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Factor Analysis Study of the Achievement Goal Framework in the Domain-Specific Task of EFL Writing

HUSAIN ABDULHAY*
Department of English Language and Literature, Arak University, Iran
MOUSSA AHMADIAN
Department of English Language and Literature, Arak University, Iran
Corresponding author email: husainabdolhay@yahoo.com

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Abstract
This study attempted to discern the factor structure of the achievement goal orientation and goal structure constructs across the domain-specific task of essay writing in an Iranian EFL context. A convenience sample of 116 public university learners participated in a single-session, in-class study of an essay writing sampling and an immediate post-task inventory completion. Cronbach's alpha reliability estimates for all the goal subscales ranged from .86 to .92, and the factor analysis results divulged that 33 items from the goal orientation and goal structure scale produced valid and reliable scores, with the seven-factor solution found to be well-fitted for the observed data. Principal component analysis revealed a two-factor model separating the goal subcomponent variables into a binary orientation and dichotomy of mastery and performance. Findings provided cultural and contextual support for the stability and applicability of the four-factor (2x2) achievement goal model; namely, mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance in specific domain of writing. The findings provided evidence that the three-factor goal structure is also invariant in the Iranian EFL context. All told, the findings imply the need for bridging the research gap on the interplay of person- and structure-related goals.

INTRODUCTION

Goal serves as a pathway through which learners make their ways to their desired end points. Achievement goal theory is the most widely adopted theoretical framework in academic contexts for conceptualizing achievement motivation and research (Senko et al., 2011; Urdan & Kaplan, 2020). Goal orientation as a feature of achievement motivation facilitates academic success(Wright & Lawson, 2005). In the achievement goal theory, goal orientation seeks to identify personal and contextual causes of an action by developing motivation and causing behavior (Wolters, 2004). It provides a socio-cognitive schema for the interpretation of motivation (Ames, 1992). It encourages the accommodation of emotional challenges in line with the objectives and the adoption of a specified action under certain circumstances (Elliot, 2006).

Goal-orientation is one of the indicators of students' higher academic performance (Lam & Zhou, 2022; Lerang et al., 2019). Academic achievement has a positive correlation to both mastery- and performance-oriented goal orientations (Richardson et al., 2012). Performance- and mastery-oriented goals strongly predict students' achievements (Abd-El-Fattah, 2006). However, different paths predict academic performance, with mastery-approach and performance-approach goals being both significant to academic performance (Mouratidis et al., 2018). Learners may pursue goals, both for the sake of enjoyment of the task itself and their grades at the same time (Chazan et al., 2022). Perceptions of evaluative and engaging performance-structured lecture classrooms have an impact on the adoption of achievement goals that in effect, influence learners' motivation, performance and grades (Church et al., 2001).

Writing achievement is pertained to the setting of goals, meaning that students who set goals and consecutively take appraisal of their writing progress attain higher grades (Zimmerman & Bandura, 1994). There are studies that show the relationship between students' goal orientations and writing achievements (Meece & Miller, 1999; Pajares et al., 2000). Encouragement of authentic writing goals, promotion of positive beliefs about writing, and establishment of a supportive writing environment and classrooms conditioned with positive emotions, all in effect, motivate students to write (Chase, 2011).

The achievement goal theory postulates that the prevailing goal structure in learning situations like classrooms affects students' adoption of achievement goals (Bardach et al., 2020). Dembo (2004) asserts that goals orient learners' performance and promote a path to success. The classroom environment affects students' perceptions of their achievement-related behaviors and outcomes (Chophy, 2018). Goal-based behaviors are also evident in classroom participation and effort investment. Lerang et al. (2019) insist on raising teachers' awareness of the effect of their support and relations with students on students' goal orientations and consecutive academic and social outcomes.

A goal structure promotes the adoption of personal goal orientations (Kaplan et al., 2002). A goal structure in the form of different environmental variables significantly influences goal orientations (Lerang et al., 2019). Typically, a classroom goal structure is perceived to be associated with personal goals (Fokkens-Bruinsma et al., 2020). The classroom climate is an important factor for students' well-being (Van Petegem et al., 2008). Goal orientation in educational environments is also associated with a learner's psychological well-being whose constitution is established by positive emotions and cognitive adaptive patterns (Kaplan & Maehr, 1999).

LITERATURE REVIEW

Achievement goal framework

In the 2×2 achievement goal framework, goal orientation is commonly made of mastery and performance as concepts of competence (Ames & Archer, 1987). Goal structure is conceptualized as an instructional environment, like a classroom or cocoon, and underscores goals (Wolters,

2004). However, achievement motivation is recognizable by its differentiation between approach or avoidance goals as functions of valence (Elliot, 1999). Both goal orientations and structures have a focus on approach or avoidance (Elliot, 1999; Middleton & Midgley 1997; Pintrich, 2000).

In the achievement goal theory, mastery orientation is conceptualized to expand or improve competence pertained to task- or self-related standards of success, while performance orientation is rendered as to portray or prove one's competence to others (Dweck, 1986; Nicholls, 1989). The approach focus relates to goals that prompt either engagement into learning or achievement situations, for attainment of (mastery-based) or demonstration of (performance-based) competence (Elliot, 2005; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001). The avoidance focus is concerned with goals that prompts avoidance of learning or achievement situation (Elliot, 2005; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001).

The mastery (or task-related) goal structure emboldens improvement and intellectual development, which is predictive of positive affect. The performance (or ego-related) goal structure underscores social comparison, competition, and elitism, which are all predictive of negative affect. As hypothesized, individual goals mediate these relationships (Kaplan & Maehr, 1999; Roeser et al., 1996); that is, in the mastery goal structure, where teachers emphasize understanding and personal progress in the classrooms, students pursue to endorse mastery goals by working on tasks for the sake of them and per improvement for success, which fosters positive affect. Conversely, in the performance goal structure, where teachers compare and push students to be better than others, performance goals are pursued, and the path to being the best threatens learners' self-esteem and imbues negative affect (Covington & Omelich, 1984; Kaplan & Maehr, 1999).

