Dimensionality in the Measurement of the Two-Axis Model of Learning Motivation

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───────────── **Abstract** ─────────────

The purpose of the current study was to examine the dimensionality and factorial structure of the two-axis model of learning motivation （Ichikawa, 1995, 2001）. The model posits six factors aligned along two axes that account for the degree of the importance of course content and the utility of learning outcomes. The two axes （two levels for importance of content and three levels for utility of learning outcomes） involve six factors: Fulfillment, Training, and Practicality for higher importance of content, and Relation, Self-respect, and Reward for lower importance of content. Two-hundred-forty 2nd-year Japanese university students completed a 36-item questionnaire that measured the six factors posited in the model. The results of factor analyses revealed that five of the scales were sufficiently unidimensional, while one scale exhibited a possible second dimension. Deleting three items per scale resulted in clear, unambiguous factor loadings. The findings suggest that some of the questionnaire items should be revised or removed to improve the psychometric properties of the testing instrument.

Keywords: learning motivation, two-axis model, dimensionality

Motivation has been identified as one of the most influential individual difference variables in second language learning. Numerous models of motivation can be found in the literature, and each model tends to posit a unique combination of factors that constitute the motivational aspects of second language learning. One such model is the two-axis model of learning motivation proposed by Ichikawa (1995, 2001). Several studies have reported on the validity of this model (e.g., Horino & Ichikawa, 1997; Kubo, 1997; Maeda, 2003, 2004). However, few studies have examined the instruments used to measure the constructs in the model. The purpose of the present study was to examine the factorial structure of the two-axis model of learning motivation.

The Two-Axis Model

Ichikawa （1995） developed the two-axis model of learning motivation using a bottom-up approach. He collected free comments about learning motivation from university students and categorized them as follows. First, on the basis of the concepts of intrinsic and extrinsic motivation, affiliation motivation, and achievement motivation, he categorized the statements related to rewards and punishment as extrinsic motivation, the statements related to desire as affiliation

motivation, and the statements related to intellectual interest as intrinsic motivation. These three categories were then named reward orientation, relation orientation, and fulfillment orientation, respectively. He also created the categories of practicality, self-respect, and training. Practicality indicated that learners considered learning to be instrumental and placed importance on the content to be learned. The category of self-respect included those statements related to the desire to compete with others and to be superior to others. Training was comprised of the statements related to the improvement of intellectual ability. Then, he developed a learning motivation questionnaire that included items which targeted the six hypothesized constructs and offered evidence for the validity of a model of learning motivation.

The model is depicted as a two-by-three matrix with two axes. One axis indicates the degree of the importance of the content to be learned (high or low) while the other indicates the degree of the utility of learning outcomes (high, middle, or low). Accordingly, six types of motivation were proposed. Fulfillment orientation, training orientation, and practicality orientation represent the importance of the content to a learner; the other three (relation orientation, self-respect orientation, and reward orientation) represent a lower degree of importance. Fulfillment and relation orientations are at the low point in terms of the utility of learning results, whereas practicality and reward orientations are at the high point in terms of the utility of learning results.

Ichikawa (2001) considered the relationship between the two-axis model of learning motivation and intrinsic-extrinsic motivation (see Kage, 1994, 1995; Ryan & Deci, 2002). In his framework, he considered extrinsic motivation to be positioned as reward orientation; on the other hand, intrinsic motivation was positioned as fulfillment orientation. In other words, the continuum of intrinsic-extrinsic motivation can be drawn diagonally in the two-axis model of learning motivation. Thus, intrinsic-extrinsic motivation may be unidimensional according to the degree of external rewards, but the two-axis model added a new dimension, that is, the learners' perception of the importance of content.

Ichikawa (2001) used 36 items (6 items for each type of motivation) to measure learning motivation. In order to explore the relationship between learning motivation and English vocabulary learning strategies, Horino and Ichikawa (1997) administered questionnaires about general learning motivation and strategies to 321 3rd-year senior high school students (12th graders) and collected the academic grades of the students. One of the findings was that fulfillment, training, and practicality orientations correlated with one another while relation, self-respect, and reward orientations correlated with one another. They referred to the former as content-attached motives and the latter as content-detached motives. Thus, they found that the axis of the importance of learning content should be primary. They suggested that the framework of intrinsic-extrinsic motivation, which considers the axis of the utility of learning results to be significant, may not be appropriate. They also showed that content-attached motives related to the use of learning strategies, whereas content-detached motives did not. In addition, one of the learning strategies, that is, organization strategies, correlated with English learning achievement.

