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THE STRATEGY INVENTORY FOR SECOND LANGUAGE LEARNING: TESTED, ADAPTED, AND VALIDATED IN THE SLOVENIAN HIGHER EDUCATION CONTEXT

Abstract

In administering the Strategy Inventory for Language Learning (SILL) survey, our research focused on the use of second language learning strategies (SLLS) among higher education students, ascertaining what SLLS they use, the relationships between the strategies, and how the use of one group of SLLS can explain the use of other groups of strategies. This study examined the validity of the SILL (Oxford, 1990: 293-300) in a specific context by performing an exploratory and confirmatory factor analyses based on the survey response data of 225 students learning English at the Faculty of Administration, University of Ljubljana, Slovenia. The results show that most of the fit indexes used to test Oxford's SILL provide an unacceptable fit, so a modification is proposed on the basis of the results of a confirmatory factor analysis (CFA). The adapted strategy inventory model with validated fit is introduced and discussed. It shows that basic cognitive and metacognitive strategies explain 58% of the variance of social learning strategies. The results also show that certain SILL strategies are out-dated, possibly due to advancements in information technology and language learning. The implications of these findings are discussed in the light of future study areas of SILL and SLLS research.

Key words

second language learning strategies, Strategy Inventory for Language Learning (SILL), confirmatory factor analysis, structural equation modelling, higher education.

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1. INTRODUCTION

European higher education, with Slovenia comprising a part thereof, promotes citizens' mobility and employability, and the greater compatibility and comparability of the higher education systems which were the principles of the European Bologna higher education reform in the 1990s. All graduates in Europe are, *inter alia*, expected to be able to communicate in at least two languages other than their mother tongue, to know how to learn new languages, and to be confident in using them (European Ministers of Education, 1999). Slovenian students come from a range of secondary school English learning and teaching programmes, their level of English proficiency varies, and they have different expectations and motivations. Therefore, higher education is challenged by the desire to educate persons with these various profiles so that they become self-directed and relatively independent students. This involves building self-esteem and the capacity to direct one's own (language) learning and to take responsibility for learning and building one's autonomy to cope with the demands of language learning for their future careers.

According to Benson and Voller (2014), autonomy in language learning can be regarded as a means to an end and can be boosted by letting students recognise their strategies and activities, and the decisions they make in the process. Employing various strategies can help students recognise their learning skills, increase their capacity and responsibility to learn, become familiar with their learning style in order to be capable of determining the direction of their learning, and thus become more autonomous and successful learners (Gardner, Tremblay, & Masgoret, 1997).

In order to research the use of learning strategies, an instrument called the Strategy Inventory for Language Learning (SILL) was devised by Oxford (1990: 293-300), and has been the primary data-collection instrument in language learning strategies research for approximately 30 years (Mizumoto & Takeuchi, 2018). The questionnaire consists of six strategy groups: memory, cognitive, compensation, metacognitive, affective, and social.

Despite the SILL's wide use, its statistical reliability and validity, using either an exploratory factor analysis (El-Dib, 2004; Robson & Midorikawa, 2002) or a confirmatory factor analysis (Park, 2011; Saks & Leijen, 2016), have not been demonstrated often. Additionally, researchers have stressed that the learning context of language learning strategies research also represents an important factor. That is why more context-oriented research on the SILL and other areas of language learning strategies is needed (Cohen & Griffiths, 2015). Thus, the aim of this paper is to test the reliability and validity of the SILL for Speakers of Other Languages Learning English, with a focus on the context of Slovenian higher education students. The hypothesis posed in our research is that the original structure of the SILL cannot be validated in the researched context based on the findings of the previous research (Heo, Stoffa, & Kush, 2012; Park, 2011) and on

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the notion of the obsolescence of the instrument (Oxford, 2011: 162). The influence of information technology on the use of second language learning strategies (SLLS) could improve the SILL by including some IT-based strategy items, as suggested by Amerstorfer (2018).

The paper is structured as follows: after the Introduction, the second section provides the theoretical background of language learning strategies and their use. Section 3 describes the methodology used in the empirical research, which is based on the SILL. The fourth section describes the results of the survey and highlights some interesting findings, including an adapted and validated model of the SILL instrument. Section 5 connects the results to the theoretical background and previous studies focusing on the hypothesis stated in this paper. The paper concludes with some limitations of the study, and directs the reader to the practical implications of the results and further study of this research area.

2. LITERATURE REVIEW

O'Malley and Chamot (1990: 1), who connect language learning strategies with cognitive theory of learning, define learning strategies as special ways (thoughts or behaviours) of processing information that enhance comprehension, learning, or the retention of information. They suggest that strategies also help learners to analyse, monitor, and organise new information. According to Oxford (1990: 8), language learning strategies are steps taken by students to enhance their own learning such that it is faster, more enjoyable, more self-directed, more effective, and more transferable to new situations. The identification of learning strategies helps improve learners' self-regulation in setting goals, paying attention, organising information, using resources, and managing motivation and emotions in performing tasks (Oxford et al., 2014). Oxford (1990: 8) also suggests that students should have greater awareness of the utility of the strategies they use in language learning as tools for their active, self-directed involvement in study and stresses the importance of assessing students' language learning strategies and providing students with information about which strategies they employ. Such practices could make their learning more effective and more transferrable to new strategies. Cohen (2011: 7), too, states that learner strategies are thoughts and actions or behaviours that are consciously chosen by learners to assist them in carrying out a multiplicity of tasks.

Giving a very concise definition of SLLS, Oxford (2016: 48) claims that they are complex, dynamic thoughts and actions selected and used by learners with some degree of consciousness in specific contexts in order to regulate multiple aspects of the learning process (such as cognitive, emotional, and social aspects) for the purpose of (a) accomplishing language tasks; (b) improving language performance and use, and/or (c) enhancing long-term proficiency. Students use second language learning strategies flexibly in chains (when strategies are used in

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a sequence) or clusters (when strategies occur at the same time). Their use may also have physical and therefore observable manifestations: students talk to each other, employ mobile phones to access various online language learning resources, underline text, speak to peers, raise their hand to seek information, use pictures, etc. Learners in their given contexts decide which strategies to use and their appropriateness depends on multiple personal and contextual factors (Wang, 2015).