Past studies on 2x2 achievement goal model

Elliot and McGregor (2001), in a factor analysis study, revealed that 2×2 achievement goals have distinct constructs. Finney et al. (2004) verified the four-factor structure of the replicated goal orientation in a general academic context. Baranik et al. (2007) on two independent samples documented that responses to a truncated 18-item version of the instrument fit a four-factor model well, whilst removing five problematic mastery-avoidance items. Additionally, initial support found that each of the four goal orientations has a unique theoretical relationship with external criteria. Correlations among the four goal orientations divulged that they are related, yet discrete.

Multitudes of factor analysis studies stand by the distinct constructs of the performance-approach and performance-avoidance goals (Baranik et al., 2007; Conroy et al., 2003; Day et al., 2003; Murayama et al., 2009; Zweig & Webster, 2004). Bardach et al. (2022) showed evidence that the approach-avoidance distinction for the personal performance goal did not extend to the domain of goal structure. Dietz (2014) documented the relationship between the approach and avoidance items, as being comprised of uniquely distinct constructs. However, there are some studies that show strong positive correlations between performance-approach and performance-avoidance goals, raising concerns that performance-approach and

performance-avoidance goals may not be differentiated (see Bong, 2009; Brophy, 2005; Duda, 2005; Murayama, 2003; Roeser, 2004; Roeser et al., 2006; Tyson & Ben-Eliyahu, 2008; Urdan, 2004; Urdan & Mestas, 2006). There is also less empirical evidence to acknowledge mastery-avoidance goal orientations in terms of the approach and avoidance distinction (Maehr & Zusho 2009).

Cook et al. (2018) found a good model fit for the reliability and factorial model of the achievement motivation constructs, when they administrated it to178 high school students. Zhao et al. (2020), in examining the achievement goal structure constructs (mastery, performance, and performance avoidance) among teachers' perceptions of 3,149 Chinese school students, recorded a low to marginal internal consistency for the whole scale and subscales. The two-factor model provided the best fit for the data, implying culturally distinct achievement goal structures with different students. Bardach et al. (2020), in a meta-analysis study, indicated that all the achievement goals were the most strongly related to their contextual counterpart. Jansen in de Wal et al. (2015), in exploring 722 fifth- and sixth-grade elementary school students' achievement goal profiles in language and mathematics at three points in time, found three similar goal profiles and relatively stable personal dispositions at all measurement waves for both language and mathematics.

Chiang et al. (2011) recorded that the 2×2 achievement goal model also has a better dimensional structure in the Taiwanese context. Üztemur (2020) studied the achievement goal orientation of 259 Turkish middle public school students. Using a random sampling technique, the 2x2 achievement goal model was compared to the 3x2 model and showed a better fit as a result. Charalampou (2018), in a confirmatory factor analysis study, also endorsed the factorial and dimensional structure of 2x2 achievement goals for male and female learners.

Banzon et al. (2022) examined the goal orientation profiles of undergraduate writing students to see whether those goal profiles differ among 60 students engaging in multiple writing processes. The findings confirmed the occurrence of multiple goal profiles and the varied complexity of students' writing motivations. Miller (2019) found that majority of 165 Spanish second language students embrace all of the four goal orientations. Pesonen et al. (2023) also assumed the appropriateness of the pervasive three-factor model fared better than the four-factor model of achievement goal orientation (performance, mastery approach, and mastery avoidance). Tan and Miksza (2019), in a cross-cultural study, validated a collective achievement goal framework through sample of non-music-major college band students from the US and Singapore. The model yielded a superior fit to the data compared to four competing dichotomous and trichotomous models.

Studies on classroom goal structure and achievement goal

There is an interconnected relationship between classroom goal structures, achievement goals, individual processes (Kaplan et al., 2002) and learning strategies (Miki & Yamauchi, 2005). Classroom goal structures are often conduced in achievement goal orientations (Anderman & Midgley, 1997; Roeser et al., 1996; Shanon et al., 2012; Urdan, 2004). For instance, Guo and Hu (2021) studied the relationship among classroom goal structures, goal orientations, and

achievements in mathematics of 532 Chinese students using structural equation models, and found that classroom goal structures are related to the achievement motivation and achievement in mathematics.

Tossman et al. (2008) found that mastery goal structures are weakly related to performance goal structures for 6th grade learners and they were not linked with performance goals structure for 7th grade learners at all. Personal mastery goals were not attuned to personal performance-approach or personal performance-avoidance goals. For 6th grade learners, the mastery goal structure consisted of personal mastery goals, while the performance goal structure consisted of personal performance-approach goals. Interestingly enough, personal performance-avoidance goals were of little relevance.

Zimmerman and Bandura (1994) proved the nexus of goal-setting in writing achievement with higher writing grades gained by students who exercised goal-setting and took note of their writing progress. Mastery goal-oriented students are more probable to embrace writing tasks because of their verve in writing skill improvement (Church et al., 2001). According to Ames (1992), Pintrich, (2000), and Schunk (2001), these students reported higher levels of motivation than their counterparts who were performance-oriented. Performance-approach learners tend to enjoy an extrinsic motivation in their attempt to outdo their peers or gain their approval of their competence through higher scores (Elliot & Harackiewicz, 1996), or dodge tasks completely lest they should look incompetent and inept (Elliot & Church, 1997).

Alivernini et al. (2016), in a multilevel structural equation modeling study, examined the factor structures of personal and classroom goal structures and the relationship between them by administrating the adaptive learning scales (PALS) to a sample of 3,544 Italian 10th-grade students from 184 classrooms. Findings showed that the factor structure of the personal goal scale was consistent with other studies in different cultural contexts. Baudoin and Galand (2020) documented the simultaneous consideration of the relevance of personal goals to classroom goal structures using multilevel models. Simamora and Mutiarawati (2021), in a single cross-sectional study, also confirmed that the 2x2 achievement goal model is better and more accurate for measuring goal orientations of old-timer students and that the trichotomous model is better for newer students. Other studies also confirmed that the validity and reliability of the 2x2 model (Awofala et al., 2013; Korn & Elliot, 2016; Ratsameemonthon, 2015; Sanchez, 2015).

