Raising Learner Awareness of Language Learning Strategies in Situations of Limited Resources

Susan Bull* and Yingxin Ma†

* ARIES Lab, Department of Computer Science, University of Saskatchewan, Saskatoon, SK S7N 5A9, Canada.
bull@cs.usask.ca

† Dezhou College, Shandong, P.R. China.
yingxinma@hotmail.com

Abstract: This paper introduces LS-LS, an interactive learning environment to raise learner awareness of language learning strategies. Strategies of potential interest to a student are suggested based on (1) the student's learning style; and (2) similarities between new strategies and strategies already used by the individual. LS-LS is intended primarily for use in contexts where resources are limited. An initial study suggests that learners will find many of the strategy recommendations useful.

Keywords: interactive learning environment; learner awareness; learning strategies; second language acquisition.

1 Introduction

Although some students will be successful in learning a foreign language regardless of the teaching method, it is recognised that a mismatch between the learning style of a student and teaching style of a class tutor can result in learner anxiety or dissatisfaction, and reduced achievement (Ehrman, 1996; Felder & Henriques, 1995; Oxford & Lavine, 1992). In order to help students become more autonomous and improve learning outcomes, there has been much interest in training in the use of language learning strategies (e.g. O'Malley & Chamot, 1990; Oxford, 1990; Oxford et al, 1990; Weaver & Cohen, 1994; Wenden, 1986). Since links between a student's learning style and their strategy use have been suggested (Ehrman, 1994; Ehrman & Oxford, 1990; Moody, 1988; Tyacke, 1991), such relationships should be taken into account when considering strategy training.

Discussions of the effectiveness of strategy training have often recommended that it be integrated into the normal language curriculum (Chamot & Kupper, 1989; Oxford et al, 1990; Tyacke, 1991). While it is true that good integrated strategy training programmes may benefit many students, it is often the case that resources required for effective learner training are not available. Furthermore, it should be remembered that successful learners do not all use the same techniques (Stevick, 1989); and there appears to be no single set of strategies appropriate for recommendation to all learners (Gillette, 1987). A method is therefore needed to help learners find out about language learning strategies in a manner that takes account of their individual characteristics, but that also provides sufficient support in a resource-poor environment.

This paper describes LS-LS (learning style–learning strategies): an interactive learning environment to raise learner awareness of language learning strategies, while taking individual variation into account. It makes suggestions of potentially useful strategies, based on possible links between learning styles and learning strategies, as discussed by Ehrman and Oxford (1990). Strategy suggestions also take into consideration the strategies already used by a learner, as strategy understanding may to some extent be affected by strategies already used (Bull, 1997). Thus, with LS-LS, access to the concepts involved becomes easier: all strategy suggestions are explicitly linked back to the learner's starting point (of learning style and current strategy use). This reduces the need for students to comprehend some external framework, which is particularly helpful in a situation where additional support and teacher explanation is restricted.

2 Learning Style and Language Learning Strategies in LS-LS

In this section we focus on how learning style may influence strategy choice, and how considering relationships between strategies already employed by a learner, and new strategies to be suggested, may help students appreciate the potential benefits of additional strategies. The aim is to make the notion of language learning strategies more meaningful to students, by relating descriptions to their own characteristics and individual approaches to learning.

2.1 Language Learning Strategies

Language learning strategies have been defined in various ways. Fox and Matthews (1991) state a popular view that learning strategies are 'concerned with how learners use their brains consciously and purposefully to handle their learning and make it more effective'. MacIntyre (1994) claims that 'the issue of intentionality is central to the strategy concept'. Other researchers believe that strategies will not necessarily be conscious. For example, Kohonen (1992) states that strategies may become automatised, and be used without conscious application. Kohonen continues: 'they can also be brought to conscious observation and awareness and can be modified as a result of conscious effort'. In LS-LS it is not assumed that students will already be aware of the learning strategies they use: LS-LS helps students to develop their awareness of learning strategies regardless of their level of consciousness of their strategy use at the outset.

