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# The Validity and Reliability Study of Turkish Version of Strategy Inventory for Language Learners

*Melek Demirel*

Department of Educational Sciences, Faculty of Education, Hacettepe University, Turkey

**Abstract:** This study aims at performing the adaptation of Strategy Inventory for Language Learning (SILL) developed by Oxford (1990) into Turkish. For this purpose, validity and reliability study in the Turkish sample group was conducted. The research group was composed of the 702 students attending the School of Foreign Languages, Erciyes University. The scale, which was found to have linguistic validity, was analysed in terms of validity and reliability. The construct validity was tested through factors analysis and evidence supporting the construct validity in both models formed was obtained. The scale consisted of six sub-dimensions compatible with the original form. The sub-dimensions were memory, cognitive, compensation, metacognitive, affective and social strategies. The correlation of the scale with a similar scale measuring the learning strategies was found to be r: 0,70. The internal consistency coefficient of the scale was found as 0,92 and test retest reliability coefficient as 0,83. All the analyses conducted demonstrated that the strategy inventory for language learners was equally valid and reliable for use in Turkey as the measuring instrument.

**Key words:** Language learning strategies · Scale adaptation · Undergraduate students

## INTRODUCTION

With the acceptance of a language approach emphasising communication in the 1970s, an increase occurred in the number of research studies placing the role undertaken by the learner into the centre throughout the learning process. Thus, what successful language learners thought in the whole process of learning and how they behaved in the process were made the subject matter of many studies. Studies aiming to determine why some students learned better than others caused attention to be directed to learning strategies.

**Language Learning Strategies:** Language learning may be defined in its most general sense as the instruments or tactics that students employ in performing the learning duties based on such language skills as speaking, writing, listening and reading. The learner who faces a problem to be solved or a learning task to be performed tries to terminate the learning activity successfully using the cognitive, metacognitive, affective or social strategies in his repertoire. A brief review of relevant literature will make clear what is meant by learning strategies in language teaching. Wenden [1], defines learning strategies as "behaviours, steps, habits, plans, cognitive abilities and learning skills adopted consciously by the learner throughout the learning process"; and points out that the use of strategies is effective in improving the learner's autonomy. Brown [2], defines foreign language learning strategies as the techniques used in solving the problems encountered in second language learning process. Chamot and Kupper [3], on the other hand, state that strategies are the techniques utilised by students in acquiring, storing and recalling new knowledge and skills; and that some of them are observable while others are not. Nunan [4] says that an authoritative learner is an individual who can make a choice with regard to learning tasks and strategies; and defines learning strategies as the mental and communicative procedures that learners use in learning and using the language. And finally, Oxford [5] defines strategies as "the activities, behaviours, steps or techniques used by the learner to activate learning" and believes that those help such processes as acquiring, storing and recalling the knowledge.

Learning strategies can be used consciously and they can also become automatic over time. As is clear from the definition, individuals who attain successful learning are considered as the ones who use a series of strategies to facilitate the

**Corresponding Author:** Dr. Melek Demirel, Department of Educational Sciences, Faculty of Education, Hacettepe University, Ankara, Turkey

choice, encoding and recalling the knowledge from the memory when needed in order to process the knowledge actively.

A close review of field literature demonstrates that one of the most detailed studies on a classification of learning strategies is the one conducted by Oxford [6]. Oxford categorises the strategies used more often to activate language acquisition on the principle of hierarchies. The researcher bases the inventory developed on this classification. Basically, Oxford groups learning strategies into two: direct and indirect. Oxford defines direct strategies as "the strategies directly related with the issue or the content" and indirect strategies as "the strategies which are necessary for active learning even though they are not directly related with the field of the issue." Direct and indirect strategies each are divided into three and each carries out a number of mental functions. Oxford's [6] "Strategy Inventory for Language Learning" (SILL) consists of 50 strategies classified into six major categories, including memory, cognitive, compensation, metacognitive, affective and social. Memory strategies, like grouping, associating, or using imagery, "have a highly specific function: helping students store and retrieve new information"; cognitive strategies, such as highlighting, analyzing, or summarizing messages, "enable learners to understand and produce new language by many different means"; compensation strategies, like guessing or using synonyms, "allow learners to use the language despite their often large gaps in knowledge"; metacognitive strategies, like arranging, planning and evaluating one's learning, allow learners to control their own cognition through planning, arranging, focusing and evaluating their own learning; affective strategies like deep breathing and using checklists, help learners control their feelings, motivations and attitudes related to language learning; and social strategies, like asking questions or cooperating with others, facilitate learning to learn with others in a discourse situation.