Substantial evidence exists that accredits the achievement goal framework (e.g., see Elliot, 2005, 2008; Pintrich, 2003; Senko et al., 2011). However, research on the utility of the dimensional structure of the 2×2 achievement goal model (Elliot & McGregor, 2001) is still insufficient (Chiang et al., 2011). According to Hofverberg and Winberg (2020), research on the interaction between achievement goals and goal structures is inadequate. However, an unexplored field of research in Iranian context is the construct validity of the dichotomous achievement goal model integrating goal orientations and structures in writing tasks. There also exists a dearth of research with a focus on addressing the inconsistent results of studies on multiple goal combinations. Thus, based on the existing literature and review of the research outcomes of the achievement goal theory, the present study aims to address the gap in

validation studies on goal orientations and structures in an Iranian EFL writing context. Accordingly, the following research question for which an answer would be found was formulated.

Q: Is there any differentiation between mastery- and performance-related goal orientations and goal structures with regards to their respective component constructs?

Based on the research question, the following hypothesis was also formed:

H: It is expected that there is a differentiation between mastery- and performance-related goal orientations and goal structures with regards to their respective component constructs.

METHODOLOGY

Study design

Guided by the study objectives and assumptions, this study built on multiple achievement goals (Elliot & Church, 1997) to examine the construct validity of four distinguishable measures of goal orientations and three measures of goal structures in academic writing. A one-off design was utilized to collect the data in a single session by taking writing samples, whereafter a survey was immediately handed over forthwith to participants to fill out. Since it was impossible for the teachers to afford providing more than one session for the study, the researchers had to administer essay tasks and questionnaires to every class in one go. Thus, a non-experimental design was set for the data collection process and analysis since this kind of one-off data elicitation (in the form of cross-sectional model) is cost-effective, allowing researchers to study numerous variables and prevent losses for the participants.

Participants

The data were collected from 116 sophomore undergraduate state-run university learners (47 males and 69 females), aged between 19 and 23 years old, from different classrooms with different teachers, majoring in English and taking an essay-writing course. The participants had already passed three two-credit courses; namely, a paragraph-writing course and two grammar ones. Moreover, the Oxford Quick Placement Test (2004) was administered to ensure the homogeneity of the participants in order to reduce variations and ensure a high internal validity in the data for the intended analyses. The participants' scores were ranked as being at the intermediate level of English language proficiency based on a standard deviation above and below the mean of their scores.

Instrument

The questionnaire was developed by Kaplan et al. (2009) from the Patterns of Adaptive Learning Survey (Midgley et al., 1998) and adapted for use in this study. This two-dimensional instrument, anchored on a 7-point Likert scale, ranged from strongly disagree to strongly agree, comprised

34 close-ended items for measuring achievement goal orientations and goal structures. The achievement goal orientation assessed four sub-components (see Appendix). It assessed mastery-approach goals, which were abbreviated as 'Ma', having five items of which "One of my goals when I did the writing assignment was to develop deep understanding of what we were learning" is one example. Mastery-avoidance goals were abbreviated as 'Mv', including three items in which one instance was "I was concerned that I might not learn as deeply as I could". Performance-approach goals were abbreviated as 'Pa'; had 5 items, e.g., "One of my goals in doing the writing assignment was to show others that I'm good at this work". Performance-avoidance goals were abbreviated as 'Pv' with four items, e.g., "One of my goals was to keep others from thinking I'm not smart in the writing assignment". The goal structure measure includes mastery goals ('Mg') with six items, e.g., "My writing teacher wanted us to understand our work, not just simply write.", performance-approach goals ('PaG') with 5 items, e.g., "My writing teacher told us how we compare to other students."), and performance-avoidance goals (PvG) with 6 items, e.g., "In our writing class, it is important that we don't look stupid." The simplicity and assertiveness of the mastery and performance division are among the appealing features helping this approach attract broad theoretical and empirical attention in the achievement motivation studies (Elliot & McGregor, 2001). Moreover, taking the initiative to examine the stability and suitability of the well-received model integrating goal orientations and structures ingrained with both intrapersonal and interpersonal achievement motivations were some grounds for proceeding with the study.

Validity and reliability of the instruments

Formers studies have demonstrated that these scales enjoy good evidence of both reliability and validity (e.g., Kaplan et al., 2009). However, to determine the internal consistency and reliability of the characteristics of the questionnaire used in this study, a pilot sampling with the size of 15 Iranian EFL subjects was conducted by computing Cronbach's alpha. After making sure that the questionnaires enjoyed satisfactory reliability and construct validity, the researchers used them for the main study. The classroom time for the essay performance lasted forty minutes, while the rest was used for the administration of questionnaires, which took at least thirty minutes based on the pilot test.

Procedures

Convenience sampling is a form of non-probability sampling method, and was used in the administration of the surveys, under the guise of quantitative data collection after the participants completed the writing task. The data collection was arranged to take place after midterms, which would ensure that learners had undergone adequate essay-writing instructions and practice, especially with argumentative essays. Accessibility of population and availability of classrooms were taken as criteria for assigning writing tasks and administrating instruments.

Permissions from the head of the faculties were obtained for carrying out the study so as to abide with the standards of research ethics by following their recommendations. Researchers contacted the university teachers in person to ask for their consents and make prearrangements to use their regular 90-min classrooms for the study, after explaining the research process and

aim. One of the researchers joined teachers in providing information to the participants about the value and objective of the research and the way the writing task and survey was to be completed. The researcher was personally in charge of data collection within the allocated classroom time, and explaining the objective and method of the study. Participants were ensured that their responses would remain confidential and would not have any effect or consequence on their grades in the end-of-semester final evaluation.

