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An Exploratory Factor Analysis of the Strategy Inventory for Language Learning (SILL) in Ukrainian Philology Students

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Abstract

Purpose

This study examines the factor structure of the Strategy Inventory for Language Learning (SILL) in a sample of English- and Ukrainian-speaking, Ukrainian college students. There is abundant research supporting the pedagogical belief that the use of learning strategies by second language learners is strongly associated with language learning success. Worldwide, the SILL is the most popular instrument that assesses these skills; however, studies evaluating the psychometric properties of the scale have offered mixed results.

Methodology

This study used exploratory factor analysis (EFA) to examine the factor structure of the SILL with a sample of 193 Philology students enrolled in a large university in northeastern Ukraine.

Results/Findings

Our modification of the 50-item SILL resulted in a condensed, 38-item, two-factor revision of the scale which was more psychometrically defensible for the assessment of second language learner characteristics. To reflect the more psychometrically-sound revision, the modified scale is called the SILL-KK. Results of our study failed to find support for the original six-factor structure put forward by Oxford and instead found the data best characterized by a two-factor model. Our refinement of Oxford's 50-item SILL resulted in an abbreviated, 38-item, two-factor version of the instrument

Implications

First, this study addresses criticisms of the dearth of SILL psychometric validation research. Second, the study responds to some theoretical concerns raised in the literature regarding strategy category overlap. From a practical standpoint, the SILL-KK will hopefully lead to more accurate diagnoses of language learning strategies for both students and instructors in addition to the design and development of better individualized instructional materials.

Keywords: Motivation; Learning strategies; Strategy inventory for language learning (SILL); Factor analysis; Language learning

1. Introduction

Over the past fifty years, learning styles and strategies utilized by students in the fields of English as a Second Language (ESL) and English as Foreign Language (EFL) have received increasing attention from researchers (Chang, 2011; Cohen, 1998; Pawlak, 2021; Vann & Abraham, 1990), and have been characterized as the most researched factors among all other learner differences in the extant literature on language learning (Brown, 2000;

Ehrman, Leaver, & Oxford, 2003; Peacock, 2001). A number of studies have demonstrated that more proficient language learners used a greater variety of language learning strategies (Griffiths, 2020; Lee, 2003; O'Malley & Chamot, 1990; Rahimi et al., 2008), and in particular, students with different levels of language proficiency make differential use of their underlying skills (Ross & Rost, 1991). Additionally, student awareness of the specific cognitive strategies they are utilizing to enhance their second language (L2) learning has been demonstrated to predict academic success (Chamot, 2004; Oxford, 2001; Zhang, 2002).

Although there is agreement that metacognitive learning strategies utilized by L2 learners are directly related to ease of mastering the second language, the term 'language learning strategies' has rarely been agreed upon by researchers over the past three decades (Do¨rnyei & Skehan, 2003). In addition, Ehrman et al. (2003) noted that within the L2 literature, learning style, cognitive style, personality type, sensory preference, and modality are often used interchangeably by different researchers in the field. In general, language learning strategies are thought to be the specific, intentional steps taken by the learner to facilitate acquisition, retention, and retrieval and are conscious, purposeful behaviors (Chamot, 2004; O'Malley & Chamot, 1990; Oxford, 1990). For example, Oxford (2017) has listed several dozen different definitions for the terms including 'language learning strategies,' 'learner strategies,' and 'self-regulated learning strategies'. However, researchers have typically defined language learning strategies differently based upon two considerations: whether they produce a direct (Rubin, 1981) or indirect (e.g., Ellis, 1994) impact on language learning; and secondly, based on human psychology: language learning strategies are a combination of behavioral and cognitive influences (Cohen, 1998; O'Malley & Chamot, 1990).

Learning styles have been defined as "the general approaches - for example, global or analytic, auditory or visual - that students use in acquiring a new language or learning in any other subject" (Oxford, 2001, p. 359) that are consistent and rather enduring (Brown, 2000). Oxford (2001) has further opined that language learning strategies are among the best predictors of determining the quality of second and foreign language learning. Similarly, Weinstein & Rogers (1984), have defined learning strategies as actions that a learner employs that are intended to facilitate the attainment, preservation, and reclamation of new knowledge. O'Malley and Chamot (1990) considered strategies as tools for active, self-directed involvement that are necessary for the development of SL/FL communicative ability. In recent years, researchers have identified key areas of individual difference that can influence the choice of LLS and the frequency of their use (Balci, 2017; Chang, 2003; Griffiths, 2020).

