ORIGINAL ARTICLE

The contribution of reading emotions to reading comprehension: the mediating effect of reading engagement using a structural equation modeling approach

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Abstract

Given the fact that reading is considered as a crucial language skill through which the reader can interact with the author to obtain the required information for the higher communication and participation in the current literary society (Walker in Diagnostic teaching of reading: techniques for instruction and assessment, Merril, Columbus, 2000), the present study contributes to the important, yet, a small body of research on the impact of reading emotions and reading engagement on reading comprehension. In so doing, a sample of 220 Iranian English as a Foreign Language learners from different language institutes were requested to complete English Language Learners' Reading Emotions Scale, English Language Learner's Reading Engagement Inventory as well as taking three tests of reading comprehension. The findings disclosed the mediating role of reading engagement in the relation between reading emotions and reading comprehension. Moreover, the results revealed that reading emotions and reading engagement can significantly predict reading comprehension. In the end, to assist the policymakers and material developers in meeting the operational challenges of reforming the prevalent materials, the results and the implications of the study for research and educational practices are discussed.

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1 Introduction

Reading is regarded as one of the fundamental skills through which one can stay updated at the information age in which the professional knowledge is expeditiously disseminating (Schoor 2016). As a skill, reading not only can expand readers' world view but also it can improve one's critical thinking by laying the ground for the interaction of bottom-up and top-down processes (Grabe and Stoller 2002). It is perhaps one of the most daunting language skills which requires the orthographic, phonological, syntactic, and semantic processing of the texts (El-Kilabi 2005).

Being of great concern, research in this regard has been mostly centered on literacy skills, language proficiency, and cognitive strategies (Proctor et al. 2014). Other reading-related studies have been focused on metacognition (Carrell 1989), reading difficulties (Alderson 1984), textual features (Beck and McKeown 2001), coherence (Kendeou and Van Den Broek 2007), syntax (Blau 1982), and semantics (Rapp and Kendeou 2007).

In case of second and foreign language reading, however, it is suggested that reading comprehension seems to involve the interaction of both L1 and L2. In fact, the timeline of delving into the relation between L1 and L2 dates back to over 30 years ago when Alderson (1984) raised a question of whether L2 reading is a language problem or a reading problem. In answer to this question, Grabe and Jiang (2018) have reached fairly consistent results declaring that both L1 reading ability and L2 language proficiency can have a significant effect on L2 reading ability; however, L2 reading proficiency has proved to be a stronger predictor of L2 reading than L1 especially for the learners who have not reached the advanced level yet.

Besides, being known as an international language, many foreign language students have to study their subject areas in English which makes EFL (English as a Foreign Language) reading a prerequisite for one's academic success (Al-Mahrooqi and Roscoe 2014). McKay (2002) has referred to book publishing as another contributory factor to the spread of English since more books are published in English than in any other languages and 84 percent of the web servers serve the files in English. However, understanding the content of such texts requires the close interplay of text characteristics, reader characteristics, and processing abilities (Lee 2009) being known as *engagement* (Hyland and Jiang 2016).

In particular, reading engagement does not merely occur in response to the rhetorical dimensions of the text as it takes support, interest, background knowledge, and the cultural context into account; rather, it is also affected by learners' emotional responses to the text (Hyland and Jiang 2016). Consequently, as engagement occurs both due to the rhetorical and affective aspects of the text, emotions seem to play a crucial role in learners' higher reading engagement (Hyland and Jiang 2016; Wang et al. 2016) which may thereby affect one's reading comprehension.

In this regard, the present study aims to examine the impact of three specific academic emotions namely *anxiety, enjoyment, and boredom* on EFL learners' reading comprehension as the aforementioned emotions are documented to be more relevant to learning environments and the activity of reading (Baker et al. 2003; Hamilton 1983; Pekrun 1992). To illustrate, as it is supported by Rathnude (2003), the experience of flow (Csikszentmihalyi 1975), which is the highest point of engagement with the text, is highly related to the match between one's reading skills, the challenges of the task, and the experience of enjoyment, anxiety, or boredom during the task.

It is worth mentioning that in spite of the crucial impact of emotions on one's experience of flow and involvement with the task, it seems that there is a dearth of research to examine the distinctive impact of reading enjoyment, anxiety, and boredom, the frequently reported emo-

tions by the students in both learning and reading contexts, on readers' achievement. In return, studies in this realm have mostly been centered on the impact of engagement on emotions rather than the potential reverse effect of emotions on engagement and optimal experience. Likewise, to the researchers' best knowledge, within the realm of language skills, research regarding the exploration of the relationship among reading emotions, reading engagement, and reading comprehension across L2 adult learners has relatively been scarce. Hence, the present investigation aims to test the proposed model on the relationship between reading emotions, reading engagement, and reading achievement in adults' EFL classes.

2 Theoretical framework

2.1 Achievement emotions and academic performance

Numerous studies have confirmed that emotions play a pivotal role in the students' learning and academic performance (e.g., Goetz et al. 2013; Pekrun et al. 2002, 2011; Pishghadam et al. 2013, 2016; Pishghadam and Shayesteh 2017). Elias (1997) suggests that schools should make every effort to promote students' academic, social, and emotional learning. To achieve this goal, Pishghadam et al. (2013) proposed *Emotion Based Language Instruction* (EBLI) holding the view that the learners can learn better, deeper, and easier when they have strong emotions toward language entities. Thus, *emotionalization* can lead to better outcomes in second/foreign language learning (Pishghadam et al. 2013). Prior studies have also underlined the fact that students experience a rich diversity of emotions which may happen frequently in academic settings (Pekrun et al. 2002). Experiencing various emotions such as enjoyment, boredom, anxiety, hope, pride, anger, and shame are concerned as an integral part of learning and teaching in any academic settings (Pekrun et al. 2011).

Theoretically, achievement emotions are proposed based on Pekrun's (2006) control-value theory. This theory assumes control appraisals (competence, beliefs, expectancies, attributions) and value appraisals (the activity or outcome value) as the principal antecedents of achievement emotions. It describes achievement emotions as emotions which are directly attached to achievement activities or achievement outcomes; thus, contrary to the past research which conceptualized achievement emotions merely as achievement outcomes, the recent line of research suggests that emotions tied to achievement-related activities are also regarded as achievement emotions (Schutz and Pekrun 2007). In fact, outcome-related emotions are experienced either when the goal is met (joy and pride) or the effort is failed (shame and frustration), whereas activity-related emotions such as enjoyment, boredom, and anger arise frequently from learning or instruction (Schutz and Pekrun 2007).

As Schutz and Pekrun (2007) stated, prospective outcome emotions are the ones which will emerge when positively valued success or negatively valued failure are to be anticipated. For instance, if the perceived control is high and the focus is on success, *joy* will be experienced. If the perceived control is high and the focus is on failure, the resulting emotion will be *relief*. Depending on whether the focus is on success or failure, if there is a partial control, either *hope* or *anxiety* might be experienced. On the other hand, retrospective outcome emotions such as *pride*, *shame*, *gratitude* or *anger* are induced by the attribution of the success or failure to the self, other persons, or situational factors. Finally, activity emotions are instigated due to the relationship between the controllability level and the activity value. For example, if the activity is controllable and positively valued, *enjoyment* will emerge. However, if the activity is controllable but negatively valued, *anger* will be induced. In contrast, if the

activity is valued, but there is no adequate control, the outcome will be *frustration*, while if it is neither valued positively nor negatively, *boredom* will result. To summarize, taking the role of discrete emotions into account, emotions can be categorized into four main groups based on Pekrun et al. (2007) comprehensive model of emotions: positive activating emotions (e.g., enjoyment, hope, pride, gratitude); positive deactivating emotions (e.g., relaxation, contentment, relief); negative activating emotions (e.g., anger, frustration, anxiety, shame); and negative deactivating emotions (e.g., boredom, sadness, disappointment, hopelessness).

In the context of learning, a new line of research has indicated the significant impact of negative as well as positive emotions on instruction, learning outcomes, and achievement (Goetz et al. 2006b; Pekrun et al. 2002). To explicate, in the realm of mathematics, there was a significant positive relationship between enjoyment and test achievement. Nonetheless, the relationships were negative for anxiety and boredom with the performance (Lichtenfeld et al. 2012). Additionally, prior research by Pekrun et al. (2011) revealed that there is a clear linkage between one's emotions and performance with positive emotions such as enjoyment being positively related to intrinsic motivation, effort, elaboration of learning material, and self-regulation of learning, and with negative emotions such as boredom and anxiety being negatively correlated with intrinsic motivation, effort, elaboration, self-regulation, and academic performance.

In effect, as posited by the control-value theory, the pattern of relationships attested that positive activating emotions seem to be instrumental in acting on students' engagement and learning, while negative deactivating emotions proved to have debilitative roles. In the same vein, Kljajic et al. (2017) have found that negative emotions can have adverse effects on learners' engagement in school-related tasks, while positive emotions can have instrumental roles in experiencing higher levels of involvement as they do school tasks.

Taking foreign language learning into account, Pishghadam et al. (2016) have investigated the role of various emotions, while EFL learners were engaged with the three language skills, namely during listening, speaking, and writing. The results indicated that anger was mostly experienced over listening; enjoyment and pride over speaking; shame over listening and speaking; hope, boredom, and hopelessness over writing and listening; and finally, anxiety over all the language skills. Concerning the skill of reading, Massimini et al. (1988) along with McQuillan and Conde (1998) *found reading as the most noted flow inducing activity* in which the learners can experience the highest level of enjoyment compared to boredom and anxiety as the other frequently reported emotions by the students. Besides, in a neuroscience study, Ponz et al. (2013) examined the brain dynamics of emotional information processing during reading based on the classic sequential theories of reading and the neural re-use perspective. The findings asserted that emotions have an effect on a brain region that responds to different emotions throughout reading tasks.

In the context of education, Pekrun et al. (2002) found that students experience a wide range of positive and negative emotions and these academic emotions are highly related to the students' motivation, learning strategies, cognitive resources, self-regulation, and academic achievement as well as to the personality and classroom antecedents. The existing literature also underlines the internal relationship between achievement emotions and achievement goals; however, most of the models in this realm have considered the dichotomous nature of achievement goals (mastery goals and performance goals) as well as the two dimensions of achievement emotions (positive versus negative affect) rather than concentrating on distinct constructs of discrete emotions (Pekrun et al. 2009). Taking this into account, Pekrun et al. (2006) examined the predictive relations between students' mastery, performance-approach, performance-avoidance goals, and their subsequent distinct emotions. The findings of the study showed that, on the one hand, mastery goals were the positive predictors of enjoyment

of learning, hope, and pride, and the negative predictors of boredom and anger. On the other hand, performance-approach goals positively predicted pride, while performance-avoidance goals positively predicted anxiety, shame, and hopelessness. A new line of research has also showed that activity emotions (enjoyment, boredom, and anger) are related to mastery goals, while positive outcome emotions (hope, pride) are associated with performance-approach goals, and that negative outcome emotions (anxiety, shame, and hopelessness) are tied to performance-avoidance goals (Pekrun et al. 2009).

