

A Short Form of the Achievement Emotions Questionnaire: Measurement Model and Its Association with Career Adaptability, Epistemic Emotion, Academic Buoyancy, and Academic Satisfaction*

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This study aimed to evaluate the psychometric properties of the achievement emotions questionnaire (AEQ-S) among Persian speakers. In total, 1153 (41.4% men) academic students in the age range of 17-29 participated ($M = 21.63$, $SD = 2.24$). Participants also completed the Career Adaptability, Epistemic Emotion, Academic Buoyancy, and Academic Satisfaction Inventory. Confirmatory factor analysis (CFA) was performed to test the factor structure of the questionnaire. The factor structure was similar to the one obtained on the original sample. The questionnaire showed a high level of internal consistency (Cronbach's $\alpha = .93$ and McDonald's $\omega = .87$). Correlations of AEQ-S with other psychological constructs were calculated as well. The findings indicate that the short form of the questionnaire is a valid and reliable tool for assessing achievement emotions during student activities and

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Data Availability. The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Participants Consent Statement. In accordance with procedures approved by the Committee for Medical and Health Research Ethics, Ferdowsi University of Mashhad, Mashhad, Iran.

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outcomes. From a therapeutic and practical point of view, student-related organizations can use this educational tool to screen students.

Keywords: achievement emotion, psychometric, validity, reliability, student

Highlights:

- Achievement Emotions Questionnaire – Short Form (AEQ-S), a brief measure of students' emotions, was developed and validated.
- Confirmatory factor analysis (CFA) supported the model of AEQ-S.
- Significant associations of achievement emotions with career adaptability, epistemic emotion, academic buoyancy, and academic satisfaction were found on the data.

Emotions are considered to be multi-dimensional phenomena that include a series of coordinated emotional progressions such as emotional, mental, motivational, expressive, and physiological components (Pekrun, 2017; Scherer, 2000). Achievement emotions (AEs) can be defined as emotions that occur in reaction to occurrences and functions that are judged based on qualification-based quality standards (Pekrun et al., 2023). In the educational spaces, students are in a variety of situations dealing with a series of emotions related to class, learning, and test, namely hope, enjoyment, relief, pride, shame, hopelessness, anxiety, boredom, and anger. They are called AEs because they are connected to activities and outcomes (Pekrun, 2017, 2022; Pekrun et al., 2011). For example, participating in a class is an activity, and success on a test is an outcome. The theory of control-value is considered to be one of the most reliable and well-cited theoretical/conceptual efforts in the field of AEs. In the three-dimensional classification of AEs based on research (Pekrun et al., 2002; Pekrun & Perry, 2014), the discrimination between activity emotions like the boredom of education and outcome emotions (e.g., a sense of relief in success), is associated with the object focus of these emotions. In addition, AEs can be categorized grounded on valence value (positive-negative emotions) and the arousal level (activating-deactivating emotions).

The purpose of this study is to create and evaluate a short version of the AEQ, which is a self-report tool that assesses students' emotions associated with academic activities and outcomes, such as enjoyment, hope, pride, anger, anxiety, and boredom. The study seeks to validate the measurement model of the AEQ-S and to investigate its relations with other pertinent constructs, such as career adaptability, epistemic emotion, academic buoyancy, and academic satisfaction. The study adds to the literature on AEs by offering a concise and trustworthy measure that can be applied in various educational settings and by examining its connections with important outcomes for students' learning and well-being.

Achievement Emotions and Their Importance for Mental Health and Adaptation

Despite the recent expansion of AEs, test anxiety has attracted the most attention from researchers compared to other emotions which have received less attention from researchers (Zeidner, 2014). However, emotions are significant in a variety of cognitive processes including decision-making, problem-solving, storing and restoring memory (Clare & Huntsinger, 2009), motivation, and mental health (Lewis et al., 2010). It is also notable that cognitive appraisals of situational demands or desires, individual capabilities, and the significance of achievement and failure consequences probably play a fundamental role in arousing these feelings. Despite the extension of students' emotional experiences in situations of achievement (Camacho-Morles et al., 2021; Pekrun et al., 2002), the research that evaluates or improves the methods or techniques used to study the AEs has been undeniably slow (Lichtenfeld et al., 2012). The role of emotional experiences in academic settings is significant, as emotions can aid in explaining and predicting how students perform, learn, feel, and behave in different situations. Therefore, it is essential to avoid underestimating it.