Students who are able to monitor their own metacognitive processes will be better poised for diverse and changing pedagogical techniques. Chamot (2004) characterized strategic learners as learners having metacognitive knowledge about their own learning processes and the ability to use strategies properly in accordance with the specific task and their own learning strengths.

Within the framework of metacognition, the incorporation of successful learning strategies will subsequently be associated with increased academic success. Research on cognitive strategies has demonstrated a significant correlation between cognitive learning strategies and academic performance, including language learning (MacIntyre, MacMaster & Baker, 2001; Sachs, Law, Chan, & Rao, 2001). Without question, instructors and second language learners must be able to synchronize pedagogical and cognitive strategies in a manner that will facilitate language learning.

Much of this development is directly traced to Chomsky's (1965) emphasis on language behaviors and the capacities that the learner brings to the learning situation. Chomsky's Learning Acquisition Device (LAD) was in direct conflict with the mechanistic behavioral theories of the time as it described cognitive processing as a much more active process much akin to Piaget's notions of assimilation and accommodation. Not surprisingly, Chomsky and the subsequent ideas of Vygotsky (1978, 1986) were ignored in the post-war Soviet Union in favor of the Marxist teaching that individual minds combine to produce a "societal" mind.

Making this situation more complicated, cultural background plays an important role in the use of students' language learning strategy (Lee, 2023; Oxford, 1996). Research has shown that Asian students use different language learning strategies than students from other cultural backgrounds (Politzer & McGroarty, 1985). For example, regardless of their geographic setting, (e.g., mainland China, Taiwan, or the United States), Chinese students have been shown to prefer the use of compensation, language learning, strategies. However, these same students, as well as Korean students, infrequently use memory strategies. Further, social strategies are also avoided by Chinese and Japanese subjects, again, regardless of the country they are studying in. Similarly, Alhaysony, (2017) found that Saudi students tend to use only a small subset of the full range of language cognitive learning approaches. Clearly, cultural factors play an important role in the selection of language learning strategies however no significant differences in overall strategy have been associated with the duration of studying English (Khalil, 2005; Magno, 2010).

1.1. Oxford's taxonomy

Rebecca Oxford (1990) was one of the earliest educators to develop a taxonomy of language learning strategies (LLSs). Beyond general language learning strategies, Oxford divided these strategies into two subgroups

which she identified as direct and indirect learning strategies. Direct learning strategies incorporate the specific use of language and are further subdivided into memory, cognitive, and compensation strategies. Indirect learning strategies do not use language directly but support and manage language learning; they are categorized into metacognitive, affective, and social strategies (Oxford, 1990). More specifically, Oxford (2001) identified six major types of learning strategies in terms of L2 learning: cognitive, metacognitive, memory, compensatory, affective, and social which were incorporated into The Strategy Inventory for Language Learning (SILL).

Oxford's (1990) classifications of the language learning strategies used by students are the most frequently used scale of this type around the world and have been extensively examined in L2 acquisition regarding language strategy use (Bruen, 2020; Gardner, Tremblay, & Masgoret, 1997). The SILL 7.0 (ESL/EFL) for learners of English as a second/ foreign language (50 items) was developed by Oxford (1990). The scale contains 6 subscales: memory strategies (9 items), cognitive strategies (14 items), compensation strategies (6 items), metacognitive strategies (9 items), affective strategies (6 items), and social strategies (6 items). The SILL has been increasingly employed in second language research (Mizumoto & Takeuchi, 2018) and has established a prominent role in mixed-methods, studies (Gavriilidou & Psaltou-Joycey, 2018).

The SILL has been translated into at least 17 languages and administered to thousands of learners (Chamot 2001). The ESL/EFL version of the SILL has exhibited Cronbach alpha reliability coefficients above .90 in Chinese, Greek, Japanese, Korean, Turkish, and Puerto Rican Spanish translations (Cesur & Fer, 2007; Oxford, 1996). Despite the widespread popularity of the SILL, it suffers from two significant psychometric limitations. First, although the translated versions of the SILL have demonstrated high reliability as measured by Cronbach's alpha coefficients between .91 and .95 (Hsiao & Oxford, 2002), in most cases this coefficient was derived from scores from the overall scale rather than from the six individual subscales. However, coefficient alpha assumes that a scale measures a single construct and that all items have the same true score variance and relationship to the measured construct (Watkins, 2017). These assumptions are unlikely to be met by the SILL, given its purported measurement of six interrelated constructs, resulting in reliability estimates that may either over or under-estimate the population reliability (Green & Yang, 2009).

