

## **Induction of Emotions from TOEFL iBT Reading Tests as a Construct-irrelevant Factor and its Interference with Emotional Intelligence**

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### **Abstract**

Cognitive appraisal of individuals directs to the creation of an emotional response, which is related to emotional intelligence. The present study shows the presence of induced emotions as an unrelated factor on the construct of a TOEFL iBT reading test which can interplay with emotional intelligence for regulating the induced emotions towards reading passages. The present participants were 393 Iranian EFL TOEFL iBT candidates. The present researchers detected induced emotions based on PANAS before and after reading the three selected passages of a TOEFL iBT reading section. Also, emotional intelligence was detected by Schutte Self-Report Emotional Intelligence Test after reading the selected passages. Our results confirmed this hypothesis statistically by reporting that induced emotion from the passages of the selected TOEFL iBT test has a significant effect on emotional intelligence. This study found that if test developers provide a condition for test-takers to activate their emotional intelligence, they might control the induced emotion as the construct-irrelevant variable during reading.

**Keywords:** Emotional intelligence, appraisal, cognition, emotion, TOEFL iBT reading tests

### **Introduction**

Have you ever felt any emotions when you are taking a reading comprehension test? The influence of several factors on language tests is significant, so understanding these factors about how they affect test scores is necessary to create and use language tests (Bachman, 1990). Accordingly, Bachman believes that one of the component of the propositional content is how input induces an expected response in a language test. Likewise, based on the same logic, the present researchers hypothesize that a passage as an input influence comprehension by emotional responses felt during reading. Thus, emotional induction could be the another component of the propositional content which deserves attention.

In particular, the induction of emotion is related to cognitive processes. As Arnold (1960) claimed that emotions originate from individuals' appraisals. It means appraisals about a context form an emotional response to it (Scherer et al., 2001). Accordingly, cognition is measured during a reading comprehension test; however, as well as cognition, if emotions are induced from individuals' appraisals of cognitive engagements, these emotions cause particular responses (Scherer et al.).

According to ETS (2010), a fair review of exams is essential in identifying and reducing factors unrelated to the structure that hinder the optimal performance of exam participants. Likewise, from the connection between emotion and cognition, peoples' appraisals could cause emotional responses and this could be a construct-irrelevant factor, which might play a role in reading comprehension. Likewise, if the information in a passage decrease or increase the motivation and enthusiasm of readers, what will be the consequences? Also, do language tests intentionally study their claimed test constructs such as skills, knowledge, and abilities that the tests are supposed to investigate (ETS, 2002)?

Bucich and MacCann (2019) stated that emotional intelligence could regulate emotions. If the impact of emotions on comprehension while reading a test becomes true, then test developers need to control the induced emotions of their passages so the need for an interplay-variable to control the extraneous emotions is vital. According to scholars, emotional intelligence could play a significant role in reading comprehension tests by emotion regulation (Ateş, 2019; Bucich & MacCann, 2019; Mikolajczak & Luminet, 2008; Taheri et al., 2019).

The purpose of the study is to show the presence of induced emotions as an unrelated factor on the construct of a TOEFL iBT reading test which can interplay with emotional intelligence for regulating the induced emotions towards reading passages. Accordingly, TOEFL iBT test was used because it is an international and comprehensive test and it should not be forgotten that the TOEFL reading test was designed to assess people's language skills and its reliability was recorded by ETS (2011).

The significant of the study is based on the logic claimed by Messick (1989): If construct-irrelevant factors are minimized, it improves test fairness. Do TOEFL iBT reading tests intentionally study their claimed test constructs such as skills, knowledge, and abilities that the tests are supposed to investigate (ETS, 2002)?

## Literature Review

### Emotion and reading

Human beings' appraisals of actions can be the source of induced emotions (Arnold's theory, 1960; Jamieson et al., 2018; Koole & Rothermund, 2019; McEachrane, 2009; Moors et al., 2013; Scherer et al., 2001). Emotions are induced by how much feeling interacted with a text; that is, while reading, someone feels different emotions such as surprise, joy, fear, which are exclusive and essential to human beings (Brewer & Lichtenstein, 1982; Schreiner et al., 2019; Förster, 2014; Wirth, 2006). According to the researchers, these interacted feelings influence reading when readers' tempers are not consistent with the text, and if this happens, the most direct consequence maybe a stop from reading (Mar et al., 2011). Also, emotions can increase or decrease the step of reading based on the feelings induced from features of a passage; if readers become deeply dependent in characters, their feelings could decrease the step of reading. This leads to create a deeper engagement with the passage; hence, emotions induced and practiced during reading can confine cognitive effects (Cupchik et al., 1998; Habibian et al., 2015; La'szlo' & Cupchik, 1995). The induced emotions from a piece of a passage will also affect readers in ways similar to other passages with the same induced emotional stimulation. Someone who becomes anxious in response to reading an exciting passage, as an illustration, could show the typical responses related to anxiety for example sensitive alertness and these responses could be present on other passages with the same induced emotions (Habibian et al., 2015; La'szlo' & Cupchik, 1995).

