

# CLASSIFICATION THEORIES OF FOREIGN LANGUAGE LEARNING STRATEGIES: AN EXPLORATORY ANALYSIS

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## Abstract

*The present paper provides a comparison of common taxonomies of foreign language learning strategies using empirical data from a Czech adaptation of the strategy inventory SILL (Oxford, 1990). In an initial analysis none of the traditional taxonomies received strong empirical support. Based on an exploratory follow-up analysis we thus propose a basic three factorial model of foreign language learning strategies distinguishing 1) elaboration strategies, organisation strategies and self-control, 2) strategies of cooperative learning, and 3) motivational-emotional strategies. This three factorial model bears some similarity to O'Malley's and Chamot's (1990) classification of strategies into cognitive, metacognitive, and socioaffective strategies, although cognitive and metacognitive strategies were primarily represented by a single factor, while social and affective strategies appear to be two separated groups of strategies. Based on these first results we suggest better ways to assess foreign learning strategies in future research.*

## Keywords

*classification of learning strategies, second language acquisition, factor analysis*

## Introduction

Oxford's (1990) taxonomy of foreign language learning strategies is one of the most widely used taxonomies in teaching practice and research on language learning. In an influential article, Hsiao and Oxford (2002) compared different classification theories of language learning strategies and showed that although this taxonomy did not produce a fully adequate fit to the data, Oxford's 6-factor model of learning strategies "is the most consistent with learners' strategy use" (p. 368). However, Hsiao and Oxford (2002) also suggest that "other possible approaches should be considered as well" (p. 368). The purpose of the present paper is to follow up on this work and to explore the factor structure of foreign language learning strategies using data collected in the Czech Republic.

## Theoretical background

Second and foreign language learning strategies can be understood as "any set of operations, steps, plans, routines used by the learner to facilitate the obtaining, storage, retrieval, and use of information" (Wenden & Rubin, 1987, p. 19). They are intentional (Cohen & Macaro, 2007) and (at least to some degree) conscious procedures by which a learner reaches his or her learning goal. Strategies can be placed on a continuum in terms of the degree of planning and control involved and strategy size (i.e., macro to micro) or specificity (general strategies or specific for the learnt subject). Strategies do not occur in isolation but in sequences or clusters and the quality of their orchestration is important for learning. Accordingly, the definition and especially classification of language learning strategies is a major issue in language learning strategy research and theory.

Learning strategies represent one of the key determinants of language acquisition and educational achievement. From a pedagogical point of view, learning strategies are often considered as more easy to modify as compared to individual learning styles<sup>1</sup> or even cognitive styles.<sup>2</sup> The acquisition of

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<sup>1</sup> *Learning style* is an individual's natural or habitual pattern of acquiring and processing information in learning situations (e.g., individuals differ in how they learn) (James & Gardner, 1995).

<sup>2</sup> *Cognitive style* refers to psychological dimension representing consistencies in an individual's manner of cognitive functioning, particularly with respect to acquiring and processing information (Ausburn & Ausburn, 1978).

effective learning strategies is a central goal at every level of the educational system in the Czech Republic (see the Framework Educational Programmes, for example RVP ZV, 2010), but also of educational policies of the EU or OECD.

Parallel to development in research in cognitive psychology, research on second and foreign language learning strategies has increased tremendously since the end of the 1960's. While early research was primarily concerned with the identification of strategies used by "good language learners" these initial classifications became more and more refined in recent research.

### *Classifications of second/foreign language learning strategies*

There exist several international second and foreign language (L2)<sup>3</sup> learning strategies classifications (Wenden & Rubin, 1987; O'Malley, Chamot, Stewner-Manzanares, Küpper, & Russo, 1985; Oxford, 1990; Stern, 1992; Ellis, 1990 etc.). The differences are primarily due to different research methods (such as observation, interviews, or questionnaires) or measuring strategies at different language tasks and in different contexts (such as foreign language learning or second language acquisition or on learners with different L2 level of competence). Differences and ambiguities of strategy classifications appear as well at the unification process concerning to which category or strategy group individual concrete strategies belong and which strategies form the logical whole. Classification criteria are important and they can differ considerably. According to O'Malley and Chamot (1990), great differences can be observed, for example in learning strategy classifications between linguists and psychologists as linguistics often fails to implement new findings from the general learning theory (e. g., classification of strategies are not sufficiently based on current theories of information processing and learning). The most frequently referenced classifications of L2 learning strategies in foreign language literature are classifications by Naiman, Fröhlich, Stern, & Todesco (1978), Rubin, & Wenden (1987), Oxford (1990), O'Malley et al. (1985), Stern (1992) or Cohen & Weaver (2006). These classifications are briefly summarised in Table 1.

