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Construct Validity of Language Achievement Causal Attribution Scale (LACAS)

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ABSTRACT

Causal attribution theory has attracted the attention of the scholars recently as it has a pivotal role in learners' motivated behaviour and effort for their future learning experiences. According to this theory, learners' perceived cause of their academic performances can be based on *locus of control, controllability* or *stability*. In this way, it might be easier for scholars or teachers to identify the "motivationally-at risk" students and take necessary actions. Although learners might state a wide range of reasons for their performances including *effort, ability,* or *teacher*, it is challenging to collect quantitative data when the number of the participants is quite high as a valid and a reliable scale, specifically designed for language learning- has not been developed in the world yet. Considering this shortcoming, this study purports to develop a scale to measure causal attributions of language learners, so that scholars can easily determine motivational problems among students.

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Steering people toward taking actions or not in life, beliefs play a pivotal role in language learning process (Williams, Mercer, & Ryan, 2015). According to Williams et al. (2015) and Kalaja, Barcelos, and Aro (2018), since the mid of the 1990s, studies on belief systems in language education has increased to a certain extent. As such, in language learning motivation could explain the underlying reason why individuals decide to do something, to what extent they feel strong-willed to sustain the task or the learning process, and to what degree they are involved in taking a course of action. Despite the existence of an array of theories on belief systems and motivation, attribution theory can be regarded as one of the remarkable theories in exploring the causal roots of a learning process. Weiner (1972b, 1985) is the first scholar to define academic self-attributions as the perceived causes of success or failure based on their individual experiences. In congruent with his definition, Williams et al. (2015) describe it as "Individuals' perception of their own successes or failures and the reasons they provide for those successes and failures" (p.71). In order to gain a deeper insight into these causes, the researcher categorized four main causal attributions as *effort, luck, ability,* and *task difficulty*. However, it has been noted by learners as well as teachers that depending on the contextual differences, a great number of causal attributions in language learning could be added to the four main causal attributions of the original theory (Graham, 2004; Tse, 2000; Vispoel & Austin, 1995; Williams, Burden, Poulet, & Maun, 2004). Many studies on such a wide range of causal attributions for learners' academic performances have been conducted, but to the researchers' knowledge, no specific scale on language learning achievements has been found. To this end, the present study purports to develop a valid and a reliable scale for foreign or second language learning contexts.

2. Literature Review

In the first part of the literature review, the theoretical framework of attribution theory, causal attributions, and their dimensions will be defined and presented with examples. In the second part of this section, the issues on the empirical studies using questionnaires or problematic scales will be presented and discussed in detail.

2.1. The Theoretical Framework of Attribution Theory

Weiner (1972a, 1985, 2010, 2014, 2018), having worked on the attribution theory for many years, base the theory on three dimensions, and he determined four main causes of academic achievements or failure, namely *effort, luck, ability* and *task difficulty*. The importance of the theory becomes more evident considering the fact that these perceived causes depending on their dimensions shape whether learners' continue to take actions or withdraw from their own learning process (Erten, 2015b; Faber, 2017; Gobel & Mori, 2007). To illustrate, if a learner accounts for his/her success by referring to *effort*, i.e. thinking that s/he studied enough or hard enough to be successful, this learner is likely to be successful in his/her prospective academic life. Conversely, if such a learner points to the existence of his/her ability in language learning, that person might go through failure or some hopeless in return. Considered as the most widely cited attributions, *effort, luck, ability,* and *task difficulty* are not enough to explain possible causes of a success or failure as belief system is such an intricate and a complex system that is prone to be affected by employment of a *strategy*, (lack of) *interest, family influence* and *teacher* effect (Vispoel & Austin, 1995); *mood, maturity, habits, social and psychological environment, other people, previous experiences, attitudes, self-perception and maturity,* and *peers* (Graham, 2004; Tse, 2000; Williams, Burden, Poulet, & Maun, 2004). It is of great value to delve into the underlying reason to guide learners to sustain and persist in their process, but such a high number of causes make it inconvenient to address students' needs. In this vein, Weiner's theoretical framework of Causal Dimensions (Weiner, 1972a, 1972b, 1985) enables researchers to

deal with these causes much more easily. As suggested by Anderman and Anderman (1999), these causal dimensions are even much more pivotal in determining students' prospective motivation.

Weiner (2000), the pioneer of the attribution theory, highlight that the perceived reasons why academic events occur vary based on three dimensions: "stability (unstable/stable), locus of control (internal/external) and controllability (controllable/uncontrollable)" (Chodkiewicz & Boyle, 2014, p.79).

Locus of causality can be defined as whether the perceived and ascribed cause for an event exists within an individual or outside the control of this person having performed in an academic test or in a process (Weiner, 2014, 2018). Similar to this definition, according to Williams and Burden (1997), *locus of causality*, means "perceived location of causes is internal or external to the learner" (p. 194). Resting upon this dimension, *task difficulty* and *luck* might be regarded as external attributions that students view the reasons for their achievement as external to them. In contrast, *ability*, as well as *effort*, is considered as internal attributions, meaning that the underlying causes of the achievement are considered to be within learners, themselves (Williams et al., 2015). Weiner, Russell, and Lerman (1978), as well as Weiner (1979, 1980), point out that affecting the probable emotional state and the sustained motivation of the learner (Dörnyei, 2001), *locus of causality* is of great importance and automatically affects the continuation of the motivation. When a student identifies internal elements in his/her success, s/he is likely to have pride, confidence, and satisfaction and if s/he makes a reference to external factors, s/he is inclined to experience feelings of "gratitude, surprise, thankfulness" (Weiner, 2014, p. 358). Conversely, while those linking failure to internal causes tend to feel regret, guilt, and aimlessness and if s/he resorts to external attributions, s/he might have possible anger, surprise, and hostility (Haynes, Perry, Stupnisky, & Daniels, 2009; Koçyiğit, 2011; Peacock, 2009; Weiner, 2010).