The questionnaire used in Ichikawa (2001) and Horino and Ichikawa (1997) consisted of items about general learning motivation. Horino and Ichikawa (1997) focused on general learning motivation, but they did not examine motivation to learn English. Several studies have utilized the two-axis model of learning motivation in order to measure motivation to learn English.

Kubo (1997) reported two studies, one of which was to develop a questionnaire to explore motivation to study English on the basis of the two-axis model. First, she developed a 51-item questionnaire (8 to 9 items per motivation type), administered it to 434 Japanese university students learning English, and analyzed the data from 425 students. A factor analysis resulted in a two-factor solution: a Fulfillment-Training factor and a Self-Respect-Reward factor. Finally, she developed a 22-item questionnaire about English learning motivation with 11 items for each factor. In addition, she performed a two-way analysis of variance with major and sex being between-subjects factors. She found that the main effect of major was statistically significant for the two factors while the main effect of sex was statistically significant for only the Fulfillment-Training factor. Although statistical significance was found between female and male students and between science majors and non-science majors, she suggested that her questionnaire can be valid for both attributes of each factor because both yielded a similar factor structure.

Maeda (2003) developed a 7-point Likert-type scale questionnaire about motivation to study English on the basis of the two-axis model. The questionnaire consisted of three items for each type of motivation. He administered the questionnaire to 1, 177 senior high school students. He divided his participants into three proficiency groups based on the results of a C-test. Through confirmatory factor analysis and multi-group confirmatory factory analysis (structural equation modeling by simultaneous analysis for multiple groups), he attempted to examine the extent to which the two-axis model could be applied to Japanese high school students with English proficiency levels taken into consideration. Results supported the validity of the questionnaire and showed that learners with higher proficiency tended to have stronger motivation in the content-attached motives such as fulfillment and practicality, whereas different proficiency groups did not vary in content detached motives.

Maeda (2004) attempted to cross-validate these results with a new sample of Japanese senior high school students and a revised version of the questionnaire. For his second study, he developed a 5-point Likert-type scale questionnaire with 36 items (six items for each type of motivation). He administered the questionnaire to 1,584 senior high school students who were divided into three proficiency groups based on the results of a C-test. Again, results of a multi-group confirmatory factor analysis confirmed the validity of the two-axis model of motivation.

Thus, previous studies lent support for the validity of the two-axis model of motivation for Japanese senior high and university learners of English. However, item-level analyses of the questionnaires are scarce in the literature. To further and more strictly examine the instruments used to test the two-axis model of motivation, this study attempted to examine the validity of the two-axis model of motivation for university learners of English by considering item functioning and scale dimensionality.

Research Questions

Two research questions guided this study:

1．What is the dimensionality of the factors in the two-axis model of learning motivation?
2．Does a six-factor structure adequately account for the relationships in the model?

Method

Participants

Initially, 262 2nd-year Faculty of Education undergraduate students of a national university in central Japan participated in the study. The quota of this faculty was 280 for each grade. With the permission of the instructors, the questionnaires were administered during general English courses, which were required courses for 2nd-year students. The participants were informed of the purpose of the study and of the anonymousness of the questionnaires. Participation was voluntary and unrelated to course grades. Of the 262 students that completed the questionnaires, 22 students who did not indicate participatory agreement on the consent form or exhibited missing data were excluded from the analysis. The responses from the remaining 240 participants were analyzed.

Instruments

As reviewed above, so far three questionnaires based on the two-axis model have been created: （a）Kubo's （1997）22-item questionnaire scored using a 5-point Likert-type scale, （b）Maeda's （2003）18-item questionnaire scored using a 7-point Likert-type scale, and （c）Maeda's （2004）36-item questionnaire scored using a 5-point Likert-type scale. For the present study, we decided to use Maeda's （2004）version of the questionnaire for three reasons: （a）the items reflect the original concepts proposed by Ichikawa （2001）; （b）it focuses on motivation to study English; and （c）the number of items provided fuller coverage of the various constructs proposed in the model. The 5-point Likert-type scale used in the current study ranged from a rating of 1 （strongly disagree） to 5 （strongly agree）.