A great many studies were conducted on the role of learning strategies in language acquisition in the last twenty years. A considerable number of them dealt with variables affecting language learning strategies. Oxford and Ehrman [7], examined studies concerned with factors affecting the use of strategies and found that gender, ethnic and cultural origins, the level of motivation, age, the level of language proficiency, the learning task and learning styles were determinants in strategy use. The strategy inventory developed by Oxford for language learners deeply affected the research conducted in relation to strategies in the 1980s and the 90s.

**Purpose of the Research:** This research aims at adapting the "Strategy Inventory for Language Learners" developed by Oxford [6] into Turkish. For this purpose, validity and reliability study in the Turkish sample group was conducted.

**Method:** Study Group: This research was conducted with 702 university students attending the School of Foreign Languages of Erciyes University. 494 of them (70.4%) were female whereas 208 (29.6%) were male. Of the research group 293 (41.7%) were from the faculty of economics and administrative sciences, 266 (37.9%) from engineering school, 81 (11.5%) from the school of medicine, 62 (8.9%) from the faculty of letters and science and they were all attending the preparatory class. 466 (66.4%) of the students entered university on the basis of numerical scores whereas 236 (33.6%) came to university with verbal scores. 342 students (48.7%) graduated from state high schools, 145 (20.6%) from Anatolian high schools, 101 (14.4%) from high schools offering intensive foreign language courses and 114 (16.3%) from other types of high schools (such as private, technical, science high schools).

**Instruments:** Oxford bases the strategy inventory on taxonomy and is faithful to the main and sub-groups that she has determined. Statements concerning students' observable behaviours for making the categorised strategies concrete in addition to verbal statements to reveal mental and thought processes are also available in the inventory. The Strategy Inventory for Language learners (SILL) developed by Oxford [6] is six dimensional and consists of 50 items. Via a five-point Likert type scale the students were asked to choose the alternative that suited them (does not definitely reflect me, reflects me very slightly, reflects me to a certain extent, reflects me to a great extent, reflects me fully) for each item.

This inventory was referred to in more than 40 studies, of which 12 were doctoral dissertations. The mentioned studies involved approximately 8000 students all over the world. The reliability of the inventory, which is usually employed by translating into other languages, (calculating the Alpha Cronbach internal reliability) varies between.93 and 98 [8]. The studies examined the interaction between language learning strategies and such variables as age, gender, success and language proficiency.

**Findings:** The problem statement of the research is: What is the validity and reliability of the language learning

strategies scale in the Turkish sample group? The adaptation of the scale was performed so as to find an answer to the question.

**Translation of the Inventory into Turkish:** For the adaptation of the inventory into Turkish, the items in the original scale were translated into Turkish through back-translation. Linguistic validity studies aim to reach the Turkish correspondence of the scale items. In selecting experts, choosing those who have good command of both languages is not sufficient; experience in the field must also be taken into consideration [9]. For this reason, the original scale was translated into Turkish by a commission of five members composed of linguists and pedagogues; and some of the expressions were modified so that they were better understood and made sense in Turkish. Following the translation work done first separately by the commission members and then together, the inventory was translated back by a translator who was competent in both languages and who was an expert in both linguistics and pedagogy. The translation was compared with the original scale and inconsistencies were detected and thus the modifications and corrections necessary were made.