Concerning the relationship between emotions and academic performance, Pekrun et al.'s (2017) have also examined the adolescents' progress in math. The findings showed a reciprocal effects model between emotions and achievement with the positive emotions (enjoyment, pride) being positively related to math achievement and academic achievement being positively related to these emotions. Conversely, negative emotions (anger, anxiety, shame, boredom, hopelessness) were negatively related to achievement and achievement was negatively related to them.

In another experimental study, Olafson and Ferraro (2001) found that emotions can affect motivational and cognitive processes which will ultimately act on one's cognitive performance. In this regard, positive emotions can increase motivation to approach tasks, while negative emotions can affect mood-congruent avoidance motivation. Taken together, research directly analyzing the students' emotions in classroom settings has mostly been centered on test anxiety; thus, leaving little space for the examination of the relationship between other achievement emotions and academic performance (Pekrun et al. 2002; Zeidner 2007).

In general, negative emotions have been more investigated than the positive ones in case of academic outcomes (Macklem 2015). As a matter of fact, negative emotions in general have shown to have a detrimental effect on the students' grade point averages and overall academic performance (Valiente et al. 2012). Another line of inquiry by Pekrun et al. (2009) has also attested that negative emotions have affected the learners' academic performance more than their ability or motivation. In this vein, anxiety has received higher attention from researchers as it is highly associated with lower levels of academic performance (Maloney et al. 2010). Likewise, research in case of boredom shows that it is negatively related to motivation, cognitive involvement, self-regulation, and achievement (Preckel et al. 2010).

Regarding the positive emotions, enjoyment has claimed to be a positive predictor of learning and performance (Frenzel et al. 2007; Goetz et al. 2007). In fact, recent studies suggest that positive emotions are strongly connected to academic interest and effort which can in turn affect achievement (Valiente et al. 2012). Villavicencio and Bernardo (2013) posit that higher levels of enjoyment can lead to higher self-regulation which thereby can act on the students' better outcomes. In sum, academic emotions can affect the learners' thinking and behavior through self-regulation which can be instrumental in their extent of engagement with the task at hand and their overall performance.

Despite the importance of emotions, the research in the realm of academic emotions within the academic settings has not received sufficient attention in educational psychology research with the exceptions of test anxiety and attribution theory (Peixoto et al. 2015; Pekrun et al. 2011). Therefore, to broaden our perspectives sufficient attention should be paid to other academic emotions and other related concepts as well (Pekrun et al. 2002). The suggested line of study may shed more light on the role of these emotions in learning a foreign language, and more specifically, in reading achievement.

2.2 Reading comprehension and engaged reading

Reading is considered as a crucial language skill and one of the primary language textbook components through which the reader can interact with the author to obtain the required information for having higher communication and participation in the current literary society (Alfassi 2004). It is known as a basic skill and a fundamental building block to all other learning (Melby-Lervag and Larvag 2014). Likewise, Bachman (2000 as cited in Alderson 2000) emphasized the importance of reading as the skill through which we can have access to the world of ideas and feelings as well as the knowledge of various ages and visions of future.

Collins and Collins (2002) maintained that sufficient attention should be paid to highlight the importance of the activity of reading due to the following reasons. First, reading can pave the way for gaining success in any information-driven community. Second, the proportion of students who have difficulty in reading is increasing. Third, teachers will benefit from an empirical analysis of reading processes and how students learn to read to become more engaged readers. Fourth, studies in reading can aid the teachers in being more aware of the role of individual differences, the family environments, and the larger community in which the learners live in predicting the reading difficulties. Fifth, useful assessment of reading instruction can be instrumental in designing effective instructional practices. Finally, reading investigations are of critical importance as they can promote the teachers' ability to analyze instructional reading texts in order to fill the gaps with strategies that can support the young readers.

In fact, reading, comprehending, and extracting meaning from a text are the three essential skills for learning, intellectual growth, and educational achievement (Singh 2010). To be more specific, reading comprehension has been defined as an active process of shifting between the sources of knowledge, explaining meaning or describing an information, monitoring the readers' comprehension, and using the background knowledge that is related to the social context of the text to reflect the corresponding response (Walker 2000).

In this case, comprehension can be constructed as a result of undergoing a number of stages including word encoding, lexical access, identifying the semantic roles while merging the existing information in a given sentence with the prior information in the text and the reader's background knowledge (Demirel 2003 as cited in Bölkbas 2013). In other words, a skillful reader is the one who knows how to interact and engage with the text by combining the background knowledge with the text information to perceive and interpret the given input with a critical eye (Bölkbas 2013). Thus, as Pressley (2002) describes, a good reader is the one who has an active and purposeful engagement with a text, investigates the text and makes guesses about what is going to come next, employs the background knowledge, monitors his/her comprehension throughout the text, uses the context to guess the meaning, paraphrases the meaning, and takes reading as a productive process.

In effect, reading comprehension by itself is a complex cognitive task which requires actively engaging with the text by going through the process of extracting and constructing meaning simultaneously (Guthrie and Wigfield 2000; Guthrie et al. 2004; Sweet and Snow 2003). In other word, it is a matter of engaging with the content by fine-tuning various cognitive skills and abilities. In particular, comprehension requires a construction of a suitable mental model in which the comprehender can highly engage with the sense of words and sentences while bringing them together into a meaningful whole in the mind (García-Madruga et al. 2014). Therefore, when reading engagement takes place successfully, reading comprehension would be accomplished through the integration of lower and higher reading strategies and skills with the reader's prior knowledge (Keenan et al. 2008).

Engaged reading is motivated, strategic, knowledge based, and socially interactive (Guthrie et al. 2012); hence, the writer should make a mental note of the interests, background knowledge, expectations, and epistemological and interpersonal conventions of the target readers (Hyland and Jiang 2016). Affective factors such as fondness or enjoyment in reading along with diversity of readings and reading strategies are considered as the tentative facets of reading engagement which may have an impact on the learners' reading performance to read more eagerly, extensively, and skillfully (Cheung et al. 2016).

Evidence suggests that reading engagement can be influenced by three distinct, yet, interwoven components: cognitive, emotional, and behavioral dimensions (Fredricks et al. 2004). Cognitive engagement has been conceptualized as using deep learning strategies for self-regulated learning and the higher comprehension of more complex concepts (Zimmerman 1990). Emotional engagement is defined in terms of having intense emotional reactions, valuing learning, and being interested in the learning content (Fredricks and McColskey 2012). Ultimately, behavioral engagement has been described as the academic involvement with reading materials by having increased concentration and more commitment to the reading activity (Fredricks et al. 2004).

Taken together, an extensive body of research reveals that engagement has a predictive role in learning as it affects the learners' academic performance (Burrows 2010 as cited in Shukor et al. 2014), knowledge acquisition (Chen et al. 2010), academic emotions (Scott and Walczak 2009), and other cognitive, affective, and behavioral constructs. More specifically, research in the realm of reading suggests that engagement is an important variable as the amount of reading can determine one's reading comprehension, reading achievement, and their world knowledge (Guthrie and Wigfield 2000). In this sense, "engagement" is defined as the extent to which the readers can interact with the text in both a strategic and motivated manner (Wigfield et al. 1996). To explicate, engaged readers are motivated to read, strategic in their approaches to comprehend the content, capable of extracting and constructing meaning from text, and socially interactive throughout reading (Guthrie et al. 2004; Guthrie and Wigfield 2000). In other words, as Guthrie (2004) stated, "in sum, engaged readers are strategic, motivated, knowledge driven, and socially interactive" (p. 3).

Theoretically, as engagement is a broad construct encompassing various aspects (Fredricks et al. 2004), researchers have underlined its various dimensions in the activity of reading. To illustrate, Csikszentmihalyi (1991) presented engaged reading as a state of total absorption or *flow*. Cambourne (1995) maintained that engagement requires having a purpose, seeking to understand, having confidence in one's own capability, and taking responsibility for learning. As Guthrie et al. (1998) put it, "engagement in reading refers to the motivated use of strategies to gain conceptual knowledge during reading" (p. 261). More notably, evidence in the literature suggests that reading engagement can be a potential predictor of reading comprehension and reading performance. As Cipielewski and Stanovich (1992) mentioned, students who are more actively and frequently involved with the texts can develop higher reading skills and comprehension of texts as a consequence. Moreover, engaged reading can have a crucial impact to compensate for one's low income and family background (Guthrie and Wigfield 2000).

With respect to the relationship between reading engagement and motivation, studies have asserted that motivation can be another contributory factor to influence reading engagement (Wigfield et al. 2006). In particular, research documents that students who were more motivated to read reported reading more than three times as much as the students who were less motivated (Wigfield and Guthrie 1997). Simply put, motivation can affect the choice of activities, energy invested on the activity, and the extent of commitment to the activity; hence, it seems to be essential for one's full engagement in the activity (Wigfield et al. 2006). More

interestingly, Taboada et al. (2013) showed that both motivational and cognitive variables can be predictors of the children's reading comprehension. In this case, motivation revealed to have an activating, energizing effect on cognitive processes which, thereby, had an impact on their achievement. Overall, taking the importance of engaged reading into account, Wigfield and Guthrie (2010) introduced *concept-oriented reading instruction* which can promote the readers' engagement if only they are provided with appealing materials, supported to gain autonomy over the process of learning, given opportunities to collaborate with other students and received direct instruction in how to use different reading strategies.

2.3 Present study

Regarding the relationships among academic reading emotions, academic engagement, and academic achievement, this study aims to examine the relationships within the experience of reading by considering the predictive power of reading emotions and reading engagement in reading comprehension. In this respect, it seems that there is a paucity of research to examine the role of these two variables as predictors of foreign language reading comprehension. One plausible reason for the lack of research might be the scarcity of measurement instruments to assess reading emotions as well as reading engagement. Therefore, using CFA, one of the primary goals of the present research is to validate instruments that can measure a variety of distinct reading emotions and reading engagement.

In this regard, CFA was used for the scale validation as it is considered as one of the most widely applied statistical techniques for the scale validation (Brown 2015). It is used for testing measurement models which aims at confirming the relationships between the observed measures and the latent variables (Kline 2005). The latent variables or the factors are the variables which cannot be explicitly observed, while the observed variables or indicators are the ones which are used as indicators of the latent variables (Kunnan 1998). More specifically, CFA is an indispensable statistical procedure for the construct validation since it can verify the convergent and the discriminant validity of the constructs as the two subtypes of the construct validity. The convergent validity refers to the extent to which two measures of construct that should be theoretically related are in fact related, while the discriminant validity or the divergent validity refers to the degree to which the measures or the concepts that are not supposed to be theoretically related are truly unrelated (Brown 2015).