Data collection

Data collected was quantitative through the administration of an anonymous self-report questionnaire survey issued immediately after the participants had completed the in-class essay-writing task during their regular class time. To encourage their participation, the confidentiality of their information was once again ensured. The participants were informed of the rationale of the study and reassured that their responses to the task items would not have any effect or consequence on their end-of-term final evaluation. One of the researchers also gave instructions on the way to approach the writing task and fill out the instruments.

The participants were asked to anonymously perform the essay-writing task, fill out the survey and reply with maximum sincerity and honesty, as there were no correct or incorrect answers. They were assigned to write an argumentative essay, because this kind of written discourse usually requires more complex processing (Grabe & Kaplan, 2014) over other types of writing (e.g., narratives) and as a result, reveals more nuances in the composing process among individuals with diverse cognitive and motivational characteristics. Hyland (1999) proposed that argumentative writing is one of the most challenging genres for learners to master due to the necessity to generate and organize ideas into a logical and convincing argument. Argumentative writing also embraces a hierarchical and analytical structure that necessitates a systematic support of critical arguments.

Topics of argumentative writing tasks assigned were centered on the theme of gender differences as it is a controversial and debatable contemporary social issue that can prompt the participants to invest in the writing process. The participants also received general directions on the length of the assigned essay to consider in their arguments. They were informed to write at least a five-paragraph essay (including a general introduction paragraph, three detailed body paragraphs, and a general concluding paragraph). All the participants did the task in a single session and were guided by the researcher whenever they needed directions.

Data analysis

The data analysis was a dual-phase process. The survey data was quantitatively processed for missing values and outliers, using SPSS 21. The scores on the goal measures were then computed for mean, standard deviations, correlation, and reliability estimates using Cronbach's alpha coefficients, in the phase of descriptive statistical analysis. To further examine the achievement goal model, confirmatory factor analysis using principal component analysis was executed to testing the structural construct validity of the instrument. Two raters holding doctoral degrees in Applied Linguistics were asked to evaluate the participants' essay tasks. The IELTS scoring

profile was used to guide the overall assessment of the essays (Shaw & Falvey, 2008). It is also through the application of this internationally recognized standardized grading benchmark that the study sought to increase the reliability and validity of the findings.

RESULTS

This study examined the psychometric properties of the goal inventory (Kaplan et al., 2009) among a sample of Iranian university students. The following tables display the analytical computation of the data. Table 1 delineates descriptive statistics of the subscale variables used in the present study.

Table 1

Descriptive statistics of the subscale variables

	Mean	***Std. Deviation***
Mastery-approach goals	27.5960	6.82757
Mastery-avoidance goals	13.5948	5.12147
Performance-approach goals	21.0199	8.51937
Performance-avoidance goals	17.3947	6.98547
Mastery goal structure	35.2600	9.77013
Performance-approach goal structure	17.7434	8.61502
Performance-avoidance goal structure	22.6939	10.06664

As noted in Table 1, the highest mean score (35.26) was recorded for the mastery goal structure and the lowest one for the mastery-avoidance goals (13.59). This suggests that the learners perceived their classroom goal structure as being more mastery-based. Likewise, the standard deviation of the scores on the performance-avoidance goal structure scale was higher than that of the rest, indicating that the performance-avoidance goal structure scores were more widely spread.

Cronbach's alpha coefficients were computed to identify the internal consistency and reliability measures of the every subscale goal. A summary of the reliability statistics for all of the goal variables is in Table 2 below.

Table 2

Internal consistency and reliability of the factors

	Cronbach's Alpha	**N of Items**
Mastery-approach goals	919	5
Mastery-avoidance goals	928	3
Performance-approach goals	918	5
Performance-avoidance goals	888	4
Mastery goal structure	862	6
Performance-approach goal structure	893	5
Performance-avoidance goal structure	908	6

Cronbach's alpha coefficients were analyzed to assess the internal consistency and reliability of every subscale. Reliability analysis indicates that all the alpha coefficients fell well within the acceptable range, with actual values ranging from .86 to .92, thereby verifying the reliability of the constructs. As indicated in Table 2, the results exhibited the strongest overall internal consistency for mastery–avoidance and mastery-approach goals (.91 & .92, respectively), for performance-approach and performance-avoidance goals (.91 & .88) and for goal structures, namely, mastery goal structure (.86), and performance–approach goal structure and performance-avoidance goal structure (.89 & .90).

Confirmatory factor analysis using principal component analysis was carried out to examine the structural construct validity of the items for the achievement goal model. Before doing this, Kaiser's normalization and Bartlett's test of sphericity were also calculated to identify the appropriateness of the data for the factor analysis. With respect to the data adequacy for the factor analysis, the Kaiser-Meyer-Olkin (KMO) coefficient index needed to be greater than .50 and Bartlett's sphericity test result had to be yield a significant value (Field, 2013).

Table 3 depicts the results of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's sphericity tests. The factorial validity results for the items of the measurement tools are shown below.

Table 3

KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.835
Bartlett's Test of Sphericity Approx. Chi-Square	4035.086
df	561
Sig.	.000

As shown in Table 3, the significance value of the Kaiser-Meyer-Olkin test for the scores on the subcomponents were .000, indicating normality in the scores. KMO indices (.835) and Bartlett's sphericity test (X^2 = 4035.086, df = 561) provided evidence that the data were appropriate for factor analysis.

Table 4 illustrates the observed factor loading for all 34 items of the achievement goal orientation and goal structure measures using principal component analysis with varimax rotation.