Although *locus of causality* plays a vital important role in elucidating learners' predisposition to pursue their success, Weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum (1971) underscored the need of a second dimension as certain internal and external factors do not remain the same over time, while others change. In this sense, *stability* means to the extent that the perceived attributed reason for a learners' achievement are fixed or malleable (Williams et al., 2015). Weiner (1985, 2000, 2014) hold the idea that if learners think that the causal attribution is fixed like the reference to the *teacher*, they might not be willing to put effort or persevere to succeed in the future. On the other hand, when learners construct such unstable reasons as *effort*, which could change based on the learners' will; this attribution can lead to prospective achievements on the part of the learners.

In as much as a belief in stable causes shapes learners' future motivation and willing to sustain the *effort*, students' credit to uncontrollable factors such as *ability* or *teacher* might bring about a similar effect on the learners. At this point, it is clearly seen that the *controllability* dimension takes place in learners' enthusiasm to expend more effort or get motivated to take an active role in their own academic performances. On the other hand, providing students give *effort* as an account for their failure or success, they might have a tendency to be successful in the future process as *effort* can be put under control and it is a volitional action that can be shaped by the learners.

Weiner (1979) expanded his ideas by positing that *effort* is largely dependent upon volitional control meaning that an individual is likely to expend more or less effort as long as s/he wants (Weiner, 1985). At this point, Weiner coined the term of *controllability* based on the notion of intentionality or volition. Similar to the *locus of causality*, *controllability* enables people to think that they can put the perceived factors under control so that they can take an active role in their future process. Below is table where learners' perceived causes of their performances as well as their dimensions are presented:

Table 1
Causal Attributions and Their Dimensions

	Locus Of Control	Stability	Controllability
Ability	Internal	Stable	Uncontrollable
Effort	Internal	Unstable	Controllable
Luck	External	Unstable	Uncontrollable
Task difficulty	External	Stable	Uncontrollable
Strategy	Internal	Unstable	Controllable
Interest	Internal	Unstable	Controllable
Family	External	Stable	Uncontrollable
Teacher	External	Stable	Uncontrollable
School System	External	Stable	Uncontrollable
Classroom Environment	External	Stable	Uncontrollable
Health	External	Unstable	Uncontrollable

Note. Adapted from Vispoel and Austin (1995), based on Weiner (1979)

Researchers have amassed a compelling body of research that demonstrates the effects of causal ascriptions and their dimensions on learning as well as teaching practices. One of the prominent projection on practice is the distinction between adaptive and maladaptive attributional styles (Chodkiewicz & Boyle, 2014; Erten, 2015 a). When a learner achieves in a task and perceives himself or herself as successful and generates more controllable and internal attributions such as *effort* or use of *strategy*, this student is considered as an adaptive student, meaning that she could have a chance to prosper in the future as she believes and most probably makes an *effort* to achieve more (Weiner, 2014; 2018). According to Chodkiewicz and Boyle (2014), such students have more perseverance to put *effort* and succeed in prospective tasks. On the other hand, if a student fails and relates this failure to more outside factors that are difficult to change as they stand out of learners' control, they may hold a more maladaptive attitude, which keeps them from studying more in the future.

2.2. Studies on Attribution Theory and the Problems with Their Scales/ Questionnaires

Although a number of studies have employed statistical tests in their studies on attributions, they have not used a scale, or each has its own repercussion. Such researchers as Sucuoğlu (2014), Gobel and Mori (2007), Ghanizadeh and Ghonsooly (2015) designed their own scales in educational contexts to reveal learners' endorsement of their causes of the performances. However, none of them fulfills the need, considering the proliferation in the statistical examination of the attributional studies. In fact, Sucuoğlu (2014) developed her scale, which incorporates three causal attributions, namely the student himself or herself, *teacher* or the *family*, hence it is restricted to these factors, only. Taking the considerable number of causal attributions into account (Graham, 2004; Tse, 2000; Vispoel & Austin, 1995; Weiner, 1985; 2000, Williams, Burden, Poulet, & Maun, 2004), it would not serve the purpose when scrutinizing a number of ascriptions of academic performance, in particular in language learning process. Gobel and Mori (2007) restricted the scope of the study to a specific task that was given to the students in class time; that is why; it may not yield reliable findings when implemented for the underlying reasons of an exam performance. In their scales, Ghanizadeh and Ghonsooly (2015) aimed to measure *teacher* attributions rather than students, so it would not also fulfill the aims of the studies on learners' own perceptions.

Different questionnaires were applied to the student participants in certain studies; to exemplify, Zohri (2011) implemented a survey in a foreign language context. In a similar vein, Özdiyar and Demirel (2010); Erten and Burden (2014); Erten (2015b), McClure, Meyer, Garisch, Fischer, Weir, & Walkey, (2011); Özdiyar and Peacock (2009) measured learners' achievement attributions through the use of one item for each construct or attribution. McClure et al. (2011) claim that single items could sometimes be used if a concrete concept is referred such as relating one's performance to *ability* or *effort*. However, a psychometrically and validated scale needs to have more than one item to test a concept or a construct as the pioneers in testing and evaluation experts explain in their books (Dörnyei, 2001; Pallant, 2011; Şencan, 2005). In Höl (2016)'s dissertation, the items were presented to the participants regardless of a self-language (e.g., Item 1: "Students are not successful in learning English because their teacher is not successful in teaching English" (p.119). As the pioneer scholar, Weiner (1979, 1985, 2010) and Vispoel and Austin (1995) pinpoint, respondents reflect their own beliefs better when they personalize their own experience rather than agree with general beliefs on hypothetical scenarios. The need to explore participants' own cases is also in line with the "critical incident methodology" (Vispoel & Austin, 1995, p. 378), which suggests that learners "to be engaged in introspection on their own attributions", exclusively-designed for their individual experiences.