Regardless of the classification of emotions, they are associated with an extensive array of educational variables, namely academic buoyancy and satisfaction. The capability of reacting appropriately to daily tasks, obstacles, and densities that students experience during their academic life is called academic buoyancy (Martin & Marsh, 2008). Putwain and colleagues (Putwain et al., 2022) show that constructive and destructive emotions are associated with adaptive responses to adversity, including academic buoyancy. Furthermore, it is believable that buoyancy reduces the strength of emotions such as apprehension and boredom and reduces their destructive scholastic impression both. Educational satisfaction alludes to the assessment of numerous facets of educational experiences, and it refers to an individual state that results from the confirmation or not of the students' expectations (Meneghel et al., 2019). For instance, Reyhani et al., (2016) also affirmed that emotions have a significant relationship with academic satisfaction. Career adaptability can help people quickly adapt to changes when facing their career roles and maintain their ability to balance their roles, which affects their necessary psychological resources for career development and getting more meaning in life. One of the most recent research showed that emotions are predictors of career adaptability (Rezaiee, 2022).

According to Camacho-Morles et al. (2021), Pekrun (2017), Pekrun et al. (2011) and Rezaiee (2022) despite some exceptions in past research, AEs such as enjoyment, pride, hope, and relief can have a positive effect, and AEs like anxiety, shame, and anger have negative effects. Empirical evidence on the effects of emotions, particularly positive AEs is infrequent, but supports the view that activating positive emotions can increase performance (Pekrun, 2017).

Achievement Emotion Questionnaire for Student

The achievement emotions questionnaire (AEQ) established the foundation for innovative studies on emotive practices in a variety of scholastic and achievement situations (Burić & Sorić, 2012). One of the keys to this achievement is the theoretical choice of the AEQ, which is based on the control-value theory of achievement emotions and permits wide-ranging scrutiny of these types of feelings, such as enjoyment, pride, hope, anger, anxiety, and boredom. AEQ covers emotional experiences before, during, or after preparation and measures the emotional, mental, motivational, and physical factors of each feeling. This wide range permits scholars to examine an inclusive diversity of emotional capabilities in educational situations. The disadvantage of the AEQ is its lengthiness. In sum, it comprises 232 items, of which 80 are related to classroom emotions, 75 items are related to learning-associated ones, and 77 are related to test-associated types. The length of the AEQ can pose challenges or difficulties for experimental studies in academic research, as it affects the participants' time, cost, and fatigue (Bieleke et al., 2021). The evidence of this disadvantage is the choice of particular scales, such as the sole examination of certain AEs in a certain academic setting rather than the whole AEQ conduct, since each subscale of AEQ contains an average of 10. Accordingly, it is acceptable that a small number of scholars employ the whole AEQ in one study; they use only the selection of scales or condense them for their objectives instead.

The AEQ-S contains 96 items, 32 of which are class-associated, 32 are learning-associated, and 32 are test-associated (the participants rate the different 32 items in three different settings). They consist of hope, enjoyment, relief (just in the test setting), pride, shame, hopelessness, anxiety, boredom (associated with the class and learning settings), and anger. The reliability of the AEQ-S scales fluctuated from .75 to .93 and has adequate goodness of fit indices (Bieleke et al., 2021).

The Present Study

A review of empirical evidence in the field of AEQ-S features shows that few studies have been conducted with the aim of psychometric analysis with the AEQ-S. AEQ is very significant for two reasons. Firstly, there is a lack of information resources related to measuring the technical characteristics of the comprehensive form of the AEQ in Iran. Secondly, emotional experiences (positive and negative) in achievement situations are inevitable and growing. These experiences affect a wide range of objective and subjective indicators of academic life quality (Bieleke et al., 2021). Since a wide range of empirical evidence with emphasis on the interpretive power of AEs to predict objective and subjective indicators of academic life quality has insisted more than ever on the significance, and the necessity for accessibility to a valid and reliable tool for measuring the concept of AEs in three conceptual areas, learning emotions, classroom emotions, and test-related emotions; Therefore, the psychometric

evaluations of the AEQ-S with a range of positive and negative emotions become doubly important.