Oxford et al. (2014) reviewed the approaches of learning strategy experts to the identification and teaching of language learning strategies. The findings and results of their research provide evidence that a good (proficient) language learner is autonomous, makes relevant decisions, is responsible, and has the ability to reflect critically on his or her learning. A good language learner demonstrates strategies for monitoring his or her own speech and that of others and for learning from his or her own mistakes or attending to the meaning and the context of the speech act and language as such. Cohen and Griffiths (2015) stress that more in-depth research on strategy instruction would be beneficial as regards what learners need and obtain therefrom, and in terms of what teachers know and how they employ such knowledge.

Oxford (1990: 14) organised strategies in two groups: direct strategies (memory, cognitive, compensation) and indirect strategies (metacognitive, affective, social). In the process of language learning, indirect strategies support direct strategies as a kind of an "internal guide". Furthermore, strategies work closely together by mutually supporting each other and thus connecting and assisting every other strategy group. As the author understands it, memory strategies help learners remember and retrieve information, cognitive strategies aid in understanding and producing the language, and compensation strategies fill gaps in knowledge. Indirect group strategies support the learning process, in which metacognitive strategies coordinate the process, affective strategies control emotions arising therein, while social strategies facilitate learning with others.

Considering the groups of strategies, the research of Green and Oxford (1995) and Park (1997) suggests that a high level of language proficiency can be associated with the increased use of both direct and indirect groups of strategies. Research by Park (1997), using a standardised test, discovered the same positive relationship, and identified the key success factors in using metacognitive strategies. In Peacock and Ho's work (2003), cognitive and metacognitive strategies showed high correlations with high language proficiency levels. The research of O'Malley and Chamot (1990: 143) and Griffiths (2003) pointed out that good language learners make frequent use of a wide range of metacognitive strategies. It has been claimed that low-proficiency students use more communication strategies than high-proficiency ones and that low-proficiency students outperform high-proficiency ones in their use of compensation strategies (Chen, 2002). Radwan's study (2011) showed that more proficient students use cognitive, metacognitive, and affective strategies significantly more than less

proficient learners, which corresponds to the result obtained by Nisbet, Tindall, and Arroyo (2005).

Oxford (1990: 13) states that strategies are flexible and can be applied creatively. Saad, Yunus, and Embi (2015) tested separate strategy chains for writing and oral communication using different sequences of learning strategies and found that different users follow similar strategy clusters for both writing and oral communication modules. Research by Cohen (2011: 27) proved that, depending on the complexity of the task, learners simultaneously use a cluster or combination of strategies to solve it. Finally, Macaro (2006) found that the orchestration of clusters of strategies is more effective than the linear deployment of several strategies.

One of the more important future research areas, as stressed by 23 eminent language learning researchers and published by Cohen and Griffiths (2015), was that there is value in conducting research that looks at the crucial links among cognitive, social, and affective variables, which is also the focus of this paper. In Oxford (2011: 162), the author significantly revisited her original model and encouraged researchers to adapt SILL items to the given context and to leave space for students to write in additional strategies. The author encouraged the SILL users to make cultural adaptations and re-assess the reliability and validity of the SILL in the specific sociocultural context.

Additionally, Tragant, Thompson, and Victori (2013) emphasised that construct validation of the SILL has not received the necessary attention in the research. Therefore, we set the following research questions:

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1. Are there dependencies between strategy use items and between strategy constructs or groups of the SILL? Are they statistically significant?
2. If not, can the structure of the SILL be adapted and validated as a model?

3. MATERIAL AND METHODS

3.1. Participants

The context of our research is the Faculty of Administration of the University of Ljubljana, Slovenia, which caters to future employees in the Slovenian public and private sectors in both national and international professional environments. English for Specific Purposes (ESP) is a compulsory 75-hour first-year course in the Higher Education Professional Study Programme in Administration and the University Study Programme in Public Sector Governance. In both programmes groups of between 40-50 students meet once a week in a traditional on-site 60-hour course while about 15 hours are done in e-learning mode, i.e. as

asynchronous e-learning in LMS (Learning Management System). Students in years 2 and 3 of both programmes can take English as a 30-hour elective course.

Students who enrol in the Higher Education Professional Study Programme in Administration have passed the "vocational *matura*", i.e. the state secondary school leaving exam in a set of subjects. One of the subjects (optional, not compulsory) is English at level B1, as defined in the vocational *matura* exam catalogue for English language (Državni izpitni center, 2018), which suggests that the *matura* language assessment system is based on the Common European Framework of Reference for Languages (Council of Europe, 2001). Therefore, language groups formed in the first-year study are a combination of students with pre-existing mixed language abilities, which greatly constrains the language teaching and learning practice in the programme.

On the other hand, students in the University Study Programme in Public Sector Governance have all taken the compulsory "general *matura*" exam in English at level B2, according to Bitenc Peharc and Tratnik (2014) as English is the first compulsory foreign language in Slovenian secondary education, while other languages (e.g. German or Italian) can be elected as second foreign languages. It can be concluded that the first-year students in the programme enter higher education with more or less predictable language ability. At the time of data collection, the survey participants had been studying English for at least 8-9 years in the Slovenian education system (4-5 years in primary and 4 years in secondary education).

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The goal of our empirical research was to gather information about SLLS used by students at the Faculty of Administration. The questionnaire was given to 248 students. We received 225 completed questionnaires from students (only 10% male) in the higher education professional study programme (36% of respondents) and the university programme (64% of respondents). The participants comprised 91 first-year students, 58 second-year students, and 76 third-year students.