Although some researchers such as Dong et al. (2013) integrated the single items with CDS II, it is possible to cast some doubt on the validity of the instrument as the authors did not provide it. On the other hand, Stepleman, Darcy, and Tracey (2005) applied a valid scale projecting students' attributions; still, it was performed in a psychology class, not seemingly applicable for a language learning domain. Taking all the pitfalls in the mentioned studies, the need to design and develop a scale to have robust and reliable results to test learners' causal attributions became apparent.

2.3. Statement of the Problem

A number of research has been carried out to elucidate causal attributions in academic contexts, but not limited to language learning. Despite the great number of studies which employed quantitative methods to construe causal attributions (Dong, Stupnisky, & Berry, 2013; Erten & Burden, 2014; Gobel & Mori; 2007; Höl, 2016; Koçyiğit, 2011; Mori, Thang, Nor, Suppiah, & Oon, 2011, Satıcılar, 2006; Zohri, 2011), they did not address the attribution-related issues on well-established scales. To the best knowledge of the researchers, Causal Dimension Scale-CDS II (designed by McAuley, Duncan, & Russell, 1992) is the only scale incorporating Weiner (1985)'s theoretical framework of causal dimensions. However, it is of great value to base the quantitative results upon a well-validated and reliable scale in order to get more robust inferential statistical findings. In addition, exploring causal dimensions would not suffice to throw light onto the thorough picture of learners' or teachers' beliefs. It would be better when the interplay between these causal dimensions and specific perceived causal attributions are analyzed in depth.

2.4. The Aim of the Study

Given the potential to scrutinize causal attributions of the learners in language learning contexts and the scarcity of a psychometrically-validated and a reliable scale, the researchers endeavored to develop a reliable and a valid attribution scale- specifically for a language learning context- by going through a one-year process (Phase 1: Pilot study; Phase 2: Main study) with a great number of students in different proficiency levels at a tertiary level.

3. Methodology

3.1. Setting and Participants

The present study was conducted at Middle East Technical University in Turkey. It is a one-year study (two different academic semesters) in which a total of 1715 undergraduate participants, studying in the English preparatory program, were recruited on a voluntary basis. The study basically has two phases: the pilot and the main study, respectively. In phase 1, 710 Elementary (A2) and Beginner B (A1+) level students took part in the study, whereas 1005 students -including 308 Beginner A (A1), 451 Beginner B (A1+) and 239 Elementary level (A2) students- were the participants in the second phase of the study. Seven students did not indicate their proficiency level in the second part of the study, though.

3.2. Instruments and Procedures

As attribution studies have gained interest over the last years in the field of foreign language learning context (Erten & Burden, 2014), to the researchers' knowledge, there is not a valid and a reliable scale to measure causal attributions of a language learner. Considering this need, the researchers developed a scale, and then they conducted some analysis in the following phases.

3.3. Development of the Scale

The Language Achievement Causal Attribution Scale (LACAS) was designed by the researchers to examine the achievement attributions of foreign language learners. LACAS is a 5-point Likert scale on which participants are expected to complete "I earned this score from the latest English exam because… (e.g. I did not study enough for the exam: *effort*) with the anchors at 5-strongly agree, 4-agree, 3-not sure, 2-disagree, 1-strongly disagree for me at all. The scale was constructed in two main steps:

3.3.1. Phase 1: Pilot study

The details of the pilot study will be described here.

3.3.1.1. Item Pooling Stage

Based on the literature and the attribution theory, itself (Weiner, 1972; 1980) and the informal interview with the students and the teachers, some items were first pooled (Erten & Burden, 2014; Hsieh, 2004; Peacock, 2009; Vispoel & Austin, 1995; Williams and Burden, 1997), and some others were written from scratch by the researchers.

3.3.1.2. Testing the comprehensibility of the scale

At the very first stage of this process, 52 items were compiled including 13 factors (causal attributions), 20 students both marked the items and also gave feedback on the clarity of them, three of them read aloud the items and the researchers took notes about the ambiguous items and tried to make minor changes on phrasing. For the expert opinions, five Ph.D. candidates and also three language instructors in the same institution gave feedback on the clarity of the items.

3.3.1.3. Content validity and reduction stages

After reframing the items based on the feedback during the previous stage, 52 items were administered to 767 Elementary level students in the spring term of the year 2016 as the pilot study.

As some of the items were not neatly loaded under the expected 13 attributions, the researchers went through a selection process. Regarding the principal component analysis in an Exploratory Factor Analysis (EFA), the selection of the item was based on two primary criteria: first, the items need to be loaded under one factor with the load of .40 or more, and also, if the loading of an item is seen in relation to more than one factor, the discrepancy between the multi-loadings is preferably around 0.10 at minimum as Şencan (2005) proposes. Considering these criteria, 14 items were discarded from the scale. Some outliers (*N*= 57) were also excluded from the data when the difference between the agreement band and the disagreement band differed significantly as these items were expected to generate similar responses. The aim, hereby, was to check the lack of care taken while filling in the survey on the part of the students.