In line with the global research in previous studies on the AEQ-S and preliminary sign of former Iranian research of students' AEs, the current study makes an effort to approve the construction of the Persian-language form of the AEQ-S with a group of Iranian students using confirmatory factor analysis (CFA), and the reliability of the AEQ-S. Moreover, this research tries to scrutinize the cross-national generalizability of the AEQ-S's factor structure and arranges for a supplementary test of its validity and reliability. The present paper was intended to determine the relationship between the AEs and special career-education forms (e.g., career adaptability, buoyancy, and satisfaction) and also evaluated detailed assumptions in line with the extensive studies on AEs: (a) positive AEs will be related to positive epistemic emotions, academic buoyancy, and academic satisfaction and (Pekrun et al., 2011) (b) negative AEs will be in a positive relationship with negative epistemic emotions, and negative relationship with buoyancy, and academic satisfaction.

Method

Participants

In the present research, an overall of 1153 people took part, of which 477 (41.4%) are men and 676 (58.6%) are women with an age range of 17 to 29 years ($Mean = 21.63$, $SD = 2.24$) selected by cluster random sampling. To this end, the target population consisted of all undergraduate students in Semnan province. Next, a list of universities in this province was prepared and some of them were randomly selected. Finally, the questionnaires were administered. Participants included 539 students (46.7%) from Payame Noor University, 391 students (33.9%) from Semnan University, and 223 students (19.3%) from Damghan University. Among the participants, 413 students (35.8%) were studying in the first year, 251 (21.8%) in the second year, 235 (20.4%) in the third year, and 254 (22%) in the fourth year. In addition, 459 students (39.8%) were studying mathematics, 118 students (10.2%) were studying experimental sciences, and 576 students (50%) were studying humanities. The lowest number of participants was in the age range of 27 to 29 years (4.6%), and the highest number of participants was in the age range of 21 to 23 years (51.3%). The criteria for participating in this research were academic students who 1) were at the undergraduate level and 2) were included in this study with satisfaction.

Measures

Achievement Emotions Questionnaire (AEQ-S). A short form of the AEQ-S was developed by Bieleke and his colleagues (Bieleke et al., 2021). In the AEQ-S, participants answered each on a five-point scale (1 = *strongly disagree* to 5 = *strongly agree*). The Persian form of the AEQ-S was translated into Persian by a group of three Persian speakers (Spanier & Thompson) and psychologist scholars and then back-translated into English by another translator. The writer of the first form of the AEQ-S investigated the final version and provides some comments. After the back translation, some modifications were done and approved.

Epistemic Emotions Scale (EES). Twenty-one items were responded employing a five-point Likert scale that asked participants to report how intensely they felt several emotions

during completing the epistemic emotion scale (Pekrun et al., 2017). Data collected in this study had goodness-of-fit indices and indicated that this version fitted the data sufficiently ($\chi^2 = 1895.96$, $df = 394$, CFI = .97, GFI = .86, NFI = .97, SRMR = .069, RMSEA = .086), and the reliability through coefficient alpha was .86 that was appropriate.

Academic Buoyancy Scale (ABS). Martin and his colleague (Martin & Marsh, 2008) developed the scale by using 4 items with a five-point Likert scale (1 = *strongly disagree* and 5 = *strongly agree*). The Cronbach's alpha coefficient for the reliability of the questionnaire was .81. The validity of the questionnaire was assessed by CFA, which yielded the following values for each item: .68 for item 1, .68 for item 2, .78 for item 3, and .73 for item 4. In the present study, the model was consistent with the data according to the goodness-of-fit indices ($\chi^2 = 5.80$, $df = 2$, CFI = .99, GFI = .99, AGFI = .99, SRMR = .010, RMSEA = .041), and the questionnaire had acceptable internal consistency as shown by the Cronbach's alpha coefficients (.82).

Academic Satisfaction Scale (ASS). It was developed by Salehi (Salehi, 2014) using 5 items with a 6-point Likert scale (1 = *not at all* to 6 = *very high*). Convergence construct validity was obtained by calculating the correspondence between the test and student grade point average ($r = .67$, $p < .01$), and divergent construct validity were obtained by examining the relationship between the scale and academic burnout test ($r = -.52$, $p < .01$). The internal consistency of the test was also obtained .92. In the present study, the model was consistent with the data according to the goodness-of-fit indices ($\chi^2 = 20.07$, $df = 5$, CFI = .99, GFI = .98, AGFI = .95, SRMR = .016, RMSEA = .089), and the questionnaire had acceptable internal consistency as shown by the Cronbach's alpha coefficients (.90).