Second, the structural aspect of construct validity has not been well established (Messick, 1995). The SILL scoring structure specifies six subscales (Oxford, 1990) but does the empirical structure of the SILL mirror those subscale scores? In an attempt to address this issue, Oxford and Burry-Stock (1995) examined the factor structures of ESL/EFL SILL reported by a number of independent researchers. In their review they discovered that over 13 different LSS factors had been identified, accompanied by no clear theoretical explanation for many of the results. More recent factor analytic studies have found anywhere between one and fifteen factors (Dörnyei & Ryan, 2015; LoCastro, 1994; Phakiti, 2003; Skehan, 1991). For example, Nyikos and Oxford (1993) found five factors among university students in Korea and the USA while Yang (1999) found evidence for a six-factor solution in the SILL among university students in Taiwan. Additionally, Green and Oxford (1995) and El-Dib (2004) found nine- and eight-factor solutions among university students in Puerto Rico and Kuwait, respectively, while Robson and Midorikawa (2001) found a 15-factor solution for the SILL among university students in Japan. As a result, there currently exists no agreed-upon conclusion regarding the exact number of factors employed by the SILL for use with L2 learners.

These inconclusive factor analysis results have likely been caused by investigators' use of different versions of the SILL and their differing degrees of statistical sophistication (Gorsuch, 1983). Researchers must make several thoughtful and evidence-based methodological decisions while conducting a factor analysis and reviews of the professional literature have consistently found that many applications of factor analysis were marked by an injudicious choice of techniques (Morin et al., 2020; Watkins, 2018).

In summary, the psychometric properties of the SILL have demonstrated that the empirical structure arrived at via factor analysis bears little correspondence with the measurement model offered by Oxford (1990). In this regard the goal of the present study was to examine the factor structure of the SILL utilizing best-practice exploratory factor analytic (EFA) methods (Gorsuch, 1983; Morin et al., 2020; Watkins, 2018, 2021) in a sample of university philology students from an Eastern European, former Soviet state, a geographic and political region vastly underexplored in the language-learning literature.

2. Methods

2.1. Participant

All data were collected prior to the 2022 Russian invasion of Ukraine. The sample included 193 Philology students enrolled in a large university in northeastern Ukraine. The sample was primarily female (89%), with an average age of 21.2 years. All students had proficiency in at least English, Russian, and Ukrainian languages. Informed consent was obtained by all students and the anonymity of all participants were guaranteed.

2.1. Instruments

The instrument used for this study was Version 7.0 of the 50-item Strategy Inventory for Language Learning (SILL). The English language version of the Scale was utilized which produced scores for each of the six purported sub-factors as well as a total-scale score. Subscales included Memory Strategies, Cognitive Strategies, Compensation Strategies, Metacognitive Strategies, Affective Strategies, and Social Strategies. Subscales were presented in continuous sequence, which may allow participants to recognize item patterns, but is consistent with the directions for administration provided by the author. Each item of the SILL is scored on a 5-point Likert scale.

In addition, several demographic questions were created by the researchers which asked about participants' background information relevant to their involvement in this study (i.e., age, gender, year of study, languages spoken).

3.4. Data collection and analysis

The SILL was administered via the online resource Qualtrics (www.qualtrics.com) which allowed for easier collection of the data and a faster response time in a secure, web-based environment. Prior to responding, all participants completed an online consent form which had been approved by the first author's University Institutional Review Board. Respondents completed the questions on an Internet accessible computer at their university.

Due to the conflicting findings regarding the factor structure of the SILL, exploratory rather than confirmatory factor analysis was employed (Watkins, 2018, 2021). Common factor analysis was considered more appropriate than principal components analysis as the goal of the current study was to identify the scale's latent structure (Widaman, 2018). Principal axis extraction was applied due to its relative tolerance of multivariate nonnormality and its superior recovery of weak factors (Briggs & MacCallum, 2003). Communalities were initially estimated by squared multiple correlations (Flora, 2018).