**The Relations Between the Original Scale and Turkish Translation:** In order to determine the relations between the original and the Turkish version of the scale, the two forms were applied to the students who had knowledge of both languages every two weeks. The study group formed for this purpose consisted of 100 fourth year students studying English Language and Literature at Erciyes University. In the first application, half of the group was given the English form and the other half was given the Turkish form. In the second application, this was reversed and thus efforts were made to avoid time mistakes. The total correlation holding between scores obtained from the two applications was found to be r:0.81. It is evident that this value is quite high as the cross validity of the translated scale.

**The Correlation Between the Scale and a Similar Scale:** In order to determine the validity of the scale according to an external criterion, the same sample group (702 prep class students) was given a similar scale and the degree of relations was found between the scores received from the two inventories. "The Scale of Learning Strategies", which was developed by Güven [10] and for which validity and reliability work was conducted, was employed as the similar scale. The two scales were applied in the same session and the correlation between the total scores was found to be r: 0.70. This coefficient shows that a correlation is available between the scores obtained from this scale and the scores obtained from a similar scale and that the scale displays a concurrent validity according to an external criterion.

**The Correlation Between Learning Strategies:** The correlation holding between scores of learning strategies as well as between the total score of the scale are shown in Table 1.

**The Construct Validity of the Scale:** The construct validity of strategy inventory for language learners, which was adapted into Turkish, was tested through confirmatory factor analysis [11]. In Model 1,the six-factor strategy classification model confirmed by Oxford [6] was taken as a model, a six-factor oblique model was constructed and was tested through confirmatory factor analysis. And in Model 2, six-factor model with one higher- order factor, which is suggested by Hsiao ve Oxford [12] and to which the six factors of the previous model are linked at a higher order, was constructed and tested. In its current state, Model 2 is a second order confirmatory factor analysis (CFA) model. Both models provide evidence to support the construct validity of foreign language learning strategies inventory.

As can be seen in Table 2, Strategy inventory for language learners consists of six dimensions. Namely, memory strategies (items 1-9), cognitive strategies (items 10-23), compensation strategies (items 24-29), metacognitive strategies (items 30-38), affective strategies (items 39-44) and social strategies (items 45-50).

9 items are available in the dimension of memory strategies and factor loads are in the $\lambda$=0,35-0,62 range. 14 items are available in the dimension of cognitive strategies and the factor loads of the items are in the $\lambda$=0,39-0,67 range. In the dimension of compensation strategies 6 items are available and the factor loads of the items are in the $\lambda$=*0,30- 0,73* range. In the dimension of metacognitive strategies 9 items are available and the factor loads of the items are in the $\lambda$=0,55-0,72 range. In the dimension of affective strategies 6 items are available and the factor loads of the items are in the $\lambda$=0,34-0,53 range. In the dimension of social strategies 6 items are available and the factor loads of the items are in the $\lambda$=0,39-0,67 range. On examining the t values in the SIMPLIS output, the regression coefficients of all the items in the model were found to be significant. Table 2 shows that the $R^2$ values (which also give the validity of the items) are quite high [13].

Table 1: The Analysis of Correlation Between Learning Strategies

| | Memory | Cognitive | Compensation | Metacognitive | Affective | Social |
|---|---|---|---|---|---|---|
| Cognitive | 0,603** | | | | | |
| Compansation | 0,386** | 0,510** | | | | |
| Metacognitive | 0,489** | 0,697** | 0,389** | | | |
| Affective | 0,421** | 0,511** | 0,385** | 0,555** | | |
| Social | 0,424** | 0,605** | 0,369** | 0,616** | 0,547** | |
| Total | 0,730** | 0,900** | 0,620** | 0,830** | 0,700** | 0,750** |

As is clear from Table 1, correlation values are in the 0.385- 0.900 range and the whole is significant at 0.001 significance level.