3.2. Instrument

The research employed a quantitative approach by using the SILL, in particular, the version for Speakers of Other Languages Learning English, i.e. the SILL questionnaire ESL/EFL Version 7.0 (Oxford, 1990: 293-300). It measures the type of strategy (memory, cognitive, and compensation as direct strategies, and metacognitive, affective, and social as indirect strategies) and the frequency of strategy use in the form of closed questions (see the Appendix 1) to assess how often language learners employ individual SLLS.

The instrument has been widely used and has proved efficient in previous research (Hsiao & Oxford, 2002; Mizumoto & Takeuchi, 2018; Park, 2011). We used the SILL questionnaire in English in spite of the fact that some researchers

have warned about wording problems (Li, 2014) and other limitations, such as students' inability to remember accurately how and when SLLS were usedand a lack of self-awareness when filling in a self-report questionnaire (Griffiths, 2003). On the other hand, translation might cause some other issues of understanding and interpretation. In contrast, Amerstorfer (2018) ranks the SILL's user-friendliness for L2 learners as a major advantage.

Respondents were asked to rate their use of SLLS on a five-point Likert scale from "(1) never or almost never true of me" to "(5) always or almost always true of me."

3.3. Procedure

The students answered the survey by means of computers in the classroom. In order to avoid possible obstacles in filling in the questionnaire, the students received some basic information on what language strategies are and what the purpose of the investigation was. The teachers explained the nature of the research to the students, asked for their honest responses to the SILL, and made it clear that the data would be used for research purposes only. The teachers were also allowed to clarify the meaning of a specific survey item upon being asked by the students.

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3.4. Analysis

According to the research findings of some of the above-mentioned authors (Gardner et al., 1997; Heo et al., 2012), the six-group taxonomy is not always valid and should be tested and discussed, and the option of restructuring the SILL instrument should be considered. Therefore, we 1) performed a descriptive analysis, 2) tested the instrument structure using exploratory factor analysis (EFA) and built an adapted model, and 3) tested the model validity and adopted it using confirmatory factor analysis (CFA) and structural equation modelling. The data were structured and examined with IBM SPSS 22 software and further analysed with IBM AMOS 22 software.

We conducted a basic statistical analysis with the SPSS tool, including EFA to test the factors (latent variables) representing different theoretical types, i.e. groups of learning strategies (Field, 2013: 627). The reliability of and correlations among the constructs were investigated by calculating Cronbach's α and Pearson product-moment correlations. In order to validate the groups defined in the SILL instrument, or the so-called model validity, we had to consider the sample size limitations. Namely, the minimum sample size in terms of the ratio of cases (N) to the number of model parameters that requires statistical estimates (q) should be 20:1 (Kline, 2005: 11). In our case, since the number of cases is fixed, we had to balance the number of parameters. Therefore, EFA was important in deciding

which items best represent the construct. Maximum likelihood factoring and Varimax rotation were used to extract the factors according to the six strategy groups of the SILL. For data reliability, we used the Kaiser-Meyer-Olkin (KMO) test for sampling adequacy (Field, 2013: 682). The appropriateness of the data for the EFA was verified to check if there is a redundancy between the variables that can be summarised with some factors. We additionally tested for the convergent and discriminant validity of each construct by testing the composite reliability (ρ_c), Cronbach's alpha, and the average variance extracted (AVE) (Fornell & Larcker, 1981). The discriminant validity between constructs was checked on the basis of the rule that the square root of every AVE should exceed the correlation between any pair of latent constructs. To assess convergent validity, three criteria were tested:

1. each item loading (λ) should be statistically significant and larger than 0.70;
2. the composite reliability (ρ_c) of each latent construct should be larger than 0.70 and should be interpreted as a Cronbach's coefficient (internal consistency); and
3. the average variance extracted (AVE) for each latent construct should exceed 0.50.

Models describing learning strategy groups were proposed as described below and tested by performing a maximum likelihood CFA with the IBM AMOS tool. Structural equation modelling (SEM) was used since it is most appropriate when theory or *a priori* guidelines allow the researcher to posit the relationships among the variables (observed and latent) in the model (Schumacker & Lomax, 2015: 3).

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4. RESULTS

4.1. Descriptive analysis

Initially, a full set of items from the SILL instrument with six-strategy group segmentation was explored. First, we analysed the mean values and standard deviations (Table 1) by testing the normality of the distribution using the threshold of the z-score (±2.58), taking into account the large sample value (Field, 2013: 139) and visual inspection of the histograms.

Item	Mean	SD	Item	Mean	SD	Item	Mean	SD
MemRela*	3.39	0.97	MemRhym	1.96	1.03	MemPage	3.32	1.19
MemSent	3.26	1	MemFlsh	1.97	1.04	**Memory**	**2.88**	
MemSoun	3.04	1.17	MemActo	3.28	1.16	CogSeve	3.4	1.12
MemPict	3.07	1.12	MemRewl	2.67	1	CogNati	3.17	1.18

Item	Mean	SD	Item	Mean	SD	Item	Mean	SD
CogSoun	3.5	1.13	ComPara	4.27	0.78	AffeEnco	3.54	1.1
CogUsew	3.33	1.03	ComRead	3.89	1.05	AffeRewa	2.43	1.28
CogConv	2.84	1.15	ComGNxt	3.47	1.1	AffeNoti	2.93	1.35
CogTVsh	4.48	0.83	ComMkup	2.53	1.2	AffeWrit	1.64	0.96
CogRead	2.82	1.39	**Compensat**	**3.48**		AffeTalk	2.41	1.33
CogWrit	2.78	1.09	MeCoWays	3.5	1.07	**Affective**	**2.73**	
CogSkim	3.46	1.13	MeCoMist	3.88	0.91	SocSlow	3.93	0.94
CogMyla	3.08	1.19	MeCoAtte	4.32	0.83	SocCorr	3.2	1.2
CogPatt	2.97	1.03	MeCoTryb	3.82	0.95	SocPrac	2.7	1.22
CogPart	3.42	1.12	MeCoPlan	2.6	1.02	SocComm	2.81	1.34
CogTran	3.44	1.13	MeCoPeop	2.75	1.21	SocAskq	3.08	1.17
CogSumm	2.92	1.12	MeCoOppo	3.02	1.19	SocCult	2.83	1.28
Cognitive	**3.26**		MeCoThink	3.41	1.04	**Social**	**3.09**	
ComGues	3.34	0.99	**Meta-cog**	**3.41**				
ComGstr	3.38	1.01	AffeRelx	3.45	1.11			

*See List of abbreviations of SILL items in Appendix 1.