3.3.2. Phase 2: The administration of the scale in the main study

Before administering the scale to the students in the main study, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were done again with a split half method for a preventive purpose. The initial validation step ended up a much neater scale composed of 32 items and nine factors. Depending on the findings of the standardized estimates and t-values, the tenth attribution, i.e. *mood* and its related items, was combined with *health*. The refined scale measured nine attributions, namely *effort, luck, ability, task difficulty, classroom environment, school system, health, family, and teacher.* At this stage, the participants of the pilot study were separated into two by a random selection on SPSS 23.0, so but 350 cases were put into the EFA, and 360 of them were used in the CFA process.

Based on the results, the 32 item scale was given to 1005 students during the academic year 2016-2017 to confirm the factors determined at the pilot phase.

3.4. Data Analyses

As for the scale development processes, SPSS 23 was used for the EFA processes and IBM Analysis of Moment Structures (AMOS) version 23 was utilized for the CFA. The main bulk of the data were scrutinized and both descriptive as well as inferential statistical analyses were administered through SPSS 23.0. First, the frequencies, percentages and also the standard deviations for each item were calculated. In the latter phase, the mean scores for the items in each category were found. Negative items of the scales were reverse-coded in order to find out the average score for each construct. Yet, the percentages and frequencies will be shown in the tables as they exist in the scale.

4. Results

The findings will be presented in two steps. First, the results in relation to validation process of the scale, including a series of both EFA and CFA, will be described in detail. Secondly, the contrastive group analysis incorporating the difference between successful and unsuccessful groups' causal attributions, and the reliability processes for the scale will be introduced.

4.1. Phase 1: Scale Development Results of the Pilot Study

For the validation of the scale, different techniques were used: "(a) principal component analyses and varimax rotation and (b) contrasted groups" (Erten, Topkaya, & Karakaş, 2010, p.189). In basic terms, the researchers performed EFA after the pilot study in July-August, 2016. Based on the analysis, the researchers eliminated some items considering some criteria and ended up 11 factors. Then, EFA and CFA with a split -half method were done with the same sample in September, 2016 and found out nine factors in total. The researchers collected the data from the main group of the study and did both EFA and CFA with this sample. To further validate the constructs in the scale resting upon the theory, the researchers did contrastive group analysis to validate the constructs at the end. To make it simpler, the pilot study will be named as Phase 1, and the main study will be called as Phase 2.

4.1.1. Phase 1: The EFA results of the pilot study

After the pilot study, construct validity of LACAS was checked with the help of exploratory factor analysis (EFA) on Statistical Packages for Social (SPSS) version 23. Factors were identified using an "exploratory principal component analysis" (Pallant, 2007, p.181). Kaiser-Meyer-Olkin Measure of Sampling Adequacy was found as .907, revealing very good adequacy of the items for performing a factor analysis (Barlett's chi-square = 17622; $p < .01$) with suitable variance.

The results revealed that 11 of the factors (or causal attributions) were clumped together on one of the four factors following the varimax rotation, which explains 61,949 % of the total variance.

In some aspects, the EFA model included different factorial pattern than the expected one based on the literature. Some of the items were in more than one factor, or the loadings were lower than 0.4; for example, *interest* items were cumulated together with *ability* and *task difficulty*; or the difference between the two loadings was not at least 0.10. Those ten items were left out from the scale and it ended up 11 factors. However, the expected factors were still overlapping with each other. The researchers, later, decided to eliminate some students' responses with the care check items, meaning that if their responses differ in terms of their agreement in two reverse items. EFA was performed again, and such factors as *strategy,* and *interest* items were not cumulated together at an acceptable level. Since it was difficult to refine or revise the items, the researchers left them out. Excluding ten more items entailed taking out the attribution to *interest* and *strategy*, based on the fact that the misfit of 10 out of 42 items was a sign of the poor fit of the constructs.

4.1.2. Phase 1: The CFA with a split- half method in the pilot study

Then, 710 participants were retained for further analyses, and the data was treated as two different sets of data by implementing a split-half method to try out EFA and CFA with a number of 32 items. During the split-half process, EFA (the second EFA) results yielded 32 items, nine factors (*effort, luck, task difficulty, ability, health, classroom environment, school program, family, and teacher),* explaining 70.858 % of the variance. However, CFA findings did not confirm the factors at an acceptable level.

The suggested model of the scale was checked by CFA using the AMOS version 23 statistical packages. The chi-square statistic ($\chi 2 = 5499.31$, $p < .05$) was found to be statistically significant, and the ratio of $\chi 2 / df$ was 12.84, revealing the misfit or the rejection of the proposed model. Therefore, GFI (goodness-of- fit index), CFI (comparative fit index) were not calculated. RMSEA (root mean square error of approximation) value was found to be 0.182, which is not an acceptable level, according to Hooper, Coughlan and Mullen (2008). These results show that the nine–factor model of LACAS was not confirmed in the analysis.

The reliability scores of the subscales were found at an acceptable level (Özdamar, 2004):

Table 2
Cronbach's Alpha Scores for Each Subscale

Factors	Cronbach's Alpha (Total .83)
Effort	.88
Ability	.87
Task difficulty	.59
Classroom Environment	.77
Teacher	.79
Health	.97
Family	.76
Luck	.68
School System	.83

As seen in Table 2, all subscales seem reliable based on Cronbach's alpha levels, except *Task Difficulty*. *Luck* was almost acceptable with a level of .68.

The researchers ended up the updated version of the LACAS scale with 32 items. However, EFA results showed nine factors, and after directing SPSS to extract nine factors, the 9th factors' eigenvalue was found to be 0.83, which is not recommended with such a number of participants based on the Monte Carlo Parallel Analysis criteria (Pallant, 2007).