There exist several language learning strategy classification systems (e.g. O'Malley & Chamot, 1990; Oxford, 1990). In this work we use Oxford's (1990) Strategy Inventory for Language Learning (SILL), since the version developed for learners of English has been used extensively by researchers throughout the world, indicating high validity, reliability and utility (Oxford & Burry-Stock, 1995). The SILL questionnaire measures the frequency with which a student uses *memory*, *cognitive*, *compensation*, *metacognitive*, *affective* and *social* language learning strategies. Oxford describes these strategy types thus:

> *Memory strategies*, such as grouping or using imagery, have a highly specific function: helping students store and retrieve new information.
> *Cognitive strategies*, such as summarizing or reasoning deductively, enable learners to understand and produce new language by many different means.
> *Compensation strategies*, like guessing or using synonyms, allow learners to use the language despite their often large gaps in knowledge.
> *Metacognitive strategies* allow learners to control their own cognition–that is, to coordinate the learning process by using functions such as centering, arranging, planning, and evaluating.
> *Affective strategies* help to regulate emotions, motivations, and attitudes.
> *Social strategies* help students learn through interaction with others.
>
> (Oxford, 1990: 37 & 135)

The SILL questionnaire is used to identify the level of strategy use (low, medium or high) for each strategy class. In LS-LS we are also interested in the use of *individual* strategies (62 in total), and similarities between individual strategies. Thus LS-LS requires an additional layer on top of Oxford's (1990) strategy classification system, to represent these inter-strategy linkings: a measurement of the similarity between individual learning strategies.

The *strategy similarity measure* is a theoretical construct, used to help a learner become aware of how new strategies relate to those they already use, by explicitly including linking information in strategy explanations (see Section 3.4). This makes new strategies more accessible, and is particularly useful in the context of LS-LS, since there is likely to be little additional teacher support available to help students individually.

As an illustration, imagine a learner who uses sounds or images as a strategy to aid vocabulary learning. The *keywords* strategy is an extension of this: it is used to make meaningful auditory *and* visual links to remember a word. Oxford (1990) describes it as follows:

> The first step is to identify a familiar word in one's own language that sounds like the new word - this is the 'auditory link'. The second step is to generate an image of some relationship between the new word and a familiar one - this is the 'visual link'.
>
> Oxford (1990: 41-42)

The keywords strategy can be more powerful for some learners, than sounds or images used independently. Suggesting this strategy to a student who currently uses one of these approaches can build upon their experience of the known strategy in the introduction of the new *keywords* strategy. The following is an example of such an explanation given by LS-LS:

Keywords:
You stated in STEP 3 that you use the strategy of imagery when learning vocabulary. If you also made a mental link between the sound of a new word, and a word in your own language (or another target language word), you could also combine this second word in your image. This might be a more powerful way for you to remember new words.
For example, a German speaker learning English, faced with the word 'plate', might notice the similarity in sound and spelling to the German 'Platte' (record/LP). They may form a mental image or make a drawing which contains 'plate', but also some aspect of 'Platte': e.g. a plate revolving on the turntable of an old record player. Recalling the visual image will remind the learner that the word they are seeking is in some way similar to the sound of the German 'Platte'.

Such descriptions give the student enough information to decide whether they wish to pursue a strategy further: they have both an example of the new *keywords* strategy, and a description of how to apply this strategy, which takes *imagery* as its starting point–a strategy already employed by the learner.

If a student would like to find out more about any strategy, they may start by looking again at the definitions and examples provided in LS-LS of the various learning strategies. Alternatively they may choose to use accompanying printed materials, web-based materials, published guides, or they may discuss suggested strategies with a classmate who already uses the strategy.

2.2 Learning Style

Self assessment of learning style can also help to raise awareness in learners, of their language learning needs (Franklin et al, 1997; Ilieva, 1997). Using Myers and McCaulley's (1985) Myers-Briggs Type Indicator (MBTI), Ehrman and Oxford (1990) found psychological type to be 'the single most powerful of the variables' to correlate with learning strategy use. (The other variables studied were sex, occupation and age). The MBTI is a forced choice questionnaire, based on Jung's (1971) theory of psychological types. The MBTI has 16 possible outcomes, according to combinations of the following four components: Extravert-Introvert, Sensing-Intuitive, Thinking-Feeling, Judging-Perceiving. Thus, for example, the result ISTJ indicates that an individual's psychological type comprises: Introvert, Sensing, Thinking, Judging. Myers and McCaulley summarise the MBTI preferences as follows:

> *Extraversion/Introversion:* Whether to direct perception judgment mainly on the outer world (E) or mainly on the world of ideas (I).
> *Sensing perception/Intuitive perception:* Which kind of perception is preferred when one wishes or needs to perceive.
> *Thinking judgment/Feeling judgment:* Which kind of judgement to trust when one needs or wishes to make a decision.
> *Judgment/Perception:* Whether to deal with the outer world in the judging (J) attitude (using T or F) or in the perceptive (P) attitude (using S or N[1]).
>
> Myers & McCaulley (1985: 2)

Ehrman and Oxford (1990), relating MBTI results to learning style, found that some classes of strategy are particularly liked or disliked by those with different learning styles. For example, they found that nearly all their Thinkers liked cognitive strategies (e.g. analysing and creating structure), whereas most Feelers found cognitive strategies uncomfortable. Thus, finding out whether a learner is a Thinker or Feeler can help when suggesting strategies that the student might find useful. From the previous example, students with the learning style ISTJ may feel particularly comfortable with metacognitive strategies, as Ehrman and Oxford found that nearly all their Introverts and Judgers, and most of their Sensers and Thinkers, liked metacognitive strategies.

Since Ehrman and Oxford's students were government employees undertaking intensive language training, they are unlikely to be typical of language students in general. It is therefore necessary to consider their results only as indicative for the purposes of LS-LS. However, because the aim of awareness-raising is not compromised by incompleteness, it is not necessary that the personality descriptors, or implications derived therefrom, are entirely accurate for them to be useful in LS-LS.

LS-LS does not incorporate the MBTI and SILL directly, but uses less strictly the four personality descriptors of Myers and McCaulley (1985) together with Oxford's (1990) language learning strategy classification system, and

[1] *N* is used for *intuitive*, since *I* is used for *introversion*.

the findings of Ehrman and Oxford (1990) which link these two areas of research. LS-LS suggests learning strategies that an individual might like to consider using inside or outside the classroom, in a computational or non-computational context, according to inferences about their personality and learning style. This is designed to offer students a more comprehensible way into the topic of language learning strategies.

3 The LS-LS Interaction

As stated previously, the aim of LS-LS is to raise strategy awareness in the manner most suited to the individual, in a context where resources are restricted (e.g. lack of time, staff, or costly computing equipment such as required, for example, for Rubin's (1996) multimedia strategy instructional program). LS-LS runs on most Macintosh computers. It assumes good reading ability in English, but it is not restricted to contexts where English is the native or target language.

Before using LS-LS, students require some introduction to the concept of language learning strategies. This may take place in the classroom or through written materials. It is also useful for there to be at least one follow-up classroom session, or subsequent group interviews, based on the group members' LS-LS results. The latter may be a particularly beneficial method for some learners to develop their strategy awareness by considering the strategies of their peers (see Fernández-Toro & Jones, 1996; Yang, 1996). Follow-up sessions also enable a teacher to introduce the idea of using strategies which are *appropriate* to a task. This is important because some unsuccessful learners have been found to use many of the same strategies as successful learners (Vann & Abraham, 1990).

Since its main purpose is to *prompt interest*, LS-LS does not depend on such extensive teacher participation as for other effective strategy-introduction methods. It is intended as a means of sparking interest in, and curiosity about, language learning strategies. It does this by relating new strategies to those already experienced, also taking account of the student's learning style, in a more meaningful, personal approach. From this basis students will be in a position to reflect on their strategy use, and follow this up in a way that suits them.

Since it takes advantage of the computer's ability to link together large amounts of information, LS-LS also has the benefit that it is able to adapt to the individual in a manner not achievable by a class tutor: i.e. LS-LS is able to keep track of numerous relationships between strategies, and also how these relationships apply to different individuals. Thus LS-LS might also be useful as an additional resource in situations where economic restrictions do not place such limitations on resource availability, and may in these contexts have potential beyond other strategy prompting programs where the training offered could also be carried out in the classroom (e.g. see Kenning, 1996).

As described above, LS-LS uses the learning style and current strategy use of an individual, together with similarities between new strategies to those already known, to suggest strategies that a particular learner might find interesting. The remainder of this section describes the four stages of using LS-LS.