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<sup>3</sup> L2 is used as abbreviation for second as well as foreign language. L2 is the language a person knows or is learning or acquiring in addition to their native language (L1).

Table 1

*Overview of the most widely used classifications of second/foreign language learning strategies*

<b>Authors</b>	<b>Strategies classification</b>
Naiman et al. (1978)	Active task approach, realisation of language as system, realisation of language as a mean of communication, management of affective demands, monitoring of L2 performance.
Dansereau (1985)	Primary and support strategies are differentiated and further subdivided according to a language task (reading, writing, vocabulary learning, etc.).
O'Malley et al. (1985)	Metacognitive, cognitive and socioaffective.
Weinstein & Mayer (1986)	Primarily building upon the difference between learning strategies and teaching strategies. The major 6 groups of learning strategies are differentiated according to whether they are suitable for basic or complex learning tasks (rehearsal, elaboration, and organisational strategies). Further 2 groups are comprehension monitoring strategies (e.g., checking for comprehension failures), and affective and motivational strategies (such as being alert and relaxed, to help overcome test anxiety).
Rubin & Wenden (1987)	Direct strategies, that is learning strategies: cognitive and metacognitive. Indirect strategies: communication strategies, social strategies.
Oxford (1990)	Direct strategies: memory, cognitive, compensation. Indirect strategies: metacognitive, affective, social.
Stern (1992)	Management and planning strategies, cognitive, communication-experimental, interpersonal and affective.
Wild, Schiefele, & Winteler (1992, in Wild, 1997)	Primary strategies (cognitive and metacognitive) and secondary strategies.
Bimmel & Rampillon (2000)	Direct strategies: memory, language processing. Indirect strategies: self-regulatory, affective, social, language use strategies.
Cohen & Weaver (2006)	a) Retrieval, rehearsal, communication and cover strategies. b) Listening, reading, writing, speaking, vocabulary, and translating strategies.

The classifications illustrated in Table 1 differ in the degree of clarity and complexity of involvement of single learning strategies as well as higher order groups of strategies. Most of the classifications do not provide a detailed categorisation of single strategies but only mention some examples from

a group of strategies (where the observed strategies usually result from a specific research method). A problematic aspect in the classifications on process is the assignment of single strategies both to subgroups and sometimes to the main group of direct or indirect strategies. The strategy assignment often depends on a chosen interpretation of a certain strategy. Some strategies are classified as direct as well as indirect strategies depending on the intention of their use by a learner. Moreover, classifications by psychologists, linguists, and education scientists are often different, involving different definitions, and implying different theories of second language acquisition.

At least five basic classification types of language learning strategies can be identified: 1) classifications connected with research of good language learners (e.g., Rubin, 1975), 2) classifications based on psychological functions (e.g., O'Malley & Chamot, 1990), 3) classifications with a linguistic background dealing with meaning mapping, language monitoring, formal and functional practice (e.g., Bialystok, 1981), or communication strategies such as paraphrasing and loanwords (e.g., Tarone, 1983), 4) classifications connected with language skills (e.g., Cohen, 1990; Cohen & Weaver, 2006), 5) classifications based on the distinction of learning styles or types of learners. The variety of classifications indicates the essential problem in strategy research, that is, the field reveals a wide and ambiguous learning strategies concept and non-disjunction of dimensions of strategy classifications while a psychometrically founded and generally accepted classification system for strategy description is absent.

### **General methodological background**

Building upon the seminal research by Hsiao and Oxford (2002) with the present study, we set out to explore different classifications of language learning strategies by means of exploratory and confirmatory factor analysis. For the purpose of the present paper, and in line with Hsiao and Oxford (2002), we decided to focus on three of the most widely used taxonomies of L2 learning strategies: Rubin's (1981), Oxford's (1990) and O'Malley and Chamot's (1990) classification of language learning strategies. Whereas Rubin's classification distinguishes rather roughly between direct and indirect strategies, Oxford's taxonomy (see Table 4 and 5) postulates six main factors (metacognitive, cognitive, memory, compensation, social, and affective). In contrast, O'Malley and Chamot's classification proposed a slightly simpler taxonomy which differentiates between metacognitive, cognitive, and socioaffective strategies. In this paper we provide a more detailed comparison of the three taxonomies.