As in the case of the scales of the present study, goodness-of-fit indices are used to verify the validity of the measurement models. Besides, average variance extracted (AVE) is examined as an indicator of convergent validity (the amount of variance captured by the construct in relation to the amount of variance due to measurement error). The suggested threshold is 0.5, meaning that the convergent validity of the scales can be established if AVE > 0.5 (Hair et al. 2010). Moreover, the discriminant validity of the scales is established if maximum shared variance (MSV) is less than AVE (ASV < AVE) and the square root of AVE is greater than inter-construct correlations (Hair et al. 2010). As a result, the following research questions guided the present investigation:

RQ1. Do English Language Learners' Reading Emotions Scale (ELL-RES), English Language Learner's Reading Engagement Inventory (ELL-REI), and the reading items meet the psychometric properties of reliability and validity?

RQ2. Are reading emotions and reading engagement significant predictors of Foreign Language Reading Comprehension (FLRC)?

RQ3. Does reading engagement mediate the relationship between reading emotions and FLRC?

3 Method

3.1 Participants

The sample consisted of 220 foreign language learners (females: $n = 123$, 55.90%; males: $n = 97$, 44.10%; Mean age = 22.30, SD = 1.84; age 18–25) who were attending English classes at a governmental language institute in Mashhad (a city in northeast of Iran). The respondents were at the intermediate language proficiency level determined by their performance on the language proficiency placement test. They were all humanities students who were studying English at the foreign language institute to gain communicative competence by promoting their productive and receptive language skills. Participants were excluded if (a) they were exposed to any other foreign language other than English, (b) if they had spent six months or more in an English speaking country, (c) if they had previously taken part in any other English as a foreign language classes other than schools, and (d) if their score in the foreign language proficiency placement test was not within two standards deviations of the mean.

3.2 Procedure

After obtaining approval from the teachers, the researchers collected the data in the second half of the academic year (from February to May 2017). In view of the scales, all measures were collected by the researchers who clearly explained to the students the purpose and the way they should complete each questionnaire. The study was conducted during the regular classroom hours. Initially, the pilot study of the full sub-scales of the three learning-related achievement emotions of AEQ along with Wang et al.'s (2016) math and science engagement sub-scales had been done with 31 language learners. Having difficulties and ambiguities in understanding some items, the reliability of the original learning-related emotions questionnaire and Wang et al.'s (2016) engagement scale was initially .65 and .68, respectively, which were improved after the ambiguous item deletions and modifications in both scales. The reported reliability of the adapted scales was .91 for ELL-RES and .80 for ELL-REI. The adapted scales were modified using parallel item wordings (very similar wordings as the original scale). The items were originally prepared in English and then translated into Persian using back-translation method (Parameswaran and Yaprak 1987) by two experts in translation to assure the translation accuracy. The researchers further checked the scales for any inconsistencies and then pilot tested them again with 32 language learners. Having no difficulty in understanding the items, no alterations were made to the scales. Indeed, the Persian questionnaires were applied to increase the return rate as the respondents were at the intermediate level.

Regarding the texts, the learners were asked to read one text each session. In order to ensure the generalizability of findings, in case of the learners' reading emotions and reading engagement, the students were asked to go through ELL-RES and ELL-REI items three times, each time for one text, the average of which was taken into account. To be more specific, one text was read during each session, with a total of three consecutive sessions and, therefore, three texts that were read. Right after reading each text, ELL-RES and ELL-REI items were first administered, followed by reading achievement items. More importantly, the correlations between the three sets of scores of the respondents on ELL-RES and ELL-REI, each administered three times, a week apart, show that the texts were highly correlated. More specifically, the Pearson correlation coefficient on ELL-RES was .71 between "Text 1" and "Text 2," .73 between "Text 2" and "Text 3," and .74 between "Text 1" and "Text 3" which

is significant ($p < .001$ for a two-tailed test). Likewise, the Pearson correlation coefficient on ELL-REI was .75 between "Text 1" and "Text 2," .74 between "Text 2" and "Text 3," and .73 between "Text 1" and "Text 3" which is significant ($p < .001$ for a two-tailed test).

Right after reading each text, the respondents were supposed to reflect their emotions and engagement during the reading experience by completing the ELL-RES and ELL-REI for the corresponding text. Afterward, the researcher-made five-item multiple-choice items were administered to assess the respondents' reading achievement. Thus, the actual order in which the tasks were completed is as follows: reading the text, ELL-RES and ELL-REI completion, and doing multiple-choice items. The process of reading, scales completion, and answering reading comprehension items took around 30 min per session. The participants took part in the study based on their willingness to communicate and were assured of the confidentiality of their responses. For the data analysis, first, ELL-RES, ELL-REI, and the test items were validated through CFA to assess the factor structure of the items. Next, the hypothetical model was tested using SEM.

3.3 Measures

3.3.1 Reading achievement tests

To examine the participants' reading comprehension level along with their reading engagement, and emotions and to increase the probability of homogeneity in text difficulty, three texts of different genres, yet, of approximately the same length, readability, and difficulty level were taken two from *Top Notch 1* (pp. 70 and 80) (Saslow and Ascher 2006a) and one *Top Notch 2* (p. 56) (Saslow and Ascher 2006b) (2nd Ed.) to rate the learners' reading performance. To increase the probability of generalization, the three texts were chosen from various genres including narrative, descriptive, and expository. Next, the researchers designed a five-item multiple-choice test for each text which was validated through CFA, subsequently. Moreover, the homogeneity of the texts regarding the texts' difficulty level was assessed using Flesch Reading Ease Readability Formula and Gunning Fog readability formula. Flesch Reading Ease score was 79.5 for "Text 1, p. 70," 74.6 for "Text 2, p. 80," and 74.4 for "Text 3, P. 56," indicating that the readability of the texts ranged between "Easy to read" to "fairly easy to read." Similarly, based on Gunning Fog readability formula, the readability level was 7.9 for "Text 1, p. 70" 7.8 for "Text 2, p. 80" and 9.1 for "Text 3, p. 56" confirming the "Easy to read" and "fairly easy to read" readability level of the texts. Finally, each reading was accompanied by a separate sheet of the researcher-made five-item multiple-choice test which was designed according to Spearritt's (1972) guidelines. The respondents were supposed to answer the reading comprehension items right after completing reading emotions and reading engagement scales. The reliability of the narrative text items was $\alpha = .75$, the descriptive text was $\alpha = .88$, and the expository text was $\alpha = .82$.

3.3.2 English Language Learners' Reading Emotions Scale (ELL-RES)

To measure the learners' reading emotions, a reduced and modified version of Pekrun et al. (2005) Achievement Emotions Questionnaire (AEQ) by Pekrun et al. (2011) was used. It is described as the first comprehensive scale to measure academic or achievement emotions as it is based on a more complex definition of achievement emotions than the other existing measurement attempts (Macklem 2015). The original instrument contains 24 scales measuring nine different emotions (enjoyment, hope, pride, relief, anger, anxiety, shame, hopelessness,

boredom) in class-related, learning-related, and test-related settings. However, in the present study, the items were modified in a way that they would reflect English language learners' reading emotions. More specifically, the scale focuses exclusively on the three learning-related emotions, namely enjoyment, boredom, and anxiety (Baker et al. 2003; Hamilton 1983; Pekrun 1992) as they are specifically relevant to the reading activity and optimal experience (Massimini and Carli 1998; Massimini et al. 1987; Massimini and DelleFave 2000). In fact, after the initial full sub-scale pilot study and the modification of the original (AEQ), eighteen items were selected and modified to be used for measuring the reading emotions due to the following reasons (a) the selected items proved to have no ambiguities for the respondents, (b) they had less embedded repetitions, (c) they were more relevant to the reading activity and the English reading classes, and (d) compared to the original scale, the reliability of the modified version improved from .65 to .91 after the ambiguous item deletions and modifications. It is a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) which was validated through Confirmatory Factor Analysis (CFA) (Tables 3, 4). All the items were introduced "while reading the text…", followed by six items for reading boredom (e.g., "…I found the text fairly dull."; $\alpha = .90$), six items for reading anxiety (e.g., "…I felt it makes me uneasy."; $\alpha = .94$), and six items for reading enjoyment (e.g., "…I was glad that it paid off to read it."; $\alpha = .89$) (See "Appendix A" for the scales and sample items).

3.3.3 English language learner's reading engagement inventory (ELL-REI)

Reading engagement scale measures cognitive, behavioral, and emotional engagements in the domain of English using measures adapted from Wang et al.'s (2016) math and science engagement scale. Wang et al.'s (2016) scale is a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) from which 18 items were selected to measure the learners' reading engagement. Moreover, the validity of the reduced adapted version was confirmed through CFA (Tables 3, 4). The scale included six items on cognitive engagement (e.g., "While reading the text, I did not think that hard."; $\alpha = .75$), six items on behavioral engagement (e.g., "While reading the text, I stayed focused."; $\alpha = .81$), and six items on emotional engagement (e.g., "While reading the text, I enjoyed learning new things."; $\alpha = .84$) (See "Appendix B" for the scales and sample items). More specifically, following the initial full sub-scale pilot study and the modification of the original Wang et al.'s (2016) math and science engagement scale, eighteen items were selected and modified to be used for measuring the learners' reading engagement due to the following reasons (a) the selected items proved to have no ambiguities for the respondents, (b) they had less embedded repetitions, (c) they were more relevant to the reading activity and the English reading classes, and (d) compared to the original scale, the reliability of the modified version improved from .68 to .80 after the ambiguous item deletions and modifications.

3.3.4 Foreign language proficiency exam

To control the role of language proficiency, the participants' language proficiency scores which have already been obtained by the institute's district-mandated annual placement test prior to the learners' entry into the intermediate level were taken into account. The exam serves as a criterion to classify the learners based on the four dimensions of language skills (listening, reading, writing, and speaking). The reported reliability for the internal consistency of the subsets ranged from .85 to .93.

Table 1 Descriptive statistics

Scales	N of item	Mean	SD	Cronbach's alpha	Skewness	SE of skewness	Kurtosis	SE of kurtosis
CE	6	17.73	2.95	.75	.05	.58	.28	.66
BE	6	17.12	3.06	.81	.02	.68	.24	.59
EE	6	17.67	2.30	.84	.28	.82	.39	.74
Boredom	6	11.71	3.82	.90	.67	.76	.67	.58
Anxiety	6	11.81	4.76	.94	.78	.64	.63	.52
Enjoyment	6	22.05	4.38	.89	.54	.55	.80	.83
FLRC	15	7.86	2.56	.82	.30	.89	.71	.52

CE cognitive engagement, *BE* behavior engagement, *EE* emotional engagement, *FLRC* foreign language reading comprehension

4 Results

The present study followed a two-step approach employing CFA and SEM that was conducted by the means of LISREL (Version 8.8) (Joreskog and Sorebom 1996). Firstly, the measurement models of the instruments were assessed in terms of the convergent and discriminate validity (Anderson and Gerbing 1988). Secondly, two models regarding the predictive power of AE-FLR and reading engagement in FLRC were tested.