Procedure

After the AEQ-S translation process, the existing Persian version of the AEQ-S was piloted on 100 students in the pretest stage who were supposed to estimate the readability and simplicity of each of the Persian language items discretely on a five-point Likert (5=*completely agree* to 1=*completely disagree*). In the pilot stage, they were inquired to delineate any misinterpretation or absence of clearness associated with notions or phrasing. The maximum prevalent degree by participants was "quite agree" (answer choice number 5). This route is validated at 95% or higher through all items. Therefore, their responses designated no requirement for item modification (Habibi et al., 2014).

The required permissions, including ethical approval, were obtained from the Ferdowsi University of Mashhad. All processes implemented in the education, such as participants, were in accord with the principle criteria of the official and (or) general investigation agency and with the 1964 Helsinki affirmation (Rickham, 1964) and its future revisions or similar ethical criteria. Written consent forms were taken from participants, informing them that their involvement was voluntary and they could end their participation whenever they desired. Totally, 1153 students from four schools were approved to take part out of 1300 (an 89% response rate). The validity framework of the present research is based on Kane's emphasis: on scoring, generalization, extrapolation, and implications (Cook et al., 2015).

Statistical Strategy

Missing data were <5%. Thus, list-wise deletion with no imputation of data was used in the present analyses. The assumption of normality was checked and confirmed. Internal consistencies were calculated by running Cronbach's α . An $\alpha \geq .90$ regarding as brilliant, an $\alpha \geq .70$ as good, and an $\alpha \geq .60$ as satisfactory (Kline, 2015)"title": "Principles and

practice of structural equation modelling", "type": "book"}, "uris": [{"http://www.mendeley.com/documents/?uuid=0c862da9-519e-365a-9a72-70878fcb8f1b"}], "mendeley": {"formattedCitation": "(Kline, 2015).

In CFA, several indexes were run to evaluate the model's goodness of fit: Root mean square error of approximation ($RMSEA \leq .10$), Comparative fit index ($CFI \geq .90$), Goodness of fit index ($GFI \geq .90$), Adjusted goodness of fit index ($AGFI \geq .90$) (Browne & Cudeck, 1992), and Chi-square (χ^2) (Barrett, 2007). According to (Hu & Bentler, 1999), model fit is considered satisfactory with Standardized root mean square residual (SRMR) values $\leq .08$, and respectable for values lower than $\leq .05$. Researchers used maximum likelihood for CFA because it is common, reliable, normal, and informative.

The obtained data were analyzed in four stages using SPSS v21 and LISREL v8.80: 1) extracting descriptive indices including mean, standard deviation, and Cronbach's alpha; 2) CFA and investigation of its factors; and 3) investigating the correlation of the AEQ-S Inventory with Career Adaptability, Epistemic Emotion, Academic Buoyancy, and Academic Satisfaction Persian-questionnaire.

Results

Content Validity

To validate the content of AEQ-S items, five educational psychologists working in the field of feeling and emotion were wanted to assess its contents. The Persian form of AEQ-S and tool instructions, the conceptual description of the form, and its facets were sent to these assessors. Each item was assessed using a four-point Likert response measure (1 = *irrelevant* to 4 = *highly relevant*) to see whether the item was related to the target form. The content validity index (CVI) for each item and total items were assessed from the ratio of assessors who scored items as either 3 or 4. CVI grades higher than .80 were checked as acceptable (Davis, 1992).

Confirmatory Factor Analysis

We employed CFA to examine whether the AEQ-S replicates the second-order model of AEs (i.e., nine diverse emotions placed in three different settings) which revealed to designate data gathered with the AEQ-S. Model fit indices based on the desired value, show that the value of model fit indicators is the AEs, so this model has a good fit ($\chi^2 = 16383.16$; $\chi^2/df = 3.7$; $CFI = .96$; $GFI = .91$; $AGFI = .90$; $SRMR = .069$; $RMSEA = .090$ [90% CI = .086-.094]).

The factor loadings of class-associated emotions, learning-associated, and test-associated are between .45 to .98, .49 to .95, and .64 to .97, respectively. As Kline (2015) shows, coefficients above .30 indicate the importance of correlation. Furthermore, t-values for emotions related to these three types were obtained from 15.77 to 31.66, 15.55 to 36.25, and 16.19 to 33.47, respectively.