Table 2: The Results of Confirmatory Analysis Concerning Model 1

| | DIMENSIONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Memory | Cognitive | Compesation | Metacognitive | Affective | Social | | |
| Items | Factor Loads ($\lambda_x$) | | | | | | Error Variance ($\delta$) | $R^2$ |
| I 1 | 0,39 | | | | | | 0,84 | 0,16 |
| I 2 | 0,54 | | | | | | 0,70 | 0,30 |
| I 3 | 0,40 | | | | | | 0,84 | 0,16 |
| I 4 | 0,39 | | | | | | 0,84 | 0,16 |
| I 5 | 0,35 | | | | | | 0,88 | 0,12 |
| I 6 | 0,35 | | | | | | 0,88 | 0,12 |
| I 7 | 0,44 | | | | | | 0,80 | 0,20 |
| I 8 | 0,62 | | | | | | 0,62 | 0,38 |
| I 9 | 0,39 | | | | | | 0,85 | 0,15 |
| I 10 | | 0,40 | | | | | 0,84 | 0,16 |
| I 11 | | 0,53 | | | | | 0,72 | 0,28 |
| I 12 | | 0,60 | | | | | 0,64 | 0,36 |
| I 13 | | 0,55 | | | | | 0,70 | 0,30 |
| I 14 | | 0,56 | | | | | 0,69 | 0,31 |
| I 15 | | 0,54 | | | | | 0,71 | 0,29 |
| I 16 | | 0,67 | | | | | 0,55 | 0,45 |
| I 17 | | 0,53 | | | | | 0,71 | 0,29 |
| I 18 | | 0,45 | | | | | 0,80 | 0,20 |
| I 19 | | 0,42 | | | | | 0,83 | 0,17 |
| I 20 | | 0,41 | | | | | 0,83 | 0,17 |
| I 21 | | 0,39 | | | | | 0,85 | 0,15 |
| I 22 | | 0,40 | | | | | 0,84 | 0,16 |
| I 23 | | 0,51 | | | | | 0,74 | 0,26 |
| I 24 | | | 0,57 | | | | 0,68 | 0,32 |
| I 25 | | | 0,30 | | | | 0,91 | 0,08 |
| I 26 | | | 0,55 | | | | 0,70 | 0,30 |
| I 27 | | | 0,41 | | | | 0,83 | 0,17 |
| I 28 | | | 0,60 | | | | 0,65 | 0,35 |
| I 29 | | | 0,73 | | | | 0,46 | 0,54 |
| I 30 | | | | 0,69 | | | 0,52 | 0,48 |
| I 31 | | | | 0,72 | | | 0,48 | 0,52 |
| I 32 | | | | 0,60 | | | 0,63 | 0,37 |
| I 33 | | | | 0,59 | | | 0,65 | 0,35 |
| I 34 | | | | 0,62 | | | 0,62 | 0,38 |
| I 35 | | | | 0,69 | | | 0,52 | 0,48 |
| I 36 | | | | 0,70 | | | 0,51 | 0,49 |
| I 37 | | | | 0,58 | | | 0,66 | 0,34 |
| I 38 | | | | 0,55 | | | 0,70 | 0,30 |
| I 39 | | | | | 0,53 | | 0,72 | 0,28 |
| I 40 | | | | | 0,50 | | 0,75 | 0,25 |
| I 41 | | | | | 0,45 | | 0,80 | 0,20 |
| I 42 | | | | | 0,34 | | 0,88 | 0,12 |
| I 43 | | | | | 0,40 | | 0,82 | 0,16 |
| I 44 | | | | | 0,43 | | 0,82 | 0,18 |
| I 45 | | | | | | 0,39 | 0,84 | 0,16 |
| I 46 | | | | | | 0,46 | 0,79 | 0,21 |
| I 47 | | | | | | 0,61 | 0,62 | 0,38 |
| I 48 | | | | | | 0,50 | 0,75 | 0,25 |
| I 49 | | | | | | 0,67 | 0,56 | 0,44 |
| I 50 | | | | | | 0,46 | 0,78 | 0,22 |