Analysis

To examine the factorial structure of the two-axis model of motivation, reliability statistics and correlations coefficients were computed, and exploratory factor analyses were conducted. These analyses were carried out in SPSS 18.

Results

Descriptive statistics for the six scales are shown in Table 1. PRAC3 had the highest mean score at 3.95, while REW2 had the lowest at 1.59 （see Table 7 for the content of the items）.

Table 1   Descriptive Statistics for the Learning Motivation Questionnaire Responses ($N=240$)

Item	M	SE	SD	Skewness	Kurtosis
FULF1	3.51	.074	1.14	−0.73	−0.18
FULF2	3.77	.068	1.05	−0.96	0.58
FULF3	3.40	.075	1.16	−0.54	−0.50
FULF4	3.61	.070	1.09	−0.79	0.03
FULF5	3.15	.077	1.19	−0.38	−0.72
FULF6	2.78	.074	1.15	0.09	−0.82
TRAI1	2.94	.077	1.20	−0.20	−0.92
TRAI2	2.68	.073	1.14	0.04	−0.97
TRAI3	2.66	.074	1.15	0.23	−0.74
TRAI4	3.43	.076	1.18	−0.68	−0.49
TRAI5	2.72	.074	1.15	0.22	−0.74
TRAI6	2.81	.077	1.19	0.09	−0.94
PRAC1	3.21	.078	1.21	−0.34	−0.80
PRAC2	3.40	.073	1.13	−0.43	−0.59
PRAC3	3.95	.063	0.97	−1.06	1.07
PRAC4	2.84	.080	1.24	−0.00	−1.12
PRAC5	3.14	.068	1.06	−0.39	−0.64
PRAC6	3.84	.066	1.02	−1.00	0.76
RELA1	2.71	.083	1.29	0.02	−1.27
RELA2	2.09	.063	0.98	0.67	−0.05
RELA3	2.29	.076	1.18	0.50	−0.79
RELA4	2.23	.072	1.12	0.45	−0.91
RELA5	2.02	.068	1.06	0.86	−0.04
RELA6	2.68	.080	1.24	0.15	−1.08
SELF1	2.07	.066	1.02	0.78	0.01
SELF2	2.05	.066	1.02	0.93	0.39
SELF3	2.13	.068	1.05	0.67	−0.28
SELF4	2.35	.070	1.08	0.35	−0.78
SELF5	2.67	.077	1.19	0.09	−1.15
SELF6	2.27	.072	1.12	0.62	−0.42
REW1	2.11	.070	1.09	0.79	−0.16
REW2	1.59	.052	0.81	1.27	1.11
REW3	2.38	.069	1.08	0.42	−0.58
REW4	3.67	.070	1.08	−0.90	0.27
REW5	2.85	.080	1.24	−0.01	−1.13
REW6	2.89	.080	1.23	−0.05	−1.01

Note: Standard error of skewness=0.16. Standard error of kurtosis=0.31. FULF=Fulfillment. TRAI=Training. PRAC= Practicality. RELA=Relation. SELF=Self-respect. REW=Reward.

Scale Dimensionality

The reliability of the six scales was estimated by computing Cronbach's alpha for each set of items. Table 2 shows the corrected item-total correlations and the changes to Cronbach's alpha for item deletion by scale. The reliability estimate for the Fulfillment scale was high at .87. Deletion of an item did not result in an increase in the reliability of the scale. However, item

FULF 6 exhibited the lowest item-total correlation of the six items (.59).

The reliability estimate for the Training scale was high at .88. Deleting an item did not increase the overall reliability; however, three items had item-total correlations over .70 (TRAI3, 5, & 6), while three items had item-total correlations under .70 (TRAI1, 2, & 4).