Internal consistency

Cronbach's alpha, McDonald's Omega, and composite reliability were used to check the internal consistency of the AEQ-S scale. The results displayed high levels of reliability (.93 for a total of AEQ-S, .80 for class-associated emotions, .80 for learning-associated emotions, and .80 for test-associated emotions). The reliability of McDonald's Omega was .87. Also, the composite reliability of class-, learning-, and test-associated are between .75 to .97, .72 to .95, and .85 to .95, respectively. The results of these reliabilities show the generalizability of the findings (Refer to Table 1 for more information).

Table 1
Factor loading, t-Value, Internal Consistency, Mean, Standard Deviation, and skewness of the items of the subscales of the AEQ-S

Subscales	Standardized loadings	t-value	M	SD	SK
<i>Related to the class</i>					
EN	.68	23.54	3.68	1.07	-.31
	.68	25.65	3.90	1.01	-.56
	.72	23.94	3.71	1.11	-.47
	.80	25.73	3.35	1.17	-.19
HO	.76	24.36	3.56	1.17	-.36
	.72	24.74	3.83	1.09	-.67
	.75	26.94	3.73	1.07	-.48
	.70	26.75	3.97	1.01	-.71
PR	.76	27.85	3.97	1.05	-.80
	.71	26.86	3.75	1.02	-.43
	.69	25.41	3.80	1.03	-.52
	.45	15.77	4.12	1.00	-.99
AG	.68	19.10	2.60	1.27	.42
	.66	16.00	2.73	1.44	.27
	.78	23.31	2.01	1.22	1.08
	.83	25.22	2.01	1.23	1.04
AX	.80	26.39	1.90	1.16	1.20
	.81	24.17	2.18	1.25	.78
	.73	25.14	1.66	1.10	1.65
	.77	26.16	1.79	1.12	1.29
SH	.88	25.29	2.17	1.32	.83
	.86	26.76	1.87	1.23	1.25
	.89	28.32	1.79	1.22	1.41
	.91	28.46	1.86	1.24	1.31
HL	.84	29.23	1.77	1.13	1.38
	.77	30.00	1.61	1.02	1.66
	.83	29.82	1.71	1.10	1.50
	.83	30.61	1.64	1.08	1.72
BO	.96	28.31	2.28	1.32	.71
	.98	31.68	2.10	1.24	.89
	.93	27.66	2.17	1.30	.83
	.92	30.13	2.06	1.21	.93

Subscales	Standardized loadings	<i>t-value</i>	<i>M</i>	<i>SD</i>	<i>SK</i>
<i>Related to the Learning</i>					
EN	.71	19.16	3.93	1.00	-.47
	.73	25.74	3.72	1.08	-.37
	.73	25.14	3.97	1.09	-.78
	.49	18.73	4.27	.93	-1.16
	.77	28.09	3.96	1.06	-.77
HO	.75	28.37	3.87	1.03	-.60
	.78	29.73	3.99	1.03	-.84
	.73	28.52	4.03	1.01	-.80
	.80	30.78	4.06	1.03	-.89
	.79	31.44	4.03	1.00	-.85
PR	.84	32.41	3.98	1.04	-.74
	.69	15.55	4.21	.96	-1.04
	.70	20.58	2.11	1.22	.93
	.88	26.25	2.06	1.26	.99
	.84	27.85	1.74	1.16	1.53
AG	.87	25.42	2.31	1.29	.67
	.81	28.11	1.81	1.12	1.35
	.80	21.75	2.73	1.35	.24
	.80	24.30	2.00	1.23	1.04
	.86	24.82	2.10	1.30	.92
AX	.87	29.65	1.75	1.16	1.49
	.95	29.40	2.05	1.27	.99
	.89	28.79	1.96	1.21	1.12
	.90	29.06	1.93	1.21	1.13
	.90	34.09	1.70	1.09	1.50
SH	.84	30.79	1.73	1.09	1.44
	.85	32.24	1.68	1.08	1.54
	.87	28.36	1.87	1.20	1.28
	.93	32.08	1.89	1.17	1.15
	.88	34.45	2.08	1.26	.93
BO	.78	33.75	2.23	1.31	.75
	.91	36.20	2.09	1.26	.92
<i>Related to the Test</i>					
EN	.85	26.50	3.03	1.21	-.04
	.91	28.31	3.10	1.24	-.09
	.97	29.84	3.15	1.27	-.08
	.91	27.99	2.86	1.26	.15
	.81	27.48	3.49	1.14	-.37
HO	.84	28.85	3.33	1.13	-.20
	.84	29.06	3.34	1.14	-.26
	.89	30.84	3.46	1.15	-.33

