item on the RMET



As can be seen in Figure 1, each of the 36 photos on the RMET is given with four alternatives appearing on its top and bottom corners. Baron-Cohen *et al.* (2001) chose the keyed response representing the mental state expressed by each photo and its three alternatives by piloting them on a group of eight judges. The criterion was the acceptance of the keyed response and each of its three alternatives by at least five and two judges, respectively. Finding no significant correlations between IQ and RMET, Baron-Cohen *et al.* announced that as a measure of social intelligence, RMET “is independent of general (nonsocial) intelligence” (p. 247).

The RMET has been used not only with autistic individuals (e.g., Baron-Cohen *et al.*, 2001) but also with brain-damaged patients suffering from prefrontal cortical lesions or amygdectomy (e.g., Stone *et al.*, 1998; 1999) to explore how the damages affect their social intelligence. No study has, however, investigated whether the RMET relates significantly to English language proficiency of normal adult students. The present study has, therefore, been designed to fill the gap and explore whether university students with low, intermediate and advanced levels of language proficiency perform significantly differently on the RMET. In other words, the study attempts to find out whether higher language proficiency correlates significantly with higher social intelligence.

## 2. Methodology

### 2.1. Participants

One hundred eighty one, 140 (77.3%) female and 41 (22.7%) male, undergraduate university students participated voluntarily in this study. They had registered in the courses Linguistics II (n=45, 24.9%), Reading Comprehension II (n=52, 28.7%), Principle and Methods of Language Teaching (n=40, 22.1%), and General English for the Students of Theology (n=44, 24.3%), offered by the first author. (Some participants did not, however, take the two tests employed in the study for reasons beyond the researchers’ control or did not answer most of their items comprising the tests. These participants were excluded from the study. To be more specific, therefore, the number of participants who completed the RMET and

TOEFL is given in relevant tables.) Their age ranged between 18 and 46 (Mean=20.5, SD=2.9). They spoke Persian (n=179, 98.9%), Kurdish (n=1, 0.6%) and Turkish (n=1, 0.6%) as their mother language.

## 2.2. Instruments

Three instruments were employed in this study, i.e., a demographic scale, Persian Reading the Mind in the Eyes Test and English Language Proficiency Test.

### 2.2.1. Demographic Scale

The demographic scale employed in the study consisted of several short answer questions and multiple choice items dealing with the participants' age, the place and field of study, gender and mother language.

### 2.2.2. Persian Reading the Mind in the Eyes Test

The Persian Reading the Mind in the Eyes Test (RMET) was downloaded from the homepage belonging to the Autism Research Centre (2013) of University of Cambridge. Out of 93 words given as the lexicon of English RMET, only 26 have been translated into Persian, i.e., accusing, affectionate, terrified, jealous, arrogant, sympathetic, playful, panicked, upset, embarrassed, decisive, sarcastic, aghast, doubtful, confused, preoccupied, imploring, defiant, pensive, reassuring, suspicious, desire, dispirited, distrustful, joking, and fantasizing. With the exception of "arrogant" whose Persian equivalent is given only, the other 25 Persian equivalents have been defined and presented in example sentences.

Although there are 36 photos on the English RMET, they measure 32 mental states, i.e., accusing, anticipating, cautious, concerned, confident contemplative, decisive, defiant, desire, despondent, distrustful, doubtful, fantasizing, flirtatious, friendly, hostile insisting, interested, nervous, pensive, playful, preoccupied, reflective, regretful, serious, skeptical, suspicious, tentative, thoughtful, uneasy, upset, and worried. The four mental states "cautious, fantasizing, interested, and preoccupied" are measured by two photos each. The number of Persian equivalents given for the 32 words, however, drops to 31 because the same Persian schema DOUDEL (دودل) has been offered for both "doubtful" and "tentative" mental states.

The 31 words representing the mental states expressed by the 36 photos on the Persian RMET as its key responses are presented along with 78 words which bear syntactic and semantic relationships with each other. The keyed response in Figure 1, i.e., panicked, is, for example, an adjective as are the three alternatives "jealous", "arrogant", and "hateful" and thus syntactically related. They are also semantically related because each of the three alternatives were chosen by at least two judges in Baron-Cohen *et al.*'s (2001) study as the mental states expressed by the photo. The researchers contacted the designers of the site via email to get the statistics of the Persian RMET but did not receive any response.