Table 1 shows the descriptive statistics of the factors related to the administered instruments: ELL-RES, ELL-REI, and FLRC. The results of the data screening confirmed the normal distribution of the data using skewness and kurtosis indices. Calculating a Cronbach's Alphas provided additional support for the reliability of the measurement scales (α ranging from .75 to .94).

Using LISREL, CFAs were conducted on ELL-RES, ELL-REI, and FLRC to examine whether the instruments exhibit internal validity with regards to their presumed internal structures and to confirm the number of factors underlying the scales. CFA is a special technique in SEM which is applied for the confirmatory hypothesis testing (Kline 2011). Relying on the original scale of AEQ (Pekrun et al. 2005) and Math and Science Engagement Scale (Wang et al. 2016), a three-factor model with 18 items was specified for ELL-RES and ELL-REI, respectively. Moreover, based on the number of the three different given texts, a three-factor model with 15 items was defined for FLRC.

To conduct the analyses, correlations and covariance matrices were calculated and the solutions were generated based on maximum-likelihood estimation. Table 2 shows Pearson correlations among cognitive engagement, behavioral engagement, emotional engagement, boredom, anxiety, enjoyment, and FLRC. Enjoyment was positively correlated with cognitive engagement, behavioral engagement, emotional engagement, and FLRC. Anxiety was negatively correlated with cognitive engagement, behavioral engagement, emotional engagement, and FLRC. Likewise, the results show that boredom was negatively correlated with cognitive engagement, behavioral engagement, emotional engagement, and FLRC.

To check the validity of the measurement models, first, the guidelines on several goodness-of-fit indices were followed (Hoyle and Panter 1995). In so doing, χ^2/df (Chi-square divided by degree of freedom), the root mean square error of approximation (RMSEA), GFI (goodness-of-fit index), incremental fit index (IFI), comparative fit index (CFI), adjusted goodness-of-fit (AGFI), and the Tucker–Lewis index (TLI) were calculated (Table 3). The

Table 2 Pearson correlations matrix

Scales	1	2	3	4	5	6	7
1. CE	1.00						
2. BE	.27**	1.00					
3. EE	.25**	.32**	1.00				
4. Boredom	− .54**	− .66**	− .67**	1.00			
5. Anxiety	− .38**	− .32**	− .36**	.40**	1.00		
6. Enjoyment	.51**	.45**	.49**	− .59**	− .20**	1.00	
7. FLRC	.45**	.51**	.42**	− .40**	− .36**	.38**	1.00

CE cognitive engagement, *BE* behavior engagement, *EE* emotional engagement, *FLRC* foreign language reading comprehension

**p < .01

Table 3 Goodness-of-fit indices of the measurement models

Measures	χ^2/df	RMSEA	GFI	IFI	CFI	AGFI	TLI
ELL-RES	1.33	.03	.94	.96	.96	.97	.91
ELL-REI	2.13	.07	.93	.91	.91	.91	.94
FLRC	1.21	.03	.95	.94	.93	.94	.92

ELL-RES English Language Learners' Reading Emotions Scale, *ELL-REI* English Language Learners' Reading Engagement Inventory, *FLRC* foreign language reading comprehension

Table 4 Convergent and discriminant validity of measures

Scales	1	2	3	4	5	6	7	AVE	MSV	Square root of AVE
1. CE	1.00	.76	.26	.87						
2. BE	.27	1.00	.88	.12	.93					
3. EE	.25	.32	1.00	.75	.05	.86				
4. Boredom	− .54	− .66	− .67	1.00	.73	.28	.85			
5. Anxiety	− .38	− .32	− .36	.40	1.00	.82	.08	.90		
6. Enjoyment	.51	.45	.49	− .59	− .20	1.00	.87	.16	.93	
7. FLRC	.45	.51	.42	− .40	− .36	.38	1.00	.79	.19	.88

CE cognitive engagement, *BE* behavior engagement, *EE* emotional engagement, *FLRC* foreign language reading comprehension, *AVE* average variance extracted, *MSV* maximum shared variance

results indicated an acceptable model based on $\chi^2/df < 3$, GFI > .90, IFI > .90, TLI > .90, CFI > .90, and RMSEA < .08 (MacCallum et al. 1996). Second, to examine the construct validity of the scales, both the convergent and discriminant validity of the measures were verified using AVE, MSV, the square root of AVE, and inter-construct correlations (Table 4).

Regarding the measurement models, the standardized loadings ranged from .40 to .83 and all *t* values were significant. Moreover, the average variance of each extracted latent variable was above .50 and was as follows: "Text 1," .64; "Text 2," .58; "Text 3," .55; "boredom," .62; "anxiety," .66; "enjoyment," .58; "cognitive engagement," .68; "behavioral engagement," .66; and "emotional engagement," .69. None of the shared variances was larger than the average
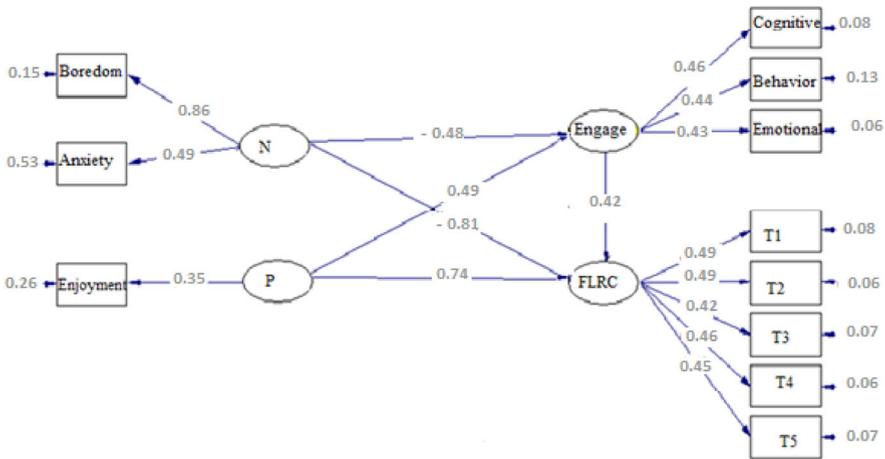
Fig. 1 Structural results of Model A (direct model)

variance. Overall, depending on the evaluation of the measurement models and the model fitness indices (Table 3), CFAs confirmed the factor structure of the instruments.

Besides, *the convergent* and *discriminant validity* of the measures were established by examining the values of AVE, MSV, the square root of AVE, and inter-construct correlations. As it is shown, the convergent validity of the measures is supported as AVEs are greater than .5. Besides, the latent variables demonstrated to have discriminant validity as MSVs are less than AVEs and the square root of AVEs are greater than inter-construct correlations (Table 4).

Next, both the direct and mediated models were calculated. In essence, the direct model (Model A see Fig. 1) aims at investigating the direct effects of reading emotions on reading engagement, and reading engagement on FLRC along with the direct effects of reading emotions on FLRC, while the mediated model (Model B see Fig. 2) tests the indirect effect of reading emotions on FLRC through reading engagement.

Concerning the second question regarding the exploration of the unique impact of reading emotions and reading engagement on reading comprehension, SEM was applied (Fig. 1). As correlations reported in Table 2 and the path coefficients in the direct model (Model A see Fig. 1) show, all the direct relations between reading emotions, reading engagement, and reading comprehension were significant; thus, the conditions for checking the mediation analysis were met (Prussia and Kinicki 1996).

As depicted in Model A, the relationships between all the latent variables were significant; yet, reading emotions (negative and positive) were a stronger single explanatory factor for FLRC than reading engagement. As it is depicted in model A, the path coefficients in the model for N (Negative) and P (Positive) emotions to FLRC were significant ($-$ .81, $t = -$ 17.34 and .74, $t = 15.30$, respectively) with the negative emotions having a higher predictive role in FLRC. In addition, the path coefficient for reading engagement (Engage) to FLRC was significant (.42, $t = 4.93$). Therefore, the results of SEM in Model A provide a strong support for the predictive power of reading emotions in reading engagement along with the unique impact of reading engagement on reading comprehension which, consequently, laid the groundwork for the examination of the mediational model as well.

Further, to compare the mediated model with the competing direct model, first, χ^2 difference test was computed ($p < .05$) as the test allows to decide whether a given model fits
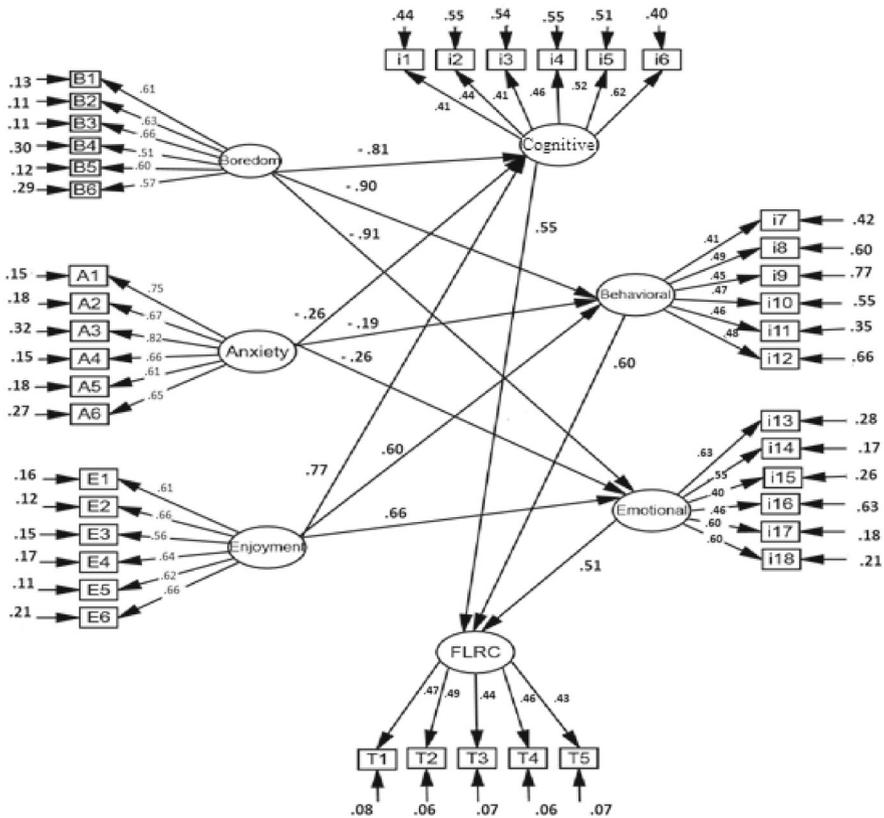
Fig. 2 Structural results of Model B (mediated model)

Table 5 Goodness-of-fit indices for the structural models

Measures	χ^2/df	RMSEA	GFI	IFI	CFI	AGFI	TLI
Model A	1.99	.06	.91	.92	.91	.91	.92
Model B	2.32	.04	.92	.93	.92	.94	.93

significantly better or worse than a competing model (Chen et al. 2005; Satorra and Bentler 1994, 2001). The results for the direct ($\chi^2 = 81.94$, $df = 41$) and mediated ($\chi^2 = 1781.68$, $df = 767$) models indicated a significant difference ($\Delta\chi^2 = 1699.74$, $\Delta df = 726$, $p < .05$) and the better fitting of the mediational model. Second, the goodness-of-fit statistics were taken into account. Based on the model fit indices (Table 5), both models showed a good fit to the data; however, the indices were better for the partial mediated model. Thus, the partial mediation model revealed to be a better fitting one. Relying on the statistical analyses, all the path coefficients in both models were statistically significant at alpha level 0.05.