Subscales	Standardized loadings	<i>t-value</i>	<i>M</i>	<i>SD</i>	<i>SK</i>
PR	.85	28.96	3.71	1.14	-.55
	.85	29.64	3.47	1.12	-.28
	.84	28.98	3.54	1.13	-.37
	.84	24.99	3.16	1.26	-.12
RE	.77	25.78	3.98	1.08	-.82
	.90	33.47	4.14	1.03	-1.01
	.74	18.91	3.59	1.34	-.57
	.77	23.27	3.90	1.17	-.83
AG	.80	24.81	2.12	1.20	.86
	.75	20.39	2.69	1.31	.28
	.90	24.56	2.08	1.37	.99
	.75	24.93	1.68	1.12	1.62
AX	.78	25.89	1.71	1.14	1.57
	.64	16.19	3.03	1.38	-.06
	.94	26.59	2.19	1.35	.83
	.68	16.36	2.90	1.45	.11
SH	.93	32.31	1.83	1.16	1.33
	.90	29.86	1.92	1.19	1.16
	.87	31.51	1.67	1.11	1.65
	.89	25.08	2.13	1.33	.86
HL	.95	33.12	1.83	1.17	1.33
	.90	31.09	1.84	1.17	1.25
	.90	32.16	1.75	1.13	1.44
	.91	32.96	1.74	1.13	1.46

Not. EN: Enjoyment, HO: Hope, PR: Pride, RE: Relief, AG: Anger, AX: Anxiety, SH: Shame, HL: Hopelessness, BO: Boredom

Concurrent Validity of the AEQ-S

The correlation of students' AEs across different academic settings: class, learning, and test was examined. Different emotions, such as enjoyment, anger, frustration, and boredom, were assessed using 24 scales. A high level of consistency was observed, with correlations ranging from .82 to 1.00. The AEQ-S subscales are significantly related to several other constructs, including epistemic emotions, academic buoyancy, and academic satisfaction. For example, the enjoyment related to the class with career adaptability ($r = .39$) curiosity ($r = .11$), enjoyment ($r = .12$), frustration ($r = -.08$), and boredom ($r = -.08$) in the epistemic emotions, as well as academic buoyancy ($r = .19$), and academic satisfaction ($r = .34$) has a significant relationship at the level of .01, while the AE of enjoyment in class has no significant relationship with surprise, and confusion.

Therefore, AE enjoyment showed the highest correlation with career adaptability, academic satisfaction, academic buoyancy, enjoyment, curiosity, frustration, and boredom respectively. This explains that being satisfied with

the education and the ability to cope effectively with everyday problems and challenges without feeling uncomfortable has a more positive and significant relationship than other variables with the enjoyment related to activities and outcomes.

Table 2 presents the Pearson correlation coefficients between AEQ-S and its subscales with epistemic emotions, career adaptability, academic buoyancy, and academic satisfaction. As seen in the example above, the results indicate that, as anticipated, the AEQ-S and its subscales have a positive relationship with positive epistemic emotions, academic buoyancy, and academic satisfaction, and a negative relationship with negative epistemic emotions. According to some research (Vogl et al., 2021), the emotion of surprise can be both pleasant and unpleasant, which in the current research has a positive relationship with negative emotions.