4.2. Phase 2: Scale Development Results of the Main Study

In Fall, 2016, the re-shaped scale comprising 32 items was implemented on the participants of 1005 students [including 308 Beginner A (A1), 451 Beginner B (A1+) and 239 Elementary level (A2) students] to confirm the nine-factor model of 32 items in LACAS. The EFA results show that factor model fits into the expected factors with the 1005 participants; however, item number 5 (*luck*) and 27 (*luck*) were clumped under health factor, so the scale showed eight factors in EFA results. Item 9 and 20 *(psychological health /mood*) were left out from the analysis and also the surveys with the missing data (*N*= 153) were excluded from the analysis as AMOS version 23 was quite sensitive to the missing data during the CFA process. Eventually, EFA was performed again by SPSS version 23, and the latest CFA was done with a number of 852 participants' responses and 29 questions.

4.2.1. Phase 2: The EFA results of the main study

Factors were again identified through an exploratory principal component analysis. Kaiser-Meyer-Olkin Measure of Sampling Adequacy was found to be .811, showing perfect adequacy of scale items for factor analysis (Barlett's chi-square = 11.013; $p < .01$) with adequate variance. Principal component analysis revealed the presence of nine components with eigenvalues exceeding one. These nine factors extracted by varimax rotation explained 71.4 % of the total variance in LACAS scores, which is higher than the previous EFA results. Table 3 presents factor loadings and variance explained by each factor; on the other hand, Figure 1 shows the scree plot.

Table 3
Explanatory Factor Analysis

Items	Factors 1	2	3	4	5	6	7	8	9
Item12 *Because I did not put a lot effort into this exam.**	**.879**	.071	.007	.039	.041	-.005	.003	.057	-.008
Item 8 *Because I did not study for the English class.**	**.858**	.066	.010	.007	.059	.000	-.008	.026	.013
Item 29 *Because I studied for this exam really hard.*	**.851**	.052	.059	-.031	.046	.128	-.077	-.053	-.034
Item 1. *Because I did not get prepared enough for this exam.**	**.846**	.026	-.017	.033	.017	-.007	-.003	.092	.007
Item 19 *Because I studied hard during the semester.*	**.822**	.106	.037	-.074	.101	.077	-.013	-.047	-.023
Item 22 *Because I am talented to learn a foreign language.*	.094	**.872**	.100	-.008	.068	.095	.061	.003	.018
Item 7 *Because I have an ability to learn English.*	.053	**.851**	.109	-.029	.091	.029	-.025	-.022	.014
Item 2 *Because I have no ability to learn English.**	.053	**.810**	.047	.017	.055	-.018	.031	.134	.058
Item 14 *Because I think I have an ear for learning English.*	.101	**.809**	.026	.039	.116	.101	-.018	.025	-.006
Item 24 *Because my teacher teaches well.*	.052	.047	**.818**	.013	.133	.129	.019	.090	.148
Item 31 *Because my teacher do not care about me (do not give me the right to speak. do not help me in the lessons. do not guide me…etc.)**	.010	.090	**.787**	.127	.087	.000	.079	.150	.039
Item 15 *Because I like my teacher.*	-.002	.050	**.727**	.080	.125	.141	-.043	.088	.036
Item 6 *Because my teachers' teaching methods were good.*	.035	.102	**.686**	.004	.205	.005	.128	.052	.047
Item 25 *Because I fell sick on the exam date.**	-.011	.009	.081	**.869**	.012	.009	.070	.059	.210
Item 17 *Because I did not feel good on the day of the exam (e.g. I felt nausea. had stomachache…)**	-.006	-.011	.079	**.866**	.054	-.031	.041	.064	.119
Item 4 *Because my teacher teaches well.*	-.003	.018	.056	**.826**	.072	.004	.108	.054	.079
Item 23 *Because the testing system does not support my English learning.**	.040	.126	.171	.120	**.796**	-.025	.061	.057	.036
Item 10 *Because the educational system at METU did not help me to learn English.**	.050	.072	.057	.001	**.699**	-.029	.098	.388	.143
Item 16 *Because school system helped me to learn English.*	.074	.181	.201	-.001	**.695**	.129	.054	.058	.108
Item 32 *Because the curriculum /program that is followed in the school is good.*	.102	.005	.150	.037	**.687**	.114	.124	.070	-.021
Item 13 *Because my family supported me to learn English.*	.059	.095	.063	-.003	.123	**.921**	.013	.094	-.012
Item 28 *Because I felt the support of my family for English learning.*	.105	.097	.190	-.017	.047	**.905**	.030	.004	-.004
Item 21 *Because the exam questions were easy.*	-.040	.005	.044	.004	.121	.035	**.783**	-.021	.048
Item 3 *Because the exam questions were difficult.**	-.003	.032	-.096	.108	.087	-.015	**.746**	.145	.120

Item 30 *Because the exam questions were quite manageable.*	-.052	.003	.352	.137	.075	.023	**.638**	.015	.040
Item18 *Because in English classes, there was not any atmosphere that facilitates learning English.**	.053	.107	.216	.092	.137	.061	.043	**.823**	.022
Item 11 *Because my classroom atmosphere was not suitable for my learning.**	.011	.020	.155	.095	.240	.049	.085	**.810**	.071
Item 27 *Because it was all for tough luck.**	-.042	.027	.131	.224	.065	-.014	.088	.044	**.837**
Item 5 *Because I was unlucky in the exam.**	-.002	.052	.115	.194	.127	-.002	.126	.059	**.827**
Eigenvalue	5.570	3.796	2.584	2.143	1.698	1.454	1.350	1.095	1.016
Variance Explained %	12.75	10.11	9.32	8.18	8.12	6.19	5.85	5.58	5.31
Total Variance	71.4 %								