*Comparison of Rubin's, O'Malley and Chamot's,  
and Oxford's language learning strategy classification*

Beside the two main groups of strategies (direct and indirect), Rubin (1981) distinguishes further between eight subgroups of strategies (Table 2). Each of these subgroups is comprised of more specific strategies (for details see Rubin, 1981).

Table 2  
*Rubin's (1981) classification of language learning strategies*

Groups of strategies	Subgroups of strategies
Direct strategies	1) Clarification/verification, 2) monitoring, 3) memorisation, 4) guessing/inductive inferencing, 5) deductive reasoning, 6) practice
Indirect strategies	1) Creating opportunities for practice, 2) production tricks

O'Malley and Chamot's (1990) classification is adapted from O'Malley et al. (1985) and based on cognitive concepts of learning by Brown and Palincsar (1982). O'Malley and Chamot (1990) distinguish three broad types of learning strategies: cognitive, metacognitive, and socioaffective. These main strategies are further divided into several substrategies (Table 3).

Table 3  
*O'Malley & Chamot's classification (1990, pp. 119–120)*

Groups	Subgroups	Learning strategy
Metacognitive	Planning	Advance organisers, directed attention, selective attention, self-management, functional planning
	Monitoring	Self-monitoring
	Evaluation	Self-evaluation
Cognitive	–	Repetition, resourcing, translation, grouping, note taking, summarising, deduction, recombination, translation, imagery and auditory representation, keyword method, contextualisation, elaboration, transfer, inferencing
Socioaffective	Question for clarification	–
	Cooperation	–
	Self-talk	–

Oxford (1990) distinguishes two main group of strategies (direct and indirect), which she however defines differently than Rubin (see table 2 and 4) and which comprised of six other groups further divided into additional subgroups (see Table 4) which are further subdivided. A more detailed description is provided in Table 5.

Table 4  
*Oxford's (1990) strategy classification*

Main group	Strategy groups	Subgroups
Direct	Memory	Creating mental linkages, applying images and sounds, reviewing well, employing action
	Cognitive	Practising, receiving and sending messages, analyzing and reasoning, creating structures for input and output
	Compensation	Guessing intelligently, overcoming limitations in speaking and writing
Indirect	Metacognitive	Centering your learning, arranging and planning your learning, evaluating your learning
	Affective	Lowering your anxiety, encouraging yourself, taking your emotional temperature
	Social	Asking questions, cooperating with others, empathising with others

Oxford's (1990) detailed taxonomy originates in the attempt to integrate all known strategies into a single taxonomy. She linked her taxonomy of strategies to four language skills (reading, writing, speaking, and listening) and took into account linguistic as well as communicative aspects of L2 learning strategies and the psychological functions which strategies fulfil in information processing. Some strategies in her taxonomy (especially memory and metacognitive strategies) reflect various learning styles and good learner's strategies.

In comparison with Oxford's (1990) and Rubin's (1981) classifications, Oxford (1990) decided to not use Rubin's dichotomy of direct and indirect strategies in the construction of her Strategy Inventory for Language Learning – SILL (Oxford, 1990), because she found it not detailed enough for research operationalisation of single strategy items; she refers to the dichotomy direct vs. indirect strategies only in theory. Also their placement of strategies into categories differs. For example, Oxford did not classify clarification/verification and monitoring into direct strategies as Rubin did, but into indirect strategies: first a social strategy, second a metacognitive strategy. Furthermore, production tricks in Rubin's classification belong to

the indirect strategies, whereas in Oxford's system the compensation strategies are one of the three subgroups of direct strategies.

When comparing O'Malley and Chamot's and Oxford's classification, it becomes apparent that cognitive strategies in the O'Malley and Chamot's classification are in Oxford's classification distinguished as memory and cognitive strategies. Similarly socioaffective strategies are separated and some cognitive strategies (e.g., inferencing) are classified into compensation strategies (e.g., guessing from context) in Oxford's system. Metacognitive strategies are generally consistent in both classifications.