Table 2　Item-Total Statistics for the Learning Motivation Questionnaire Items (N＝240)

Item	Item-Total Correlation	Alpha if item deleted	Item	Item-Total Correlation	Alpha if item deleted
FULF1	.76	.837	RELA 1	.57	.715
FULF2	.63	.860	RELA 2	.41	.755
FULF3	.70	.847	RELA 3	.43	.753
FULF4	.69	.849	RELA 4	.61	.705
FULF5	.69	.850	RELA 5	.52	.731
FULF6	.59	.866	RELA 6	.52	.729
TRAI1	.69	.858	SELF 1	.81	.891
TRAI2	.59	.875	SELF 2	.79	.894
TRAI3	.80	.838	SELF 3	.65	.912
TRAI4	.59	.874	SELF 4	.79	.893
TRAI5	.74	.849	SELF 5	.77	.896
TRAI6	.71	.855	SELF 6	.75	.899
PRAC1	.55	.719	REW 1	.51	.777
PRAC2	.57	.713	REW 2	.48	.785
PRAC3	.60	.710	REW 3	.61	.753
PRAC4	.42	.756	REW 4	.46	.788
PRAC5	.35	.769	REW 5	.67	.737
PRAC6	.59	.711	REW 6	.62	.751

Note: FULF＝Fulfillment. TRAI＝Training. PRAC＝Practicality. RELA＝Relation. SELF＝Self-respect. REW＝Reward.

The items in the Practicality scale exhibited a slightly lower Cronbach's alpha than the previous two scales. The six items had an alpha of .77, and item deletion did not increase the reliability estimate. The item-total correlations were lower overall than for the Fulfillment and Training scales.

The results for the Relation scale were similar to those for the Practicality scale. The alpha was .77 for the six items, and item deletion did not improve this statistic.

The items in the Self-respect scale exhibited a high Cronbach's alpha at .91. Item deletion did not improve the reliability estimate. One item had an item-total correlation below .70.

The items in the Reward scale were sufficiently reliable at .80. Item deletion did not increase this statistic. However, three of the item-total correlations were below .60, while the other three were above this figure.

Each scale was then factor analyzed to examine scale dimensionality. The items of the Fulfillment scale loaded on a single component with an eigenvalue of 3.69. This loading was the only one over 1.0, and it explained 61.42% of the variance. The loadings on the extracted factor were as follows: FULF1＝.85, FULF2＝.74, FULF3＝.80, FULF4＝.80, FULF5＝.79, and FULF6＝.71.

The items of the Training scale loaded on a single component, which showed an eigenvalue of 3.79. This loading was the only one over 1.0, and it explained 62.81% of the variance. The loadings on the extracted factor were as follows: TRAI1＝.79, TRAI2＝.70, TRAI3＝.88, TRAI4＝.71, TRAI5＝.84, and TRAI6＝.81.

The items of the Practicality scale loaded on a single component with an eigenvalue of 2.84. This loading was the only one over 1.0, and it explained 47.25% of the variance. The loadings on the extracted factor were as follows: PRAC1＝.71, PRAC2＝.75, PRAC3＝.77, PRAC4＝.59, PRAC5＝.50, and PRAC6＝.76.

The items of the Relation scale loaded on two components－the first had an eigenvalue of 2.79, and the second had an eigenvalue of 1.00. The first factor explained 46.52% of the variance, and the second accounted for 16.73% of the variance. The loadings on the two factors are shown in Table 3. Items RELA2 and RELA3 loaded on the second factor, while item RELA6 cross-loaded on the two factors.

Table 3　Rotated Factor Loadings for the Relation Scale Items (*N*＝240)

Item	Rotated Factor Loadings	
	1	2
RELA1	.81	.33
RELA2	.31	.79
RELA3	.31	.84
RELA4	.84	.34
RELA5	.78	.26
RELA6	.60	.57

The items of the Self-respect scale loaded on a single component with an eigenvalue of 4.20. This loading was the only one over 1.0, and it explained 70.07% of the variance. The loadings on the extracted factor were as follows: SELF1＝.88, SELF2＝.86, SELF3＝.75, SELF4＝.86, SELF5＝.85, and SELF6＝.83.

The items of the Reward scale loaded on a single component with an eigenvalue of 3.00. This loading was the only one over 1.0, and it explained 50.05% of the variance. The loadings on the extracted factor were as follows: REW1＝.67, REW2＝.63, REW3＝.76, REW4＝.60, REW5＝.79, and REW6＝.76.