To answer the third question, all estimates in the mediated model were significant (Model B). It must be noted that not only a significant relationship exists between the mediator and the dependent variable (engagement → FLRC) but also there is a direct relationship between the independent and dependent variable (positive and negative emotions → FLRC); hence, to be more precise, partial mediating effects of engagement (cognitive, behavioral,

Table 6 The path coefficients in the mediational model

Paths	Path coefficient	t value
Cognitive → FLRC	.55	10.76
Behavioral → FLRC	.60	26.73
Emotional → FLRC	.51	9.65
Boredom → cognitive	− .81	− 19.88
Boredom → behavioral	− .90	− 19.51
Boredom → emotional	− .91	− 19.83
Boredom → cognitive → FLRC	− .44	− 3.88
Boredom → behavioral → FLRC	− .54	− 4.33
Boredom → emotional → FLRC	− .46	− 3.93
Anxiety → cognitive	− .26	− 8.76
Anxiety → behavioral	− .19	− 6.43
Anxiety → emotional	− .26	− 7.01
Anxiety → cognitive → FLRC	− .14	− 2.27
Anxiety → behavioral → FLRC	− .11	− 1.99
Anxiety → emotional → FLRC	− .13	− 2.70
Enjoyment → cognitive	.77	10.11
Enjoyment → behavioral	.60	8.98
Enjoyment → emotional	.66	8.33
Enjoyment → cognitive → FLRC	.42	4.41
Enjoyment → behavioral → FLRC	.36	4.21
Enjoyment → emotional → FLRC	.33	3.92

and emotional) were statistically identified. Indeed, based on Table 5, all the path coefficients are statistically significant with at least 95% confidence intervals as the reported t values are either greater than 1.96 or less than − 1.96. To be more specific, boredom ($\gamma_{11} = − .81, t = − 19.88$) proved to have the highest effect on cognitive engagement, followed by enjoyment ($\gamma_{31} = . 77, t = 10.11$) and anxiety ($\gamma_{21} = − .26, t = − 8.76$). Regarding the behavioral engagement, boredom ($\gamma_{12} = − .90, t = − 19.51$) was a stronger predictive factor compared to enjoyment ($\gamma_{32} = .60, t = 8.98$) and anxiety ($\gamma_{22} = − .19, t = − 6.43$). Concerning the emotional engagement, boredom ($\gamma_{13} = − .91, t = − 19.83$) was a more determining factor than enjoyment ($\gamma_{33} = .66, t = 8.33$) and anxiety ($\gamma_{23} = − .26, t = − 7.01$). Simply put, the results revealed that boredom and anxiety exerted a significant negative effect on the cognitive, behavioral, and emotional engagement, whereas enjoyment played a positive role in all the underlying constructs of engagement (Table 6).

Besides, taking the potential effect of reading engagement on FLRC into account in the partial mediated model (Model B), behavioral engagement ($\beta_{23} = .60, t = 26.73$) had a stronger predictive role, followed by cognitive engagement ($\beta_{13} = .55, t = 10.76$), and the emotional engagement ($\beta_{33} = .51, t = 9.65$). In this vein, cognitive, behavioral, and emotional engagement proved to have a positive impact on FLRC (Table 6).

Moreover, Sobel tests (Kline 2005) were conducted to verify the indirect effects of emotions on FLRC through engagement (Table 6). The results regarding the standardized indirect effects were significant. Thus, reading engagement received further empirical support for its latent mediation role. Specifically, the results demonstrated the indirect effect of boredom on FLRC through cognitive engagement (standardized indirect effect = − .44, t = − 3.88),

behavioral engagement (standardized indirect effect $= -$ .54, $t = -$ 4.33), and emotional engagement (standardized indirect effect $= -$ .46, $t = -$ 3.93) highlighting the stronger mediating impact of behavior engagement. Likewise, the indirect effect of enjoyment on FLRC via cognitive engagement (standardized indirect effect $=$ .42, $t = 4.41$), behavioral engagement (standardized indirect effect $=$ .36, $t = 4.21$), and emotional engagement (standardized indirect effect $=$ .33, $t = 3.92$) stressed the stronger mediating role of cognitive engagement. Finally, the indirect effect of anxiety on FLRC through cognitive engagement (standardized indirect effect $= -$ .14, $t = -$ 2.27), behavioral engagement (standardized indirect effect $= -$ .11, $t = -$ 1.99), and emotional engagement (standardized indirect effect $= -$ .13, $t = -$ 2.70) indicated the stronger mediating impact of cognitive engagement. Taken together, boredom and enjoyment revealed to have a larger indirect effect on FLRC than anxiety.

5 Discussion

As noted earlier, the primary concern of the present study was, first, to verify the validity of the instruments including the modified version of AEQ designed by Pekrun et al. (2005), the adapted version of Wang et al. (2016) math and science scale, and the multiple-choice items of the texts in order to measure EFL learners' academic emotions while reading along with their reading engagement and reading achievement. Second, it aimed at testing the proposed research models by examining the direct impact of reading emotions and reading engagement on FLRC as well as investigating the role of reading engagement as a mediator variable in the relationship between reading emotions and reading comprehension.

Using CFA, the model fit indices adequately confirmed the structure of ELL-RES, ELL-REI, and the multiple-choice items. Moreover, the results of the structural models underlined the mediating role of reading engagement in the relation between reading emotions and reading achievement. Finally, the findings revealed that reading emotions and reading engagement can significantly predict reading achievement; however, reading engagement was a better predictor of reading performance.

Taking the first objective of the study into account, the results of the measurement models provide support for the validity of the ELL-RES, ELL-REI, and the test items. This set of finding is in line with the relevant studies of Peixoto et al. (2015) and Pekrun et al. (2005, 2011) with regards to the internal consistency of AEQ along with the investigations of Wang et al. (2016) in the realm of engagement highlighting the fact that both reading emotions and reading engagement are a second-order latent variable.

Regarding ELL-REI, CFA confirmed the three-factor structure of the model which is in line with Appleton et al. (2008) who declared that engagement is a multidimensional construct which entails an understanding of the combination of affective and cognitive factors within the academic setting along with learners' behavior. Concerning the students' engagement, Fredricks et al. (2004) have also declared that the prior literature on behavioral (i.e., time on task), emotional (i.e., interest and value), and cognitive engagement (i.e., self-regulation and learning strategies) has revealed that what makes engagement a unique construct is its multidimensional nature which involves the three aforementioned dimensions.

The results are also consistent with Meece et al. (1988) who confirmed the importance of cognitive engagement in the students' performance as it requires putting in effort for the comprehension of complex concepts or the mastery of more demanding tasks. Moreover, emotional engagement has long been established as a prominent factor affecting the learners'

sense of belonging, valuing, and appreciating when gaining success in school-related outcomes by affecting their degree of willingness to do the tasks as well (Connell and Wellborn 1991; Finn 1989; Voelkl 1997). The third existing factor was behavioral engagement which is in line with findings of Finn et al. (1995) along with Finn and Rock (1997). Taken together, Li and Lerner (2013) have explicitly mentioned that engagement is a well-recognized multidimensional construct having three latent variables which are influential in gaining academic outcomes.

Taking the three-factor structure of reading emotions into account, the results substantiated Csikszentmihalyi (1975) *theory of flow and the feelings one may experience throughout the reading task. Based on the premises of this theory, the learners can experience either enjoyment, anxiety, or boredom depending on the level of* balance between the perceived challenges of the task and their own perceived skills. *In fact, the findings of the present study corroborate previous literature in that language scholars have frequently asserted that enjoyment, boredom, and anxiety are among the most prevalent self-reported students' emotions within the context of language classes (*Dewaele and MacIntyre 2014; Larson 1990; Seligman and Csikszentmihalyi 2000). Overall, the present study lent support to the credibility of the scales to measure the learners' reading emotions, reading engagement, and reading outcomes.

Regarding the results of the structural model and the unique predictive roles of reading emotions and reading engagement in reading achievement, the validity of the models was documented in positive correlations between academic reading emotions, reading engagement, and reading achievement in the direct model. In this respect, the results are in line with previous studies which have shown the strong linkage between academic emotions and academic performance (Lichtenfeld et al. 2012; Pekrun et al. 2002). To be more specific, researchers have asserted the significant impact of anxiety and boredom as well as enjoyment on instruction, learning, and achievement in the context of learning (Goetz et al. 2006b; Pekrun et al. 2002). As such, in the realm of mathematics, there was a significant positive relationship between enjoyment and test achievement. Nonetheless, the relationships were negative for anxiety and boredom with the performance (Lichtenfeld et al. 2012). Empirical findings have also shown that enjoyment and pride are positively related to achievement, while anxiety and boredom are negatively related to students' performance (Pekrun 2006).

In case of reading enjoyment, Bartlett and Elliott (2018) have underlined the role of enjoyment in reading as they declared that the students who read as a result of personal interest in the topic or reading for enjoyment were more engaged in reading and showed higher extent of commitment and persistence. A study by Mol and Bus (2011) also revealed that the students who had higher enjoyment in reading obtained higher GPAs than their peers. One possible explanation may have to do with the fact that the students who enjoy reading can get more engaged in the activity of reading (Green and Brock 2002; Oatley 2012) which can ultimately result in the higher comprehension of the text as such reading engagement can reinforce the construction of mental situational models (Oatley 2012). Thus, further highlighting the role of reading enjoyment in EFL classes, the present study indicates that enjoyment can be considered as a potential contributory factor to enhance the learners' reading engagement as well as reading comprehension. In this vein, Sadoski and Paivio (2001) have ascribed the underlying reason to the higher propensity of the interested readers to use mental imagery strategies to form vivid mental pictures of texts in "their mind's eye."