Table 4

Rotated component matrix[a]

	Component						
	1	2	3	4	5	6	7
qPvG32	.834						
qPvG31	.809						
qPvG33	.791.751						
qPvG30	.695						
qPvG34	.690						
qPvG29		.861					

	Component						
	1	2	3	4	5	6	7
qMa2		.844					
qMa1		.844					
qMa3		.842					
qMa4		.769					
qMa5			.833				
qPa11			.822				
qPa9			.812				
qPa10			.785				
qPa12			.774				
qPa13				.862			
qMg21				.859			
qMg20				.821			
qMg23				.810			
qMg22				.612			
qMg19					.845		
qMg18					.806		
qPaG25					.732		
qPaG24					.721		
qPag26					.645		
qPaG27						.770	
qPaG28						.750	
qPV17						.750	
qPV16						.695	
qPV15							.918
qPV14							.881
qMV6							.862
qMV8							
qMV7							

Note. Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Table 4 shows the item loading on the seven components as extracted. The analysis yielded a meaningful seven-factor scale with eigenvalues larger than one, with factor solution accounting for 74.46% of the total variance. The ordering of the items arranged along rows lists items in sequence belonging to original goal orientation subscales. Additionally, each of the 33 standardized factor loading was statistically significant (see Table 4), indicating that all the items are strong indicators of the factors they are hypothesized to measure. As noticed, the item loading for the entries is greater than 0.6 for each item. As can be seen in Table 4, all items were loaded on their respective subscales except for one variable (Mg-18) defined for mastery goal structure goal row reported as blank because of its low loading, meaning

that the item needs to be reinterpreted. Otherwise, all items were neatly clustered into seven categories, and all items were loaded higher than six.

Table 5

KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.65
Bartlett's Test of Sphericity Approx. Chi-Square	263.97
df	21
Sig.	.000

As noticed in Table 5, the significance value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy for the scores on the subcomponents was found to be more than .000, indicating normality in the scores. KMO indices (.657) and Bartlett's sphericity test (X^2 = 263.975, df = 21) both provided evidence the data were appropriate for factor analysis.

Table 6 illustrates the eigenvalues and the percentage of the explained variance for each factor.

Table 6

Total variance explained

	Initial Eigenvalues			*Extraction Sums of Squared Loadings*		
Component	***Total***	***% of Variance***	***Cumulative %***	***Total***	***% of Variance***	***Cumulative %***
1	2.692	38.452	38.452	2.692	38.452	38.452
2	1.464	20.920	59.372	1.464	20.920	59.372
3	.982	14.024	73.396			
4	.679	9.695	83.091			
5	.499	7.128	90.219			
6	.383	5.468	95.687			
7.	.302	4.313	100.000			

Based on Table 6, there are two factors extracted with eigenvalues higher than one. The first two factors possessed the highest eigenvalue and explained variance among factors. Their eigenvalues were 2.692 and 1.464, respectively, and accounted for 38.45 and 20.92% of the variance. In total, the seven factors accounted for 59.37% of the variance, which indicates sufficiency, since an acceptable variance ratio should come between 40% and 60% (Tavşancıl, 2014).

The structural validity of the subscales was determined through principal component analysis using varimax rotation, in which the eigenvalue of 1.00 was set as the threshold to determine the number of factors. Table 7 displays the results.

Table 7

Rotated component Matrix[a]

	Component	
	1	**2**
Performance – avoidance goal structure	.820	
Performance – approach goals	.785	
Performance – avoidance goals	.765	
Performance – approach goal structure	.731	
Mastery – approach goals		.849
Mastery – avoidance goals		.685
Mastery goal structure		.680

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

As noted in Table 7, the variables display loading on two components. Principal component analysis with varimax rotation ended up in a two-factor solution, with goal orientation and goal structure variables clustered into two factors, accounting for 59.372 percent of the total variance.

The fact that 59.372 percent of the scale explained deemed sufficient, since an acceptable variance ratio should come between 40% and 60% (Tavşancıl, 2014). Thus, this finding supports the hypothesis set for the present study that mastery- and performance-related goals replicated in this study belong to their respective components.

Table 8 exhibits correlation coefficients among achievement goal orientation and goal structure subscales.

Table 8

Correlations among measures of goal orientation & goal structure sub-variables

	1	2	3	4	5	6	7
1. Mastery-approach goals	-						
2. Mastery-avoidance goals	.432**	-					
3. Performance-approach goals	.150	.094	-				
4. Performance-avoidance goals	.227**	.292**	.612**	-			
5. Mastery-goal structure	.430**	.138	-.010	.145	-		
6. Performance-approach goal structure	.119	.043	.367**	.345**	.183*	-	
7. Performance-avoidance goal structure	.150	.140	.445**	.520**	.145	.600**	-

Note. **Correlation is significant at the .01 level (2-tailed).

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

Table 8 displays the interconnected relationships among the seven subscales. As shown, goal orientations and structures were associated with each other, mostly. The strongest association was between performance-avoidance goal structure and performance-approach goal structure (.60). There is a significant correlation between performance-avoidance goal structure and

performance–approach goals (.44). Performance-avoidance goal structure was significantly moderately associated with performance-avoidance (.52), whereas not significantly correlated with mastery-avoidance goals (.14). Performance-approach and performance-avoidance goals both were significantly related to performance-approach goal structure (.36 & .34, respectively). Mastery-approach goal was moderately correlated with mastery goal structure and mastery-avoidance goals both equally (.43) and related significantly to personal performance-avoidance goals (.22). Mastery-approach goal was not significantly correlated with performance-approach goal structure and performance-avoidance goal structure (.11 & .15, respectively). Notwithstanding mastery-avoidance goal being significantly related to performance-avoidance goals (.29), this proved that it is not related to performance approach goals (.09). Mastery goal structure shows a negative correlation with performance-approach goals (-.01), while also not being significantly correlated with mastery-avoidance and performance-avoidance goals (.13 & .14, respectively).

