Language Learning Strategies in Second & Foreign Language Acquisition

論文

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Résumé

This article is an attempt to review the work on language learning strategies (LLS) in second & foreign language acquisition (SFLA) research, and to give suggestions for future language learning strategies research. In the first section, I will discuss briefly the background of language learning strategies research, and in the ensuing sections, I will review articles on: (i) the identification & classification of language learning strategies; (ii) the variables affecting the use of language learning strategies; (iii) the effects of language learning strategies on second & foreign language acquisition; and (iv) the application of language learning strategies to language education. I also discuss, in the sixth section, the methodology of data collection. In the concluding section, suggestions and cautions on future research will be mentioned.

I. INTRODUCTION

This article is an attempt to review the work on language learning strategies (LLS) in second & foreign language acquisition (SFLA) research, and to give suggestions for future LLS research. LLS are defined here as operations used by learners for exploiting available information to improve their second/foreign language competence (Rigney, 1978 & Bialystok, 1978). In this section, I will discuss briefly the background of LLS research, and in the ensuing sections, I will review articles on: (i) the identification & classification of LLS; (ii) the variables affecting the use of LLS; (iii) the effects of LLS on SFLA; and (iv) the application of LLS to language education (especially training sequences and materials). I also discuss, in the sixth section, the methodology of data collection. In the concluding section, suggestions and cautions on future research will be mentioned.

Many factors are believed to be involved in successful SFLA by adult learners, and efforts have been made to investigate these factors (e.g., aptitude, attitude, motivation, input)[2]. The use of LLS is considered to be one important factor in SFLA. Research on this factor began with the studies by Rubin (1975) and Stern (1975). They examined the behaviors of "good (=successful) language learners", and found independently several behaviors (=LLS) specific to them.

Bialystok(1978), in her theoretical model of second language acquisition, hypothe-

sized that LLS played an important role in increasing the learner's proficiency in the second language[3]. More specifically, in her model, LLS are considered to be optional but crucial means for increasing learner's exposure to language, inproving his/her production, and systematically utilizing knowledge sources stored in him/her. These early studies stimulated the interest of researchers, and, by now, many theoretical and empirical studies have been made.

Before reviewing these studies, we should keep in mind that many studies in this field postulate the following: (1) the success of SFLA can be attributed, to some extent, to the effective use of LLS; (2) SFLA can be promoted not only by the implicit process but also by the explicit process of learning;[4] thus (3) teaching the effective use of LLS (=explicit process of learning) can help "poor language learners" in SFLA; and (4) once trained, learners equipped with LLS can be autonomous in their future study of second/foreign language(s) (e.g., Bialystok, 1978, 1979; Holec, 1981; Wenden, 1985; Rubin,

1987a; Fujiwara, 1989).

II. IDENTIFICATION & CLASSIFICATION OF LANGUAGE LEARNING STRATEGIES

The first academic attempt to identify and classify LLS, to the best of my knowledge, is the study conducted by Rubin (1975) on the behaviors of "good language learners".[5] Rubin, based on her own observations and experience as a language teacher, identified seven strategies in which good language learners were actively engaged[6] (See Table 1.). Stern (1975) also attempted to examine the behaviors of good language learners based on his experience as a teacher and on survey of the relevant literature in SFLA, and identified ten behaviors.

Naiman, Fröhlich, Stern & Todesco (1978) expanded the work by Stern (1975). They chose 34 good learners of French as a second language out of 72 high school students in Canada, and analyzed their behaviors in and out of the classroom by using interviews, observations, tests, and

Table 1. Classifications of LLS by Rubin & Naiman et al.

Rubin (1975)	Naiman et al. (1978)
Good Language Learners	Good Language Learners
(i) are good guessers, (ii) have a strong drive to communicate, (iii) are willing to appear foolish if reasonable communication results, (iv) are prepared to attend to forms, (v) make full use of all practice opportunities, (vi) monitor his own and the speech of others, (vii) attend to meaning.	(i) have an active approach to the learning tasks, (ii) realize language as a system, (iii) reaize language as a means of communication and interaction, (iv) manage affective demands, (v) monitor L2 performance.

* Naiman et al. (1978) is a modification of Stern (1975).

questionnaires. They identified five broad categories of LLS and many "techniques" for language learning (See Table 1 for the broad categories.).

Rubin (1981), by using data from the previous literature and her own research, devised a new classification system. In this system, strategies are divided into two broad categories: strategies DIRECTLY related to language learning, and those INDIRECTLY related to language learning (See Table 2.). Wenden (1983) examined Rubin's work and insisted that a specific "metacognitive" component be included in the system, since some of the strategies Rubin had identified were reflections on the process of learning or a manipulation of learning opportunities. The "metacognitive" component in this context includes strategies concerning either (a) thinking about or the knowledge of the learning process, or (b) planning for learning, manipulating learning opportunities, monitoring the performance, and evaluating how well one has learned.

Carver (1984), based on his experience as a language teacher, incorporated in his classification scheme a category of LLS which is partly comparable to the metacognitive component proposed by Wenden (1983). It is called "strategies for organizing learning", and includes strategies for arranging learning and for manipulating learning opportunities. His classification system also contains "strategies for coping with target language rules" (e.g., generalization, simplification), "strategies for receiving performance" (e.g., inferring, identifying key terms), and "strategies for producing performance" (e.g., rehearsing, using routines).