3.1 STEP 1: Identification of Learning Style

In the first step, learners provide information about their learning style. If the full MBTI is available, and students wish to use it, the result of its application may be given directly to LS-LS:1.[2] In other cases students complete LS-LS:1's Learning Style dialog box (Figure 1). The information given is used to distinguish Extraverts from Introverts, Sensers from Intuitives, Thinkers from Feelers and Judgers from Perceivers, as does the MBTI, but it is much briefer. A short description is given of the main characteristics of each polar choice, and students select from the options offered.

[2] Each step of LS-LS has an identifying number. For example, LS-LS:1 means 'step 1 of the LS-LS interaction'.

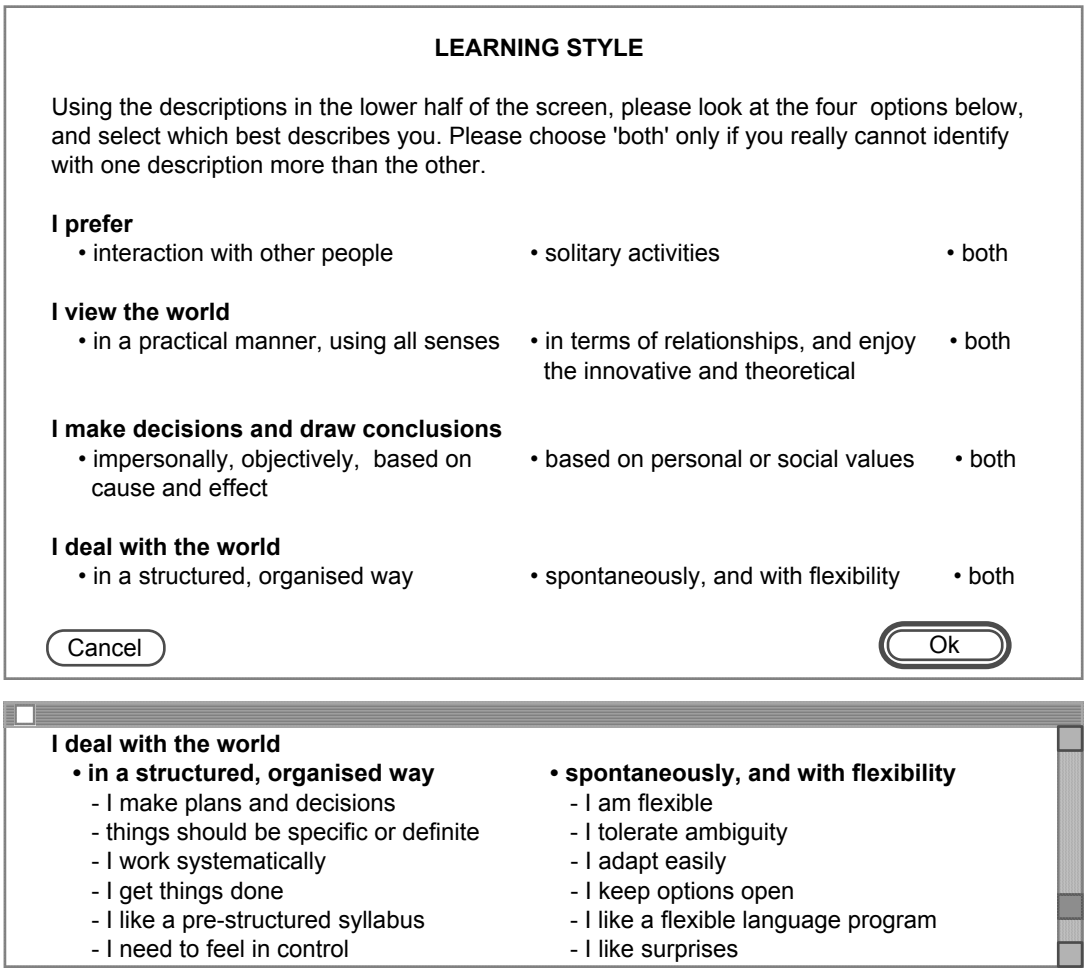

Figure 1: LS-LS:1 - identifying learning style

Unlike the MBTI, using LS-LS:1 learners are not forced to select between each pole if they are unable. This is in part because the description of each pole provided is fairly brief–brevity is considered important here, since users may have chosen this approach over the lengthy MBTI (126 items)–and it is in part because accuracy is not necessary for our goal of awareness-raising. Due to the potential for omissions if students cannot identify with one pole over another, in some cases instead of a descriptor such as ISTJ, students may be assigned a descriptor with one or more components missing, e.g. IxTJ.