**Table 1.** Descriptive analysis of the indexes

The means of each of the strategy groups were also calculated, indicating the highest average use for the compensation strategy group and the lowest for the affective strategy group.

The descriptive statistics revealed some basic information about the use of strategies by students. Some items were noticeable due to their extreme positive or negative means and standard deviations. Firstly, in the memory strategy group we noticed that "*I use rhymes …*" and "*I use flashcards to …*" were strategies scarcely used by our sample group. Today, flash cards and rhymes can no longer be recognised as much-used strategies amongst higher education students as they would be most likely used at very low levels of language learning in contemporary primary education settings. Secondly, in the cognitive strategy group, the item "*I watch English language TV shows spoken in English or go to movies spoken in English.*" had a very high mean value. In the context of this research, the majority of social media and entertainment industry products are broadcast in English, often with either English or Slovenian subtitles. Thirdly, in the compensation strategy group, the highest mean was detected for the strategy of paraphrasing, when trying to say what a word or phrase means in other words. Since a paraphrasing strategy is a process of activating and connecting to background knowledge, it has to be noted that paraphrasing is a frequently used in-class language activity when acquiring new vocabulary. It "recycles" the existing vocabulary and extends it with new items. Fourthly, in the metacognitive strategy group, "*I pay attention when someone is speaking English*" was the most common strategy. The respondents probably considered "the English speaker" to be a real person with whom they could establish genuine communication, or a speaker in some media (TV, video, social media, movies, possibly music). Next, in the affective strategy group, "*I write down my feelings in a language learning diary*" was the least common strategy,

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having the lowest mean of all the items measured. "*I talk to someone else about how I feel when I am learning English*" also had a low mean. Both strategies could be considered to be the least employed in language learning, especially in higher education, as students might not be willing to discuss some personal thoughts and feelings in the study process. Lastly, in the social strategy group, respondents displayed a very high frequency use of the "... *I ask the other person to slow down or say it again*" strategy (the highest mean in this strategy group), which is a common strategy even when someone is speaking in their native language.

4.2. EFA-based Model 1 development

An EFA was conducted to test factors describing groups of SILL items. The Cronbach's alpha of all items of the SILL was .910, which suggests the high reliability of the instrument. But, during the EFA we retained only those items that loaded primarily on one of the factors, generally with a factor loading > .5, and did not have factor loadings on any other factor > .3. In this way we narrowed the set of factors to those with the potential to generate a valid model. These items proved to be a part of one specific factor, i.e. strategy group. Our EFA results showed limitations and discrepancies considering the original SILL groups (see the factor loadings in Appendix 2), although the Kaiser-Meyer-Olkin measure of sampling adequacy value was deemed acceptable (KMO = .838) and Bartlett's test of sphericity was significant (χ^2 (1176) = 3948.354, p < .01). The factor loadings from the EFA (see Appendix 2), supported by the results of the descriptive statistics, forced us to reduce the number of initial items and retain 19 items, thus constructing Model 1 on the basis of the EFA results (Figure 1).

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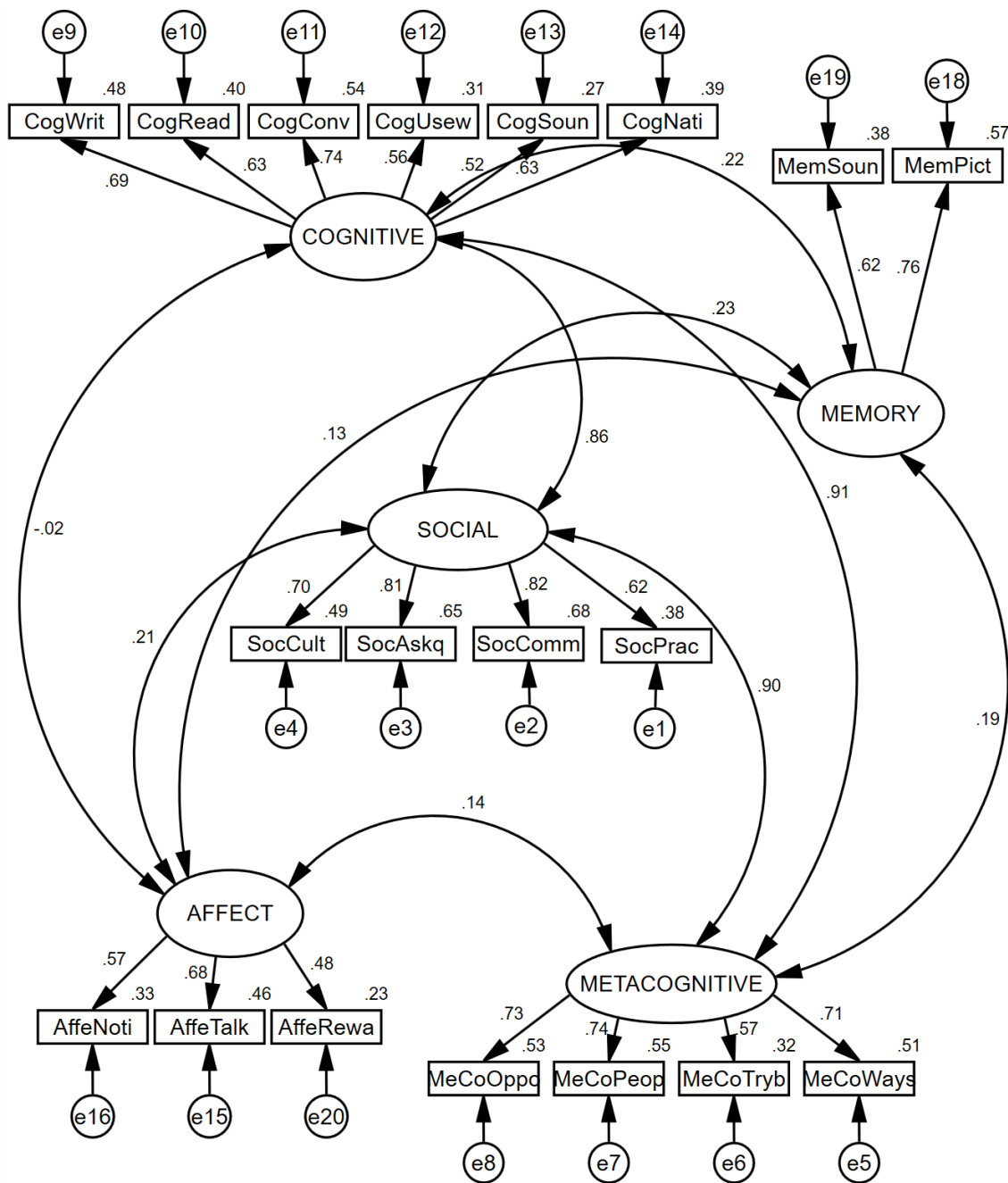
Figure 1. Model 1, constructed following the item reduction, based on the descriptive statistics results and EFA