Recently, research in cognitive psychology (e.g., Brown & Palincsar, 1982; Anderson, 1985, among others) has begun to influence the classification systems of LLS in SFLA. The most famous and successful system in this line was introduced by O'Malley, Chamot and their colleagues (1985a, b). This system has three broad categories: metacognitive, cognitive, and social/affective categories (See Table 3). The "cognitive" category includes strategies involving mental manipulation or transformation of materials to enhance comprehension or retention. The "social/affective" category includes strategies con-

Table 2.　Classification System Proposed by Rubin (1981)

Strategies which may contribute DIRECTLY to learning
　　A) Clarification/ Verification ⋯⋯⋯⋯e.g., Asks for an example of how to use a word or expression, Asks for repetition.
　　B) Monitoring. ⋯⋯⋯⋯⋯⋯⋯⋯⋯e.g., Corrects own errors, Notes source of errors.
　　C) Memorization. ⋯⋯⋯⋯⋯⋯⋯⋯e.g., Finds a mnemonic.
　　D) Guessing/ Inductive Inferencing ⋯e.g., Guesses meaning by using key words, context of discourse.
　　E) Deductive Reasoning ⋯⋯⋯⋯⋯e.g., Recognizes patterns, compares Ll with L2.
　　F) Practice⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯e.g., Experiments with new sounds, Drills self on words in different forms.

Strategies which may contribute INDIRECTLY to learning
　　A) Creates Opportunity for Practice⋯e.g., Answers to self, Listens to TV/Radio.
　　B) Production Tricks⋯⋯⋯⋯⋯⋯e.g., Uses Circumlocution, Uses cognates.

Table 3. Classification System Developed by O' Malley et al.

Strategies	Definition
《Metacognitive Strategies》	
1. Planning	Previewing the main ideas or concepts of the materials to be learned
2. Selective Attention	Deciding in advance to attend to specific aspects of input and to ignore distracters
3. Self-Management	Understanding the conditions that help one accomplish language tasks and arranging for the presence of those conditions.
4. Self-Monitoring	Checking one's comprehension or production
5. Problem Identification	Identify an aspect of the task that hinders its successful completion
6. Self-Evaluation	Judging how well one has learned
《Cognitive Strategies》	
1. Repetition	Repeating a chunk of language
2. Resourcing	Using target language reference materials
3. Grouping	Classifying chunks according to their attributes
4. Note-taking	Writing down important information or a summary of information
5. Deduction/Induction	Applying rules to understand or making up rules based on analysis
6. Substitution	Selecting alternative approaches, or revising plans
7. Elaboration	Relating new information to prior knowledge
8. Summarization	Making a summary of information
9. Translation	Rendering ideas from a language to another in a relatively verbatim fashion
10. Transfer	Using previous linguistic knowledge or prior skills to promote comprehension or production
11. Inferencing	Using information in text to guess meanings, or predict outcomes
《Social/Affective Strategies》	
1. Questioning for Clarification	Eliciting additional information from a conversation partner
2. Cooperation	Working together with peers to solve a problem, pooling information, or getting feedbacks
3. Self-talk	Reducing anxiety by using mental techniques that make one feel competent
4. Self-reinforcement	Providing personal motivation by arranging rewards for oneself

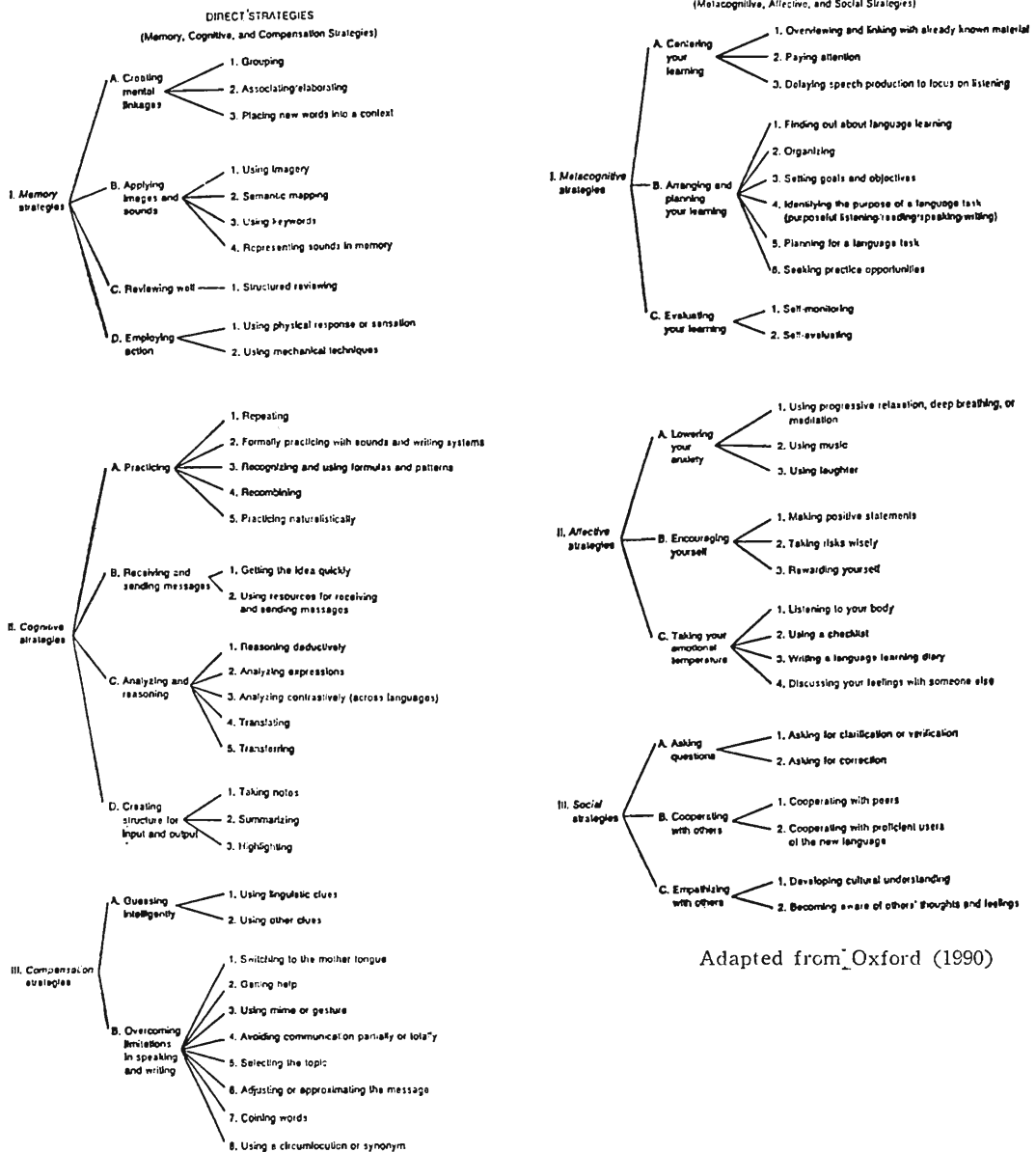Adapted from Chamot & O'Malley (1987) and O'Malley & Chamot (1990)