Several studies mentioned both the ways test developers use to assess language ability and the variables which are influential on test-takers' performance (Bachman, 1990; O'Sullivan et

al., 2019; Bijani, 2018; Clifford, 1978; Fernandez, 2018; Mouti & Ypsilandis, 2014; Vyn et al., 2019). For example, for an interview speaking exam, test-takers could be more successful in a classroom context in repose to a question than in a language laboratory (Bijani, 2018). Thus, scholars mentioned so many inflectional variables on language testing and assessment; however, this study hypothesize that while reading a passage in a test, the information in the passage interacts with its readers' appraisal and causes emotional responses during reading, and, these emotional responses could be the construct-irrelevant factor during a reading comprehension test which is not considered and analyzed by test developers and it could intertwine the purpose of each language reading test to measure reading cognition and comprehension.

### **Emotion and intertwined variables**

Reading and comprehension can be associated to cognition and emotion, but another variable may be effective in this concern. According to Mikolajcozae and Luminet (2008), emotional intelligence plays a significant role in comprehending, processing, controlling and arranging emotional information. They also stated that cognitive appraisal of individuals directs to the creation of an emotional response, which is related to emotional intelligence. Since 1990, emotional intelligence has advanced in psychology and has been utilized in so many principles, including management studies and education. Goleman (1996), the pioneer of emotional intelligence, believed that IQ is related to most variances among people in various forms of success, the variance could be described by other features that found as emotional intelligence. He has labelled emotional intelligence as including “abilities such as being able to motivate oneself and persist in the face of frustration, to control im-pulses and delay gratification; to regulate one’s moods and keep distress from swapping the ability to think; to emphasize and to hope” (Goleman, 1996, p. 34).

In particular, emotional intelligence aids reading by stress controlling (tolerating stress and controlling impulses), flexibility (solving problems, testing realities), moods (pessimism and optimism) and reading strategies; also, emotional intelligence aids a good reader to distinguish how to manage stressful conditions, how to express hitches and offer possibly valuable descriptions, how to estimate objective and subjective communication and how to regulate feelings, thoughts, and actions for managing conditions (Dehkordi & Bidabadi, 2015; Ganjouee et al., 2018; Pishghadam, 2009).

All in all, according to the related literature, emotional intelligence could regulate emotions. However, the focus on induced emotions from language reading tests and their interplay with emotional intelligence is missing. Thus, it is significant to research how emotional intelligence interplay with emotional responses induced from reading passages because these emotional responses could be the construct-irrelevant factor during a reading comprehension test and the need to control the construct-irrelevant factor for test developers could be a must. The following research questions have, therefore, been addressed in the present study:

- Q1. Does induced emotion from the passages of the selected TOEFL iBT test have any significant effect on emotional intelligence?
- Q2. Does induced emotion from the passages of the selected TOEFL iBT test have any significant effect on high emotional intelligence?
- Q3. Does induced emotion from the passages of the selected TOEFL iBT test have any significant effect on low emotional intelligence?

### **Methodology**

## Participants

The target population was five institutes running the TOEFL preparation course. As a placement test, they used the official TOEFL iBT tests for placing all their EFL learners, so it was not challenging to homogenize participants with respect to their English proficiency levels. Generally, 856 good users (ETS, 2010), who had 102 to 109 TOEFL iBT scores, were volunteers. At first, as the pilot testing, the present researchers used Random Number Generator software for selecting 30 participants out of the 856. Then, with the results of the pilot testing, the present researchers used PASS software to identify the ideal sample size and control error type I and II. Finally, 393 participants were selected randomly by Random Number Generator software. The demographic information of all selected respondents is in Table 1.

**Table 1.** *Demographic information of the selected respondents*

Demographic information	Percent
Age	79.2 % between 18 to 24
	9.8 % between 25 to 34
	8.8 % below 18
	1.6 % between 45 to 54
	0.6 % between 35 to 44
Gender	87% female
	13% male
Education	75.6 % undergraduates
	14.8 % graduates
	4.8 % below high school diploma
	4.8 % post-graduates

## Instruments

*Package 1.* According to ETS (2009), the present researchers randomly chose an official TOEFL iBT reading section with three passages from a published book (*The Official Guide to the TOEFL iBT Test*). The linguistic performance was not the goal of the present study so the reading questions were missing.