The 19 items of the SILL generated five constructs (groups). The compensation construct is missing from the model due to it not satisfying the conditions regarding the EFA: the items did not fit into a clear and unambiguous matrix structure. The correlations among the constructs in Model 1 as the results of the

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EFA (with maximum likelihood estimation and varimax rotation) are shown in Table 2.

			Corr.
Social	<-->	Metacognitive	0.899
Social	<-->	Cognitive	0.858
Social	<-->	Affect	0.211
Memory	<-->	Social	0.23
Metacognitive	<-->	Cognitive	0.908

			Corr.
Memory	<-->	Metacognitive	0.192
Cognitive	<-->	Affect	-0.017
Memory	<-->	Cognitive	0.224
Memory	<-->	Affect	0.127
Metacognitive	<-->	Affect	0.139

Table 2. Correlations among the constructs in Model 1

In order to examine whether the suggested Model 1 from the EFA phase can be validated, we carried out a confirmatory factor analysis with maximum likelihood. Model fit was evaluated according to the recommended criteria for a good fit: the scaled chi-square, root mean squared error of approximation (RMSEA; <.06 for a good fit and <.10 for an adequate fit), Bentler and Bonett's normed fit index (NFI; <.90), and Bentler's comparative fit index (CFI; >.90–.95) (Browne & Cudeck, 1993; Hu & Bentler, 1999). The fit indexes are shown in Table 3 and, as indicated, many failed to fit the suggested Model 1 appropriately. Further research on the adaptation of the model was necessary to make it valid.

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Model fit indexes	Recommended values	Model 1 values	Model 2 values
CMIN ($\chi2$) – minimum of discrepancy		322.061	61.501
Df – degrees of freedom		142	32
P – probability	> 0.05	0	0.001
$\chi2$/df – minimum of discrepancy/degrees of freedom	≤ 3.00	2.268	1.922
RMSEA – root mean square error of approximation	≤ 0.05 – 0.08 ≥	.075	0.064
PCLOSE – p of close fit	> 0.05	0	0.158
NFI – Bentler and Bonett's normed fit index	≥ 0.90	.815	0.929
CFI – Bentler's comparative fit index	≥ 0.90	.884	0.964
TLI (rho2) – Tucker-Lewis Index	≥ 0.90	.845	0.938

Table 3. Model 1 and Model 2 fit indexes

4.3. CFA-based Model 2 development

Model 2 is suggested as a modification of Model 1: four items with an unclear rotated matrix structure arrangement were left out of the cognitive and affect constructs

which would not meet reliability and validity criteria despite the clear matrix structure of the EFA results being excluded. We directed the model to a newly merged meta_cognitive construct. The meta_cognitive construct in Model 2 consists of 2 cognitive items and 2 metacognitive items as, due to precise examination of the correlation between the two supposedly different constructs, the correlation was too high to exclude multicolinearity. The final Model 2, based on theory and the CFA, with modification regarding the EFA results, successfully fits all criteria of reliability and validity measures. It comprises 10 items of the SILL related to the three constructs subsumed under direct or indirect learning strategies: memory (2 items), cognitive and metacognitive as one construct (4 items), and social (4 items).

The Cronbach's alpha, composite reliability (CR), and AVE of the constructs in the modified Model 2 satisfy the criteria (Table 4). Although the AVE is less than 0.5, the convergent validity of the construct is still adequate since the composite reliability is higher than 0.6 (Fornell & Larcker, 1981). All the other validity and reliability coefficients of Model 2 meet the criteria (Table 3). Although the factor loadings are higher than 0.6, but less than .7, we rely on the criteria of Tabachnick and Fidell (2007) with cut-off points 0.32 (poor), 0.45 (fair), 0.55 (good), 0.63 (very good) or 0.71 (excellent).