cerning either

(a) the use of social interactions to assist learning, or

(b) control over personal affect.

The difference between this system and those in earlier studies is that strategies mentioned in this system tend to look more like underlying mental processes, and can be discussed in the framework of a learning theory in cognitive psycho-logy, while those in earlier studies are general techniques for functioning effectively in the target language or general tactics for learning, and lack in a solid theoretical background.

Finally, Oxford and her colleagues(1989) proposed an exhaustive strategy classification system (See Figure 1.). This scheme, apparently influenced by Dansereau (1978) in cognitive psychology and Rubin (1981)

Figure 1. Classification System Proposed by Oxford and her Colleagues

DIRECT STRATEGIES
(Memory, Cognitive, and Compensation Strategies)

I. Memory strategies
- A. Creating mental linkages
  1. Grouping
  2. Associating/elaborating
  3. Placing new words into a context
- B. Applying images and sounds
  1. Using imagery
  2. Semantic mapping
  3. Using keywords
  4. Representing sounds in memory
- C. Reviewing well
  1. Structured reviewing
- D. Employing action
  1. Using physical response or sensation
  2. Using mechanical techniques

II. Cognitive strategies
- A. Practicing
  1. Repeating
  2. Formally practicing with sounds and writing systems
  3. Recognizing and using formulas and patterns
  4. Recombining
  5. Practicing naturalistically
- B. Receiving and sending messages
  1. Getting the idea quickly
  2. Using resources for receiving and sending messages
- C. Analyzing and reasoning
  1. Reasoning deductively
  2. Analyzing expressions
  3. Analyzing contrastively (across languages)
  4. Translating
  5. Transferring
- D. Creating structure for input and output
  1. Taking notes
  2. Summarizing
  3. Highlighting

III. Compensation strategies
- A. Guessing intelligently
  1. Using linguistic clues
  2. Using other clues
- B. Overcoming limitations in speaking and writing
  1. Switching to the mother tongue
  2. Getting help
  3. Using mime or gesture
  4. Avoiding communication partially or totally
  5. Selecting the topic
  6. Adjusting or approximating the message
  7. Coining words
  8. Using a circumlocution or synonym

(Metacognitive, Affective, and Social Strategies)

I. Metacognitive strategies
- A. Centering your learning
  1. Overviewing and linking with already known material
  2. Paying attention
  3. Delaying speech production to focus on listening
- B. Arranging and planning your learning
  1. Finding out about language learning
  2. Organizing
  3. Setting goals and objectives
  4. Identifying the purpose of a language task (purposeful listening/reading/speaking/writing)
  5. Planning for a language task
  6. Seeking practice opportunities
- C. Evaluating your learning
  1. Self-monitoring
  2. Self-evaluating

II. Affective strategies
- A. Lowering your anxiety
  1. Using progressive relaxation, deep breathing, or meditation
  2. Using music
  3. Using laughter
- B. Encouraging yourself
  1. Making positive statements
  2. Taking risks wisely
  3. Rewarding yourself
- C. Taking your emotional temperature
  1. Listening to your body
  2. Using a checklist
  3. Writing a language learning diary
  4. Discussing your feelings with someone else

III. Social strategies
- A. Asking questions
  1. Asking for clarification or verification
  2. Asking for correction
- B. Cooperating with others
  1. Cooperating with peers
  2. Cooperating with proficient users of the new language
- C. Empathizing with others
  1. Developing cultural understanding
  2. Becoming aware of others' thoughts and feelings

Adapted from Oxford (1990)

in SFLA study, tries to encompass all the strategies mentioned in the previous literature. This very extensiveness produces, at the same time, the problems of this system: overlaps among the subcategories, and removal of any theoretical underpinning of the strategies.

In the next section, I would like to turn to the studies on the variables affecting the use of LLS, most of which are based on one of the classification systems reviewed above.

III. VARIABLES AFFECTING THE USE OF LANGUAGE LEARNING STRATEGIES

In her preliminary study, Rubin (1975) listed several variables that might exert influence on the use of LLS, and implied that their effects should be examined empirically. By now, to my knowledge, some 20 studies have been conducted to examine the effects of the following variables: sex, ethnic origin, prior language experience, career, aptitude, attitude & motivation, personal characteristics, task, proficiency, and target languages.

(A) *Sex of the learner*: The first researcher who empirically examined the effect of this variable is Politzer (1983). He examined 90 American college students learning foreign languages, and found female students used social/interactional strategies more frequently than their male counterparts($p < .05$). He also found that males made more use of the strategy involving the comparison between the target language and the mother tongue ($p < .05$).