A more detailed comparison of Rubin, O'Malley and Chamot's and Oxford's classifications is provided by Hsiao and Oxford (2002).

### **Methodological approach**

The purpose of the following analyses is to (1) provide new empirical evidence for or against the three taxonomies of foreign language learning strategies by Rubin (1981), O'Malley & Chamot (1990), and Oxford (1990), and to (2) propose a modified version of the Czech SILL inventory, which may provide a basis for further research.

#### *Sample*

Data used in the article stem from research into foreign language learning strategies used at upper secondary comprehensive schools in Brno in the Czech Republic in 2004 (Vlčková, 2007). The sampling procedure was non-random and included a total of 606 students in 14 schools, 29 classes of 3<sup>rd</sup> graders and corresponding grades at eight-year comprehensive secondary school. Fifty-two percent of the sample were female. During data collection, learners were asked to report learning strategies for a foreign language of their choice, ideally their preferred foreign language. English was the language chosen most often, probably because students have learned it for the longest time, they like it, or because it is the most used language in the world. On average, students had learned their preferred foreign language for 8.2 years. The sample contained multiple cases with missing values and five cases with missing values on every item. These five cases were dropped from the analysis.

#### *Measures*

The data was collected using a Czech adaptation (Vlčková, 2007) of the strategy inventory SILL (version 5.1; Oxford, 1989). The Czech inventory measures the use of 85 single item learning strategies on a five-point scale (1 *never or*

*almost never to 5 always or almost always*) with the possibility to answer *I don't know, I'm not capable of assessing*. Table 5 provides an overview of the learning strategies taxonomy by Oxford adopted in the Czech version, together with the items' codes used in the following analyses. Table 6 provides several examples of items, along with the number of items assessed in each of the six main categories. Data management was carried out in R (version 2.5.3), and Mplus (version 6.1) was used for exploratory and confirmatory factor analyses.

Table 5

*Overview of foreign language learning strategies (according to Oxford, 1990, pp. 18–21) with items of the modified inventory (see Vlíčková, 2007, pp. 212–213)*

Strategy groups	Subgroups	Strategies	Item code
Memory strategies	Creating mental linkages	Grouping	p1
		Associating/elaborating	p2
		Placing new words into context	p3
	Applying images and sounds	Using imagery	p4,5,6
		Semantic mapping	p7
		Using key words	p8
		Representing sounds in memory	p9,10
	Reviewing well	Structured reviewing	p11,12,13
	Employing action	Using physical response or sensation	p14
Using mechanical techniques		p15	
Cognitive strategies	Practising	Repeating	kg1,2,3
		Formally practising with sounds and writing systems	kg4,5
		Recognising and using formulas and patterns	kg6
		Recombining	kg7
		Practising naturalistically	kg8,9,10,11,12,13
	Receiving and sending messages	Getting the idea quickly	kg14,15
		Using resources for receiving and sending messages	kg16
	Analyzing and reasoning	Reasoning deductively	kg17,18
		Analyzing expressions	kg19
		Analyzing contrastively (across languages)	kg20
		Translating	kg21
		Transferring	kg22
	Creating structures for input and output	Taking notes	kg23
		Summarising	kg24
		Highlighting	kg25

Compensation strategies	Guessing intelligently	Using linguistic clues	k1
		Using other clues	k2
	Overcoming limitations in speaking and writing	Switching to the mother tongue	k3
		Getting help	k4
		Using mime or gesture	k5
		Avoiding communication partially or totally	k6
		Selecting the topics	k7
		Adjusting or approximating the message	k8
		Coining words	k9
		Using a circumlocution or synonym	k10
Metacognitive strategies	Centering your learning	Overviewing and linking with already known material	m1
		Paying attention	m2,3
		Delaying speech production to focus on listening	m4
	Arranging and planning your learning	Finding out about language learning	m5
		Organising	m6,7,8,9
		Setting goals and objectives	m10,11
		Identifying the purpose of a language task (purposeful listening /reading/speaking/writing)	m12
		Planning for a language task	m13
	Evaluating your learning	Seeking practice opportunities	m14,15
		Self-monitoring	m16,17
Affective strategies	Lowering your anxiety	Using progressive relaxation, deep breathing, or meditation	a1
		Using music	
		Using laughter	
	Encouraging yourself	Making positive statements	a2
		Taking risks wisely	a3
		Rewarding yourself	a4
	Taking your emotional temperature	Listening to your body	a5
		Using a check-list	a6
Writing a language learning diary		a7	
	Discussing your feelings with someone else	a8	