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Construct	Variable	Statement	Mean	λ	CR	α	AVE
Meta_cognitive	CogRead	I read for pleasure in English.	2.83	0.704	0.886	0.81	0.533
	CogWrite	I write notes, messages, letters, reports, etc., in English.	2.78	0.71			
	MeCoOppo	I try to talk like native speakers.	3.03	0.825			
	MeCoWays	I use an English word I know in different ways.	3.5	0.672			
Social	SocPrac	I practise my English with other students.	2.7	0.622	0.893	0.824	0.552
	SocComm	I ask for help from English speakers.	2.81	0.839			
	SocAskq	I ask questions in English.	3.08	0.787			
	SocCult	I try to learn about the culture of English speakers.	2.83	0.706			
Memory	MemPict	I remember a new English word by making a mental picture of a situation in which the word might be used.	3.07	0.658	0.748	0.636	0.469
	MemSoun	I connect the sound of an English word and an image or picture of the word to help me.	3.04	0.71			

Table 4. Model 2 construct validity

The fit indexes of Model 2 approved the model fit with all the recommended values, except for the minimum of discrepancy (CMIN). However, the CMIN (x^2) statistic is very sensitive to sample size and is no longer relied upon as a basis for

acceptance or rejection (Schermelleh-Engel, Moosbrugger, & Müller, 2003; Vandenberg, 2006) and can be ignored if RMSEA is less than or equal to .08, which is true in our case. The three extracted factors included items with statistically significant and relatively strong factor loadings. Factor 1 (social) accounted for 58% of the variance in the measures, and had an estimated reliability of .824.
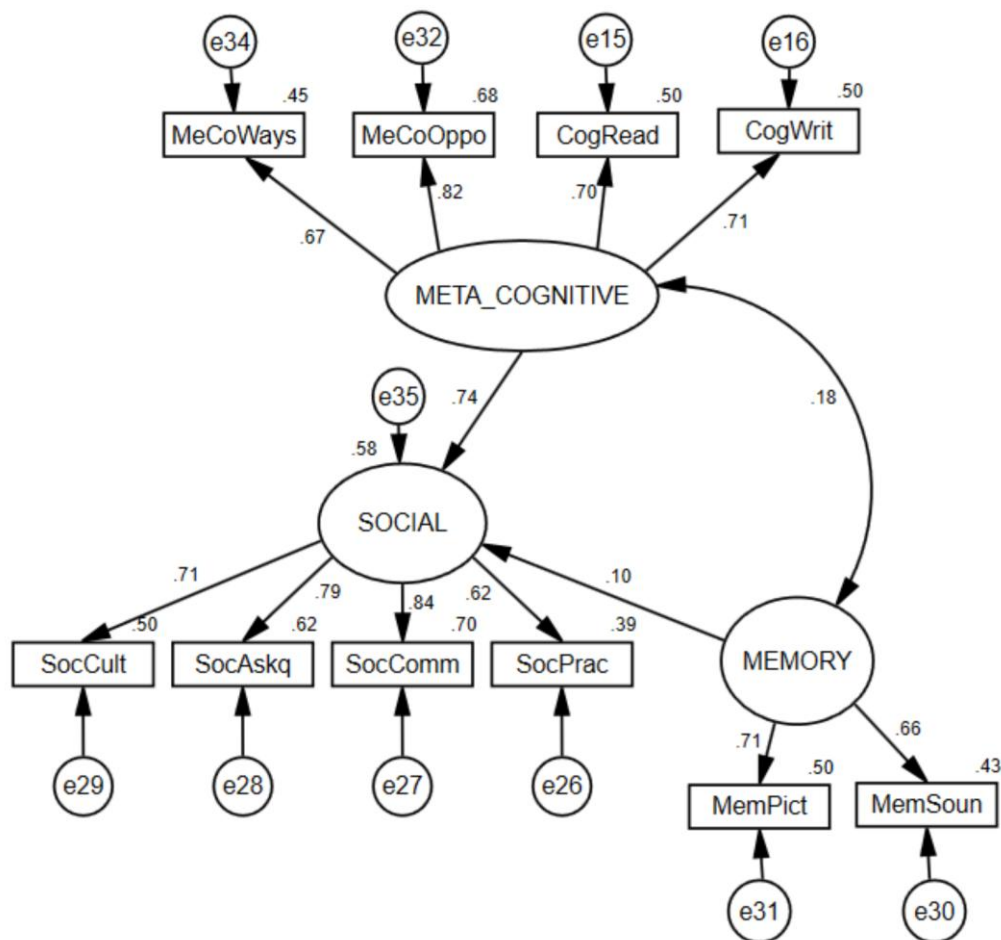
Figure 2. Model 2 with explained variance data based on the confirmatory factor analysis

The results show that the meta_cognitive learning strategy group (β = 0.737; p < 0.001) positively affects social group, while the memory group influence is non-significant (β = 0.101; p = 0.182). Model 2 suggests that meta_cognitive strategies have a strong influence on social strategies, while memory has a minimal influence, in fact non-significant. The correlation between memory and meta_cognitive is also weak. The squared multiple correlation of the social construct is high (0.58), which means that the cognitive construct explains a great amount of the social variance (Table 5).

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			Covariances	*p*	Correlation
social	<---	meta_cognitive	0.778	***	0.737
social	<---	memory	0.1	0.182	0.101
memory	<-->	meta_cognitive	0.097	0.092	0.176
Squared multiple correlations, social					0.58

*** less than 0.001

Table 5. Covariances and correlation results from Model 2

5. DISCUSSION

5.1. The importance of the context

The results proved that some of the items on the standardised questionnaire are actually not relevant for the surveyed learners and their learning context (cultural background) and not fit for present-day language learning, since the SILL was built almost 30 years ago. Flashcards, to the best of our knowledge, have not been used in language learning in secondary and tertiary education for some time. It can be assumed that the age of learners and their language proficiency would not favour the use of such prompts. We argue that the use of flashcards or rhymes, for example, has been overtaken by the use of modern information technology, although some authors claim that kinaesthetic students might enjoy working with tangible objects nonetheless (Oxford, 2003: 273). To some extent, the use of ICT (Information and Communication Technology) can be noticed in the strategies the students in our research employ in language learning. Modern technology, social media, and channels such as YouTube, Spotify, etc., enable users to be exposed to English content to a much greater extent inside and outside the classroom. Therefore, the high level of reported strategies such as the *"I watch English language TV shows spoken in English or go to movies spoken in English"* can be ascribed to students' high exposure to English, especially in "non-dubbing" countries, as also identified by Richards (2009). According to Amerstorfer (2018), the SILL is in the process of being revised so that items related to technology-enhanced language learning are included.