Table 3: Models and CFA Results

| Models | $\chi^2$ | $\chi^2$/sd | GFI | AGFI | RMSEA | $\chi\chi^2$ |
|---|---|---|---|---|---|---|
| Model 1. (6 Factor structure) | $3671,55_{(1156)}$ | 3,17 | 0,96 | 0,96 | 0,05 | $82,61_{(9)}$ p< 0.01 |
| Model 2.(Second order factor structure) | $3754,16_{(1165)}$ | 3,22 | 0,96 | 0,96 | 0,05 | |

Table 4: Internal Consistency Reliability Coefficients for the Whole and Sub-dimensions of the Scale

| Sub-dimensions | Alpha | Number of items |
|---|---|---|
| Learning Strategies (whole scale) | 0,92 | 50 |
| Memoy Strategies | 0,72 | 9 |
| Cognitive Strategies | 0,81 | 14 |
| Compensation Strategies | 0,70 | 6 |
| Metacognitive Strategies | 0,86 | 9 |
| Affective Strategies | 0,55 | 6 |
| Social Strategies | 0,68 | 6 |

Because the same variables were analysed in Table 3, for comparisons between models $\triangle\chi^2$ difference analysis was conducted and GFI, AGFI and RMSEA fit goodness indices for the models were interpreted [14].

It is evident that fit goodness indices for both models are high enough, GFI=0,96 and AFFI=0,96, the proportions of chi square/ the degree of freedom are smaller than 5 and that RMSEA values are above acceptable limits. On the other hand, the $\triangle\chi^2$ value which enables comparison of the two models (the chi square difference between the two models) is found to be significant at the level of p<0,01. In this case, it is clear that Model 1, which generates a smaller chi square value and $\chi^2$/sd ratio, is a better model. However, since the second model also provides the fit goodness coefficients which a good model should possess, both models provide evidence supporting the construct validity of the foreign language learning strategies inventory. Standard structural weights that first order dependent hidden variables obtained from Model 2 generate with second order dependent hidden variables were found to be quite high (memory ($\chi$=0,70); cognitive ($\chi$=0,38); compensation ($\chi$=0,37); metacognitive ($\chi$=0,60); affective ($\chi$=0,47) and social ($\chi$=0,34).

Because the fit goodness of the model accounting for the second order relations is high, it may be said that this is a scale which yields total scores for both the sub-dimensions of the scale and the whole of the scale. The path diagram for the second order CFA model of Strategy inventory for language learners is shown in Figure 1.

Internal Consistency Reliability Coefficients for the Whole and Sub-dimensions of the Scale: The internal consistency reliability coefficients for the whole and sub-dimensions of the scale are shown in Table 4.

As is seen in Table 4, the internal consistency reliability coefficient for the whole scale was found as 0,92 although the scale was composed of six dimensions. Moreover, although the number of items is very low at