Ehrman & Oxford (1989), in their study on the use of LLS by various occupational groups, found much more frequent use of four categories of LLS by females (general learning strategies, $p < .002$; functional practice strategies, $p < .02$; strategies for searching for and communicating meaning, $p < .0006$; and self-management strategies, $p < .02$)[7]. Oxford & Nyikos (1989) examined 1200 college students in the USA, and proved the greater use of three categories of LLS by female students (formal practice strategies, $p < .002$;

general study strategies, $p < .0001$; and input elicitation strategies, $p < .002$).

These studies consistently showed that females made greater use than males of "social / communicative / interactional" strategies. Oxford, Nyikos & Ehrman (1988) attributed this finding to women's greater (a) desire for social approval, (b) willingness to accept existing norms, and (c) verbal ability.

In this connection, Reid (1987) investigated some 1200 college students in terms of Learning Modality Preferences (LMPs: i.e., Auditory/Visual/Kinesthetic/Tactile), which, according to Oxford (1989), are probably related to the choice of LLS, and showed that females are more prone to visual and tactile preferences than males. This may also explain the accumulated data that indicate females use social/interactional strategies more frequently than males.

(B) *Ethnic Background*: Politzer & McGroarty (1985) compared the use of LLS by 17 Asian graduate students with that by 19 Hispanic graduate students. In this preliminary study, they found the latter used all three categories of LLS examined more frequently than the former ($p < .05 - .001$). In terms of progress in English, however, Asians made more progress than Hispanics. Based on these results, they pointed out that the good LLS identified by many researchers might indeed be ethnocentric, and implied that good LLS suited for each ethnic group should be identified.

Due caution should be exercised, however, in interpreting the results of this study, because the ethnic variable was confounded with the career-orientation

variable explained later. The small number of subjects is also a problem in this study.

O'Malley (1987), in his study of 75 Hispanic & Asian high school students studying English, partially confirmed the findings reported by Politzer & McGroarty (1983). In this study, Hispanics were amenable to the training of mnemonic strategies involving grouping and imagery, while Asians were not, preferring rote-memory.

According to Reid (1987), LMPs, which are said to be closely related to the use of LLS, are also strongly influenced by the ethnic or national origin of the subjects.

(C) *Prior Language Learning Experience :* Ramsay (1980) compared ten multilinguals with ten monolinguals learning a foreign language, and found that multilinguals, who predominated in the group of successful learners, were generally (a) better at finding effective LLS in solving a task, (b) less reticent in using the target language, and (c) less afraid of making mistakes than monolinguals. In a comparative study of subjects with differing language skills learning an artificial language, Nation & McLaughlin (1986) provided an evidence that implied multilinguals had a greater flexibility in switching strategies than the other two groups (bilinguals & monolinguals).

The finding that multilinguals have a greater flexibility in the use of LLS was confirmed by Nayak, Hansen, Krueger, & McLaughlin (1990). They compared 24 multilinguals with the same number of monolinguals learning an artificial language, and demonstrated that the former

were more able to adjust their LLS according to the requirements of the task.

Reiss (1985), in a study of 38 good language learners learning foreign languages, reported that 92 % of them had had a prior exposure to at least one foreign language. Chamot & Kupper (1989), in a descriptive study of Americans learning Spanish, also pointed out the positive effect of prior language learning experience on the use of LLS.

All the data reported above seem to indicate that learners with prior experience of language learning have developed the ability to use LLS through their experience, and thus can utilize LLS effectively in learning a new language.

(D) *Career & Career Orientation*: Politzer & McGroarty (1985) compared 26 engineering students with ten humanities majors learning English in the use of LLS, and showed that the latter made greater use of LLS in the individual study category (i.e., strategies concerning what learners do when learners are by themselves and study English: p<.05). Readers need to be careful in interpreting the results because the influence of ethnic variable was mixed with that of this variable in this study.

Oxford & Nyikos (1989), in a study of 1200 US college students, revealed that humanities majors used functional practice strategies and resourceful, independent strategies more frequently than technology majors (p<.02 and p<.01 respectively)[8].

In a comparative study of 22 linguists, 26 language teachers, and 30 language students, Ehrman & Oxford (1989) reported that linguists made greater use of four categories of LLS than language teachers (authentic language use strategies, p<

.0001; strategies for searching for and communicating meaning, p<.005; formal model-building strategies, p<.02; and affective strategies, p<.05). Between language teachers and students, a significant difference in authentic language-use strategies was detected (p<.0001, T>S).

(E) *Aptitude, Attitude & Motivation:*
Bialystok & Fröhlich (1978), in a study of 157 high school students studying French as a second language, discovered a positive .66 correlation between attitude and strategy use (p<.01), and advocated a model in which attitude exerted influence on achievement via the use of LLS. They also found that there existed no relation between aptitude and strategy use (r= − 0.05). Their findings were confirmed by Bialystok (1979).

As to motivation, Oxford & Nyikos (1989) ascertained that it had the greatest influence on the use of LLS among the eight variables investigated (e.g., sex/ career-orientation/major) in this study. More specifically, those who were highly motivated made greater use of four (out of five) categories of LLS than those who were not motivated (formal practice strategies; functional practice strategies; general study strategies; and input elicitation strategies: all at p<.0001)[9].

(F) *General Personality Characteristics:*
Ehrman & Oxford(1989)conducted a survey exploring the effects of personality characteristics on the use of LLS. Extroverts, in this survey, were found to use two categories of LLS more frequently than introverts (affective strategies, p<.04; visualization strategies, p<.04)[10]. Introverts, on the contrary, made greater use of strategies for searching for and communicat-

ing meaning than extroverts(p<.01). The latter finding is somewhat unexpected, and needs to be confirmed by other studies.