Taking the negative emotions into account, anxiety has been the most-researched emotion in both educational (see Frenzel et al. 2007) and foreign language research (see Dewaele and MacIntyre 2014). The results of the current study also underline the negative impact of anxiety and boredom on reading engagement and reading comprehension. In the realm of

L2 reading, studies have attested that reading is an anxiety-provoking activity (Saito et al. 1999). More specifically, Jalongo and Hirsh have found reading anxiety as a type of situational phobia which arises from an unpleasant emotional or cognitive reaction toward the text. A study by Sellers (1998) demonstrated the inverse effect of language anxiety on the reading comprehension and recall. Likewise, Saito et al. (1999) have asserted that reading anxiety is distinct from general types of foreign language anxiety and that its higher levels can lead to the decrease in the students' reading performance.

Concerning the potential role of boredom in various situations, Nett et al. (2011) have found boredom as a frequently experienced emotion which is often regarded as a plague of modern society (Pekrun et al. 2010). Within the educational contexts, studies have highlighted the detrimental impact of boredom on the students' achievement outcomes (Goetz et al. 2006a; Pekrun et al. 2010). By and large, Daniels and Tze (2014) have declared that boredom has been reported to interfere with school performance and achievement as much as anxiety. One possible reason might lie in the fact that not only can it affect the individuals' motivation but also their attention and engagement (Macklem 2015). To be more specific, boredom is found to decrease one's motivation to perform as well as reducing the likelihood of making an effort cognitively by acting on learners' self-regulation, engagement, and achievement (Preckel et al. 2010).

Moreover, the outcomes of the current study underlined the major effect of academic emotions on students' engagement which is in line with Kljajic et al. (2017) findings, declaring that negative emotions have an adverse effect on learners' engagement in school-related tasks, while positive emotions can have an instrumental role in experiencing higher levels of involvement as they do school tasks. The impact of academic emotions on students' engagement has been confirmed by Pekrun and Linnenbrink-Garcia (2012) as they found the profound effect of emotions on students' cognitive, motivational, behavioral, cognitive-behavioral, and social-behavioral engagement.

With respect to the impact of academic engagement on the students' achievement, the results in this study bring additional support to the previous studies which have found engagement as a predictive factor of learning outcomes and achievement. More precisely, engaged learners are likely to gain better outcomes as they are highly focused on the task to the extent that they lose track of time; thus, experiencing more absorption and flow (Salmela-Aro and Upadaya 2012; Schaufeli et al. 2002) which will, in turn, lead to better academic performance (Casuso-Holgado et al. 2013; Salanova et al. 2010). Therefore, the results are consistent with Ghonsooly and Hamedi (2014) and McQuillan and Conde (1998) who declared reading as a flow generating activity.

Likewise, the findings lent support for Shahian et al. (2017) study, who found emotioncy (as an indicator of sense of engagement) and flow as the predictors of reading performance. In this vein, a new line of research by Pishghadam et al. (2016) suggested that to affect learners' achievement through emotioncy, texts should be selected relying on the sensory/emotional background of learners. By and large, in the examination of the application of emotioncy to vocabulary teaching, Pishghadam and Shayesteh (2016) demonstrated that the learners with higher levels of emotioncy gained better outcomes accordingly.

On account of the third question and the partial mediated model, overall findings provide evidence, suggesting that reading emotions and reading comprehension are significantly related through reading engagement. Although the results of the initial hypotheses regarding the unique impact of reading emotions and reading engagement on reading performance were supported by the direct model, the partial mediated model proved to be a better fitting model.

Consequently, the significant indirect effects between indices of emotions and reading comprehension through reading engagement can be supported by prior research findings. To elucidate, Efklides et al. posit that positive emotions lead to higher involvement and more mental effort investment and thus, gaining better learning outcomes which can be used as an evidence to support the indirect impact of emotions on achievement via cognitive engagement. Likewise, the indirect effect of emotions on achievement via behavioral engagement can be explained through the application of self-regulation and metacognitive strategies as they can offer active processes through which learners' thoughts, behavior, and emotions can be balanced to achieve their ends. Further, self-regulatory strategies have been reported as indicators of higher engagement and academic achievement (Richardson et al. 2012).

Concerning the indirect influence of emotions on academic achievement through emotional engagement, the findings of the present study provide empirical support for the profound influence of emotions on students' engagement, learning, and achievement (Christenson et al. 2012). Besides, the results lend credence to the application of EBLI proposed by Pishghadam et al. (2013) as well as the emotioncy-based framework for teaching culture (Pishghadam et al. 2017) as a novel approach to language learning. In this regard, EBLI places emphasis on building effective emotional relationships with students and emotionalizing language.

In fact, the findings of the present study can have pedagogical implications for the language teachers and material developers to account for the impact of emotions and engagement on one's reading achievement in language classes. Thus, the obtained results also can serve as a beginning for the further examination of the tentative roles of other embedded yet less researched emotions in learners' reading comprehension. In so doing, as Linnenbrink-Garcia and Pekrun (2011) proposed, the teachers are required to gain a deep understanding of the clear definition of various types of emotions such as anger, frustration, confusion, boredom, shame, hopelessness, enjoyment, hope, relief, contentment, and pride. Besides, they must carefully align their assessment of emotions with the theoretical conceptualizations. By and large, the teachers must decide whether to be concentrated on a specific emotion or broader range of emotions which has important implications in terms of developing fine-grained analyses of how particular emotions affect cognitive processing and engagement along with capturing the complexity of students' emotional life in classrooms (Linnenbrink-Garcia and Pekrun 2011). Further, this study can bridge the gap of lacking objective measures to evaluate ELT materials concerning the degree to which they can promote learners' reading comprehension through their emotions and engagement.

Overall, as the selection of appropriate ELT textbooks and instructional materials can make a big contribution to the teaching and learning process and it is determined by a considerable professional, financial, or even political investment, the results of the present study will have significant implications for the language teachers and supervisors who take on a leading role in educational contexts as they interact with the students are in immediate touch with textbooks and are assumed to facilitate language acquisition for learners. Thus, they may gain a better insight into selecting more effective and engaging teaching materials. As a matter of fact, depending on the constructed ELL-RES, ELL-REI, the instructors can be more aware of the extent to which the texts can affect learners' emotions and sense of engagement and will become more empowered to share these with policymakers more frequently.

6 Suggestions for future research

The findings of the present study corroborated the proposed internal structure of ELL-RES and ELL-REI as the measurement models fit the data adequately and confirmed the factor structure of the scales. While the current study is in line with Pekrun et al.'s (2005) AEQ as well as Wang et al.'s (2016) math and science engagement scale and confirms the external validity of the measures through the structural models, the findings should be treated more cautiously with several limitations in mind. First, the size of the sample was limited due to the strict policies of language institutes for taking their class time. Therefore, further research is needed to be conducted with a larger sample size to come up with more valid generalizations from the results. Besides, there is a need to replicate such a study in other countries as the data in this study were from one country and therefore, may not be representative of other countries.

Second, it was beyond the scope of this study to go about a fully comprehensive analysis of the probable effect of other intervening variables such as gender and age on academic reading emotions, reading engagement, and reading performance in a single study. In this regard, Price-Mohr and Price (2017) have found evidence of gender differences in using reading strategies, suggesting that boys learn more easily through whole-word and synthetic approaches. In case of reading enjoyment, however, Mol and Jolles (2014) revealed that girls who enjoyed reading in general got higher average school grades compared to boys. Besides, boys who enjoyed reading in higher educational tracks outperformed the ones who did not enjoy reading at all. More importantly, Macklem (2015) has underscored the reciprocal influence of specific emotions such as boredom on non-cognitive factors including students' motivation, self-regulation, goals, self-concept, and attributions. In addition, Connelly et al. (1991) have specified the impact of age differences among older and younger adults in reading achievement. In other words, age differences affect inhibitory attentional mechanisms which can, thereby, result in distraction effects. Thus, further investigation of the intervening role of these variables can provide better understanding of the impact of other potential factors.

Third, only a few achievement emotions were examined as they seem to have more relevance to the reading skill based on the existing literature. In this regard, as the emotions investigated in this study were limited, future research can focus on other distinct emotions as well. Fourth, as the study was cross-sectional in nature, more longitudinal studies are recommended to be conducted to address the linkages between reading emotions, reading engagement, and reading achievement. Finally, due to the domain specific nature of emotions and engagement, future studies are encouraged to use the adapted versions of the instruments to be used in other academic domains as well as other language skills.

Appendix A

English Language Learners' Reading Emotions Scale (ELL-RES)

Reading boredom

While reading the text,

1. I found the text fairly dull.
2. My mind began to wander as I got bored.
3. I was tempted to put the text aside as it was boring.
4. I thought about what else I could go through rather than reading this text.
5. I got bored to the point that I had problems staying alert.
6. I got restless.

Reading anxiety

7. I felt it makes me uneasy.
8. I felt it makes me nervous.
9. I worried whether I am sufficiently prepared for it or not.
10. I skipped some parts because I felt so nervous.
11. I got tense.
12. I felt my heart raced as I did not understand something important.

Reading enjoyment

13. I got excited about its content.
14. I enjoyed reading it.
15. I started looking forward to going through the text.
16. I was glad that it paid off to read it.
17. My enjoyment of the reading made me proceed.
18. I was so excited saving time on it.

Appendix B

English Language Learner's Reading Engagement Inventory (ELL-REI)

Cognitive engagement

While reading the text,

1. I thought about different ways to solve the reading problems.
2. I tried to connect what I was learning from the reading to what I had learned before.
3. I preferred to be told the answer than have to do the work.
4. I was not thinking that hard.
5. I only studied the easy parts when the work was hard.
6. I did just enough to get by.

Behavioral engagement

7. I stayed focused.
8. I put effort into reading the text.
9. I kept trying even if something was hard.
10. I talked about the reading content to others.
11. I got distracted.
12. I gave up right away if I did not understand.

Emotional engagement

13. I looked forward to continuing reading it.
14. I enjoyed learning new things.
15. I felt good.
16. I often felt frustrated.
17. I thought it is boring.
18. I did not care about its content.

References

Alderson, J. C. (1984). Reading in a foreign language: A reading problem or a language problem? In J. C. Alderson & A. H. Urquhart (Eds.), *Reading in a foreign language*. London: Longman.

Alderson, J. C. (2000). *Assessing reading*. Cambridge: Cambridge University Press.

Alfassi, M. (2004). Reading to learn: Effects of combined strategy instruction on high school students. *Journal of Educational Research, 97*(4), 171–184.

Al-Mahrooqi, R., & Roscoe, A. (Eds.). (2014). *Focusing on EFL reading: Theory and practice*. Cambridge: Cambridge Scholars Publishing.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411–423.

Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45,* 369–386.

Baker, J. A., Dilly, L. J., Aupperlee, J. L., & Patil, S. A. (2003). The developmental context of school satisfaction: Schools as psychologically healthy environments. *School Psychology Quarterly, 18,* 206–221.

Bartlett, B., & Elliott, S. N. (2018). "Opportunity to read": Student voice as a reading engagement enabler. In *Empowering engagement* (pp. 91–115). Springer, Cham.