As an alternative, Watson, et al. (1988) stated that people's emotions can be described in two general ways: positive or negative, and even individuals can simultaneously combine positive (e.g., passion) or negative emotions. (For example, feeling sad and lacking in energy). They also introduced PANAS as the Positive and Negative Emotion Scale, in which the intensity / extent of emotions in both positive and negative directions is measured using the Likert method. Also, according to Klonsky et al. (2019) and Mar et al. (2011), before-and-after self-report can be used for rating the intensity of emotion.

Likewise, based on the same logic, in order to find out the extend of emotions before and after the selected passages, respondents self-reported the load of each primary emotion (sadness, happiness, disgust, fear, contempt, surprise, and anger) (Ekman & Cordaro, 2011) before and after reading on the same Likert scales leveled from "nothing" to "extreme". Also, the reliability of the before-and-after self-report scale used in the present study was also measured in the pilot testing stage and the alpha level was 94 percent. Table 2 shows the self-report scale.

**Table 2.** *Self-reported scale for detecting the seven primary induced emotions*

	Nothing	So Little	Little	So-So	Much	So Much	Extreme
Happiness							
Sadness							
Fear							
Anger							
Disgust							
Contempt							
Surprise							

Also, in order to control the carryover effect, the present participants filled in twelve demographic questions about race, ethnicity, gender, age, education, profession, occupation, marital status, and so forth in two paper sheets immediately after reading Passage 1 and Passage 2.

Package 2 has Schutte Self-Report Emotional Intelligence Test (SRETT; Schutte, et al. 1998). It is a technique of specifying general Emotional Intelligence (EI) through four sub-components: emotion consciousness, operating emotions, management self-relevant emotions, and management of others' emotions. Schutte, et al. claimed a reliability rating of 0.90 for the emotional intelligence scale. SSEIT adapted its emotional intelligence model from the model of Salovey and Mayer (1990). The SSEIT has a 33-item self-report containing a one (strongly agree) to five (strongly disagree) scale for answers. The scores of the measure go from 33 to 165. A higher score would say high emotional intelligence and vice versa.

### Procedure

It was challenging to meet all 393 respondents in one exact time. Thus, the time for each group of participants who had to be present at their institute was randomly selected. The situations for communicating with the present participants, and how they got the instruments were similar.

In order to study the influence of emotion on one's reading comprehension, the present researcher selected a TOEFL iBT reading exam, but due to the lack of hardware materials, the selected reading exam was not given online through the Internet at a designated testing site. In particular, ETS (2011) claimed that TOEFL iBT reading sections and the passages in each section are no different with respect to the reliability and validity. Thus, it is significant to see that the presence of induced emotions from each passage can differently interplay with emotional intelligence. Thus, before reading Passage 1, all respondents self-reported the intensity of their before reading emotions. After reading Passage 1, they immediately self-reported the intensity of their after reading emotions. The present participants self-reported six demographic questions between Passage 1 and Passage 2. Next, the participants self-reported their after reading emotions for Passage 2. The present participants self-reported six demographic questions between Passage 2 and Passage 3. Again, the participants self-reported their after reading emotions for Passage 3.

Then, immediately, after Package 1, Package 2 was handed out among all the participants. Each of them started to fill in the SREIT questionnaires.

### Study Design and Data Analysis

Because of measuring within-subjects effects, between-subjects effects, and their interaction, a repeated-measures ANOVA was used in this study to investigate changes in mean scores at the four-time points and differences in mean scores under the seven basic emotions and their significant effect on emotional intelligence.

### Results

The first research question of the present study is asking to see if the induced emotions from the three passages of the selected TOEFL iBT have any statistically significant effect on emotional intelligence or not. Likewise, Table 3, Table 4, and Table 5 show if the induced emotions before and after reading the three passages of the selected TOEFL iBT reading test have a significant effect on emotional intelligence or not.

**Table 3.** *The Induced Emotions before and after Reading Passage 1 and their Effect on Emotional Intelligence*

	SS	Df	MS	F	P	Partial Eta Squared
<b>Within-Subjects Effects</b>						
Emotional Intelligence	9.879	1	9.879	12.125	0.001	.028
Error	343.005	421	.815			
<b>Between-Subjects Effects</b>						
Emotional Intelligence	38.809	1	52.809	19.066	.004	.023
Error	1616.511	421	3.840			

The induced emotions from before and after Passage 1 have a statistical significant effect on emotional intelligence ( $p < .05$ ). Concerning the effect size (the last column), the effect size within-subjects effects and between-subjects effects for Passage 1 were small.