Social strategies	Asking questions	Asking for clarification or verification	s1,2
		Asking for correction	s3
	Cooperating with others	Cooperating with peers	s4,5
		Cooperating with proficient users of the new language	s6,7
	Empathising with others	Developing cultural understanding	s8
		Becoming aware of others' thoughts and feelings	s9

Table 6  
*Examples of SILL items (Oxford, 1990)*

Strategy group	Number of items	Item's codes	Example of SILL items
Memory	15	p1–p15	I use flashcards to remember new FL words. (p15)
Cognitive	25	kg1–kg25	I find the meaning of an FL word by dividing it into parts that I understand. (kg19)
Compensation	10	k1–k10	To understand unfamiliar words, I make guesses. (k1)
Metacognitive	18	m1–m18	I notice my FL mistakes and use that information to help me do better. (m17)
Affective	8	a1–a8	I encourage myself to speak FL even when I am afraid of making mistakes. (a3)
Social	9	s1–s9	If I do not understand something in English, I ask the other person to slow down or say it again. (s1)

### *Statistical analysis*

The data analytic approach consists of three steps:

- 1) Exploratory factor analysis (EFA) using all items.
- 2) Item selection and instrument modification on the basis of EFA results in step 1.
- 3) Confirmatory factor analysis (CFA) of the revised instrument and further post hoc modification.

*Ad 1) Exploratory factor analysis*

Mplus 6.1 was used for exploratory factor analysis with geomin rotation (Muthén & Muthén, 1998–2010, see also Browne, 2001). As described before, the data are clustered with individual students nested in classes, which in turn are nested in schools. The mean intra-class correlation was .020 at the school level, .034 at the class level, respectively. Due to the small intra-class correlations, we decided to ignore the school level clustering, while controlling for class differences between classes by group mean centering at the class level. Missing values were handled via full information maximum likelihood estimation (Arbuckle, 1996). Figure 1 shows the resulting scree plot, which suggested the extraction of either three or five factors. A subsequent parallel analysis suggested the extraction of 16 factors. As described above, previous research provided somewhat mixed evidence for (classification by Oxford, 1990), three (classification by O'Malley & Chamot, 1990), or two (classification by Rubin, 1972) factors. Together with the five factor solution suggested by the scree plot in Figure 1, we thus decided to more closely examine a six, five, three, and two factor solution, using orthogonal as well as oblique rotation.

*Ad 2) Item selection and instrument modification*

Initial results did not reveal a clear factor structure in line with any of the three taxonomies of L2 learning strategies discussed before. In order to improve the measurement instrument and to arrive at a substantively meaningful classification, we excluded all items which had a factor loading  $< .30$ , cross-loading  $> .30$ , and an item-total-correlation  $< .30$ . This procedure was repeated five times, beginning with five factors. The scree plot based on the selected items does not clearly indicate a three factor solution. However, from the initial five factors solution two factors were dropped in the iterative procedure described above due to a lack of items and subsequently a lack of substantive relevance.

*Ad 3) Confirmatory factor analysis and post hoc modification*

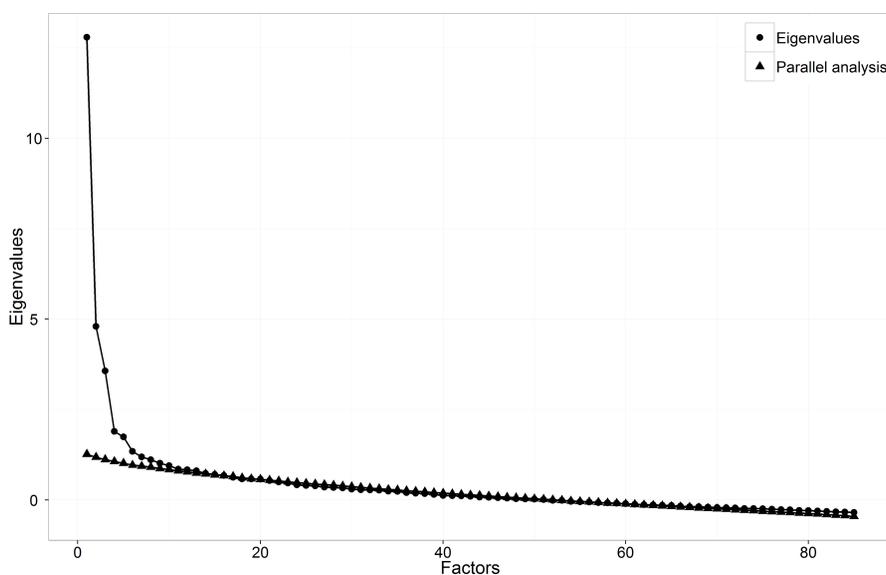
In the last step the revised instrument was subject to a confirmatory factor analysis.