3.2 STEP 2: Previewing Language Learning Strategies

Step 2 is optional. It may instead be undertaken concurrently with step 3. In LS-LS:2 learners may view (and print) adapted strategy descriptions based on the 62 strategies comprising Oxford's (1990) six strategy categories.

3.3 STEP 3: Identification of Language Learning Strategies Already Used

Previous research suggested that adult students with different language learning backgrounds, and different language learning strategies, might be interested in exploring the use of learning strategies in a computer environment (Bull et al, 1993). Moreover, these students' construction of an initial profile of their strategy use demonstrated that they were also *able* to identify the strategies they used, from short strategy descriptions. LS-LS:3

is based on these findings, and involves the student in identifying their current strategy use.[3] This procedure is in 6 parts: one for each of Oxford's strategy types (memory, cognitive, compensation, metacognitive, affective and social). Each stage produces a dialog box listing strategies in the grouping, together with explanations of the individual strategies (Figure 2). Students indicate which of these strategies they use.

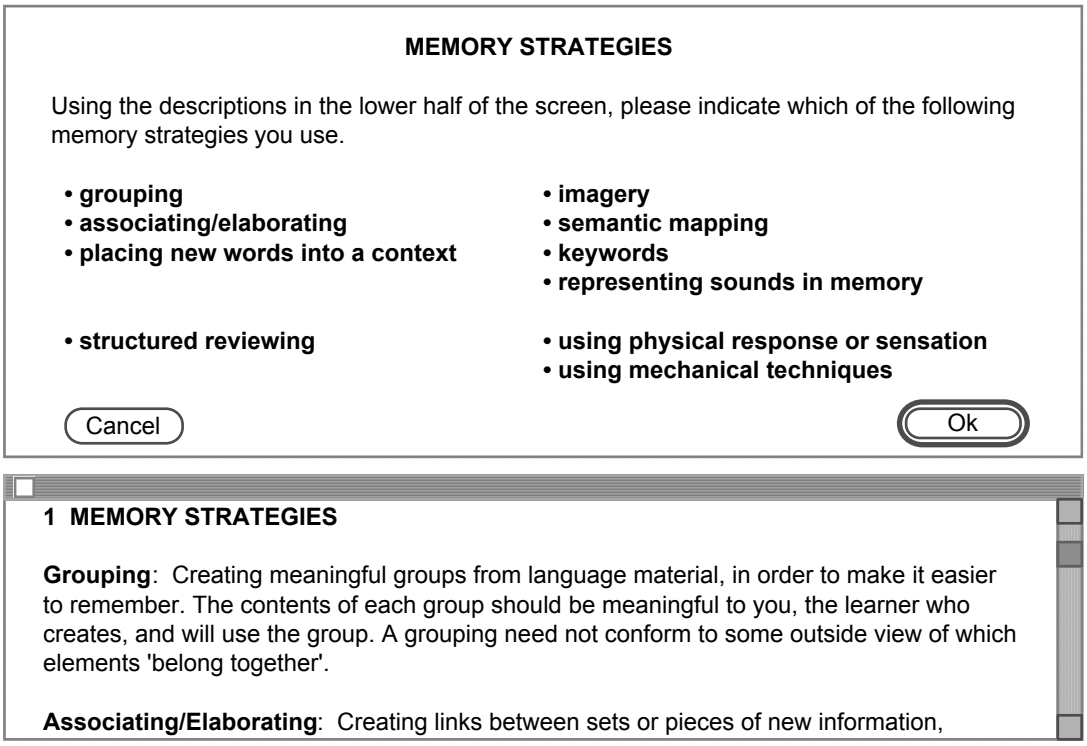

Figure 2: LS-LS:3 - identifying learning strategies already used

The strategy type first presented to students depends on the learning style identified in LS-LS:1. For example, ISTJ or IxTx students will receive metacognitive strategies first, followed by cognitive strategies; ISFJ learners initially receive only metacognitive strategies, since Ehrman and Oxford's (1990) study found that most Feelers dislike cognitive strategies, whereas nearly all Thinkers have a positive attitude towards them (and no other learning style component is typically negative). After responding for one or two strategy types, as suggested by their learning style, students are asked whether they wish to continue for the remaining four or five groups. At this stage, students will have given information about the strategies they are most likely to use, given their learning style, and the option to finish here allows the less motivated learner to proceed to LS-LS:4's suggestions before they 'give up'. However, learners are encouraged to continue with step 3, as the more information there is available to LS-LS, the more useful its suggestions are likely to be.