Table 2
Correlation of AEQ-S subscales with other measures

Emotion	Setting	M	SD	CA	CU (EES)	SU (EES)	CO (EES)	EN (EES)	AX (EES)	FR (EES)	BO (EES)	Buoyancy	Satisfaction
EN (AEQ-S)	C	14.63	3.8	.39**	.11**	-.001	-.07*	.12**	-.05	-.08**	-.08**	.19**	.34**
	L	15.88	3.30	.50**	.23*	-.04	-.11*	.19*	-.10*	-.13*	-.09*	.27**	.44*
	T	12.14	4.50	.35*	.12*	.01	-.09**	.17**	-.08*	-.08*	-.07*	.35**	.34*
HO (AEQ-S)	C	15.09	3.57	.56**	.14*	-.07*	-.16**	.14**	-.15*	-.17**	-.13*	.36**	.51**
	L	15.88	3.57	.53**	.20*	-.07*	-.15**	.18**	-.14*	-.17**	-.12*	.37**	.53**
	T	13.62	4.08	.44**	.12*	-.04	-.13**	.16**	-.12**	-.13**	-.08*	.43**	.55**
PR (AEQ-S)	C	15.63	3.23	.54**	.13**	-.02	-.11**	.13**	-.08**	-.13**	-.10*	.29**	.50**
	L	16.27	3.30	.55**	.14**	-.01	-.10**	.15**	-.08**	-.12**	-.07**	.34**	.52**
	T	13.87	3.96	.47**	.16**	-.01	-.10**	.20**	-.08*	-.12**	-.08*	.37**	.55**
RE (AEQ-S)	C	15.61	3.64	.16**	.10*	-.02	.01	.10**	.01	-.03	.01	.14**	.22*
	L	9.35	4.01	-.08*	.03	.21**	.22**	.02	.24**	.24**	.23**	-.13*	-.25*
	T	8.22	4.05	-.16**	-.02	.31**	.32**	-.01	.31**	.33**	.31**	-.11**	-.28**
AG (AEQ-S)	C	8.57	3.99	-.17**	.04	.30**	.31**	.11**	.32**	.31**	.32**	-.19**	-.29**
	L	7.53	3.80	-.17**	-.01	.28**	.30**	.01	.33**	.30**	.28**	-.22**	-.28**
	T	8.63	3.96	-.24**	.01	.31**	.34**	.03	.34**	.33**	.31**	-.23**	-.34**
SH (AEQ-S)	C	7.69	4.43	-.24**	.01	.29**	.30**	.01	.31**	.29**	.24**	-.22**	-.29**
	L	7.68	4.13	-.27**	.01	.30**	.34**	.02	.33**	.34**	.31**	-.23**	-.36**
	T	7.55	4.19	-.21**	-.03	.34**	.37**	.01	.39**	.38**	.35**	-.22**	-.31**
HL (AEQ-S)	C	6.73	3.79	-.26**	.02	.28**	.29**	.03	.29**	.29**	.26**	-.21**	-.36**
	L	6.98	3.91	-.29**	-.02	.29**	.31**	-.01	.33**	.34**	.30**	-.20**	-.38**
	T	7.16	4.20	-.26**	-.01	.28**	.30**	.03	.34**	.34**	.30**	-.26**	-.39**
BO (AEQ-S)	C	8.61	4.45	-.27**	.01	.20**	.23**	.04	.20**	.24**	.23**	-.16**	-.34**
	L	8.30	4.47	-.33**	.01	.25**	.30**	-.01	.29**	.32**	.29**	-.17**	-.43**

Note. * $p < .05$; ** $p < .01$; CA: Career Adaptability, CU (EES): Curiosity, SU (EES): Surprise, CO (EES): Confusion, EN (EES): Enjoyment, AX (EES): Anxiety, FR (EES): Frustration, BO (EES): Boredom, EN (AEQ-S): Enjoyment, HO (AEQ-S): Hope, PR (AEQ-S): Pride, RE (AEQ-S): Relief, AG (AEQ-S): Anger, AX (AEQ-S): Anxiety, SH (AEQ-S): Shame, HL (AEQ-S): Hopelessness, BO (AEQ-S): Boredom, Buoyancy: Academic Buoyancy, Satisfaction: Academic satisfaction

Discussion

The purpose of this study was to verify the factor structure, reliability, and concurrent validity of the Persian form of the AEQ-S in a sample of Persian speakers. Generally, the scale was found to be reliable and valid for Persian speakers. This research makes an effort to expand the research process of emotions in Iran and to assess the psychometric properties of the above-mentioned scale in a group of academic students. In previous research, not enough attention has been paid to AEs, while they covered a large part of the students' condition, especially his academic life. As a result, there is a need for a measurement tool whose reliability and validity are specifically assessed among the group of students so that the current paper was to fill this lacuna.

Moreover, this study highlights the importance of distinguishing among various types of AEs and broadening their conceptual scope from a research perspective. It also calls for the development of a concise and comprehensive questionnaire to measure AEs in different contexts. The findings of this paper support the differentiation of AEs by showing how they vary across different educational situations. Overall, the theoretical multidimensionality and the empirical discrimination of the scales are among the strengths of this instrument (Berscheid et al., 1989).