　　　Three of the five least used strategies (with the lowest means) in our research are related to the affective strategy group, which is focused on emotions, anxiety levels, and motivation (self-rewarding, talking, and writing about feelings). Similar results, which showed a low level of affective strategy use with weaker students, were also obtained by Radwan (2011), Lai (2009), and Wu (2008). Jacobson and Faltis (1990: 24) observed serious neglect of affective strategies in

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strategy research, which was also reported by Oxford (2016: 214). The research thus far revealed that affective strategies are crucial at all levels, but their role is most obvious at lower levels of proficiency. In our case, the neglect of affective strategies resulted in respondents reflecting very little on such strategies.

5.2. Structure of the SILL and the impact of the adapted model

The study explored the structure of the SILL and its groups of items, which reflect the groups of strategies used by ESP learners in the researched context in Slovenia. With respect to the aggregated group results of the survey, compensation, metacognitive, and cognitive strategy groups had the three highest group means, followed by the social and memory groups, while the affective group of strategies had the lowest mean, which is comparable to the findings regarding Chinese students in the research of Li (2014). Although compensation strategies might be used to compensate for a lower level of language knowledge, the participants in Lai's (2009) research also reported using compensation strategies most frequently (and affective strategies least frequently). We argue that in our research context the very high mean of compensation strategy use could lead to the conclusion that the respondents perhaps compensate for a lack of proficiency in grammar and, possibly, vocabulary in understanding and producing the new language, which is what Oxford (1990: 48) suggests as well.

    The EFA analysis tested the data gathered by the survey and proved that for the data of the researched context the strategy groups of items do not reflect the structure of the original instrument. Different researchers have tested exploratory factor analysis (EFA) on the SILL and many have recognised various numbers of factors that differed from the original six strategy groups, some coming down to one single factor (Heo et al., 2012; Park, 2011). Our results can also be deemed comparable to those of Amerstorfer (2018), who claims that the categories in the SILL functionally overlap and support each other. Another possible reason for the deviation from the original grouping can be found in the effects of one's cultural background, as reported by Griffiths (2003). With adaption and a decreased scale of 10 items, using CFA and structural equation modelling, we created a validated model of three constructs based on items that successfully loaded on the determined factors. While our validated model included only three constructs instead of the original six, other researchers also found a lower number of items that formed a validated adapted SILL instrument (Ardasheva & Tretter, 2013; Saks & Leijen, 2016; Tragant et al., 2013). Similar models have been formulated by other researchers as well (Hsiao & Oxford, 2002; Park, 2011).

    The first construct included cognitive and metacognitive items and proved to have a statistically significant influence on the social learning strategy group. A similar model, developed by Saks and Leijen (2016), merged the items of these three groups to create a common construct. Many other SILL models have been

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tested in other research studies but few have detected the validity in the original six-group structure. We agree with Amerstorfer (2018) that the SILL should be adapted, revised, and used with regard to the specific contexts and demands of the modern world.

Our adapted Model 2 also showed the important impact of more commonly recognised learning strategies such as reading and writing, which can be regarded as core strategies, but also explained the use of more socially oriented strategies like seeking out people to talk to, finding out about their culture, asking questions, and also practising speaking with other students.

5.3. Limitations

We are aware that the questionnaire (the learners' self-report principle) we used may not be able to capture the multi-dimensionality of learners' strategy use, as suggested by Gao (2004). It may be assumed that a lack of any prior strategy-based instruction in the researched ESP context influenced the results of the survey.

Therefore, we would recommend that future investigation into SLLS should be preceded by research to discover the particularities of the context. Initially an ESP proficiency test on students' language ability could inform the research; an ESP needs assessment and investigation into demographic factors could establish a platform for further SLLS research on strategy instruction and use. As suggested by Cohen and Griffiths (2015), fine-tuning the survey model can be continued by investigating the research methods and instruments for collecting data, and by adding new strategy items that are appropriate to the researched context. A variety of interpretations of strategy items and the effects of cultural background and the level of English proficiency on response patterns could also have been factors in the survey responses. Moreover, since this research was conducted at a Slovenian university, generalisation of the findings should be made with caution. Similar research should be conducted in other higher education ESP learning contexts, which could improve the results of this research. Furthermore, the analysis showed that perhaps some of the standard SILL indexes are inappropriate for the researched context.

6. CONCLUSION

The study explored the use of SLLS among higher education students using the SILL by testing dependencies among strategies, and detected an unacceptable statistical fit of the original SILL to the data. The model based on the original learning strategy groups was found to be statistically unacceptable, therefore a new adapted model with adequate model fit was proposed. The results provide enough evidence to consider the following implications. Firstly, the context of

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learning plays an important role in strategy use and should be considered when developing curriculum and classroom activities. Secondly, it is possible to identify coherent learning strategy groups that will diminish the burden on teachers and aid them in understanding the diversity of the whole class and, according to Yamamori, Isoda, Hiromori, and Oxford (2003), facilitate better instructional decision-making and understanding of learners, both as types and as individuals. The primary concern is the identification of language tasks and activities that employ their preferred strategies, strategy groups, or strategy chains, and thus promote learning. According to our results, language learning should be designed as a strong social interaction between the participants in the learning process, with a large amount of genuine communication on real-life issues and topics closely related to their study programme. Our research produced an adapted model with its limitations, relevant for the context of ESP at the Faculty of Administration, University of Ljubljana, Slovenia. Although it is not meant to be a prescribed version of a research instrument, our model is statistically valid and can serve as a firm ground for further strategy use instruction and investigation. The fact that some students in our research displayed good SLLS and some reported few or ineffective strategies calls for further research on differentiated strategy instruction. The investigation into a variety of strategies, influenced by the use of modern technology in everyday life and study, could reveal a use of SLLS that the existing SILL did not encompass.