3.4 STEP 4: Individualised Suggestions of Additional Language Learning Strategies

In Step 4, LS-LS makes suggestions of strategies the learner might find interesting or useful. Students are reminded that these are only suggestions, and that no strategy will necessarily be 'better' than another. It is claimed only that strategies suggested have been found useful by some learners with similar characteristics as themselves.

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[3] One difference between this strategy identification process, and that examined in Bull et al (1993), is that LS-LS is based on Oxford's (1990) learning strategy classification system, whereas the earlier work used O'Malley and Chamot's (1990) strategy descriptions. This is because Oxford's classification has been tested more extensively; and Ehrman and Oxford's (1990) study, which was used to inform the design of LS-LS, was based on Oxford's classification. This change should not affect a student's ability to identify their strategy use from strategy descriptions.

The following illustration is from a Japanese learner (F), learning English in the U.K. Based on F's responses to step 1, she was identified as EIFP. In step 3, F indicated that she used a wide range of strategies: 42 of the 62 total, in each of the categories. LS-LS:4 suggested six additional strategies that F might find interesting, three of which had multiple justifications: *grouping*, *coining new words* and *cooperation with peers*. Figure 3 shows the reasons given for suggesting *coining*, based on F's use of *synonyms*, *requesting help* and *mime*.

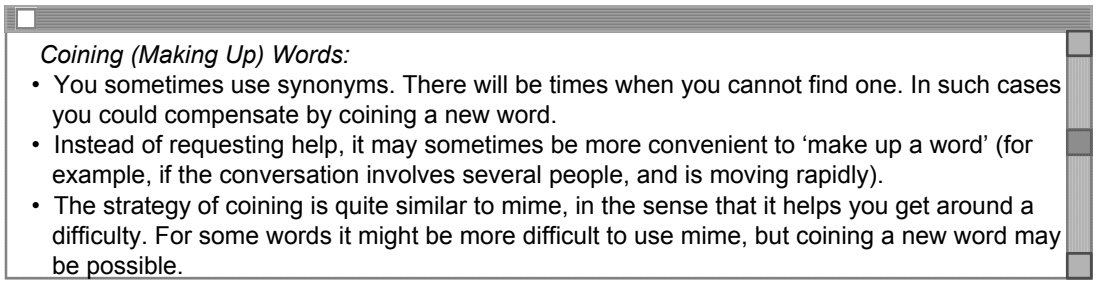

Figure 3: LS-LS:4 - learning strategy suggestion based on strategies used

The suggestion is that there may be occasions when F's usual compensation strategies cannot be applied. *Coining* may be an easy alternative for F in such cases. There is no implication, however, that she should use *coining* if her usual strategies could be employed. This is an issue for F to decide for herself, once she has experienced the strategy of *coining*.

Mainland Chinese learner M, also living in the U.K., was identified as type xSTx; i.e. he considered himself neither an Extravert, nor an Introvert. Similarly, he could not distinguish between the Judging/Perceiving dimension. Suggestions to M resulting from his personality descriptor were therefore based on the types Sensing and Thinking. In step 3, M identified his use of 22 learning strategies, none of which came from the types metacognitive or social. This is significantly less than F, both in terms of total strategy use, and spread of strategy types. LS-LS:4 suggested 15 strategies of potential interest to M.

In addition to the strategy suggestions shown in the previous example for F, the illustration for M (Figure 4) also reflects Ehrman and Oxford's (1990) finding that some classes of strategy are especially liked by certain kinds of learner. The example for M refers to Sensing types being the only group that is particularly comfortable with memory strategies.