**Table 4.** *The Induced Emotions before and after Reading Passage 2 and their Effect on Emotional Intelligence*

	SS	df	MS	F	P	Partial Eta Squared
<b>Within-Subjects Effects</b>						
Emotional Intelligence	1.305	1	1.305	1.677	0.196	0.0020
Error	327.810	421	0.779			
<b>Between-Subjects Effects</b>						

Emotional Intelligence	24.087	1	24.087	6.286	.013	0.009
Error	1613.217	421	3.832			

The induced emotions from before and after Passage 2 do not have a statistical significant effect on emotional intelligence. Concerning the effect size (the last column), the effect size within-subjects effects and between-subjects effects for Passage 2 were small.

**Table 5.** *The Induced Emotions before and after Reading Passage 3 and their Effect on Emotional Intelligence*

*	SS	df	MS	F	P	Partial Eta Squared
<b>Within-Subjects Effects</b>						
Emotional Intelligence	5.825	1	5.825	5.319	.222	.012
Error	461.125	421	1.095			
<b>Between-Subjects Effects</b>						
Emotional Intelligence	3.507	1	3.507	.953	0.063	.002
Error	1548.554	421	3.678			

The induced emotions from before and after Passage 3 do not have statistical significant effect on emotional intelligence. In relation to the effect size (the last column), it should be noted that the effect size within-subjects effects and between-subjects effects for Passage 3 was small.

Likewise, Table 6 shows if the induced emotions after reading the three passages of the selected TOEFL iBT reading test have a significant effect on emotional intelligence or not.

**Table 6.** *The Induced Emotions Reading all Three Passages and their Effect on Emotional Intelligence*

	SS	df	MS	F	P	Partial Eta Squared
<b>Within-Subjects Effects</b>						
Emotional Intelligence	43.114	1	43.114	8.630	0.003	0.020

	Error	284.553	419	0.679			
Between-Subjects Effects							
	Emotional Intelligence	43.114	1	43.114	8.630	0.003	.020
	Error	2093.264	419	4.996			

The significance threshold of emotional intelligence within-subjects effects and between-subjects effects was set ( $p < .05$ ). Also, the effect size (the last column) after reading the three passages was small.

The second and third research questions of the present study are asking to see if the selected participants with high and low emotional intelligence significantly affect the induced emotion from the passages of the selected TOEFL iBT test. Likewise, Table 7 shows the descriptive statistics of the selected participants with high and low emotional intelligence who feel emotions after reading the selected passages.

**Table 7.** Descriptive Analysis of Induced Emotion with High and Low Emotional Intelligence After Reading

Emotional intelligence	Passage 1		Passage 2		Passage 3	
	M	Sd	M	Sd	M	Sd
Low	2.4203	1.39243	1.5861	2.4203	3.0233	1.01156
High	2.9203	1.50455	1.5153	2.9203	3.2093	1.12458
Total	2.4348	1.54710	1.5238	2.4348	2.6047	1.13682

According to the results, the difference in the average scores obtained from people with two levels of emotional quotient after reading the three selected passages is somewhat noticeable. On the other hand, the standard does not show much dispersion for the three selected passages in the present participants' scores.

**Table 8.** Analysis of Within-Subject and Between Subjects Effect After Reading the Three Passages

	SS	Df	MS	F	P	Partial Eta Squared
Within-Subjects Effects						
Passages	69.944	2	34.972	41.498	.000	.032
Interaction of passages and EI	1.462	2	.731	.868	.001	.001
Error	2122.012	2518	.843			
Between-Subjects Effects						
EI	.329	1	.329	.075	.784	.000

Error 5531.173 1259 4.393

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According to the results, the estimated scores confirm the significant difference among the three passages. Also, the present results confirm the significant difference between the selected passages and emotional intelligence. However, the significant difference between-subjects effects of low and high emotional intelligence are not confirmed. In other words, according to the results, induced emotion from the passages of the selected TOEFL iBT test does not have any significant difference between high and low emotional intelligence.

### **Discussion**

After reviewing what language researchers mentioned about so many inflectional variables on language tests, the present study claims that while EFL participants read TOEFL passages, the information in the passages could interact with their appraisals and causes emotional responses and these emotional inductions could be the construct-irrelevant factor because they are unrelated to the construct of TOEFL reading tests. TOEFL tests use reading to measure English proficiency levels. It means that TOEFL tries to measure language comprehension and cognition but besides them, emotion could be the extraneous factor which is influential on reading cognition and comprehension. If this hypothesis becomes true, then test developers need to control the emotions induced from the developed passages so the need for an interplay variable to control the emotions as an extraneous variable is vital. Accordingly, scholars claim that emotional intelligence could play a significant role in reading comprehension tests by emotion regulation (Ateş, 2019; Bucich & MacCann, 2019; Mikolajczak & Luminet, 2008; Taheri et al., 2019).