Ehrman & Oxford also indicated (a) that intuitive people used four categories of LLS more frequently than sensing people (affective strategies, p<.05; formal model building strategies, p<.02: authentic language use strategies, p<.03; and strategies for searching for and communicating meaning, p<.02), and (b) that feeling-type people, compared with thinkers, showed greater use of general study strategies (p<.05).

(G) *Task:* O'Malley and his associates (1988), in a descriptive study of 70 Hispanic high school students of ESL, showed that subjects used LLS more frequently in relatively easier tasks[11]. No other studies on this issue are available, and, thus, empirical confirmation of their finding is in demand[12].

Strategy preferences in different types of language tasks were probed by O'Malley & Chamot (1990) in a longitudinal study of students studying Spanish and Russian. We can see, in their list, some strategies (e.g., self-monitoring/elaboration) are preferred in every task examined, while some strategies are task-specific (See Table 4.)[13].

(H) *Proficiency:* Bialystok (1979) examined Canadian high school students, and found that students in Grade 12 made greater use of the three strategies examined (practicing, monitoring, and inferencing) than students in Grade 10 (ANOVA main effect, p<.05). Politzer (1983) investigated 90 college students studying foreign languages, and demonstrated that the use of some strategies by advanced students was signif-

Table 4. Strategies Preferred for Different Language Tasks

Task	Metacognitive Ss	Cognitive Ss
Vocabulary	Self-monitoring	Resourcing
	Self-evaluation	Elaboration
Listening	Selective Attention	Note-taking
	Self-monitoring	Elaboration
	Problem Identification	Inferencing
		Summarizing
Cloze	Self-monitoring	Translation
	Self-evaluation	Deduction
		Inferencing
		Elaboration
Writing	Organizational Planning	Resourcing
	Self-monitoring	Translation
	Self-evaluation	Deduction
		Substitution
		Elaboration
		Summarizing

Adapted from O'Malley & Chamot (1990)

icantly different from that by intermediate and elementary students (p<.05−.01 depending on strategies). In this study, however, the effect of proficiency was mixed with that of other variables.

O'Malley and his colleagues (1985a) made a comparison between eleven beginning ESL students and eight intermediate students, and found that metacognitive strategies were used more frequently by intermediate students than by beginning subjects (34.9% vs. 27.4% of all strategies counted) Takeuchi (in press) examined 80 Japanese female college students of EFL, and revealed that students of higher proficiency in listening comprehension reported greater use of strategies for seeking opportunities to use English, for maintaining interaction in the target language, and for practicing difficult items (p<.05−.001).

Chamot & Kupper (1989), in a descriptive and longitudinal study of 67 American learners of Spanish, demonstrated that (a) the higher the proficiency of learners, the more frequently they used LLS, and (b) the higher their proficiency, the more *diverse* LLS they used. In this connection, Hayashi (1990) examined 94 college EFL students, and showed that diversity in the use of LLS can be found in the group of high-level students, but not in the group of low-level students.

Reiss (1981) explored the use of LLS by good and poor college students learning foreign languages, and found that the latter were only vaguely aware of the LLS they used, while the former could clearly describe, in non-technical terms, the LLS they used.

(I) *Target Language:* Politzer (1983) reported that college students learning Spanish used LLS less frequent than those learning other foreign languages (French and German: p<.05−.01 depending on strategies). The report that learners of

Spanish used LLS less frequently was confirmed by O'Malley & Chamot (1990), in which college-level Spanish learners were compared with those learning Russian.

The reason for this difference is less likely to be attributable to the nature of the target languages (e.g., complexity of grammar). It can be, and more likely should be, attributed, for example, to the teaching methods, and to the reasons the subjects had for selecting the foreign language that they did.

As we have seen in this section, a significant amount of knowledge about the variables affecting the use of LLS has been accumulated. Researchers should build on this large body of knowledge, and control intervening variables for obtaining reliable results in future studies of LLS.

IV. EFFECTS OF LANGUAGE LEARNING STRATEGIES ON SECOND & FOREIGN LANGUAGE ACQUISITION

One of the chief motivations to investigate the use of LLS by second & foreign language learners is the possibility that the use of all or some of LLS promotes SFLA. Studies that try to establish this relation generally adopt one of the following two approaches: (A) correlational approach; or (B) experimental training approach.

(A) *Correlational Approach*: In a correlational study, the relationships are sought by using a multiple regression or a correlation analysis between the use of LLS and the achievement or the gain of proficiency measured by tests.

Bialystok & Fröhlich (1978), in their study of 157 high school students learning French as a second language, reported that the use of the three LLS combined (practicing, inferencing, and monitoring) was responsible for the achievement on reading, listening, and grammar tests ($p < .05 - .01$). The use of LLS, however, was not related to the results of a writing test. According to the researchers, this null finding may be due to the nature of the writing test. Bialystok (1979) investigated the effects of the three LLS in Bialystok & Fröhlich (1978) respectively, and ascertained that the functional practicing strategy was most responsible for achievement on the tests, while inferencing was not related.

Politzer & McGroarty (1985) studied 87 graduate students in an eight-week intensive English course. They administered three tests twice at an eight-week interval, and sought the relationships between the score gains on the tests and the results of a questionnaire examining the use of LLS. Their findings are (a) a significant .37 correlation between a test of communicative ability and interactional strategies ($p < .05$), and (b) a positive but not significant correlation between a test of communicative ability and the use of individual study strategies (i.e., strategies concerning what learners do when they are by themselves and study English).