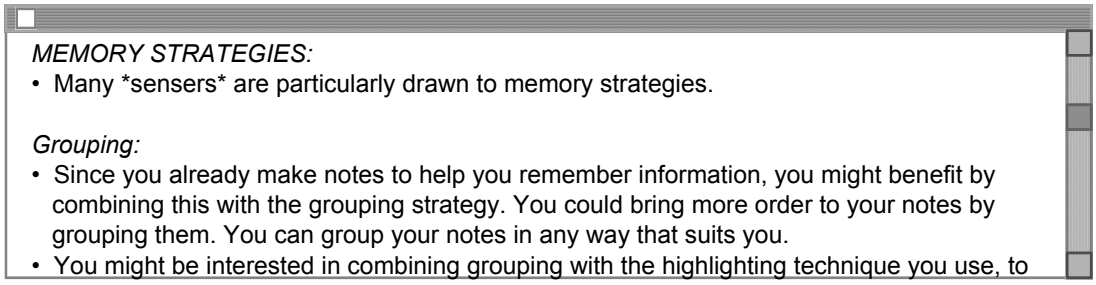

Figure 4: LS-LS:4 - strategy class suggestion based on learning style

This kind of information, related to the personality descriptor obtained in step 1, can also lead to suggestions of individual strategies that might be of interest. For example, M also received the following suggestion: "Many *thinkers* find the metacognitive strategy of planning to be useful." It is particularly helpful to have this kind of information available for students such as M, since inferences based on learning style are using partial descriptions only. Information of this kind relating to individual components of a personality descriptor can help to compensate for incomplete results in LS-LS:1.

The above examples also show suggestions derived from similarities between strategies used, and the strategy suggested for investigation. These similarities are independent of Oxford's (1990) strategy classification, and are

based on an additional *similarity measure*. This can be seen in the case of M, where his use of the cognitive strategy of *highlighting* is used as support for suggesting *grouping*, a memory strategy.