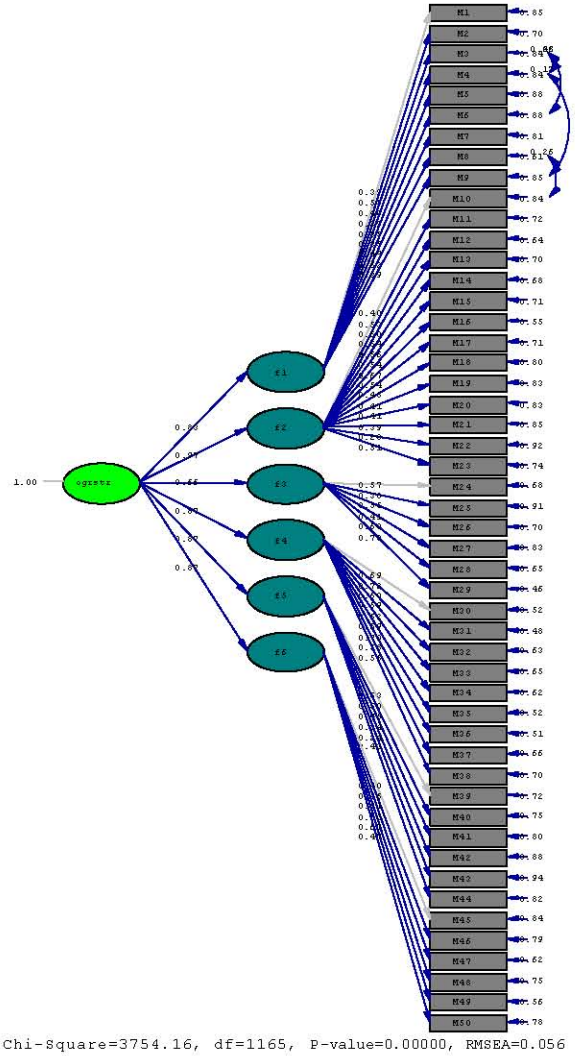


Fig. 1: The Path Diagram for the Second-order CFA Model of Strategy Inventory for Language Learners
L.S: Learning Strategies; F1: Memory;
F2: Cognitive; F3: Compensation;
F4: Metacognitive; F5: Affective; F6: Social

sub-dimensions, the reliability coefficients were found to be in the 0,55-0,86 range and those dimensions were observed to have quite high reliability coefficients.

Test- Retest Reliability of the Scale: For the test-retest reliability of the scale, a group of 165 students were given two applications with two-week intervals and r: 0,83 relation coefficient was found for the score results of the two applications. This value shows that the test-retest reliability of the scale is quite high. On the other hand, the internal consistency reliability coefficient for the whole scale was found as alpha: 0,94 (N:165) following the retest application.

In consequence, all the analyses conducted revealed that the strategy inventory for language learners might be used as a reliable and valid tool of measurement in Turkey also.

## CONCLUSION

This study aims to investigate the evidence concerning the reliability and validity of the scale after translating and adapting the strategy inventory for language learners developed by Oxford [6] into Turkish. The scale was applied to 702 students, of whom 494 were female and 208 male, attending the School of Foreign Languages of Erciyes University. Having examined and seeing the linguistic equivalence of the scale, the reliability as well as validity analyses were conducted. The items in the original scale were translated into Turkish through back translation; afterwards, the two forms were applied to a group of 100 bilingual students every two weeks. The correlation between the total scores obtained from the two applications was calculated as r: 0,81.

The construct validity of the scale was tested via confirmatory factor analysis and evidence supporting the construct validity of the scale in both models formed was obtained. In order to obtain the validity of the scale according to an external criterion, the same sample group (that is, the 702 students) was given a similar scale; thus the degree of relations between the two inventories was determined. "The Scale of Learning Strategies", which was developed earlier by Güven [10] and for which reliability and validity analyses were done, was used as the similar scale; and the correlation with the Strategy Inventory for Language Learners was found as 0,70.

An examination of the internal consistency and test-retest results of the scale showed that the values were within acceptable limits. The Cronbach alpha internal consistency coefficient for the overall "Strategy Inventory for Language Learners" was calculated as 0,92. And the reliability coefficients for the six sub-dimensions ranged in the 0,55-0,86 interval. Reliability level for all the sub-dimensions of the scale may be said to be sufficient. For the test-retest reliability of the scale, a group of 165 students were given two applications in two- week intervals and between scores concerning the results for the two applications r: 0,83 correlation coefficient was found.

Based on the findings concerning the reliability and validity analyses of the Turkish form of the "Strategy Inventory for Language Learners", it may be said that the scale can be used in a valid and reliable way so as to determine students' strategies of foreign language learning. It is believed that using this scale in research into foreign language teaching and the teaching-learning process will contribute to the field. As Aricak and Ilgaz [15] point out, in order for a scale to be of high quality and beneficial, it should be used in various research attempts and for different samples on different occasions and validity and reliability investigations should be conducted; which will contribute not only to the scale but also to the field considerably. Therefore, work to be done on different samples will also be beneficial for the reliability and validity of the scale.

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