As recommended by Gorsuch (1983), multiple criteria were used to determine the number of factors to retain for rotation, including the scree test (Cattell, 1966), minimum average partials (MAP; Velicer, 1976) and parallel analysis (Horn, 1965). For both theoretical and empirical reasons, it was assumed that factors would be correlated (Gorsuch, 1997; Meehl, 1990). As a result, Promax rotation with a k value of 4 was selected (Tataryn et al., 1999). To ensure both practical (10% variance explained) and statistical significance ($p < .05$), the threshold for salience was set at .32 (Norman & Streiner, 2014) with a goal of approximate simple structure (Morin et al., 2020; Thurstone, 1947).

Most experts recommend overestimating rather than underestimating the number of factors to extract in EFA (Wood et al., 1996); therefore, following the suggestions of Fabrigar et al. (1999) and Flora (2018) the highest to lowest number of factors were examined until the most interpretable solution was found. Guidelines for model acceptability included: (a) at least three salient item loadings (pattern coefficients) were necessary to form a factor with the exclusion of complex loadings (Gorsuch, 1997); (b) internal consistency reliability coefficients (alpha) greater than .80 for each resulting factor; (c) no obvious symptoms of model misfit due to overfactoring or underfactoring; and (d) robustness of results across alternative extraction and rotation.

3. Results

3.1. Descriptive analysis of SILL

An examination of Table 1 indicates that for the 50 SILL items, mean scores ranged from 2.02 to 3.91, with standard deviations between 1.05 and 1.48. The relatively small standard deviations reflected relative homogeneity with responses clustered closely around the mean. There were no obvious illegal or out-of-bounds values and there was no missing data. Univariate skew and kurtosis values were not extreme (maximum of 1.85 and 4.80, respectively). These relatively normal item distributions with ordered categorical data suggest that EFA with a Pearson correlation matrix should not substantially bias EFA results (Curran et al., 1996; Lozano et al., 2008).

Table 1: Descriptive statistics of strategy inventory for language learning (SILL)

Systems	Mean	SD
Memory strategies	3.02	1.307
Cognitive strategies	3.45	1.248
Compensatory strategies	3.50	1.193
Meta cognitive strategies	3.28	1.242
Affective strategies	2.78	1.273
Social strategies	3.19	1.277

Note: Five-point Likert scale was used (1. Never or almost never true of me; 2. Usually not true of me; 3. Somewhat true of me; 4. Usually true of me; and 5. Always or almost always true of me)

3.2. Factor analysis of SILL

A visual scan of the correlation matrix for the data revealed that all the coefficients were ⩾ .30, but none exceeded .90 (Tabachnick & Fidell, 2019). Bartlett's test of sphericity (1950) rejected the hypothesis that the correlation matrix was an identity matrix (chi-square of 4,042.49 with 1,225 degrees of freedom). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was acceptable with values of .86 for the total model and .58 to .88 for each of the measured variables (Kaiser, 1974). Altogether, these measures indicate that the correlation matrix is appropriate for EFA (Tabachnick & Fidell, 2019). Altogether, these measures indicated that factor analysis was appropriate.

Parallel analysis and MAP criteria were in agreement that three factors should be extracted for rotation and subsequent interpretation. In contrast, the visual scree indicated that four factors might be appropriate and Oxford's (1990) claim of six, discreet language learning subscales suggested that six factors might be required. Consequently, models with six through one factor(s) were sequentially evaluated for acceptability with the previously described guidelines.

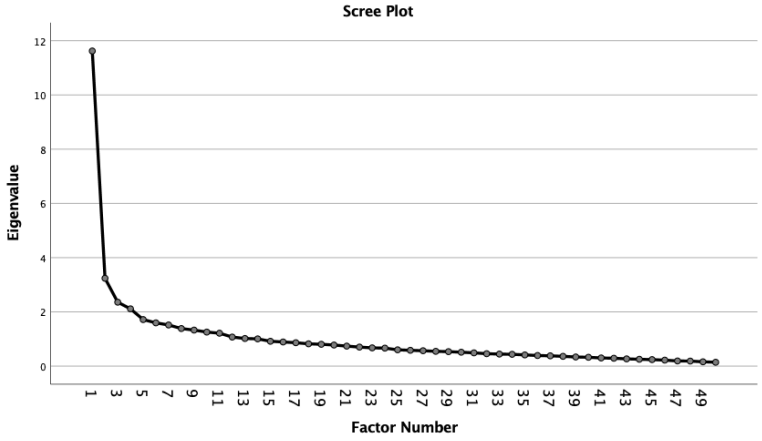

Figure 1: Scree plot indicating four factors

The six-factor model converged properly and explained 38% of the total variance before rotation, with the first through sixth factors accounting for 22.1%, 5.2%, 3.5%, 3.1%, 2.1%, and 2.0% of the total variance, respectively. The fourth, fifth, and sixth factors were saliently loaded by only five, three, and two items respectively. Three items cross-loaded and 9 items failed to load on any factor. The Cronbach alpha coefficient for the fifth and sixth factors was ,609 and .58 respectively. This is an indicator of overextraction and suggested that fewer factors would be more appropriate. Further, salient items loadings were distributed across the entire scale with no obviously alignment on the purported, appropriate factor.