Note. * Reversed items. Factor loadings > .40 are in boldface

First of all, a principal component analysis was performed on the updated data. As a loading of .40 was considered as the criterion for item discard, 18 items that loaded less than this cut-off point were discarded. After leaving out these items, the remaining 29 items were put into analysis again, and nine factors with eigenvalues which are bigger than one were determined (See Table 3). These remaining items were clearly loaded on one of these nine factors based on the varimax rotation, which accounted for 71.4 % of the total variance. The first factor having five items explained 12.75 % of the variance. Overall, the items under this factor referred to the *effort*, meaning that students have put *effort* into the exam preparation stage. *Effort*, as the number-one causal attribution, is a prominent reason for the exam performance. The second factor with four items accounted for 10.11 % of the variance and was called as *ability*. The items of this factor basically projected how much students view themselves as talented in language learning. The third factor with its four items explained 9.32 % of the variance, and it was labeled as *teacher*. The fourth factor, *health,* explained 8.18 % of the variance, and the fifth factor, namely *school system*, accounted for 8.12 % of the variance in LACAS. The following factor, *family,* revealed 6.19 % of the variance. The seventh factor, *task difficulty*, explained 5.85 % of the variance. While the *class environment* had 5.58 % of the variance, *luck* accounted for 5.31 % of the variance of LACAS scale. In essence, the finalized scale included 29 questions in total, having 18 negative items and 14 positive items. Depending upon Catell's (1966) scree test, researchers retained nine determined factors for further analysis, as seen below:

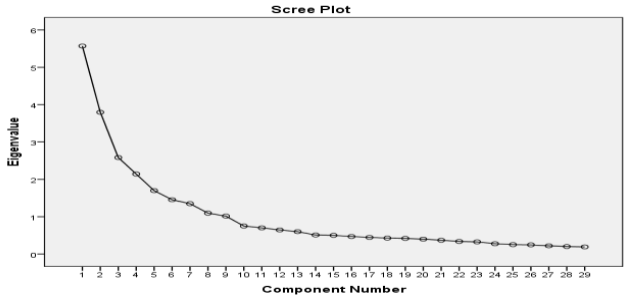

Figure 1. The scree plot for factor loadings

4.2.2. Phase 2: The CFA results of the main study

Confirmatory factor analysis (CFA) was done using structural equation modeling (SEM) in IBM Analysis of Moment Structures (AMOS) version 23 to explore the interconnected relationships in one model. The analysis drawing upon LACAS in the present study indicated that goodness of fit indices in

the exploratory factor analysis seems to be on the acceptable scale. AMOS makes use of different kinds of indexes which find out the goodness-of-fit in a model. These indexes are chi-square ($\chi 2$) or CMIN in AMOS, normalized chi-square (NC) or $\chi 2$ *(CMIN)/df*, and GFI, CFI, and RMSEA. The cut-off point for GFI as well as CFI is .92 and above, and the acceptable limit is .08 for RMSEA (Tabachnick & Fidell, 2013). The lower the value of RMSEA, the better indicator of goodness of fit is. Table 4 indicates the characteristics of the proposed model of a scale. The hypothesized model of LACAS seems to be a good fit to the data. The value of CFI was found to be .94, and the RMSEA was .049.

Table 4
Goodness of Fit Indices for Confirmatory Factor Analysis of LACAS

Model	χ2/CMIN	*df*	χ2(CMIN)/*df*	GFI	CFI	RMSEA
	1039.41	94	3.04	.92	.94	.049

Note. $\chi 2$=chi-square; *df* = degree of freedom; *GFI*= goodness-of-fit index; *CFI* = comparative fit index; *RMSEA* = root mean square error of approximation

These results show that the nine–factor model of LACAS achieved goodness of fit indices at an acceptable level. Figure 2 diagrammatically illustrates the most updated version of the model.

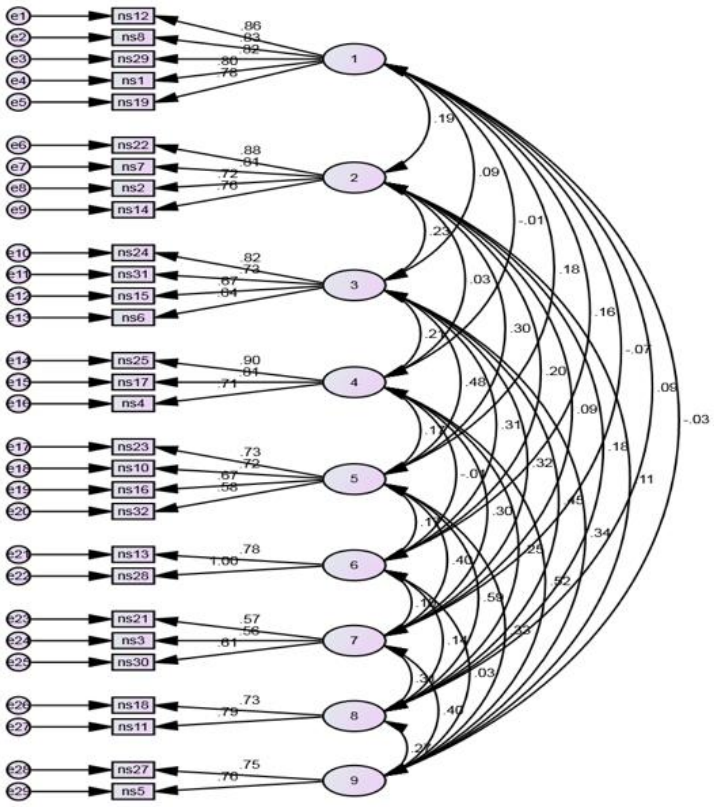

Figure 2. Confirmatory Factor Analysis Path Diagram

The acceptable measures are given below. To be accepted as a good model, the threshold level is to be ≥ .95 for GFI and CFI, and ≤ .95 for RMSEA (Hu & Bentler, 1999; Kline 2011).