### 2.2.3. English Language Proficiency Test

By piloting six passages chosen from previously used Test of English as a Foreign Language (TOEFL) forms, Hale *et al.* (1988) developed 150 cloze multiple choice items (CMCIs) on these passages and pretested them in three local American universities. From the first sentence comprising one of the passages, i.e., "It is generally understood that a ballad is a song that tells a story, ... (1) a folk song is not so ... (2) defined", two words "but" and "easily" were, for example, chosen rationally, replaced with a blank and presented along with three alternatives to be chosen by test takers as shown below. [In the present study the keyed responses and alternatives were given below the paragraphs from which they were deleted to save space. In Hale *et al.*'s (1988) study, however, the response alternatives were vertically aligned in a rectangular frame.]

The alternatives of two CMCIs comprising the language proficiency test

1	a. so	b. and	c. but	d. as
2	a. easy	b. easily	c. ease	d. easier

Based on their pretest results Hale et al. (1988) chose three passages and 50 CMCI developed on these passages as the English language proficiency test used in this study (henceforth CMCIT). The difficulty level of items matched the range of difficulty encountered in typical TOEFL tests. Along with a standard TOEFL test consisting of listening, structure and written expressions, vocabulary and reading comprehension subtests, the CMCIT was administered to 11, 290 test takers among whom 476 were Persian speakers. The mean, standard deviation, and alpha reliability coefficients reported for the test were 28.55, 9.19 and 0.89, respectively.

Table 1 presents the correlation coefficients obtained between the CMCIT and the TOEFL as well as its five subtests taken by Farsi speaking participants in Hale et al.'s (1988) study. As can be seen, although the listening subtest does not measure reading as the CMCIT does, they correlate highly with each other, i.e.,  $r=.77$ . The TOEFL itself and its reading, structure, vocabulary and written expressions subtests correlate the highest with the CMCIT, i.e., .89, .89, .88, .86, and .85, respectively. According to scholars such as Hatch and Lazaraton (1991), when two tests correlate .80 and higher, they measure the same variable. Since the CMCIT and TOEFL correlate higher than .80 with each other, the CMCIT measures the English language proficiency as best as the TOEFL does. It is, however, half the length of the TOEFL and does not take more than 33 minutes to be completed.

**Table 1:** Correlations between the CMCIT, the TOEFL and its subtests (Hale et al., 1988, p. 33)

Tests	Listening	Structure	Written exp.	Vocabulary	Reading	TOEFL
CMCIT	.77	.88	.85	.86	.89	.89

### 3. Procedure

In order to save space and objectify the marking process as much as possible, instead of requiring the participants to circle their selected choices on the test booklet, the four alternatives on the RMET were alphabetically numbered A, B, C, and D. This procedure allowed the researchers to develop the DS and an answer matrix for the RMET on a single sheet. The participants were asked to read the definitions as well as examples before and during the testing session in which they took the Persian version of RMET, look at the 36 black and white photos one by one, choose the alternative which they thought described the photo best, and mark the corresponding box on the answer sheet provided. The RMET was administered to each of the four classes in a single session. The CMCIT was held in a separate session under standard conditions. The results were reported to the participants individually and their performance on the RMET and CMCIT was discussed in terms of their standing among their classmates and the sample of the study.

### 4. Data Analysis

The descriptive statistics of the RMET and CMCIT was calculated to determine how their constituting items functioned. For estimating the reliability levels of the tests Cronbach's alpha was used. One Way ANOVA analysis was employed to find out whether the mean scores of the three language proficiency groups established on the basis of CMCIT scores would differ significantly on the RMET. For exploring the existence of any significant relationship between the two tests Pearson correlation was used. All statistical analyses were conducted via IBM SPSS Statistics 20 to answer the three research questions below.

- Q1. Does the performance of low, middle and high proficiency students differ significantly from each other on the RMET?
- Q2. Do RMET and CMCIT correlate significantly with each other?
- Q3. The performance of which proficiency group correlates significantly with the RMET?

## 5. Results

Table 2 presents the descriptive statistics of the tests in this study as well as the RMET administered to the third group in Baron-Cohen *et al.*'s (2001) study. (Their third group is chosen for comparison because they were undergraduate university students as the participants of the present study were). As can be seen, the mean score of the Iranian students on the RMET, i.e., 21.7, is lower than that of their British counterparts, i.e., 28.0, indicating that it was more difficult for the former group to read the British actors and actress' minds through their eyes. This very difficulty has resulted in the relatively low reliability coefficient of the Persian version of RMET administered in this study, i.e., .54.