DISCUSSION

This study aimed to examine the construct validity and factor structure of achievement goal orientation and structure of a sample of Iranian EFL state-run university learners within the specific domain of an academic writing context. In relation to the aim of this study, it was hypothesized that the there is a differentiation between mastery- and performance-related goal orientations and goal structures with regards to their respective component constructs. The result of the hypothesis testing yielded that the two-factor solution model assessing goal orientation and structure was an acceptable fit. Therefore, the findings of the current study demonstrate that the 2x2 achievement goal model provides a robust measure for evaluating goal orientation and structure in an Iranian EFL writing context.

To address the posed research question, principal component analysis on the achievement goal orientation and structure was computed. The findings from the PCA analysis provided empirical evidence on the internal consistency and factorial structure of the instrument administered to Iranian contexts. The instrument demonstrated satisfactory factorial and discriminant validity evidence applied to EFL writing settings. The factor loadings on each of the indicators were significant and acceptable. However, standardized pattern coefficients (i.e., factor loading) for mastery-avoidance and performance-avoidance subscales were lower than values for the mastery-approach and performance-approach subscales, which corresponds to the findings of the study done by Hargis et al. (2004) and Miller (2004).

The present study provides evidence for the construct validity of the achievement goal structure. The outcomes indicate that the expected hypothesis for this study can be substantive. A two-factor structure clustering mastery-related and performance-related goals into two distinct dimensions made a good fit for the observed data. The obtained results take note of the fact that mastery and performance goals are discrete. The result that achievement goal orientation and structure scale extrapolated to the writing domain in the Iranian EFL context is culturally invariant within the present sample size. This means that the 2×2 achievement goal model agrees with the Iranian EFL learners, being both mastery- and performance-oriented, and

adopting both approach and avoidance strategies in their writing tasks. Categorically, the outcomes provide strong support for the goal orientation and structure framework extrapolated to an Iranian setting, eliciting similar perceptions analogous to the original measurement. It implies that goal orientation and structure variables are significant to Iranian EFL learners involved in the process of an academic writing course. They are bent on doing the writing task, simultaneously paying attention to social normative competition and personal competence demonstration, and are motivated by task-relevant and structure-based end states, respectively.

The findings also present good internal consistency and reliability for all the subscales. The reliabilities (Cronbach's alpha) of all the goal sub-scales were high, ranging between .86 and .92. Cronbach's alpha estimates for mastery, performance-approach, and performance-avoidance subscales of the original PALS manual (Midgley et al., 2000) were reported to be 0.85, 0.89, and 0.74, respectively. Cronbach's alpha value for mastery-avoidance was higher than that of mastery-approach, and the value for performance-avoidance subscale was lower than that of performance-approach subscale. Reliability confirmed the existence of the 2x2 achievement goal framework. The motivational theory of goal orientation seems able to be extrapolated adequately to the educational setting of EFL programs in Iran.

With regards to the validity study, the results divulged that the items that have ties to theoretical constructs relate well to each other and items that form a construct are adequately distinguishable from items of another construct. The results of the present study indicated that all four dimensions contained in the instrument related to mastery goals fell into the mastery factor. In a similar fashion, all three dimensions related to performance goal orientation and structure constitute one factor to understand the characteristics of the performance-based goals. Notably, the factor structure of the achievement goal-orientation scale is akin to a study by Elliot and Mcgregor (2001). All goals were divided two-fold into definition and valence standards of competition, namely, mastery and performance and approach and avoidance, respectively, as endorsed in the achievement goal orientation and structure profiles of EFL learners. The inventory proved to be a psychometrically sound scale for the teachers to assess effectively the nature of goal orientations and structures in the Iranian EFL university context and to design intervention programs and for learners to do self-appraisal.

Confirmatory factor analysis using principal component analysis with varimax rotation indicated that the seven-factor structure, listing 33-item final solution, had a good data fit. PCA results showed that the scale partitioned into two dimensions, viz. goal orientation and structure, compared to the original questionnaire, constitutes the same factor structure corresponding to the 2x2 tetra-goal formulation. Factor analysis showed that all items had moderate to high factor loading values, ranging from .61 to .91, to the corresponding factor. The outcomes showed that from the sample of Iranian EFL learners, except for one item from mastery goal structure, the respective items loaded on the respective factors.

The upshots of this study confirmed the constitution of the definition and valence dimensions of competence in achievement goal orientation and structure. The findings provided evidence of substantiation of the polarization of mastery and performance goals. Distinction between mastery and performance component constructs in this study suggests a confirmation of the

assumed dissonance for the defining parameters of competence between these factors in pursuit of objective, intrapersonal, absolute, and self-referenced standards, or in contrast, normative, interpersonal, and ego-referred standards. The bifurcation of mastery and approach goals into approach and avoidance factors reinforces the existence of valence parameters for estimating the possibility of positive or negative consequences in considering their plans accordingly. Thus, the replicated framework supports the previous theoretical formulation of achievement goal orientations and goal structures for a classroom writing task in the Iranian EFL context.

With respect to the research grounded in a dichotomous model of achievement goals, this study makes a strong statement regarding the motivational dimensions of multiple goal-related orientations. This finding was consistent with the study by Basit (2017) who found that students embraced multiple goal orientations. Correspondingly, Linnenbrink (2005) found that the most beneficial classroom context is one in which learners adopt both mastery and performance approach goals. Hence, it is advisable for teachers to promote personal achievement and structure goals simultaneously as both are welcomed by the learners, as shown in this study. Additionally, the examined psychometric quality of the measurement tool can directly exert impact on the precision of research in EFL programs.

Significant correlational relationships further substantiate the findings of the current study. Results of inter-correlation analyses divulged that there were positive significant correlations among the seven subscales. Relations established between achievement goal orientation and structure variables support the validity of the measure. This result implicates the credibility of the goal measure as an invaluable research apparatus that can be applied to EFL contexts to study the motivational patterns of university learners participating in writing programs. However, mastery-approach did not correlate with performance-approach goals, while the performance-approach goal orientation had no relationship with mastery avoidance goal, demonstrating separateness in their constructs.