Padron & Waxman (1988), who were interested in the use of reading strategies by 82 Hispanic elementary school pupils of ESL, found that the results of a post-test of reading comprehension were, on the one hand, related to the results of a pre-test (i.e., proficiency, R square $= .66$, $p < .01$), and, on the other hand, were as-

cribable to the adverse effects of two negative reading strategies: thinking about something else while reading; and saying the main idea over and over (R square =.06, p<.01, and R square=.01, p<.05 respectively). No relation, however, was established between positive reading strategies and the results of the post-test.

Takeuchi (1991) examined the relationship between the use of LLS by 151 Japanese female college students of EFL and achievement on the listening section of the CELT test[14]. He ascertained that strategies for seeking opportunities to use English (p<.0034), for maintaining interaction (p<.0147), for practicing difficult items (p<.0145), and for volunteering answers(p<.0135) were mainly responsible for the achievement on the CELT test. He also found that strategies for seeking advice from good learners and/or teachers (p<.0332), for making hypotheses concerning grammar, word formation, and/ or sandhi-variation (p<.0185), and for im-

itating and practicing intonation. rhythm and/or pronunciation(p<.0142)were negatively responsible for the achievement[15].

(B) *Experimental Training Approach:* In the experimental approach, comparison is made between the experimental group (which receives LLS training) and the control group. To my knowledge, only two studies have been carried out using this approach.

Cohen & Aphek (1980) gave a brief lecture on the use of a mnemonic strategy (=association) to 26 American students of Hebrew, and had them make associations in memorizing Hebrew vocabulary. In the five-week period, three recall tests were given, and their results showed that words remembered with associations were retained more successfully than those with no association (86% vs. 72%).

O'Malley (1987) conducted the only full-scale experimental study in SFLA[16]. He and his associates divided 75 Hispanic & Asian high school students of ESL into

Table 5.　Tasks & Treatments in Each Group

Task & Strategy	Metacognitive group	Cognitive group	Control group
《Vocabulary》			
Metacog.	*Self-evaluation	*None	*None
Cog.	*Grouping/Imagery	*Grouping/Imagery	*None
Socio.	*None	*None	*None
《Listening》			
Metacog.	*Selective Attention	*None	*None
Cog.	*Note-taking	*Note-taking	*None
Socio.	*Cooperation	*Cooperation	*None
《Speaking》			
Metacog.	*Functional Planning	*None	*None
Cog.	*None	*None	*None
Socio.	*Cooperation	*Cooperation	*None

groups of eight to ten, and gave training on LLS in vocabulary, listening, and speaking for eight days in the natural classroom environment (See Table 5 for the treatments.). The results showed that no effect can be found for strategy training in vocabulary (p=.349) and in listening (p=.162). The effect of training for speaking was confirmed (p=.008).

O'Malley and his colleagues ascribed the null findings in the vocabulary and listening training to the facts that (a) Asian subjects showed no interest in the strategies taught in the vocabulary training, and stuck to their own familiar ways, (b) the explicit prompts which encouraged the use of the strategies taught were planned to be faded too quickly in the training, and (c) the listening training task was rather difficult.

This study was also designed to test the hypothesis that metacognitive strategies should always be included in training because they facilitate the transfer of LLS to new tasks (O'Malley et al., 1985a, b; Chamot & O'Malley, 1986). This hypothe-

sis, however, was not supported at least in the vocabulary & listening sections of this study.

The findings of the seven studies reviewed above indicate the possibility that all LLS identified by the studies so far do not facilitate SFLA by learners. Our knowledge on this topic, however, is rather scant, so more research should be directed to the empirical validation of the ef- fects of LLS.

V. Application of Language Learning Strategies to Language Education

《Training Sequences》

For the successful implementation of strategy training in second/foreign language classrooms, it is important to develop a concrete procedure, or a sequence for training. Three training sequences, to my knowledge, have been proposed (Hosenfeld & her colleagues, 1981; O'Malley & Chamot, 1988; Chamot & Kupper, 1989; See Table 6 for the steps in each sequence.).

An analysis of these sequences and of

Table 6. Sequences Proposed by Three Studies

Hosenfeld et al. ('81)	O'Malley & Chamot ('88)	Chamot & Kupper ('89)
for L2 (French) reading	for content-based ESL	for foreign language instruction
1) Teach "think-aloud"	1) Develop students awareness of strategies	1) Identify current use of strategy
2) Identify current use of strategies	2) Develop students knowledge of strategies	2) Assess the need of students
3) Explain the value of strategies	3) Develop students skills in using strategies for academic learning	3) Plan the instruction
4) Help students identify L1 strategy use	4) Develop students ability to evaluate own strategy use	4) Provide direct instruction
5) Help students identify strategy they can use in L2	5) Develop transfer of strategies to new tasks	5) Provide extensive practice
6) Provide direct instruction		6) Evaluate the use of strategy
7) Identify strategy use of stuednts again		7) Develop transfer of strategies to new tasks

related studies by Brown et al. (1983), Wenden (1986), and Oxford (1989) shows that an effective training sequence must include: (a) assessment of the present use of LLS by learners; (b) analysis of the needs/backgrounds of learners; (c) planning of the LLS to be taught; (d) explanation of the importance/effectiveness of the LLS; (e) explicit instruction in the LLS; (f) ample opportunities for practice; (g) promotion of the transfer of LLS to new tasks; and (h) evaluation of the results. In addition, it is desirable that the training sequence be integrated with the activities of the regular language learning program.

In evaluation, Wenden (1986) argued that the following should be taken into consideration: (a) change of the learner's attitude to the training; (b) acquisition of the strategies taught; (c) improvement of the performance of the tasks; (d) durability (continued use) of the strategies taught; and (e) transfer of the strategies taught to new tasks.