## Results

### *Exploratory factor analysis using all items*

The first factor explains 33.5 %, the second factor 12.6 %, the third factor 9.4 %, the fourth factor 5 %, and the fifth factor 4.6 % of the total variance. Figure 1 shows the corresponding scree plot.

**Figure 1.** Scree Plot and Parallel Analysis Based on All Items



### *Item selection and instrument modification*

Figure 2 shows the scree plot resulting from a factor analysis of the revised instrument with 42 items. The factor loading matrix is given in Table 7. The first factor of the revised instrument explains 47.4 %, the second factor 19.4 %, and the third factor 11.8 % of the total variance.

Table 8 shows the corresponding factor correlations. In line with previous research (Oxford, 1990; Hsiao & Oxford, 2002), the factors are not independent from each other. The item-total-correlations are given in Table 9.

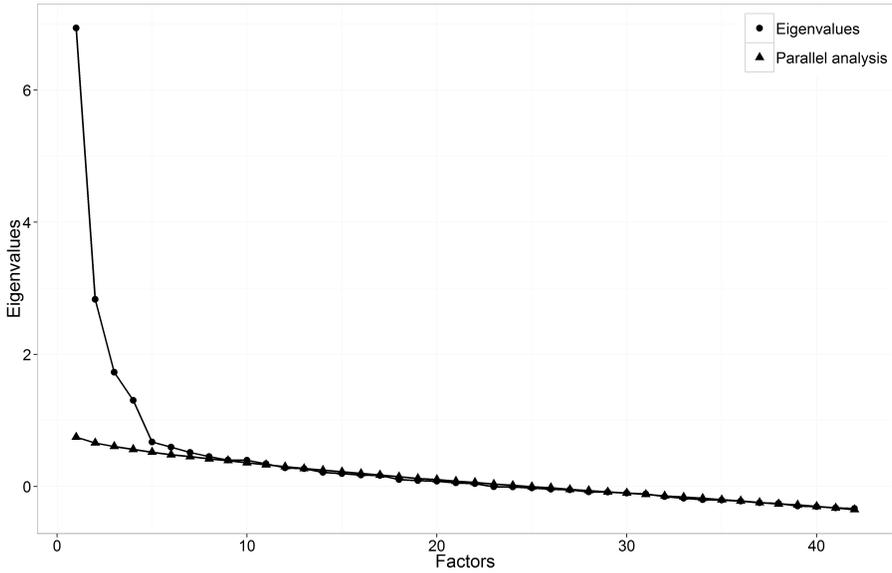
**Figure 2.** Scree Plot and Parallel Analysis Based on Selected Items

Table 7

*Factor loadings of exploratory factor analysis using oblique rotation*

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
p12	.43				
p13	.35				
kg1	.45				
kg2	.40				
kg5	.30				
kg15	.33				
kg23	.69				
kg24	.53				
kg25	.62				
m1	.38				
m2	.39				
m3	.29				
m5	.37				
m6	.43				
m8	.44				
m9	.61				
m13	.38				
kg9		.47			
kg11		.51			

kg12		.58			
kg13		.63			
m15		.54			
s5		.61			
s7		.40			
s8		.40			
m11			.40		
a1			.44		
a2			.48		
a4			.51		
a5			.52		
a6			.63		
a7			.56		
a8			.51		
k3				.49	-.43
k4				.58	-.38
k5				.54	
k7				.32	
k8				.55	
k9				.59	
kg3					.39
kg7					.45

*Note:* Factor loadings < .30 are not displayed.

Table 8

*Factor correlation matrix*

	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>	<b>Factor 5</b>
Factor 1	1				
Factor 2	.20	1			
Factor 3	.33	.29	1		
Factor 4	.33	-.10	.08	1	
Factor 5	.30	.34	.03	.24	1

*Note:* Factor correlations based on items provided in Table 7.