Next, three items that clearly defined each scale were selected based on item-total correlation coefficients and the magnitude of the factor loadings. These items were factor analyzed to ascertain the dimensionality of the scales after item deletion.

A six-factor solution was specified based on the hypothesized factorial structure of the two-axis model of learning motivation. It should be noted, however, that the eigenvalue for the sixth factor was .75, which was below the specified criterion for extraction. The six extracted factors accounted for 73.95% of the variance. As shown in Table 4, the items for each scale loaded on unique factors. No cross-loadings were observed, and all of the relevant factor loadings were＞.40.

Table 4　Factor Loadings for Exploratory Factor Analysis with Direct Oblimin Rotation of Learning Motivation Items（18 Items）

Item	Rotated Factor Loadings					
	1	2	3	4	5	6
FULF1						−.52
FULF3						−.52
FULF4						−.65
TRAI3	.76					
TRAI5	.88					
TRAI6	.63					
PRAC2		−.73				
PRAC3		−.50				
PRAC6		−.74				
RELA1			.74			
RELA4			.80			
RELA6			.47			
SELF1					.87	
SELF2					.80	
SELF4					.78	
REW3				.49		
REW5				.81		
REW6				.65		

Note: Only factor loadings＞.40 are shown.　N＝240.

Factorial Relationships

Scale scores were computed by summing the item responses for each scale. All items were used for this analysis. Table 5 shows the descriptive statistics for the scale scores. The three factors that comprise the first axis of the model, Fulfillment, Training, and Practicality, had higher mean scores that the three factors of the second axis. An inspection of histograms revealed that the variables appeared to be normally distributed, except for Relation and Self-respect—these two variables appeared to be bimodal or had a high frequency of low scores. This phenomenon is reflected in the relatively lower mean scores for those variables.

Table 5　Descriptive Statistics for the Learning Motivation Factors（N=240）

Scale	M	SE	SD	Skewness	Kurtosis
FULF	20.23	.343	5.31	−0.58	0.14
TRAI	17.23	.357	5.53	−0.14	−0.51
PRAC	20.38	.291	4.51	−0.47	0.30
RELA	14.01	.302	4.68	0.30	−0.50
SELF	13.53	.350	5.42	0.55	−0.13
REW	15.48	.300	4.64	0.20	−0.10

Note: Standard error of skewness＝0.16. Standard error of kurtosis＝0.31. FULF＝Fulfillment. TRAI＝Training. PRAC＝Practicality. RELA＝Relation. SELF＝Self-respect. REW＝Reward.

The correlations among the factors were examined to assess the concordance of the observed relationships with the expected relationships derived from the model. Drawn from the two-axis model of motivation and the relationships predicted by self-determination theory, it was hypothesized that the relationships among adjacent variables in the model would exhibit higher correlation coefficients than those among nonadjacent variables. Furthermore, the correlations among variables in the same axis would be stronger than those among variables in different axes. Table 6 shows the correlation coefficients for the variables in the model.

Table 6   Pearson Correlation Coefficients for the Scale Scores

	2.	3.	4.	5.	6.
1. FULF	.79*	.68*	.28*	.42*	.38*
2. TRAI	1	.58*	.39*	.48*	.41*
3. PRAC		1	.20*	.37*	.48*
4. RELA			1	.60*	.57*
5. SELF				1	.72*
6. REW					1

*Note: *$p < .01$ (two-tailed).*

While some of the variables were correlated as expected, others were not. All of the correlations among the variables were statistical ($p < .01$). For the first axis, the correlation between Fulfillment and Training was higher than the correlation between Fulfillment and Practicality. These relations are congruent with the predictions of the model. However, the correlation between Training and Practicality was lower than the correlation between Fulfillment and Practicality. Thus, adjacent relationships were not always stronger than other relationships within the same axis.

For the second axis, the pattern of correlations fit the model. The correlations between Relation and Self-respect and Self-respect and Reward were higher than the correlation between Relation and Reward. For both axes, the correlations among the internal factors were stronger than those between axes.