Beck, I. L., & McKeown, M. G. (2001). Text talk: Capturing the benefits of read-aloud experiences for young children. *The Reading Teacher, 55*(1), 10–20.

Blau, E. K. (1982). The effect of syntax on readability for ESL students in Puerto Rico. *TESOL Quarterly, 16*(4), 517–528.

Bölkbas, F. (2013). The effect of reading strategies on reading comprehension in teaching Turkish as a foreign language. *Educational Research and Reviews, 8*(21), 2147–2154.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. New York: The Guilford Press.

Cambourne, B. (1995). Toward an educational relevant theory of literacy learning: Twenty years of inquiry. *Reading Teacher, 49*(3), 182–190.

Carrell, P. L. (1989). Metacognitive awareness and second language reading. *The Modern Language Journal, 73*(2), 121–134.

Casuso-Holgado, M. J., Cuesta-Vargas, A. I., Moreno-Morales, N., Labajos-Manzanares, M. T., Barón-López, F. J., & Vega-Cuesta, M. (2013). The association between academic engagement and achievement in health sciences students. *BMC Medical Education, 13,* 33–40.

Chen, Z. X., Aryee, S., & Lee, C. (2005). Test of a mediation model of perceived organisational support. *Journal of Vocational Behavior, 66*(3), 457–470.

Chen, P. S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of web-based learning technology on college student engagement. *Computers & Education, 54,* 1222–1232.

Cheung, K. C., Mak, S. K., Sit, P. S., & Soh, K. C. (2016). A typology of student reading engagement: Preparing for response to intervention in the school curriculum. *Studies in Educational Evaluation, 48,* 32–42.

Christenson, S. L., Reschly, A. L., & Wylie, C. (2012). *Handbook of research on student engagement*. New York: Springer.

Cipielewski, J., & Stanovich, K. E. (1992). Predicting growth in reading ability from children's exposure to print. *Journal of Experimental Child Psychology, 54*(1), 74–89.

Collins, D., & Collins, A. (2002). *Advancing reading achievement: Becoming effective teachers of reading through collective study*. Greensboro, NC: Regional Educational Laboratory at SERVE.

Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self system processes. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self-processes and development: Minnesota symposium on child psychology* (Vol. 23, pp. 43–77). Chicago: University of Chicago Press.

Connelly, S. L., Hasher, L., & Zacks, R. T. (1991). Age and reading: The impact of distraction. *Psychology and Aging, 6*(4), 533–541.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey Bass.

Csikszentmihalyi, M. (1991). Thoughts *on* education. In D. Dickinson (Ed.), *Creating the future: Perspectives on educational change* (pp. 83–86). Aston Clinton: Accelerated Learning Systems.

Daniels, L. M., & Tze, V. M. C. (2014). How do teachers want their students to cope with boredom? *ASCD Express, 9*(8). Retrieved from: http://www.ascd.org/ascd-express/vol9/908-daniels.aspx.

Dewaele, J. M., & MacIntyre, P. D. (2014). The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching, 4*(2), 237–274.

Elias, M. J. (1997). *Promoting social and emotional learning: Guidelines for educators*. Alexanderia: Ascd.

El-Kilabi, A. (2005). *The place of reading comprehension in second language acquisition*. In Proceedings of the fifth national ELT conference, pp. 198–207). Sultan Qaboos University, Muscat, 20–21, April 2005.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research, 59*(2), 117–142.

Finn, J. D., Pannozzo, G. M., & Voelkl, K. E. (1995). Disruptive and inattentive-withdrawn behavior and achievement among fourth graders. *The Elementary School Journal, 95,* 421–454.

Finn, J. D., & Rock, D. A. (1997). Academic success among students at risk for school failure. *Journal of Applied Psychology, 82,* 221–234.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109.

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: A comparative analysis of various methods and student self-report instruments. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on students engagement* (pp. 763–782). New York: Springer.

Frenzel, A. C., Thrash, T. M., Pekrun, R., & Goetz, T. (2007). Achievement emotions in Germany and China: A cross-cultural validation of the Academic Emotions Questionnaire-Mathematics. *Journal of Cross-Cultural Psychology, 38*(3), 302–309.

García-Madruga, J. A., Vila, J. O., Gómez-Veiga, I., Duque, G., & Elosúa, M. R. (2014). Executive processes, reading comprehension and academic achievement in 3th grade primary students. *Learning and Individual Differences, 35,* 41–48.

Ghonsooly, B., & Hamedi, S. M. (2014). An investigation of the most flow inducing genres. *International Journal of Research Studies in Education, 4,* 1–10.

Goetz, T., Frenzel, A. C., Pekrun, R., Hall, N. C., & Lüdtke, O. (2007). Between-and within-domain relations of students' academic emotions. *Journal of Educational Psychology, 99*(4), 715–733.

Goetz, T., Hall, N. C., Frenzel, A. C., & Pekrun, R. (2006a). A hierarchical conceptualization of enjoyment in students. *Learning and Instruction, 16*(4), 323–338.

Goetz, T., Lüdtke, O., Nett, U. E., Keller, M., & Lipnevich, A. (2013). Characteristics of teaching and students' emotions in the classroom: Investigating differences across domains. *Contemporary Educational Psychology, 38,* 383–394.

Goetz, T., Pekrun, R., Hall, N. C., & Haag, L. (2006b). Academic emotions from a socio-cognitive perspective: Antecedents and domain specificity of students' affect in the context of Latin instruction. *British Journal of Educational Psychology, 76,* 279–308.

Grabe, W., & Jiang, X. (2018). First language and second language reading. In J. I. Liontas (Ed.), *TESOL encyclopedia of ELT: Teaching reading*. New York: Wiley-Blackwell.

Grabe, W., & Stoller, F. (2002). The nature of reading abilities. In W. Grabe & F. Stoller (Eds.), *Teaching and researching reading* (pp. 9–39). London: Pearson.

Green, M. C., & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 315–341). Mahwah: Lawrence Erlbaum Associates Publishers.

Guthrie, R. V. (2004). *Even the rat was white: A historical view of psychology* (2nd ed.). Upper Saddle River: Pearson Education.

Guthrie, J. T., Van Meter, P., Hancock, G. R., Alao, S., Anderson, E., & McCann, A. (1998). Does concept-oriented reading instruction increase strategy use and conceptual learning from text? *Journal of Educational Psychology, 90*(2), 261–278.

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (pp. 403–422). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Guthrie, J. T., Wigfield, A., & Perencevich, K. C. (Eds.). (2004). *Motivating reading comprehension: Concept-oriented reading instruction*. Mahwah, NJ: Erlbaum.

Guthrie, J. T., Wigfield, A., & You, W. (2012). Instructional contexts for engagement. In S. L. Christenson, A. L. Reschley, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 601–634). New York: Springer.

Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.

Hamilton, J. A. (1983). Development of interest and enjoyment in adolescence. Part II. Boredom and Psychopathology. *Journal of Youth and Adolescence, 12,* 363–372.

Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 158–176). Thousand Oaks, CA.

Hyland, K., & Jiang, F. K. (2016). "We must conclude that…": A diachronic study of academic engagement. *Journal of English for Academic Purposes, 24,* 29–42.

Joreskog, K., & Sorebom, D. (1996). *LISREL8: Structural equation modeling with the SIMPLIS command language*. Hillsdale, NJ: Lawrence Erlbaum.

Keenan, J. M., Betjemann, R. S., & Olson, R. K. (2008). Reading comprehension tests vary in the skills they assess: Differential dependence on decoding and oral comprehension. *Scientific Studies of Reading, 12,* 281–300.

Kendeou, P., & Van Den Broek, P. (2007). The effects of prior knowledge and text structure on comprehension processes during reading of scientific texts. *Memory & Cognition, 35*(7), 1567–1577.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: Guilford.

Kline, R. B. (2011). Convergence of structural equation modeling and multilevel modeling. In M. Williams & W. P. Vogt (Eds.), *Handbook of methodological innovation in social research methods* (pp. 562–589). London: Sage.

Kljajic, K., Gaudreau, P., & Franche, V. (2017). An investigation of the 2×2 model of perfectionism with burnout, engagement, self-regulation, and academic achievement. *Learning and Individual Differences, 57,* 103–113.

Kunnan, A. J. (1998). An introduction to structural equation modelling for language assessment research. *Language Testing, 15*(3), 295–332.

Larson, R. W. (1990). Emotions and the creative process; Anxiety, boredom, and enjoyment as predictors of creative writing. *Imagination, Cognition and Personality, 9*(4), 275–292.

Lee, S. K. (2009). Topic congruence and topic interest: How do they affect second language reading comprehension? *Reading in a Foreign Language, 21*(2), 159–178.

Li, Y., & Lerner, R. M. (2013). Interrelations of behavioral, emotional, and cognitive school engagement in high school students. *Journal of Youth and Adolescence, 42*(1), 20–32.

Lichtenfeld, S., Pekrun, R., Stupnisky, R. H., Reiss, K., & Murayama, K. (2012). Measuring students' emotions in the early years: The Achievement Emotions Questionnaire-Elementary School (AEQ-ES). *Learning and Individual Differences, 22*(2), 190–201.

Linnenbrink-Garcia, L., & Pekrun, R. (2011). Students' emotions and academic engagement: Introduction to the special issue. *Contemporary Educational Psychology, 36*(1), 1–3.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1,* 130–149.

Macklem, G. L. (2015). *Boredom in the classroom: Addressing student motivation, self-regulation, and engagement in learning* (Vol. 1). New York: Springer.

Maloney, E. A., Risko, E. F., Ansari, D., & Fugelsang, J. (2010). Mathematics anxiety affects counting but not subitizing during visual enumeration. *Cognition, 114*(2), 293–297.

Massimini, F., & Carli, M. (1998). The systematic assessment of flow in daily experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 288–306). New York: Cambridge University Press.

Massimini, F., Csikszentmihalyi, M., & Carli, M. (1987). The monitoring of optimal experience: A tool for psychiatric rehabilitation. *Journal of Nervous and Mental Disease, 175*(9), 545–549.

Massimini, F., Csikszentmihalyi, M., & DelleFave, A. (1988). Flow and bicultural evolution. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 342–363). New York: Cambridge University Press.

Massimini, F., & DelleFave, A. (2000). Individual development in a bio-cultural perspective. *American Psychologist, 55,* 24–33.

McKay, J. (2002). *The magazines handbook*. London: Routledge.

McQuillan, J., & Conde, G. (1998). The conditions of flow in reading: Two studies of optimal experience. *Reading Psychology: An International Quarterly, 17,* 109–135.

Meece, J., Blumenfeld, P. C., & Hoyle, R. H. (1988). Students' goal orientation and cognitive engagement in classroom activities. *Journal of Educational Psychology, 80,* 514–523.

Melby-Lervag, M., & Larvag, A. (2014). Effects of educational interventions targeting reading comprehension and underlying components. *Child Development Perspectives, 8,* 96–100.