The similarity of the factor structure of the Persian version of AEQ-S among Persian-speaker students with its original version shows the applicability of underlying logic AEQ-S in various types besides the explanatory infrastructure structures of the emotion provider resources in confronting motivating events in different educational settings. Our validation findings are consistent with those of Bieleke et al. (Bieleke et al., 2021), who developed and validated the AEQ-S. We found that the AEQ-S has a similar factor structure, internal consistency, and concurrent validity as the original AEQ-S. We also found that the AEQ-S measures three types of AEs: class-related emotions, learning-related emotions, and test-related emotions. These findings support the psychometric quality and theoretical basis of the AEQ-S as a brief and comprehensive measure of AEs in different academic contexts. They also corroborate the control-value theory of AEs (Pekrun, 2017), which posits that AEs are influenced by students' appraisals of control and value regarding their academic goals and tasks.

To evaluate the concurrent validity of the questionnaire, its correlation with the questionnaires of career adaptability, epistemic emotion, academic buoyancy, and academic satisfaction was calculated (see further explanation in Table 2) and with most of the research done in the field of constructive (Fredrickson, 2001; Shahabi et al., 2019; Sweeny & Vohs, 2012), and destructive (academic performance: Pekrun et al., 2009, 2011) emotions are consistent (Camacho-Morles et al., 2021; Pekrun et al., 2017; Putwain et al., 2022).

Regarding the reliability of the results, both the total questionnaire and its subscales were satisfactory (Cronbach's alpha between .78 and .81). These upshots were consistent with those reported by (Bieleke et al., 2021). Although

the alpha coefficients are similar, the difference produced can be justified considering the variability of the sample in terms of age and research context.

In general, the AEQ-S showed good reliability and validity for assessing AEs among students and, as a result, can be used by researchers interested in studying emotions in students.

As mentioned earlier, this study is the first research on the validity of a tool designed to assess AEs in Iran. On this basis, this scale can be used in correlational or experimental research. Therefore, it is expected that the process of AE research in Iran will grow faster with a valid and reliable tool. From a therapeutic and functional perspective, the Ministries of Education, the Ministry of Science, Research and Technology, the Ministry of Health, and other student-related organizations, such as schools and universities, can use this educational tool to screen students and all those in the field of emotions interrelated to tasks and results, and then protocols can be designed and implemented to create effective emotions related to activities and outcomes for this population.

Conclusion

We evaluated a short form of the AEQ to measure students' emotions in academic contexts. The AEQ-S had good reliability and validity. We also found that AEs were related to career adaptability, epistemic emotion, academic buoyancy, and academic satisfaction. These results indicate that AEs play a key role in students' academic and career development, and that the AEQ-S is a practical instrument for measuring them.

Limitations

In the present research, theoretical and empirical limitations are stated. 1) This scale is not a comprehensive measure of AEs, as it does not cover all the emotions that students may experience in relation to their academic activities and outcomes. It only includes some of the most common and relevant emotions, such as enjoyment, boredom, anger, anxiety, hope, pride, and relief. 2) The sample studied was academic students from Semnan province, and academic students from other provinces did not participate in this research. Hence, more research is required to overcome this limitation and enhance the applicability of the findings.

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Kratka forma Upitnika o emocijama postignuća: merni model i njegova povezanost sa prilagodljivošću u karijeri, epistemičkim emocijama, akademskom prilagodljivošću i akademskim zadovoljstvom

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Ova studija je imala za cilj da proceni psihometrijske osobine Upitnika o emocijama postignuća (AEQ-S) među govornicima persijskog jezika. Ukupno je učestvovalo 1153 (41,4% muškaraca) univerzitetskih studenata u uzrastu od 17-29 godina ($M = 21.63$, $SD = 2.24$). Učesnici su takođe popunili mere prilagodljivosti karijere, epistemičkih emocija, akademske prilagodljivosti (eng. academic buoyancy) i akademskog zadovoljstva. Konfirmativna faktorska analiza (CFA) je izvršena da bi se testirala faktorska upitnika. Faktorska struktura je bila slična faktorskoj strukturi originalnog uzorka (na kom je prvi put ispitivana skala na izvornom jeziku, prim. prev). Upitnik je pokazao visok nivo interne konzistencije (Cronbach's $\alpha = .93$ i McDonald's Omega = .87). Ispitana je i korelacija AEQ-S sa drugim instrumentima koji su korišćeni u ovoj studiji. Nalazi su pokazali da je kratka forma upitnika validno i pouzdano sredstvo za procenu emocija postignuća tokom studentskih aktivnosti i ishoda. Sa terapijske i praktične tačke gledišta, organizacije vezane za studente mogu koristiti ovaj obrazovni alat za skrining učenika.

Ključne reči: emocija postignuća, psihometrija, validnost, pouzdanost, učenici

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