Exploratory Factor Analysis

The questionnaire data were factor analyzed to reveal the underlying factorial structure of the 36-item questionnaire, with all items included. An oblique rotation (direct oblimin) was selected to obtain interpretable factors as the target variables were hypothesized to be correlated. The Kaiser-Meyer-Olkin measure of sampling adequacy was .908. This result indicates that the correlations found in the data set were structured in a way which allows for a factorial structure to be determined from the data. Furthermore, Bartlett's test was significant ($p < .001$), indicating that the correlations among the variables were significantly different from zero. Although a six-factor structure was hypothesized a priori, the factor analysis was exploratory due to the limited number of previous studies that examined the two-axis model. Therefore, a scree plot was examined in addition to eigenvalues. The scree plot clearly showed a five factor solution

with an ambiguous inflexion that could justify the inclusion of a sixth factor. The resultant eigenvalues supported this interpretation as six components had eigenvalues over Kaiser's criterion of 1.0 and after extraction explained 57.7% of the variance.

The resultant structure of the six extracted factors, however, was complex. Table 7 shows the factor loadings for the 36 questionnaire items. A criterion of .40 was used to determine significant factor loadings (Stevens, 2002). Five items on the fulfillment scale loaded significantly on factor 2, but item FULF6 loaded significantly on factor 1 and weakly on factor 2. The Training scale exhibited similar results in that five items loaded significantly on factor 1, but item TRAI4 loaded significantly on factor 2. Similarly, five items of the Relation scale loaded significantly on factor 4, and item RELA3 loaded significantly on factor 5 only. The six Self-respect scale items all loaded strongly on factor 5 with no cross loadings.

The factor analysis results for the Practicality scale items and the Reward scale items were more problematic. First, the Practicality scale items did not load on a unique factor－five of the items loaded on factor 2, as did five of the Fulfillment items, and one item loaded on factor 3. The second problematic aspect was that four of the Reward scale items loaded on factor 3, one item (REW3) loaded on factor 1, and two items (REW1 and REW2) loaded significantly on factor 5.

To summarize the factor analysis results, factor 1 seems to be related to training, factor 2 may be related to either fulfillment or practicality, factor 3 is most likely centered on the variable of reward, factor 4 is concerned with relationships, while factor 5 revolves around feelings of self. Many items, however, did not load as expected, and some factors were not clearly defined. Most notably, none of the items loaded significantly on factor 6, even though the criteria for extraction were met.

Discussion

The first research question focused on the dimensionality of the factors in the two-axis model of learning motivation. Based on the results of reliability analyses and factor analyses, each factor exhibited reasonable unidimensionality. The reliability coefficients for the scales were above .70. This result indicates that the scales are internally consistent and are composed of related items. Two items of the Relation scale, however, could represent a second dimension. Items RELA2 (I study English because I would like to accompany my friends in my school) and RELA3 (I study English because I would like to be regarded as a member by those around me) loaded on a second factor when the scale was analyzed independently. Furthermore, item RELA6 (I study English because I feel I am obliged to do so) loaded on both factors. These three items could be problematic in that they may represent a second dimension of Relation, which could confound the measurement and interpretation of the construct.

The second research question examined the factorial structure of the model and the questionnaire used to measure the relevant constructs. A number of items cross-loaded on multiple factors, failed to load at or above the set criterion, or loaded on a different factor. These results suggest that the wording of some items may have created ambiguity in the interpretation and

Table 7   Factor Loadings for Exploratory Factor Analysis with Direct Oblimin Rotation of Learning Motivation Items