Table 9  
*Item-Total-Correlations*

Factor 1		Factor 2		Factor 3	
Item	Item-Total-Correlation	Item	Item-Total-Correlation	Item	Item-Total-Correlation
p12	.45	kg9	.42	m11	.45
p13	.42	kg11	.44	a1	.45
kg1	.44	kg12	.47	a2	.57
kg2	.47	kg13	.54	a4	.49
kg5	.39	m15	.56	a5	.56
kg15	.45	s5	.51	a6	.56
kg23	.53	s7	.40	a7	.36
kg24	.48	s8	.45	a8	.48
kg25	.54				
m1	.48				
m2	.40				
m3	.45				
m5	.45				
m6	.48				
m8	.49				
m9	.50				
m13	.45				

*Note:* Item-Total-Correlations were computed without the item itself and are based on cases without missing values (listwise deletion).

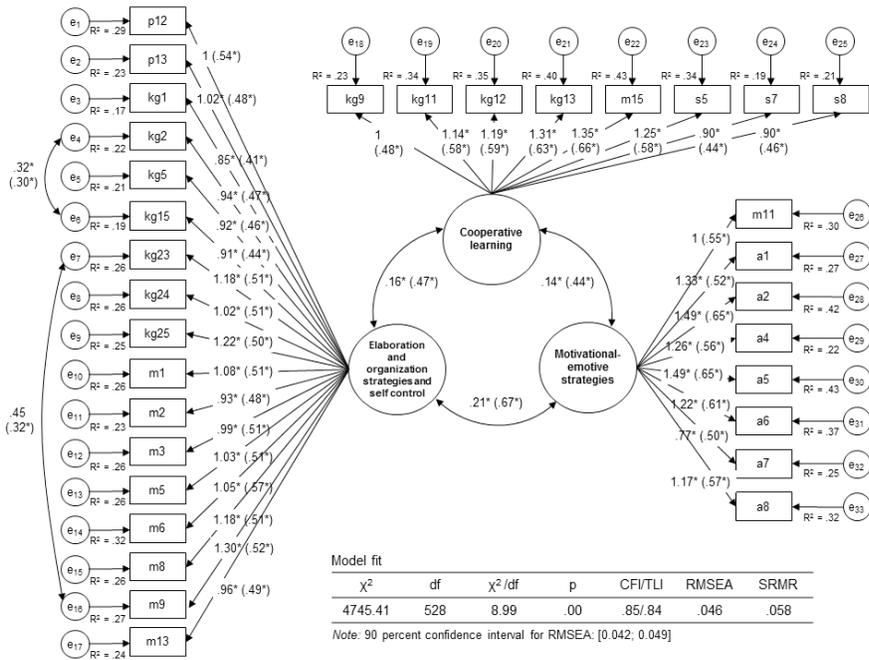
### *Confirmatory factor analysis and post hoc modification*

Figure 3 provides a graphical illustration of the confirmatory factor analysis displaying understandised and standardised factor loadings (in parenthesis). With  $\chi^2 = 4745.41$  ( $p = .000$ ), CFI = .85, RMSEA = .046 and SRMR = .058, the fit is moderate.

Modification indices reported in Mplus suggested a residual correlation between two pairs of items (kg2 and k15 as well as kg23 and m9). Investigating the very similar item formulations (kg2 “I read a foreign language text many times until I understand. For example I try to get the main idea, then answer questions about the text and then I look for the words” was correlated with kg15 “First I scan the part of the text that I should read, to know what it is about and get the main idea. Then I come back and read the text more carefully”, while kg23 “I make notes in the foreign language class” was correlated with m9 “I have a notebook where I write important language

information. For example vocabulary, new learning topics and assignments”), correlated residuals of these item pairs seemed plausible and the model was modified accordingly. All factors exhibit sufficient reliability (Cronbach’s alpha = .85 for the first factor, .76 for the second factor, and .78 for the third factor).