As a result, a five-factor model was subsequently examined. The five-factor model converged properly and explained 35.8% of the total variance before rotation, with the first through fifth factors accounting for 22.1%, 5.2%, 3.5%, 3.0%, and 2.1% of the variance, respectively. The fourth factor saliently loaded with six items and both items aligning with the proposed fifth factor cross-loaded with other items. Seven items cross-loaded and five items failed to load on any factor. As a result, the reliability of the fifth factor could not be computed and the Cronbach alpha coefficient for the fourth factor was .653. This was again an indicator of overextraction and suggested that fewer factors would be more appropriate. Again, salient items loadings were distributed across the entire scale with no obviously alignment on the purported, appropriate factor.

Subsequently, a four-factor model was examined. The four-factor model converged properly and explained 33.5% of the total variance before rotation, with the first through fourth factors accounting for 22.0%, 5.1%, 3.4%, and 3.0% of the variance, respectively. The third and fourth factor were saliently loaded by eight and five items respectively. The Cronbach alpha coefficient for the fourth and fifth factors was ,737 and .609 respectively. This was again an indicator of overextraction and suggested that fewer factors would be more appropriate. Two items cross-loaded and nine items failed to load on any factor. Again, salient items loadings were distributed across the entire scale with no obviously alignment on the purported, appropriate factor.

Next, the three-factor model supported by parallel analysis and MAP criteria was examined. The three-factor model converged properly and explained 30.40% of the total variance before rotation, with the first through third factors accounting for 21.98%, 5.06%, and 3.36% of the variance, respectively. The first factor was saliently loaded by twenty-four items, the second factor had nine salient loadings, but the third factor had only four salient

loadings. Additionally, four of the items demonstrated cross-loadings and nine of the items failed to load on any factor. Salient items loadings were distributed across the entire scale with no obviously alignment on the purported, appropriate factor. Alpha reliabilities were acceptable for the first and second factors, .918 and .746 respectively, but the resulting value of .552 was unacceptably low for the third factor.

As a next step a two-factor model was examined (see Table 2). The communalities for this two-factor oblique solution ranged from .018 to .472 with no inadmissible estimates. Communalities $\geqslant$ .60 are often considered to be high (Gibson et al., 2020). The two-factor model converged properly and explained 26.91% of the total variance before rotation, with the first and second factors accounting for 21.92% and 5.00% of the variance, respectively. The first factor was saliently loaded by twenty-five items and the second factor had fourteen salient loadings with only one of the items demonstrating cross-loadings. Ten of the scale items failed to load on either factor. Alpha reliabilities were again acceptable for the first and second factors, with coefficients of .921 and .776 respectively, Although the two-factor model appeared to be satisfactory, a one-factor model was evaluated to ensure that it was not exhibit superior fit characteristics.

The one-factor model converged properly, explained 21.85% of the total variance, produced reasonable parameter estimates, and exhibited thirty-four salient loadings on its single factor. However, communalities were weaker in comparison to the two-factor model suggesting that two factors have collapsed onto one (Fabrigar & Wegener, 2012). Additionally, the one-factor model exhibited symptoms of underextraction: failure to reflect a common unifying theme (Fabrigar & Wegener, 2012) and many large residuals, strongly indicating the presence of another factor (Cudeck, 2000). Thus, measures of model fit as well as theoretical convergence remove this model from consideration, leaving the two-factor model as the preferred solution.