《Materials》

Efforts to develop materials for strategy training have a very short history, and, so far, only a few materials have been developed. Rubin & Thompson (1982) wrote a self-study book entitled *How to be a More Successful Language Learner.* The intention of this book is for readers themselves to utilize the information offered in it, instead of having teachers provide instruction in classes, and this method is considered to be useful particularly for adults who have a strong motivation to study second/foreign languages. In this book, they explained 14 LLS

in nontechnical terms, offered examples and activities related to each strategies, and encouraged readers to try new strategies. Their explanations cover almost all the LLS described in O'Malley et al. (1985a), though they are not classified according to O'Malley et al.'s system.

Rubin (1987b, 1989) has produced a two-sided interactive video disc called "The Language Learning Disc", in which adult learners are trained (a) to choose strategies appropriate to tasks; (b) to use these strategies in classroom, self-study, or business situations; (c) to make use of strategies suited for reading, listening, and conversation; and (d) to utilize memory strategies for language learning. The disc with five accompanying diskettes provides an average of eight hours of instruction. In this disc, materials are presented in an integrated fashion so that learners are exposed to the same strategy in various situations. In addition, thanks to modern technology, learners can enjoy authentic learning environments with this disc.

Some school textbooks involving LLS training have been edited by Chamot (1987b, c) and Chamot & O'Malley (1988a, b) in the framework of the Cognitive Academic Language Learning Approach (CALLA: Chamot & O'Malley, 1987; Chamot & Kupper, 1988)[17]. CALLA is an educational system that provides transitional instruction for upper elementary & secondary students at intermediate and advanced levels of ESL. This system, which has already been introduced into some schools in the US, embeds the LLS training within activities for developing both academic language skills and content

area skills (e.g., mathematics/ science/ social studies). Accordingly, in the CALLA textbooks, a skillful integration of LLS training and content area instruction can be seen. In the accompanying teacher's guide, detailed suggestions for strategy training in the instructions of content area and of academic language skills are available.

A textbook with cassette tapes for EFL classrooms was developed by Ellis & Sinclair (1989) based on LLS research. This book is mainly for intermediate students of English, and the aim is to help students become more autonomous language learners. Students find, in this textbook, brief sketches of language learning processes, checklists of their strategy use, examples of strategy use for different tasks by learners of English, and a variety of activities involving strategy use for vocabulary development, grammatical analysis, reading, writing, listening, and speaking. Strategies to be taught in this book cover all three categories of LLS described in O'Malley et al. (1985a, b). In the accompanying teacher's book, detailed suggestions for instruction are provided, but, as O'Malley & Chamot (1990) pointed out, special training for familiarizing teachers with the approach seems to be necessary for the effective use of this textbook.

With the growing interest in LLS, materials involving strategy training are now in demand. However, as we have seen in the preceding section, not much is known yet on the relation between LLS and SFLA. In the process of materials development, therefore, materials writers should follow the LLS research, and incor-porate the relevant results in their materials as much as possible.

VI. Methodology of Data Collection

There are several methods for gathering the data in LLS research. Each method has its own merits and limitations. In this section, a review will be made of the merits and limitations of the following five data collection methods: observation, thinking-aloud, questionnaire, interview, and diary.

(A) *Observation:* In this method, researchers gather data by observing the activities of learners in classrooms. Many attempts to collect data by using this method have been made, but most of them have failed to secure fruitful data (e.g., Naiman et al., 1978; Hosenfeld, 1976; Cohen & Aphek, 1981; Rubin, 1981; O'Malley et al. 1985a). The reason for failure can be attributed to one of, or a combination of the following: (i) in classes, teachers tend to put emphasis NOT on learning processes (=strategy use), but on products (=accuracy of results); (ii) most classes tend to be teacher-directed, and students have few chances to be engaged in active learning with observable LLS: and (iii) opportunities have to be inserted to verify the observer's interpretation of LLS during the class, and, of course, this is not possible in most cases (Rubin, 1981; Cohen, 1984, 1987; Chamot, 1987a).

It seems that we cannot obtain satisfactory data by using this method only. Researchers who intend to obtain data by using observation only should employ another data collection method simultane-

ously.

(B) *Thinking-aloud :* This method was introduced by Hosenfeld (1976, 1977) into the research of reading strategies in second language. Subjects are asked individually to say out loud how they proceed in performing a task. Their descriptions are usually tape-recorded and analyzed later. During the think-aloud process, if necessary, questions are asked to prod and guide the subject. With a brief training secession, Hosenfeld (1976) said, it was possible for students who were of junior high school age or above to think aloud.[18]

One of the strengths of this method is that processes (=strategy use) rather than products (=accuracy) can be examined readily. Other advantages are in providing useful information on individual differences, levels of decision-making, and factors affecting the decision-making. (Hosenfeld, 1976; O'Malley, Chamot & Kupper, 1989).

A limitation of this method is that subjects may report only a limited range of LLS of which they are consciously aware at the moment. A second shortcoming is that the process of interrupting informants to have them report on their thoughts can change the nature of their thinking, and facilitate strategic processing which otherwise might not occur. A third concern is that most of the strategic processes may take place at an unconscious level, and therefore may be inaccessible to mental probes, such as thinking-aloud (Seliger, 1983).[19] Its time-consuming nature is also a disadvantage of this method.

(C) *Questionnaire :* In this data collection method, subjects are given a list of LLS described in non-technical terms, and asked to write, one by one, the degree of their use in language learning activities. In answering, a frequency scale of zero (never) to four (whenever possible) is often ussed. The strategy inventory for language learning (SILL) developed by Oxford (1990) is the most famous example of the LLS list.