Items I study English…	Rotated Factor Loadings					
	1	2	3	4	5	6
FULF1 because I would like to know something new.	.248	−**.657**	−.131	.056	.056	−.013
FULF2 because I would like to become a person with varied knowledge.	.126	−**.583**	.083	−.069	.167	.109
FULF3 because I enjoy understanding something.	.305	−**.568**	−.095	.016	−.062	−.097
FULF4 because I enjoy the process whereby I become able to do something.	.121	−**.591**	−.032	.021	.156	−.040
FULF5 because I feel fulfilled when I study.	.298	−**.479**	−.094	−.034	.189	−.205
FULF6 because I would not like to leave something I do not understand.	**.622**	−.146	−.021	.097	.010	−.071
TRAI1 because I think it trains my brain.	**.623**	−.154	−.043	.032	.032	−.134
TRAI2 because I would like to learn how to study.	**.423**	−.198	−.157	.240	.152	.097
TRAI3 because I would like to think reasonably.	**.842**	−.030	−.042	.002	.044	.047
TRAI4 because I would like to learn to think from different perspectives.	.338	−**.453**	−.034	−.024	.090	.266
TRAI5 because I would like to learn to think logically.	**.859**	.005	.091	−.096	−.044	.094
TRAI6 because I would like to keep my brain active.	**.717**	−.069	.087	.055	−.024	−.002
PRAC1 because I would like to use what I learn in my future job.	.088	−.322	.388	−.216	.103	.041
PRAC2 because what I learn is useful in my daily life.	−.025	−**.606**	.114	.004	−.028	−.005
PRAC3 because the knowledge seems to be useful in my job or daily life.	.071	−**.541**	.309	−.157	−.060	.165
PRAC4 because I would like to enjoy the experience of utilizing knowledge and skill.	.178	−**.484**	−.149	−.019	.368	−.073
PRAC5 because I will not have problems in my future career.	−.013	−.060	**.651**	.130	.047	.210
PRAC6 because what I learn will be helpful when it is needed.	−.036	−**.708**	.189	.114	−.090	.046
RELA1 because I think it is natural: everybody does it.	−.098	−.108	−.004	**.791**	−.075	−.208
RELA2 because I would like to do something with my friends.	.270	.101	−.074	.219	.271	−.130
RELA3 because I would like to be regarded as a member by those around me.	.046	−.067	.019	.077	**.730**	−.022
RELA4 because people around me do so.	−.024	−.008	.003	**.764**	.053	.052
RELA5 because I think it is strange if I do not follow people around me.	.084	.150	.107	**.557**	.066	.129
RELA6 because I feel I am obliged to do so.	.123	−.084	.078	**.507**	.070	.101
SELF1 because I feel superior to others if I get good grades.	−.057	−.094	−.021	.001	**.869**	.041
SELF2 because I think I will be respected if I get good grades.	.044	.066	.088	−.078	**.812**	−.132
SELF3 because I will be admired if I go to good schools.	.091	.170	.167	.267	**.538**	−.051
SELF4 because I feel happy if I am better at my studies than others.	−.050	−.010	−.013	−.014	**.888**	.194
SELF5 because I feel confident in myself if I am better at my studies than others.	.019	.038	.036	−.040	**.823**	.139
SELF6 because I would like to become better at my studies than others.	.058	−.142	.085	−.047	**.688**	−.232
REW1 because I am complimented if I get good grades.	−.077	−.089	.043	.137	**.626**	−.216
REW2 because I can get some rewards if I get good grades.	.060	.082	.044	.121	**.568**	−.028
REW3 because I would like to live an economically advantaged life in the future.	**.415**	.166	**.435**	.018	.159	−.263
REW4 because I can get benefits after I enter the business world.	−.014	−.197	**.605**	.080	.068	.172
REW5 because I can find better places of employment in the future.	.000	−.064	**.737**	.058	.082	−.287
REW6 because I can proceed to better and higher education.	.084	.070	**.463**	.158	.227	−.151

Note: Factor loadings > .40 are in boldface. $N = 240$. Items adapted from Maeda (2003).

responses to the items, or that the content of some items may have been too similar to the items tapping other factors. Take, for example, the Fulfillment and Practicality scale items. Based on the factor loadings, a possible interpretation is that learners recognize the value of studying English. For the same reasons that learners may find an activity fulfilling, they may also deem it to be practical. Similarly, some of the items on the Practicality scale and the Reward scale were focused on future work or employment. These two factors may represent an understanding that investments may payoff in the future, and that practical activities are also rewarding.

Future research should consider using a shorter version of the 36-item questionnaire examined in the present study. When three items were selected for each scale, the factorial structure was more clearly defined. When using all 36 items, however, questions remain as to the number of factors to extract and the unidimensionality of each factor. Rewording some items or reconceptualizing the overall factors could result in a more parsimonious model. Further research is needed to clarify the constructs of the two-axis model of learning motivation.

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