Table 2. Communalities and *Factor Loadings of a Two-Factor Solution of Strategy Inventory for Language Learning (SILL)*[1]

SILL Question	Communality extraction	Factor loadings	
		Factor1 1	Factor 2
SILL 1	.306	**.385**	.239
SILL 2	.243	**.457**	.123
SILL 3	.096	.014	.275
SILL 4	.220	.241	.292
SILL 5	.221	-.183	**.532**
SILL 6	.190	-.122	**.449**
SILL 7	.136	.028	**.348**
SILL 8	.266	.280	.306
SILL 9	.064	.189	-.031
SILL 10	.144	.285	.139
SILL 11	.379	**.715**	-.247
SILL 12	.333	**.572**	.207
SILL 13	.329	**.672**	.258
SILL 14	.391	**.681**	-.117
SILL 15	.442	**.765**	-.241
SILL 16	.433	**.681**	-.110
SILL 17	.425	**.765**	-.231
SILL 18	.290	-.118	**.594**
SILL 19	.224	-.121	**.528**
SILL 20	.205	.291	.223
SILL 21	.167	.103	**.427**
SILL 22	.132	**.395**	.221
SILL 23	.323	.206	**.429**
SILL 24	.180	**.381**	.135
SILL 25	.141	.261	**.412**
SILL 26	.095	.211	.329
SILL 27	.144	**.453**	-.246
SILL 28	.161	.215	.241
SILL 29	.248	**.559**	-.136
SILL 30	.505	**.722**	.080
SILL 31	.397	**.606**	.148
SILL 32	.298	**.583**	-.096
SILL 33	.444	**.544**	.188
SILL 34	.349	**.340**	**.332**
SILL 35	.353	**.501**	.147
SILL 36	.422	**.627**	-.252
SILL 37	.455	**.544**	.200

SILL 38	.418	**.525**	.187
SILL 39	.118	.187	.280
SILL 40	.355	**.636**	-.185
SILL 41	.214	-.119	**.516**
SILL 42	.018	.243	.162
SILL 43	.265	-.120	**.570**
SILL 44	.146	.121	**.424**
SILL 45	.156	.267	.180
SILL 46	.267	-.201	**.469**
SILL 47	.249	.296	.271
SILL 48	.337	.254	**.401**
SILL 49	.472	**.577**	.173
SILL 50	.303	.568	.037

Note*:* Salient factor loadings in bold

4. Discussion

The consideration of strategies for language learning has extended over almost 50 years and can be traced to Rubin's taxonomy which examined learners' thoughts, actions, and social behaviors (Rubin, 1981). Approximately a decade later, steeped heavily in cognitive theory, O'Malley et al.'s (1985) taxonomy of strategies focused on the cognitive and metacognitive strategies students used to learn a new language. Shortly afterward, Rebecca Oxford, (1990) put forward her Strategy Inventory for Language Learning (SILL) which has evolved to become the most influential instrument in LLS research internationally.

Despite its' widespread popularity the construct validity of the scale remains in question (Amerstorfer, 2018). In particular, the construct validity of the SILL has been inconsistent with different factor structures demonstrated across different learning contexts (Park, 2011). Prior exploratory factor analytic studies have demonstrated four factors (Yeşilbursa, & İpek, 2013); five factors (Nyikos & Oxford, 1993); six factors (Mohammadi & Alizadeh, 2014; Papadopoulou et al, 2018) (same as SILL); (different from the original SILL); (Yang, 1999); eight factors El-dib (2004); nine factors, (Green & Oxford, 1995); and as many as 15 factors (Robson and Midorikawa, 2001). Conflicting results have often occurred due to inconsistent EFA methodologies, e.g., using principal component analysis rather than the more appropriate factor analytic technique; used only a single criterion (eigenvalue > 1.00) to determine the number of factors to rotate.

Using what can be considered a 'best practice approach' (Gorsuch, 1983; Tabachnick & Fidell, 2001), results of our study failed to find support for the original six-factor structure put forward by Oxford and instead found the data best characterized by a two-factor model. Our refinement of Oxford's (1990) 50-item SILL resulted in an abbreviated, 38-item, two-factor version of the instrument. This revised version demonstrates improved construct validity as the psychometric properties of the scale are now more defensible. To reflect the necessary revision of the original instrument the modified scale is called the SILL-KK (see Table 3).

The factorial acceptability of the SILL-KK was evidenced by: (a) at least three salient item loadings (pattern coefficients) formed the factors and excluded complex loadings (Gorsuch, 1997); (b) internal consistency reliability coefficients greater than .80 for each resulting factor; (c) no obvious symptoms of model misfit due to overfactoring or underfactoring; and (d) robustness of results across alternative extraction and rotation methods.