The mastery and performance goals were distinguishable, and are not correlated with each other. Mastery goal structure reported a negative correlation with performance-approach goal, in contrast to the findings by Lüftenegger et al. (2017), which reported a positive relation between mastery classroom goal structures and performance approach goals. It conveys that the scale clearly separates the students' personal perceptions from their perceptions of the goal structure of the classroom learning and writing environment. It is implied that these two types of orientation goals are distinct, and elicit qualitatively different motivational patterns in the EFL writing context. The more mastery-based structure is exercised in the EFL writing environment, the less performance goals are pursued. Performance avoidance goal structure had no significant relationship with mastery goal structure. This implies that mastery and performance goals are mutually exclusive, making a distinction between mastery and performance goal structure.

However, the performance-approach goal structure had significant relationship with mastery-approach goal structure. Mastery approach goal had a significant relationship with mastery goal structure. Performance approach goal structure and performance avoidance goal

structure were related significantly to each other. The personal performance approach and avoidance goal orientation had a significant correlation with each other. This implies that either one or the other type of goal structure is pursued but not both simultaneously. Noteworthy results concern the significant linkage of performance approach to performance avoidance goals at a moderate level and the correlation between personal mastery and performance avoidance goals, which were also in agreement with the findings of a study by Soylu et al. (2017).

Consistent with the proposed hypothesis, results divulged a two-factor model including goal orientation and structure bifurcated into mastery and performance components. A two-factor structure splitting mastery and performance into separate components makes it plausible as to proffer strongly empirical-based evidence on the separation of these goals in an Iranian EFL setting. As a whole, the findings indicated that the two targeted achievement goal measurements are capable of gauging the same achievement goal constructs.

The findings of this study yield important theoretical and pedagogical implications. Theoretically, this research provided empirical evidence for the compatibility and applicability of achievement goal theory (Elliot & Church, 1997) in the field of EFL academic writing in the university context. More importantly, the present research signifies the motivating role of achievement goal orientation and structure in the writing process of EFL learners. This finding is encouraging for teachers and curriculum developers as more heed should be paid to the establishment and endorsement of goal orientation and structure in the essay writing course design and development. Additionally, the current study was also unique in that it provided evidence for the existence of the multiplicity of achievement goal profiles in Iranian EFL learners. Adoption of the different goals witnessed by the EFL learners' profiles paves the way for different academic outcomes, facilitating a transition to the adoption of a goal that is more workable and responsive.

The current study also adds to the body of literature on goal achievement by disclosing the existence of distinct constructs of approach and avoidance in the mastery and performance constructs of goal orientation and structure in an EFL writing program. Schooling systems and admission to higher education tied to rating and grading may inadvertently heighten and intensify the competitive spirit among students rather than their cooperative spirit, dictating and inculcating the adoption of performance-oriented goals regardless of how much effort instructors invest in the establishment of the mastery goal structure. However, every learning situation brings along ensuing goals and objectives, an identification of which helps teachers discern circumstances that encourage follow-ups to secure a solution to the problem and eliminate barriers to progress.

Pedagogically, the findings could inform EFL settings of the utility of goal orientation and structure for intervention studies. The results implied that EFL learners embrace all achievement goals for different reasons. Specifically, the upshot of the study endorses the acknowledgment of the approach and avoidance motivation in the framework of goal orientation and structure. The mean score for mastery goal structure was higher than any other variables, and a higher score on this scale indicates a higher level of mastery-grounded goal structure. Teachers should

help students endorse mastery goals by highlighting the significance of mastery goals and creating mastery goal structures in the classroom (Wang et al., 2022). Thus, teachers should highlight the significance of multiple goals for learners, embracing goal structure and orientations that take into account normative and mastery competencies. The perspective of multiple goals purports that the co-occurrence of mastery and performance goals is not contradictory (Chazan et al., 2022; Pintrich, 2000).

This instrument validated can render multiple valuable applications in EFL educational programs as well. It permits students to better identify and understand the specific goal orientations they pursue and weigh these orientations for their academic and professional consequences. Educators and curriculum developers also can exploit this measure to gauge educational patterns of goal orientations to better discern their motivations and dispense exigent prescriptions that would help them to become more efficacious and academically successful. Taken together, the findings of the present study are in line with PALS in which the learner's perception of personal achievement goals is asunder from that of goal structures in the learning environment.

The present study puts a premium on examining achievement motivation in EFL settings. The present study provides evidence that the mastery-performance and approach-avoidance distinctions represent fine-grained, structural aspects of competence-valence motivation. The provocative role of goal structure in inciting affect and motivation for approaching and avoiding personal goals invites curriculum developers and educators to pay more heed to the importance of this determinant faculty. For betterment and improvement of the education system and social establishments, more cultural studies regarding goal patterns need to be carried out. This calls for more investigations that take into account achievement goals both at person- and structure-based levels.

In sum, the present study provides evidence for the validation of the 2x2 achievement goal framework within the context of EFL writing. This study also provides insight into the nature and patterns of adoptions and endorsement of goal orientation and structure among Iranian EFL learners within the context of academic writing. The validation of the 2x2 achievement goal model provides a theoretically sound and methodologically valid and reliable measurement for evaluating the achievement goal levels and orientations of EFL learners. According to Dweck and Leggett (1988), the interpretation of and reaction to events is a framework created by the nature of goals individuals follow. The achievement goal theory was exploited for understanding individuals' behaviors (Farr et al., 1993; Kanfer, 1990). Goal profiles were disassembled to convey their efficacious and cognitive functions in understanding resultative behavior. Using this validated scale paves the way for tailoring to the psychological needs of EFL learners as to secure their salubrious stays at learning programs, upgrade their engagements, and help them realize their socio-educational aspirations.