**Table 2:** Descriptive statistics and reliability estimates of the RMET and CMCIT

Test takers	Baron-Cohen <i>et al.</i> (2001)				Present study (RMET)				Present study (CMCIT)			
	N	Mean	SD	$\alpha$	N	Mean	SD	$\alpha$	N	Mean	SD	$\alpha$
All	103	28.0	3.5	-	161	21.7	3.9	.54	166	26.5	11.9	.94
Females	50	28.6	3.2	-	127	21.8	3.9	-	129	24.2	12.0	-
Males	53	27.3	3.7	-	34	21.4	4.3	-	37	34.5	7.85	-

As it can also be seen in Table 2, the CMCIT is a highly reliable measure of English language proficiency, i.e.,  $\alpha=.94$ . In contrast to the RMET on which the female and male participants of this study have obtained almost the same mean score, i.e., 21.8 and 21.4, respectively, the mean score of males on the CMCIT is higher than that of females, i.e., 34.5 vs 24.2. The One-Way ANOVA analysis showed that the difference in the mean is significant ( $F=24.05$ ,  $df=1$ ,  $p<.001$ ), indicating that the male participants of this study were more proficient in English than the females.

Table 3 presents the descriptive statistics of the CMCIT taken by the participants who sat for the RMET as well. As can be seen, the mean scores of low, middle and high proficiency groups on the CMCIT differ, i.e., 8.1, 28.7 and 41.0, respectively. (Participants whose z-scores were -1 and lower and those of +1 and higher were assigned to low and high proficiency groups, respectively. Those falling in between were considered middle proficiency.) The One-Way ANOVA analysis of the mean scores obtained by the three proficiency groups showed that they differed significantly from each other, i.e.,  $F=262.716$ ,  $df=3$ ,  $p<.000$ . The Scheffe post hoc test indicated that the mean score of high proficiency group was significantly different from those of low and middle proficiency groups.

**Table 3:** Descriptive statistics of three groups of proficiency on the CMIT and RMET

Groups	N	CMCIT			RMET		
		Mean	SD	Std. Error	Mean	SD	Std. Error
Low proficiency	30	8.10	2.964	.541	20.43	4.191	.765
Middle proficiency	92	28.73	6.503	.678	22.12	3.341	.348
High proficiency	23	41.00	1.809	.377	23.22	4.221	.880
<b>Total</b>	<b>145</b>	<b>26.41</b>	<b>11.67</b>	<b>.969</b>	<b>21.94</b>	<b>3.751</b>	<b>.311</b>

As it can also be seen in Table 3, the mean scores of the low, middle and high proficiency participants differed from each other on the RMET, i.e., 20.4, 22.1 and 23.1, respectively. The One-Way ANOVA analysis showed that the difference in the mean scores was significant ( $F=4.022$ ,  $df=2$ ,  $p<.02$ ). Scheffe post hoc test, however, showed that only the mean score of low proficiency group on the RMET differed significantly from that of high proficiency. These results thus answer the *first* research question and show that *only low proficiency test takers differ significantly from high proficiency ones in terms of their performance on the Persian RMET*. No difference could, however, be found in the performance of middle and high English proficiency groups on the test.

Table 4 presents the correlation coefficients obtained between the RMET and CMCIT. As can be seen, the two tests correlate significantly with each other, i.e.,  $r=.27$ ,  $p<.01$ , when the performance of all proficiency groups are taken into account. The coefficient thus answers the *second* research question positively by revealing the fact that seven percent of variance in Iranian learners' English

language proficiency is explained by their social intelligence as measured by the RMET. These results may help researchers approach self-reported measures of emotional intelligence such as Bar-On's (1997) EQ-I more cautiously. Feizbakhsh (2010), for example, employed the Persian version of the EQ-I translated and validated by Dehshiry (2003) and could find no significant relationship between its Interpersonal Competence, i.e., social intelligence, and self-reported English language achievement.

**Table 4:** Correlations between RMET and CMCIT

Statistic	All groups	Low proficiency group	Middle-High proficiency group
Pearson Correlation	.273**	.277	.187*
Sig. (2-tailed)	.001	.139	.046
N	145	30	115

\* Correlation is significant at the 0.05 level (2-tailed)

\*\* Correlation is significant at the 0.01 level (2-tailed)

The relationship between the RMET and CMCIT, however, changes in degree when the learners are divided into two groups, i.e., low proficiency group and middle-high proficiency group. As can be seen in Table 4, only the scores of middle-high proficiency group correlate significantly with the RMET, i.e.,  $r=.19$ ,  $p<.05$ , and thus answer the *third* research question, i.e., *the performance of which proficiency group correlates significantly with the RMET?* These results indicate that gaining middle-high proficiency in English helps learners acquire a level of social intelligence which is significantly higher than their low proficiency counterparts.