#### **Different intensity levels of emotional intelligence**

According to the results, the emotion induced from the selected passages of the TOEFL iBT test has a significant effect on the emotional intelligence. However, there is not any significant difference between high and low levels of emotional intelligence and the induced emotions. In comparison with low emotional intelligence, high emotional intelligence makes people have less adverse events in their life; also, emotional intelligence is a significant factor in making confidence in people (Esmaeili, 2004). Bucich and MacCann (2019) stated that better emotion regulation might be the result of high emotional intelligence (e.g., when people can control their emotions better, they can work better with lower stress or anxiety). However, the present researchers' idea could be consistent with this claim that emotional intelligence is about the smart use of moods within the emotions to make the best appraisal in the most operative behaviors (Ciarrochi & Mayer, 2007); thus, the effect of different intensity levels of emotional intelligence may be not significant with emotion regulation during reading comprehension. That is, regulating emotions might not depend on low and high emotional intelligence and they both could similarly regulate emotions during reading the passages.

#### **Information in the passages and emotional intelligence**

In particular, scholars confirmed that emotional intelligence could have an impact on reading comprehension (Abdolrezapour & Tavakoli, 2012; Ateş, 2019; Mikolajczak & Luminet, 2008; NematTabrizi & Esmaeili 2016; Taheri et al., 2019). According to the present result, the induced emotion from Passage 1 has a significant effect on emotional intelligence. Passage 1 was

about the history of American politics in the nineteenth-century. Shahghasemi et al. (2011) claimed that most Iranian citations, from teenagers to adults, have a positive feelings toward American citations, but they do not like the U.S. government (Shahghasemi et al., 2011). When people are informed by political information through media or from the community which they live, they could use their political knowledge, and political cognition is the awareness of people about political situations, actions, politicians, and parties (Sloman & Rabb, 2019; Van-Dijk, 2002). Passage 1 could activate the smart use of moods through emotional intelligence to make the selected EFL participants who were Iranian to continue reading unpleasant information about the American politics in the nineteenth-century. However, the present results did not find significant difference of induced emotions from Passage 2 and Passage 3, and its interference with emotional intelligence. As Alm et al. (2005) mentioned, any passages hold attitudinal and, more precisely, emotional content. If the induced emotions are not what a reader want during reading, the humblest outcome maybe a stop from reading (Mar et al., 2011). Passage 2 was about how people around the world with different cultures are expressing their emotions; for example, how emotions are experienced and detected by people in different cultures. Also, Kuru-Gonen (2009) stated that unfamiliar cultural information stops learners from comprehending foreign language text. Thus, perhaps when the participants of the present study read Passage 2, they became familiar with the cultural information of Passage 2, and it could make the condition to disable emotional intelligence. Likewise, Passage 3 might stimulate the artificial restoration of the environment in the minds of the participants involved in the present study. Artificial restoration of nature can rebuild temper with curing and serenity (Allison et al., 2017). Thus, this could be the possible reason why the influence of emotional intelligence was not significantly found on during reading Passage 3.

### Conclusions

As mentioned, the cognitive appraisal of individuals directs to the creation of an emotional response, which is related to emotional intelligence. Likewise, emotional intelligence could regulate emotions through the smart use of moods within the emotions to make the best appraisal in the most actual behaviors. When passages in the reading section of the TOEFL iBT test cause emotions in a test taker, emotional intelligence could play a significant role in reading comprehension to regulate emotions towards reading passages. The study of emotion in the reading comprehension section of the TOEFL iBT test and whether emotional intelligence may play a part in this study have not addressed to our best knowledge. All in all, the present study detect emotion as the affective variable in reading comprehension, and also emotional intelligence could play the role of the intertwined variable through regulating emotion during reading comprehension.

This study sought to diagnose the existence of emotion as the irrelevant factor during interaction of input-output. This study could doubt the validity and reliability of the TOEFL iBT test, and since ETS (2010) was interested in test fairness review to identify and reduce the factors that are not relevant to the structure, it could be desirable to put emotional interactions in the process of assessing validity and reliability of the TOEFL iBT test in future. In other words, this study can aware test designers to better comprehend features such as emotions induced from passages. In particular, the results of the present study could be used by TOEFL reading test developers to detect and control emotion as the influential variable on the TOEFL tests.

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