CONCLUSION

This study aimed to measure the underlying constructs of the achievement goal orientation and goal structure extrapolated to an essay writing task in an Iranian EFL context. As far as the research hypothesis is concerned, it was expected that there would be a differentiation between mastery- and performance-related goal orientation and structure with regards to their respective component constructs. The factor analysis provided support for the postulated hypothesis. Results of the present study disclosed that the achievement goal measurement replicated in Iranian EFL context showed similar psychometric characteristics (Cronbach's alpha and factor analysis) to original PALS (pattern of adaptive learning survey). Reliability and validity analyses confirmed the existence of the four-factor achievement goal model in an EFL setting. Based on the outcomes, the goal orientation and structure inventory are deemed appropriate for discerning the achievement motivation of EFL learners in essay writing task.

This study evidenced an adequate degree of internal consistency for the goal orientation and structure scale extended and extrapolated to a cohort of university EFL learners. Cronbach's alpha reliability coefficients for each subscale administered in the sample of Iranian EFL learners ranged between .86 and .92. Based on the principal component analysis, the findings also illustrated that the seven subscales measured the same latent constructs of achievement goal orientation and structure. The outcomes of the factor analysis lend support to the robustness of the theoretical constructs extended to the Iranian EFL writing context. The seven-factor subscale partitioned into a discrete dichotomy of mastery and performance proved to be a good fit for the observed data. Findings proved that all three mastery-related goals (mastery-approach goals, mastery-avoidance goals, and mastery goal structure) and four performance-related goals (performance-approach goal structure, performance-approach goals, performance-avoidance goal structure and performance-avoidance goals)) were clustered distinctly into their respective component constructs.

In short, this study corroborated a 2x2 achievement goal framework, by hewing asunder mastery from both performance and approach from avoidance goals. The factor structure of the adopted framework for this study was akin to that of the model developed by Elliot and McGregor (2001). It implies that 2x2 achievement goal model is applicable to Iranian EFL contexts. As a result, a validation study of replicated achievement goal measure can help expedite understanding and consequently, the ameliorating of motivational patterns in Iranian EFL contexts. The application of the validated achievement goal model enables scholars to deepen research on the relations of goal structure, representing situational aspects of the classroom to learners' goal-based achievement motivation and behaviors. Future studies might examine the applicability and generalizability of the achievement goal models to schooling settings. To conclude, the interaction between personal goal orientations and classroom goal structures in mediating learners' overture to achievement and performance settings can be a subject of future studies.

THE AUTHORS

Husain Abdulhay holds a Ph.D. in applied linguistics at the Department of English Language and Literature, Arak Univesity, Iran. His research interests include self-regulated learning and educational psychology.
husainabdolhay@yahoo.com

Moussa Ahmadian is currently an associate professor at the Department of English Language and Literature at Arak University, Arak, Iran. He received his Ph.D. from Sheffield University, UK in 1995. His fields of interest are applied linguistics and second language acquisition studies, translatology, and comparative literature. He has also published and presented a number of papers in inter/national journals and conferences.
m_ahmadian@arak.ac.ir

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Appendix

Goal inventory adapted by Kaplan, Lichtinger, and Gorodetsky (2009) from patterns of adaptive learning survey (Midgley et al., 2000)

Instructions: If you think the statement is very true of you, please check 7; if a statement is not at all true of you, check 1. If the statement is more or less true of you, find the number between 1 and 7 that best describes you.

Not at all true of me 1 2 3 4 5 6 7 Very true of me

Mastery–Approach goals

1. It's important to me that I learn as much as I can from the writing assignment.
2. In writing the assignment, it was important to me that I improve my skills and knowledge.
3. One of my goals when I did the writing assignment was to learn as much as I could.
4. It was important to me to really understand what there was to learn from the writing as signment.
5. One of my goals when I did the writing assignment was to develop deep understanding of what we were learning.

Mastery–Avoidance goals

1. I was worried that I won't learn all there is to learn from the writing assignment.
2. I was afraid that I might not learn all that I could from the writing assignment.
3. I was concerned that I might not learn as deeply as I could from the writing assignment.

Performance–Approach goals

1. When I did the writing assignment, it was important to me to look smart in comparison to the other students in my class.
2. When I did the writing assignment, one of my goals was to look smart compared to others in my class.
3. One of my goals in writing was to show others that this assignment was easy for me.
4. When I was writing, it was important to me that other students in class think I am good at it.
5. One of my goals in doing the writing assignment was to show others that I'm good at this work.

Performance–Avoidance goals

1. It was important to me that I didn't look stupid when I did the writing assignment.
2. When I did the writing assignment, it was important to me that my teacher didn't think that I know less than others in class.
3. One of my goals in the writing assignment was to keep others from thinking I'm not smart.
4. One of my goals in the writing assignment was to avoid looking like I have trouble doing the work.

Mastery goal structure

1. My writing teacher thinks mistakes in this writing assignment are okay as long as we are learning.
2. My writing teacher wanted us to understand our work, not just simply write it.
3. My writing teacher really wanted us to enjoy writing this assignment.
4. My writing teacher gave us time to really explore and understand new ideas in this assignment.
5. My writing teacher helped us see how what we are writing about relates to real life.
6. My writing teacher encouraged us to find interesting and different ways for doing the writing assignment.

Performance–Approach goal structure

1. My writing teacher points out those students who get good grades in writing assignments as an example to all of us.
2. My writing teacher lets us know which students get the highest scores on writing assignments.
3. My writing teacher told us how we compare to other students in writing.
4. My teacher told us that our main goal in writing this assignment should be to get the best scores.
5. In this class, it is very important to get the highest scores in writing assignments.

Performance–Avoid goal structure

1. My writing teacher said that one of our goals should be to show others that we are not bad in writing.
2. My writing teacher told us that it is important that we do the writing assignment so it doesn't look like we can't do the work.
3. In our writing class, it is very important to students to show others that they are not bad in writing.
4. In our writing class, it is very important not to make mistakes in writing when others are watching.
5. In our writing class, it is very important not to get lower scores than others.
6. In our writing class, it is important that we don't look stupid.