If the measured variables are items or are otherwise meant to be combined into a scale, the alpha reliability (Cronbach, 1951) of each factor should exceed the threshold established for the use of such scales (Pett et al., 2003). For example, reliability coefficients in the .90s are excellent and likely sufficient for clinical decisions (DeVellis, 2017), coefficients in the .80s are good and sufficient for non-critical decisions, coefficients in the .70s are adequate for group experimental research, and coefficients less than .70 are inadequate for most applications (Hunsley & Mash, 2007; Kline, 2013). The Cronbach alpha (a = 776) for for the second factor approached the criteria for sufficient decisions but was not as high as would be preferred.

The newly created first SILL factor appears to be a general language learning factor. Factor one is a combination of metacognitive and cognitive strategies that include both direct and indirect learning strategies. Previously identified in the literature, direct strategies include strategies for remembering vocabulary, cognitive strategies for comprehending text, and compensation strategies when knowledge isn't readily available. In contrast indirect strategies include metacognitive strategies for deeper language processing, affective strategies, and social strategies.

The second factor was harder to classify but appears to consist primarily of compensatory strategies perhaps involving associative motivation or creative visualization. The strategies were not used in isolated situations however and included activities in interactive and social settings. Additionally, there appeared to be a combination of rote memorization, as well as higher-level techniques identified by the students. Ultimately, the clinical utility

of both factors will be determined by their ability to successfully predict language learning outcomes or correlates or to discern populations of language learners with differing skill levels.

The current data did not yield a factor for affective strategies, which was in parallel with the findings of Yang (1999) and Oxford & Nyikos (1989). Further, a rather large number of questions failed to load on any factor; as a result, our results suggest that the future users of the SILL consider either eliminating these questions to allow for stronger, unique factor loadings.

5. Conclusion

In conclusion, three primary benefits can be derived from our findings. First, this study addresses criticisms of the dearth of SILL psychometric validation research. Second, the study responds to some theoretical concerns raised in the literature regarding strategy category overlap (Cohen, 1998; Hsiao & Oxford, 2002). Third, the study utilized a best practice approach to EFA. From a practical standpoint, the SILL-KK will hopefully lead to more accurate diagnoses of language learning strategies for both students and instructors in addition to the design and development of better individualized instructional materials.

One limitation of our study was that we only examined Ukrainian university students. In this regard, our results can only be generalized to other locations, and to students speaking different languages, through further research. In addition, expanding the use of the scale to other age groups would significantly strengthen the construct utility of the scale. Relatedly, the population included only Philology students who would likely be better versed in second language learning strategies than would the general population. Finally, because participation was voluntary, there is a small possibility that the findings could be affected by motivation bias. Each of these factors should be considered by future researchers who investigate language learning strategies in other age groups and across diverse learning contexts.

Table 3: Adaptation of the strategy inventory for language learning (SILL)

Factor 1	Factor 2
• I watch English language TV shows spoken in English or go to movies spoken in English. • I try to find as many ways as I can to use my English. • I try to talk like native English speakers. • I start conversations in English. • I read for pleasure in English. • I use the English words I know in different ways. • I write notes, messages, letters, or reports in English. • I encourage myself to speak English even when I am afraid of making a mistake. • I look for opportunities to read as much as possible in English. • I notice my English mistakes and use that information to help me do better. • I pay attention when someone is speaking English. • I ask questions in English. • I practice the sounds of English. • I try to learn about the culture of English speakers. • If I can' t think of an English word, I use a word or phrase that means the same thing. • I have clear goals for improving my English skills. • I try to find out how to be a better learner of English. • I think about my progress in learning English. • I look for people I can talk to in English. • I use new English words in a sentence so I can remember them. • I read English without looking up every new word. • I try not to translate word-for-word. • I think of relationships between what I already know and new things I learn in English. • To understand unfamiliar English words, I make guesses. • I plan my schedule so I will have enough time to study English	• I first skim an English passage (read over the passage quickly) then go back and read carefully. • I write down my feelings in a language learning diary. • I use rhymes to remember new English words. • I look for words in my own language that are similar to new words in English. • I give myself a reward or treat when I do well in English. • I ask English speakers to correct me when I talk. • I use flashcards to remember new English words. • I make summaries of information that I hear or read in English. I find the meaning of an English word by dividing it into parts that I understand. • I talk to someone else about how I feel when I am learning English. • When I can' t think of a word during a conversation in English, I use gestures. • I ask for help from English speakers. • I physically act out new English words. • I make up new words if I do not know the right ones in English.

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