## 6. Discussions

So far no study has explored the relationship between social intelligence and English language proficiency in general and within an Iranian context in particular. Ekhtiari *et al.* (2011), however, studied social cognition impairment among opiate dependents and reported a correlation coefficient of 0.49 ( $p<.05$ ) between RMET and Raven Progressive Matrices, indicating that 24% of their normal ( $n=51$ ) and addict ( $n=50$ ) participants' fluid intelligence is explained by their social intelligence. These scholars have, nonetheless, employed the computerized Persian version of the RMET translated by Ekhtiari *et al.* (1389/2010). Since the present researchers contacted but could not get in touch with the translators nor had access to their RMET, their results could not be discussed in relation to the findings of the present study.

Similarly, in order to find out whether there was any significant relationship between social intelligence and mindfulness, Njati *et al.* (2012) administered the RMET and the Mindful Attention Awareness Scale (MAAS) developed and validated by Brown and Ryan (2003) and Carlson and Brown (2005) to 40 undergraduate and graduate students of psychology at Tehran University. Njati *et al.*, however, translated the RMET themselves in consultation with some linguists. Since they provided their readers neither with their Persian version of the RMET nor with its correlation coefficient with the MAAS, their findings could not be related to those of the present either. It is hoped that researchers in Iran would employ and probably design a Persian RMET whose content validity is established by schema theory of translation (Khodadady, 2001) and administered to a representative sample to secure its factorial validity.

The Persian RMET employed in this study shows that there is a significant relationship between learners' English language proficiency and their social intelligence. As they gain higher proficiency in English, they can better read their foreign addressees' mental states through photos taken from their eyes. Opposite relationships have, however, been reported between the TOEFL and 20-item Persian Cultural Intelligence Scale (CQS) validated by Khodadady and Ghahari (2012) in Iran and reported significant but *negative* relationship between cultural intelligence and English language proficiency ( $r=-.37$ ,  $p<.01$ ). The findings of this study thus show that social intelligence plays a far more important role in learning English than cultural intelligence does.

As an ability-based measure of social intelligence, the Persian RMET administered in this study does not, however, enjoy a high level of reliability due to its relative difficulty. While high language

proficiency group have, for example, answered 82% of items on the CMCIT right on average (mean=41), they have answered only 65% of item on the Persian RMET (mean=23.22). The present authors believe that its reliability can be improved by enhancing its content validity, i.e., measuring others' mental states both visually and semantically. First, instead of white-and-black photos, coloured ones must be utilized to attract the test takers' attention most. Almost all participants in this study asked why the photos on the test were not coloured. Secondly, they should be taken from the people who speak the language in which the test is presented. Although one of the advantages of the English RMET is its focus on limited area of face, most photos such as the example presented in Figure 1 reveal a typically mental state expressed by a European. If social intelligence is acquired and enhanced through interaction, then the participants in a given study have developed it by interacting with their own ethnic group, i.e., Iranians, than with the British.

The translator of the Persian RMET has unconsciously acknowledged relating its content to Persian audience and replaced British names with the Persian in the example sentences provided for the 25 mental states defined in the test. He has, for example, translated the proper English names Tony and Jane as Alireza and Farnoosh, respectively. However, he has not translated the remaining 68 mental states defined and exemplified in the English RMET and thus contributed to the difficulty level of the Persian RMET. It is therefore suggested that a new Persian RMET is developed with coloured photos taken from Persian characters and all the mental states tested be defined as exactly as possible to enhance its semantic or schema-based validity.

## 7. Conclusions

Since the RMET correlates significantly with the CMCIT, it reveals the important role social intelligence plays in learning a foreign language. However, when learners are divided into low, middle and high proficiency groups on the basis of their performance on the CMCIT, the social intelligence of the low proficiency group differs significantly only from the high proficiency group and thus necessitates improving the RMET through incorporating more mental states and/or employing photos taken from the speakers of the language in which it is held. Similarly, when the performance of low, middle and high proficiency groups on the CMCIT is separately correlated with their RMET, no significant relationships appear. Nonetheless, treating middle and high proficiency participants as a single group brings about a significant relationship between their social intelligence and language proficiency indicating that social intelligence has little role, if any, to play at low level of language proficiency. Future research must show whether employing a more comprehensive measure of RMET, a larger sample and language proficiency tests other than the CMCIT will shed more light on the relationship between social intelligence and language proficiency.

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