Table 5
Acceptable Measures for CFA

Measure	Threshold
chi-square/ df (cmin /df)	<3 good; < 5 sometimes permissible
P value for the model	>.05
CFI	> .95 great; >.90 traditional; > 80 sometimes permissible
GFI	> .95
AGFI	>. 80
SRMR	<. 09
RMSEA	<. 05 good; .05 -.10 moderate >. 10 bad
PCLOSE	>.05

Note. Retrieved from Hu & Bentler, 1999; Kline 2011

4.2.3. Phase 2: Contrasted-group analysis to further validate the instrument

The researchers excluded the top 27% of the students and the bottom 27% of the students to be able to diagnose any possible distinction between the groups. 230 students from unsuccessful ones and 221 for the successful students were used for this analysis. Two contrasting groups (successful and unsuccessful students) were compared. Based on the literature on adaptive and maladaptive attributional style (Erten & Burden, 2014; Weiner, 2014, 2018), the successful students in the midterm exam were hypothesized to have higher mean scores in their attributions than the unsuccessful ones as the items were reversed into positive statements as: "I earned this score because I studied hard.". The findings of independent samples t-test were mostly in line with this expectation (see Table 6).

Table 6
Sub-Factors in relation to Group Differences

Factors	Groups	Number	Mean	SD	T	df	Sig.	*Cohen's d*
Effort	Unsuccessful	230	2.4	1.2	-10.09	449	.000*	.8
	Successful	221	3.3	.9				
Ability	Unsuccessful	230	3.1	.8	-6.538	449	.000*	.6
	Successful	221	3.6	.7				
Teacher	Unsuccessful	230	4.2	.6	-2.85	449	.004	.3
	Successful	221	4.4	.6				
Health	Unsuccessful	230	4	1	-6.371		.000*	.6
	Successful	221	4.54	.6				
School System	Unsuccessful	230	3.6	.8	-6.13	449	.000*	.5
	Successful	221	4	.6				
Family	Unsuccessful	230	3.6	1	.127	449	.89	
	Successful	221	3.6	1				
Task Difficulty	Unsuccessful	230	3.4	.7	-10.14	449	.000*	.9
	Successful	221	4	.6				
Classroom Environment	Unsuccessful	230	4.08	.8	-2.89	449	.004	.2
	Successful	221	4.31	.8				
Luck	Unsuccessful	230	3.56	1.1	-9.14	449	.000*	.8
	Successful	221	4.38	.7				

Note. *p< .01 and p> .05

As Table 6 illustrates, sub-scales displayed a similar trend for both successful and unsuccessful students with the ones on the overall scale. For almost all sub-scales, except for the attribution to *family*, the scores of unsuccessful students seem to be lower than those of successful students ($p < .001$) at a statistically significant level. A significant difference between unsuccessful and successful students with regard to *teacher* and *classroom environment* ($p < .005$) was also found. The effect sizes were also found to be large enough to consider that both of these two groups are different from each other (Cohen, 1988). Still, some minor variations in the scores were found. For example, while the scores on the mean scores for successful and unsuccessful students largely differ in the attributions to the *effort* (M= 2.4 for Unsuccessful students and M= 3.3 for Successful students), *ability* (M= 3.1 for Unsuccessful students and M= 3.6 for Successful students), *health* (M= 4 for Unsuccessful students and M= 4.54 for Successful students), *school system* (M= 3.6 for Unsuccessful students and M= 4 for Successful students), *task difficulty* (M= 3.4 for Unsuccessful students and M= 4 for Successful students), and *luck* (M= 3.56 for Unsuccessful students and M= 4.38 for Successful students), such attributions as *teacher* (M= 4.2 for Unsuccessful students and M= 4.4 for Successful students) and *classroom environment* (M= 4.08 for Unsuccessful students and M= 4.31 for Successful students) yields lower differences between successful and unsuccessful students.

Phase 2: The reliability of the scale. The total cronbach's alpha estimate of the LACAS scale was calculated as .87. The score of 0.90 was found for the first subscale (*effort*) with five items; 0.87 for the second one (*ability*) with four items; 0.80 for the third one (*Teacher*) with four items; 0.83 for the fourth one (*health*) with three items, 0.79 for the fifth one (*school system*) with five items, 0.86 for the sixth one (*family*) with two items, 0.68 for the seventh one (*task difficulty*) with three items, 0.76 for the eighth one (*classroom environment*) with two items and also 0.72 for the last one (*luck*) with two items, all estimated values indicating an acceptable level of reliability. The scores for each sub scale are diagrammatically illustrated in Table 7:

Table 7
The Reliability of the Scale

Factors	Cronbach's Alpha (Total .87)
1. Effort	.90
2. Ability	.87
3. Teacher	.80
4. Health	.83
5. School System	.79
6. Family	.86
7. Task difficulty	.68
8. Classroom Environment	.76
9. Luck	.72

5. Discussion

The aim of this study is to introduce the Language Achievement Causal Attribution Scale (LACAS) purporting to measure the causal attributions of language learners (Weiner, 1985, 2000), and verify it by a set of validity and reliability tests. The data were collected from 1715 EFL learners at a state university in Turkey, where the medium of instruction is English. The findings of the study display a considerable amount of similarity between the theoretical framework of Weiner (1972a, 1985, 2000) in that four main attributions have been found to be in the sub-constructs of the scale. Also, the findings are parallel to the proposed distinction between successful and unsuccessful students' causal attributions (Williams & Burden, 1997; Williams et al., 2015).