**Figure 3.** Results of confirmatory factor analysis (standardised coefficients in parentheses)



\* p < .001

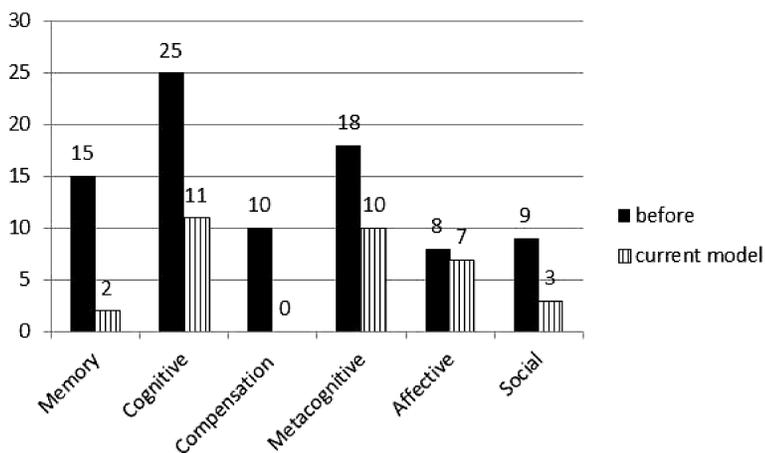
Comparing the final model to Oxford’s SILL terminology and classification, factor 1 consists of two of the memory strategies focused on reviewing (p12, p13), seven cognitive strategies: three practising strategies (repeating – kg1, kg2 and practising phonetics – kg 5), getting the idea quickly (kg15), taking notes (kg23), summarising (kg24) and highlighting (kg25), and of eight metacognitive strategies: overviewing and linking with already known material (m1), paying attention (m2, m3) and arranging and planning your learning (finding out about language learning – m5; organising – m6, m8, m9) and planning for a language task (m13). These strategies can be summarised as *elaboration and organisation strategies*, and *self-control strategies*.

Factor 2 was named *strategies of cooperative learning* and consists of four cognitive strategies, mainly practising in natural settings (watching television, movies – kg9, out school activities with FL – kg11, writing in FL – kg13), one metacognitive strategy – seeking practice opportunities (m15) and three social strategies such as cooperating with others (cooperating with peers – s5, cooperating with proficient users of the new language – s7, developing cultural understanding – s8).

Factor 3 was called *motivational-emotional strategies*. It consists of seven affective strategies: lowering own anxiety (a1), encouraging yourself (making positive statements – a2, rewarding oneself – a4), taking own “emotional temperature” (listening to your body – a5, using a check-list – a6, writing a language learning diary – a7, discussing your feelings with someone else – a8) and one metacognitive strategy (setting goals and objectives – m11).

Compensation strategies and many of the memory strategies were eliminated (see Table 10). Only 56 percent from metacognitive strategies, 44 percent of cognitive, 13 percent of memory strategies, 33 percent of social strategies, none of the compensatory and 88 percent of affective strategies remain. Some of the remaining strategies come from hierarchically higher groups: memory strategies of repetition (p12, p13), repeating of writing and reading (kg1 a g2), practising (kg9, kg11, kg12, kg13) and attention (m2, m3) and the organisation of learning (m6, m8, m9).

Table 10  
*Number of SILL items before and after the analyses*



## Discussion

The findings of the present study are somewhat mixed. Clearly, none of the three taxonomies of foreign learning strategies discussed in this paper received strong empirical support. As a matter of fact, the clear misfit between the theoretically postulated factor structure and the results of the exploratory factor analysis with all items is so striking that a formal comparison of the three models by the means of confirmatory factor analyses, along the lines of Hsiao and Oxford (2002), would have been pointless. Instead, we decided to refine the measurement instrument in order to establish a more meaningful taxonomy of foreign language learning strategies. As such, the analyses presented in this article are primarily of an exploratory nature and it is up to future research to cross-validate the findings using an independent sample. In fact, it seems that the individual (sub)categories are often more closely interrelated than postulated by some authors. Based on the final analyses, it can be surprisingly stated that metacognitive strategies like self-control and cognitive strategies like elaboration and organisation, even though traditionally cognitive and metacognitive strategies were seen as separate strategy groups and associated with the distinction of direct (before all cognitive) and indirect (before all metacognitive) strategies. Because of the similarity to the observed three factor solution in the present paper, we consider O'Malley and Chamot's (1990) classification as more promising for future research than the rather detailed classification of Oxford (1990). In conclusion, the statement regarding the quality of factor structure of a modified questionnaire (i. e., construct validity) requires validation, which is currently being realised.

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