Mol, S. E., & Bus, A. G. (2011). To read or not to read: A meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin, 137*(2), 267–296.

Mol, S. E., & Jolles, J. (2014). Reading enjoyment amongst non-leisure readers can affect achievement in secondary school. *Frontiers in Psychology, 5*(1214), 1–10.

Nett, U. E., Goetz, T., & Hall, N. C. (2011). Coping with boredom in school: An experience sampling perspective. *Contemporary Educational Psychology, 36*(1), 49–59.

Oatley, K. (2012). *The passionate muse: Exploring emotion in stories*. Oxford: Oxford University Press.

Olafson, K. M., & Ferraro, F. R. (2001). Effects of emotional state on lexical decision performance. *Brain and Cognition, 45*(1), 15–20.

Parameswaran, R., & Yaprak, A. (1987). A cross-national comparison of consumer research measures. *Journal of International Business Studies, 18*(1), 35–49.

Peixoto, F., Mata, L., Monteiro, V., Sanches, C., & Pekrun, R. (2015). The Achievement Emotions Questionnaire: Validation for pre-adolescent students. *European Journal of Developmental Psychology, 12*(4), 472–481.

Pekrun, R. (1992). The impact of emotions on learning and achievement: Towards a theory of cognitive/motivational mediators. *Applied Psychology: An International Review, 41,* 359–376.

Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review, 18*(4), 315–341.

Pekrun, R., Elliot, A. J., & Maier, M. A. (2006). Achievement goals and discrete achievement emotions: A theoretical model and prospective test. *Journal of Educational Psychology, 98*(3), 583–597.

Pekrun, R., Elliot, A. J., & Maier, M. A. (2009). Achievement goals and achievement emotions: Testing a model of their joint relations with academic performance. *Journal of Educational Psychology, 101*(1), 115–135.

Pekrun, R., Frenzel, A. C., Goetz, T., & Perry, R. P. (2007). The control-value theory of achievement emotions: An integrative approach to emotions in education. In P. A. Schutz & R. Pekrun (Eds.), *Educational psychology series: Emotion in education* (pp. 13–36). San Diego, CA: Elsevier Academic Press.

Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H., & Perry, R. P. (2010). Boredom in achievement settings: Exploring control-value antecedents and performance outcomes of a neglected emotion. *Journal of Educational Psychology, 102*(3), 531–549.

Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The Achievement Emotions Questionnaire (AEQ). *Contemporary Educational Psychology, 36*(1), 36–48.

Pekrun, R., Göetz, T., & Perry, R. P. (2005). *Achievement Emotions Questionnaire (AEQ). User's manual*. Unpublished Manuscript, University of Munich, Munich.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist, 37*(2), 91–105.

Pekrun, R., Lichtenfeld, S., Marsh, H. W., Murayama, K., & Goetz, T. (2017). Achievement emotions and academic performance: Longitudinal models of reciprocal effects. *Child Development, 88*(5), 1653–1670.

Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 259–282). New York: Springer.

Pishghadam, R., Adamson, B., & Shayesteh, S. (2013). Emotion-based language instruction (EBLI) as a new perspective in bilingual education. *Multilingual Education, 3*(9), 1–16.

Pishghadam, R., Rahmani, S., & Shayesteh, S. (2017). Compartmentalizing culture teaching strategies under an emotioncy-based model. *Kasetsart Journal of Social Sciences, 38,* 359–367.

Pishghadam, R., & Shayesteh, S. (2016). Contextualization-emotionalization interface: A case of teacher effectiveness. *International and Multidisciplinary Journal of Social Sciences Rimcis, 5,* 97–127.

Pishghadam, R., & Shayesteh, S. (2017). Emo-sensory expression at the crossroads of emotion, sense, and language: A case of color-emotion associations. *International Journal of Society, Culture & Language, 5*(2), 15–25.

Pishghadam, R., Zabetipour, M., & Aminzade, A. (2016). Examining emotions in English language learning classes: A case of EFL emotions. *Issues in Educational Research, 26*(3), 508–527.

Ponz, A., Montant, M., Liegeois-Chauvel, C., Silva, C., Braun, M., Jacobs, A. M., et al. (2013). Emotion processing in words: A test of the neural re-use hypothesis using surface and intracranial EEG. *Social Cognitive and Affective Neuroscience, 9*(5), 619–627.

Preckel, F., Götz, T., & Frenzel, A. (2010). Ability grouping of gifted students: Effects on academic self-concept and boredom. *British Journal of Educational Psychology, 80*(3), 451–472.

Pressley, M. (2002). Metacognition and self-regulated comprehension. *What Research Has to Say About Reading Instruction, 3,* 291–309.

Price-Mohr, R., & Price, C. (2017). Gender differences in early reading strategies: A comparison of synthetic phonics only with a mixed approach to teaching reading to 4–5 year-old children. *Early Childhood Education Journal, 45*(5), 613–620.

Proctor, C. P., Daley, S., Louick, R., Leider, C. M., & Gardner, G. L. (2014). How motivation and engagement predict reading comprehension among native English-speaking and English-learning middle school students with disabilities in a remedial reading curriculum. *Learning and Individual Differences, 36,* 76–83.

Prussia, G. E., & Kinicki, A. J. (1996). A motivational investigation of group effectiveness using social-cognitive theory. *Journal of Applied Psychology, 81*(2), 187–198.

Rapp, D. N., & Kendeou, P. (2007). Revising what readers know: Updating text representations during narrative comprehension. *Memory & Cognition, 35*(8), 2019–2032.

Rathnude, K. (2003). A comparison of Montessori and traditional middle schools: Motivation, quality of experience and social context. *The NAMTA Journal, 28*(3), 13–41.

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138,* 353–387.

Sadoski, M., & Paivio, A. (2001). *Imagery and text: A dual coding theory of reading and writing*. Mahwah, NJ: Lawrence Erlbaum Associates.

Saito, Y., Garza, T. J., & Horwitz, E. K. (1999). Foreign language reading anxiety. *The Modern Language Journal, 83*(2), 202–218.

Salanova, M., Schaufeli, W., Martínez, I., & Bresó, E. (2010). How obstacles and facilitators predict academic performance: The mediating role of study burnout and engagement. *Anxiety Stress and Coping, 23,* 53–70.

Salmela-Aro, K., & Upadaya, K. (2012). The Schoolwork Engagement Inventory: Energy, dedication, and absorption (EDA). *European Journal of Psychological Assessment, 28*(1), 60–67.

Saslow, J., & Ascher, A. (2006a). *Top notch 1: English for today's world*. White Plains, NY: Pearson/Longman.

Saslow, J., & Ascher, A. (2006b). *Top notch 2: English for today's world*. White Plains, NY: Pearson/Longman.

Satorra, A., & Bentler, E. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye & C. C. Clogg (Eds.), *Latent variables analysis: Applications for developmental research* (pp. 399–419). Thousand Oaks, CA: Sage.

Schaufeli, W. B., Martínez, I., Marques-Pinto, A., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students: A cross national study. *Journal of Cross-Cultural Psychology, 33,* 464–481.

Schoor, C. (2016). Utility of reading—Predictor of reading achievement? *Learning and Individual Differences, 45,* 151–158.

Schutz, P. A., & Pekrun, R. (2007). Introduction to emotion in education. In P. Schutz & R. Pekrun (Eds.), *Eemotion in education* (pp. 3–10). San Diego, CA: Elsevier Academic Press.

Scott, E. J., & Walczak, S. (2009). Cognitive engagement with a multimedia ERP tool: Assessing computer self-efficacy and technology acceptance. *Information & Management, 46,* 221–232.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*(1), 5–14.

Sellers, V. D. (1998). *On the relationship between anxiety and reading in Spanish as a foreign language*. Unpublished doctoral dissertation, The Pennsylvania State University.

Shahian, L., Pishghadam, R., & Khajavy, H. (2017). Flow and reading comprehension: Testing the mediating role of emotioncy. *Issues in Educational Research, 27,* 527–549.

Shukor, N. A., Tasir, Z., Van der Meijden, H., & Harun, J. (2014). A predictive model to evaluate students' cognitive engagement in online learning. *Procedia-Social and Behavioral Sciences, 116,* 4844–4853.

Singh, J. P. (2010). *United nations educational, scientific, and cultural organization (UNESCO): Creating norms for a complex world*. London: Routledge.

Spearritt, D. (1972). Identification of sub-skills of reading comprehension by maximum likelihood factor analysis. *ETS Research Bulletin Series, 1972*(1), i-24.

Sweet, A. P., & Snow, C. E. (2003). *Rethinking reading comprehension (Solving problems in the teaching of literacy)*. New York: Guilford Publications.

Taboada, A., Tonks, S. M., Wigfield, A., & Guthrie, J. T. (2013). Effects of motivational and cognitive variables on reading comprehension. In D. E. Alvermann, N. J. Unrau, & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (6th ed.). Newark, DE: International Reading Association.

Valiente, C., Swanson, J., & Eisenberg, N. (2012). Linking students' emotions and academic achievement: When and why emotions matter. *Child Development Perspectives, 6*(2), 129–135.

Villavicencio, F. T., & Bernardo, A. B. (2013). Positive academic emotions moderate the relationship between self-regulation and academic achievement. *British Journal of Educational Psychology, 83*(2), 329–340.

Voelkl, K. E. (1997). Identification with school. *American Journal of Education, 105,* 204–319.

Walker, J. B. (2000). *Diagnostic teaching of reading: Techniques for instruction and assessment*. Columbus, OH: Merril.

Wang, M. T., Fredricks, J. A., Ye, F., Hofkens, T. L., & Linn, J. S. (2016). The Math and Science Engagement Scales: Scale development, validation, and psychometric properties. *Learning and Instruction, 43,* 16–26.

Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R. W., & Davis-Kean, P. (2006). Development of Achievement Motivation. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (pp. 933–1002). Hoboken, NJ: Wiley.

Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth or their reading. *Journal of Educational Psychology, 89*(3), 420–432.

Wigfield, A., & Guthrie, J. T. (2010). The impact of Concept-Oriented Reading Instruction on students' reading motivation, reading engagement, and reading comprehension. In J. L. Meece & J. S. Eccles (Eds.), *Handbook of research on schools, schooling, and human development* (pp. 463–477). Mahwah, NJ: Erlbaum.

Wigfield, A., Guthrie, J. T., & McGough, K. (1996). *A questionnaire measure of children's motivations for reading (Instructional Resource 22).* Athens, GA: National Reading Research Center, University of Georgia and University of Maryland.

Zeidner, M. (2007). Test anxiety in educational contexts: Concepts, findings, and future directions. In P. A. Schutz & R. Pekrun (Eds.), *Educational psychology series: Emotion in education* (pp. 165–184). San Diego, CA: Elsevier Academic Press.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist, 25*(1), 3–17.