Questionnaires can be readily administered to a large population. In addition, the data collected is amenable to statistical analysis. It takes, however, a lot of time and effort to make a reliable list of LLS. Moreover, the data collected in this method is subject to the influence of third factors such as intelligence, a desire to give the "right" answer to please the teachers, and so forth (Oller & Perkins, 1978).

(D) *Interview :* In this method, an interviewer tries to get information by asking a subject or a small group of subjects quetions concerning strategy use according to a list of topics prepared before (Hosenfeld et al., 1981; Chamot, 1987a). Subjects are not asked to perform a language task *per se* in the interview, but are requested to consider how they typically do the task.

By adopting this method, researchers can investigate what they really want to look into. Careful consideration, however, is needed in making the list of questions to be asked. Moreover, the data collected through this method can be influenced, as is the case with those of questionnaires, by third factors such as intelligence, a desire to please the interviewer, and, in a small group, peer pressure.

(E) *Diary:* There are two variations of the diary method. The first variation is called the "free" diary method, in which subjects are given a brief general instruction about what the researchers are looking for and then write their use of LLS freely. Rubin (1981) reported that this method yielded meager results. Most of the descriptions in the diaries, according to her, were quite vague and lacking in useful information.

The second variation is the "directed" diary method, in which subjects are given concrete instruction to focus on the use of a small number of LLS, and write down their use. According to Rubin (1981: 120), this method is "an extremely useful way to obtain data about cognitive strategies". The data collected through this method, however, require much time for analysis, so it is not suitable for a large population of subjects.

As we have seen, every method has its own advantages and disadvantages. In order to secure reliable data, therefore, researchers shouud use the double- or multiple-data collection method, in which more than one data collection technique is used.

VII. Concluding Remarks

It seems to be true that the use of LLS is an important factor in determining the success of second/foreign language acquisition, but readers should be aware of the fact that it accounts for, at most, 20% of the variance in the achievement or in the gain of SFLA. Bialystok (1979) attributed 9 to 24% of the variance to the use of LLS depending on the tasks.

Some 14% of the variance can be ascribed to the use of LLS in Hayashi (1990). Takeuchi (1991) showed the use of LLS was responsible for some 26% of the variance.[20] These data seem to imply that even if we effectively train students in the use of LLS, we should not expect that more than 30% of the variance will be explained by the use of LLS. The use of LLS is an important factor, but we should remember that it is not everything.

As this review has indicated, many studies have been made on the identification & classification of LLS and on the variables affecting the use of LLS. Our knowledge, however, is limited concerning the effects of LLS on SFLA. Moreover, only a few materials involving the training of LLS are now available. Further efforts, therefore, should be directed to studies on the effects of LLS, and to materials development. Lastly, as to data collection, it is strongly recommended that data be gathered by using at least two separate methods.

NOTES

1. This article is dedicated to my infant son, Yūki Takeuchi, who has constantly disrupted my study. For his constructive criticism, my thanks go to Professor B. Susser. I also extend my thanks to Ms. M. Uda and Ms. S. Kimoto of Doshisha Women's College Library for helping me obtain hard-to-find articles.
2. On aptipude, see, for example, Carroll (1962). For attitude & motivation, see Gardner & Lambert (1972). For input, see, for instance, Long (1983).
3. See Canale & Swain (1980) for the idea of "strategic competence".
4. Krashen (1985) insists that only implicit process should lead to acquisition, while explicit process should lead to learning.

Mclaughlin (1978) and McLaughlin & his colleagues (1983), among others, oppose the dichotomy, and claim that both implicit and explicit processes lead to acquisition.

5. Nida (1957, partly reprinted in 1982) identified some LLS in non-technical terms.

6. Reiss (1985), in a questionnaire study of 38 good language learners, empirically confirmed Rubin's strategies with the exception of "good language learners are willing to appear foolish if reasonable communication results".

7. General learning strategies involve previewing lessons, arranging the study environment, and skimming the reading passage before reading it for details. Self-management strategies involve overcoming anxiety, fear and frustration by various methods.

8. Resourceful, independent strategies involve independent manipulation of materials in order to embed them in memory, and independent use of certain planning actions.

9. Chamot & Kupper (1989) also touched on the effect of motivation on the use of LLS.

10. Visualization strategies mean using mental images, linking sounds with visual images, visualizing spelling, and drawing pictures of new words.

11. The same finding is also reported in O'Malley and his colleagues (1985a) and Chamot (1987a). These two studies used the same data in O'Malley et al. (1988).

12. Chamot & Kupper (1989), based on their informal observation, made a brief comment on the effect of the degree of difficulty of the task on strategy use.

13. See also Chamot & O'Malley (1986), and O'Malley, Chamot & Kupper (1989).

14. For the details of the CELT test, see Harris & Palmer (1986).

15. Sandhi-variation means the phonological modification of grammatical forms which have been juxtaposed. Assimilation, mutation, and reduction are typical examples of sandhi-variation.

16. The same experiment is also reported partly in O'Malley and his associates (1985b) and fully in O'Malley and his colleagues (1988).

17. For the theoretical background of this approach, see also Anderson (1985), and O'Malley, Chamot & Walker (1987).

18. For the points that require attention in prodding and guiding subjects, see Hosenfeld (1976).

19. Cohen (1984) made persuasive rejoinders to the arguments rendered by Seliger. See also Cohen & Hosenfeld (1983), and Cohen (1987) on this issue.

20. Bialystok & Fröhlich (1978) compared the effects of aptitude, attitude, the use of LLS, and field dependency on the achievements of several tests, and demonstrated that the use of LLS was responsible for only 4.8 to 5.9% (p<.05 to .01) of the variance in the achievements of the tests.

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