Although the researchers started the study with a number of 13 attributions, the validity, as well as reliability analyses, caused it to end up with 9 attributions, including the four major ones as suggested by Weiner (1985). To be able to examine adaptive attributional style of the learners, the researchers of the present study tried to keep the attributions to "*effor*t, *interest* and *strategy*" which are indicators of adaptive learning styles; however, the factor analyses generated *strategy* as the sub-factor of *effort*, which is conceptually related to putting some cognitive and metacognitive *effort* to a certain extent (O'Malley & Chamot, 1990). Hence, the researchers excluded the *strategy* items, as seen in Table 3. Similarly, the items which were initially designed to measure whether their achievement is linked to the extent they have *interest* in language, failed to test the intended aim of the attribution to *interest*, leading to the omission of the causal attribution to ensure a robust scale. The researchers, at this point, strongly recommend prospective researchers to consolidate their research on causal attributions with qualitative data as respondents might highlight a wide range of personal attributions that cannot be incorporated in a scale (Hsieh & Schallert, 2008; Taşkıran, 2010; Tse, 2000; Williams & Burden, 1997; Wiliams, Burden, Poulet, & Maun, 2004). However, in order to gain more in-depth insight into the causal attributions of a great body of participants, the researchers might need a valid and a reliable scale and; at that point, the present one could serve purposes of using inferential statistics for huge groups of participants.

The first EFA and also CFA results based on a substantial number of respondents' ideas revealed nine factors out of the pre-assumed 13 factors. Some factors, such as *mood* is conceptually associated with psychological well-being, so these pre-determined constructs were decided to be combined. Additionally, *situational effort* and *strategy* which are usually employed depending on the contexts, were also integrated on the grounds that their factor loadings were either lower than .4 or clumped under different factors (Şencan, 2005). Eventually, the second EFA and CFA results displayed a neater distribution of the factors as seen in Table 3.

The hypothesized model of LACAS seems to be a good fit to the data collected (Hu & Bentler, 1999; Kline 2011; Schreiber, Amaury, Stage, Barlow & King, 2006). The CFI is found as .94 (almost perfect) and the RMSEA is revealed .049 (good), and the score for $\chi 2(CMIN)/df$ is 3.04. As proposed by Schumacker and Lomax (2004), normalized chi-square (NC) or $\chi 2/df$ is stated to be the best indicators of a good fit of a proposed model. With regard to RMSEA, values smaller than .08 are regarded as acceptable, and the lower score is considered as a better index of goodness of fit (Byrne, 2001; Hair, Black, Babin, Anderson, & Tatham, 2006). The results existing within the acceptable threshold seem to confirm the latest version of nine–factor model of LACAS. Figure 2 illustrates the finalized version of the model.

In addition to the factor analysis findings, contrastive group analyses also seem to consolidate the construct validity of the scale. Especially the attribution to *effort* seems to be congruent with what Weiner's theory (1972a, 1985, 2000). The attribution to more adaptive causal attributions is likely to be observed among successful students, whereas linking the failure to more maladaptive attributions is usually connected to the unsuccessful students (Chang, Windsor, & Helwig, 2017; Gobel and Mori, 2007, Höl, 2016; Hsieh, 2004; McClure et al., 2011; Peacock, 2009; Satıcılar, 1996; Semiz, 2011, Taşkıran & Aydın, 2017; Vispoel & Austin, 1995). To exemplify, success–oriented learners' endorsement of attributions such as *effort* implies their motivation to expend more effort to succeed more as they hold the idea that their performance exists within their control, and they can change it for the future. Also, it is clearly seen that most of the causal attributions are perceived positively by the successful students, and they have higher mean scores for each attribution. This positive tendency might imply their hope as well as their high motivation to put more *effort* in the future as Weiner (2018) suggests. The teachers could take actions towards the unsuccessful students or the successful ones with the maladaptive attributional styles.

One exception to the group difference is seen in the attribution to *family*, seemingly to be the same for both successful and unsuccessful students. This might result from the fact that family issues are quite personal and individual, which may not be directly linked to a specific exam performance. That is why, it

might be the same for both groups. In conclusion, all the procedures generated LACAS subsuming eight sub-scales, which differentiated between the groups as suggested.

As to the reliability analyses of LACAS, it can be stated that the final version of it has reached a level of acceptable internal consistency both as a whole construct of attributions and also in its sub-constructs (Fraenkel & Wallen, 2005).

6. Conclusion

Many studies on attribution theory have been carried out since it was first put forward; however, no specific, valid, and reliable scale on language learning milieu has been developed so far. Considering this need in the field, the researchers of the present study have designed and developed a scale called Language Achievement Causal Attribution Scale (LACAS).

Some researchers working on attribution theory (Martinko, 1995; Taşkıran & Aydın, 2017) recommend each causal attribution to be researched in line with their causal dimensions. Still, it is of a challenge to have a congruent data collected from a huge number of participants to have more robust statistical tests. Scales such as Causal Dimension Scale II (Duncan et al., 1992) could be used to supplement the data, or qualitative data could yield more causal chains of events of each individual. That is why, valid and reliable scales could contribute to the studies in the future.

Based on the analysis of the data collected from 1715 students and experts in the field, such a conclusion can be drawn that LACAS meets the criteria to be used in language learning contexts by both researchers and the teachers, so that they could determine their students with maladaptive attributional style. The scale meets the requirements of a valid and a reliable scale, and it offers practical measure to reveal language learners' motivational orientations and the problems along with them.

In conclusion, the resultant LACAS provides researchers, curriculum developers or material designers in applied linguistics with a scale through which they can scrutinize language learners' attitudes, belief systems or causal attributions on their exam performance. This scale could enable them to take the right course of action or to employ certain strategies for their students to address their fixed mindset (Dweck, 2006) or maladaptive attributional style.

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