In the future, two steps in the second language learning use and study could be taken. Firstly, in-depth strategy instruction could be employed as part of language learning. It would enable students to not only recognise the usability of individual strategies as a means to improve language learning, but also to self-reflect on how they learn and what works best for them. Jurkovič (2013) illustrates how the Cognitive Academic Language Learning Approach (CALLA) strategy instruction model (Chamot & O'Malley, 1994: 88-89) could be successfully used in an ESP context as one of the tools for strategy instruction purposes. The five phases of the CALLA model identify students' prior knowledge in relation to a specific language learning strategy; a new language learning strategy is presented and its use is then demonstrated and modelled; it is practised and its employment is evaluated by students. In the end, students attempt to transfer the strategy to new language tasks. Secondly, new directions for the future development of strategy use and study could be underpinned by a recent Council of Europe document (2018). Namely, the existing Common European Framework of Reference for Languages (CEFR) document replaces the traditional model of the four skills (reading, writing, listening and speaking) and offers descriptors with examples of typical language use at different levels and lists appropriate strategies (reception, production, interaction and mediation strategies) for carrying out the language tasks to be accomplished. This proposed set of strategies and tasks could be the basis for a future ESP curriculum design in the researched context, and

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could reveal a subset of new SLLS that could supplement and improve the existing strategy investigation instruments.

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Appendix 1

List of abbreviations of SILL items (see Table 1 in the text)

MemRela -	I think of relationships between what I already know and new things I learn in English.
MemSent -	I use new English words in a sentence so I can remember them.
MemSoun -	I connect the sound of a new English word and an image or picture of the word to help remember the word.
MemPict -	I remember a new English word by making a mental picture of a situation in which the word might be used.
MemRhym -	I use rhymes to remember new English words.
MemFlsh -	I use flashcards to remember new English words.
MemActo -	I physically act out new English words.
MemRewl -	I review English lessons often.
MemPage -	I remember new English words or phrases by remembering their location on the page, on the board, or on a street sign.
CogSeve -	I say or write new English words several times.

CogNati -   I try to talk like native speakers.
CogSoun -   I practise the sounds of English.
CogUsew -   I use an English word I know in different ways.
CogConv -   I start conversations in English.
CogTVsh -   I watch English language TV shows spoken in English or go to movies spoken in English.
CogRead -   I read for pleasure in English.
CogWrit -   I write notes, messages, letters, reports etc. in English.
CogSkim -   I first skim an English passage (read over the passage quickly) then go back and read carefully.
CogMyla -   I look for words in my own language that are similar to new words in English.
CogPatt -   I try to find patterns in English.
CogPart -   I find the meaning of an English word by dividing it into parts that I understand.
CogTran -   I try not to translate word-for-word.
CogSumm -   I make summaries of information that I hear or read in English.
ComGues -   To understand unfamiliar English words, I make guesses.
ComGstr -   When I can't think of a word during a conversation in English, I use gestures.
ComPara -   I make up new words if I do not know the right ones in English.
ComRead -   I read English without looking up every new word.
ComGNxt -   I try to guess what the other person will say next in English.
ComMkup -   If I can't think of an English word, I use a word or phrase that means the same thing.
MeCoWays -   I try to find as many ways as I can to use my English.
MeCoMist -   I notice my English mistakes and use that information to help me do better.
MeCoAtte -   I pay attention when someone is speaking English.
MeCoTryb -   I try to find out how to be a better learner of English.
MeCoPlan -   I plan my schedule so I will have enough time to study English.
MeCoPeop -   I look for people I can talk to in English.
MeCoOppo -   I look for opportunities to read as much as possible in English.
MeCoThink -   I think about my progress in learning English.
Meta-cog -   metacognitive
AffeRelx -   I try to relax whenever I feel afraid of using English.
AffeEnco -   I encourage myself to speak English even when I am afraid of making a mistake.
AffeRewa -   I give myself a reward or treat when I notice that I have done well in English.
AffeNoti -   I notice when I am nervous or tense when studying English.
AffeWrit -   I write down my feelings in a language learning diary.
AffeTalk -   I talk to someone else about how I feel when I am learning English.
SocSlow -   If I do not understand something in English, I ask the other person to slow down or say it again.
SocCorr -   I ask English speakers to correct me when I talk.
SocPrac -   I practise my English with other students.
SocComm -   I ask for help from English speakers.
SocAskq -   I ask questions in English.
SocCult -   I try to learn about the culture of English speakers.

Appendix 2

Model 1 EFA factor loadings for Model 1

		Factor			
SILL items	**1**	**2**	**3**	**4**	**5**
CogRead	0.227	0.763	0.127	-0.132	0.02
CogWrit	0.424	0.499	0.235	-0.015	0.03
CogConv	0.567	0.353	0.255	-0.149	0.008

CogNati	0.351	0.208	0.605	-0.094	0.14
CogSoun	0.17	0.166	0.746	0.132	0.148
CogUsew	0.384	0.213	0.399	0	-0.033
SocPrac	0.525	0.109	0.222	0.273	0.127
SocComm	0.828	0.2	0.097	0.178	0.088
SocAskq	0.652	0.226	0.41	0.058	0.142
SocCult	0.652	0.235	0.16	-0.025	0.002
MeCoWays	0.47	0.418	0.274	0.05	-0.058
MeCoTryb	0.307	0.369	0.212	0.18	0.123
MeCoPeop	0.67	0.326	0.092	0.094	0.085
MeCoOppo	0.363	0.715	0.153	0.087	0.099
AffeTalk	0.087	-0.066	-0.003	0.582	-0.003
AffeNoti	-0.111	0.021	-0.031	0.672	-0.014
AffeRewa	0.211	0.05	0.102	0.452	0.138
MemPict	0.006	0.075	0.164	0.076	0.678
MemSoun	0.096	0.007	0.007	0.012	0.665