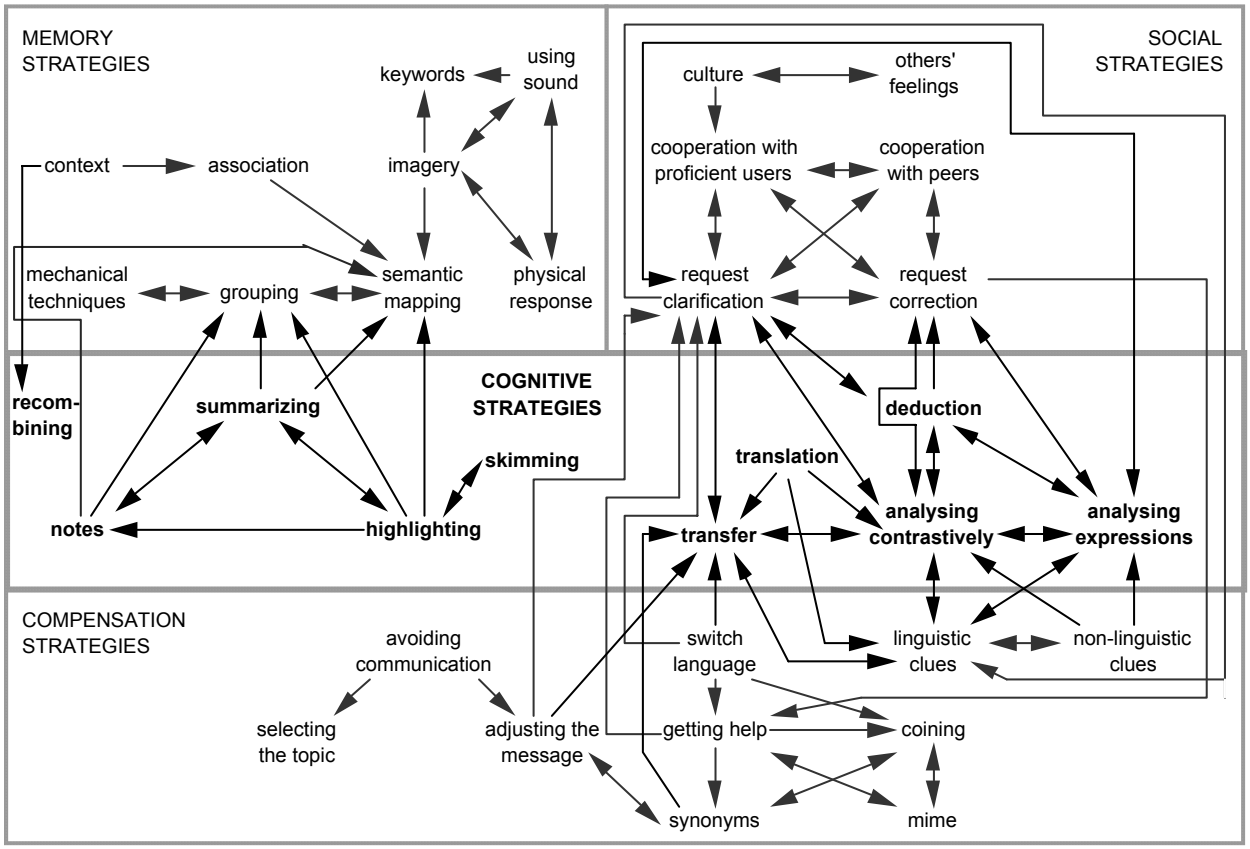

Figure 5: Excerpt from plan of relationships between strategies (focusing on cognitive strategies)

Figure 5 shows an excerpt of these additional strategy relationships.[4] The example here focuses on cognitive strategies: relationships amongst different cognitive strategies; and relationships between individual cognitive strategies and strategies from other categories. Figure 5 shows that there are two main cognitive strategy groupings: interlinkings between *noting, summarizing, highlighting* and *skimming*; and between *deduction, translation, transfer, analysing contrastively* and *analysing expressions*. An example inferred from Figure 5 is that a student who uses contrastive analysis might also be interested in analysing expressions in the target language (since both strategies are analytical in approach), and vice versa. As in this case, some relationships are bi-directional.

Recombining is not directly linked with other cognitive strategies. Cognitive strategies which are not shown (e.g. *repeating*) do not have additional relationships in LS-LS, outside of Oxford's classification and Ehrman & Oxford's learning style-strategy relationships.

There are also links between cognitive strategies and strategies of other types. For example, a student who makes *notes, summarises*, or uses *highlighting* may find it useful to use the *grouping* strategy, a memory strategy, to help bring order to their material. This is a one-way link, as a student who uses *grouping* will already successfully be using some kind of strategy to determine the material that they group together.

Figure 5 also shows how a single strategy can be used to support suggestions of a range of different strategies. For example, M uses the *translation* strategy. Suggestions to M to consider *analyzing contrastively* and *transfer* are in part based upon his use of translation (see Figure 6).

[4] For the sake of clarity, some of the links between memory, social and compensation strategies are not shown. Neither are affective or metacognitive strategies included.

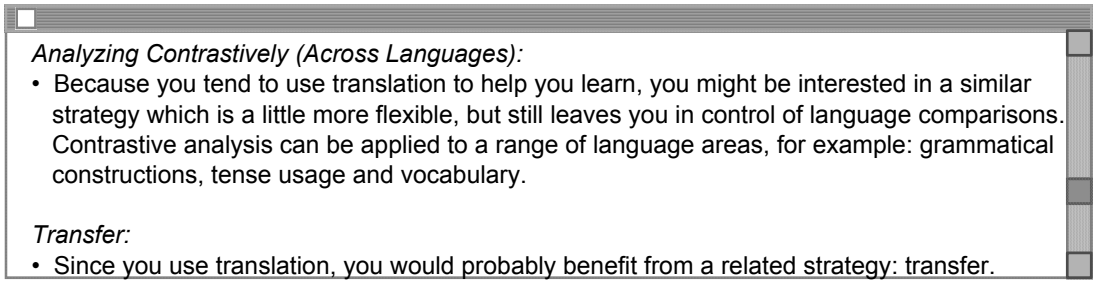

Figure 6: LS-LS:4 - learning strategies suggested based on a single strategy used

In order to pass the 'suggestion threshold', strategies must satisfy the results of both LS-LS:1 and the relationships illustrated in Figure 5. Thus, for example, an ISTJ learner will receive all suggestions for unused strategies which have cognitive-cognitive interrelationships with known strategies in Figure 5, and also all memory-memory and cognitive-memory relationships. Such a learner will also receive suggestions involving metacognitive relationships (metacognitive-metacognitive; metacognitive-memory; metacognitive-cognitive), not shown in Figure 5. The ISTJ learner will not, however, receive any suggestions where social, compensation or affective strategies are included. The number of strategy classes accepted by a personality descriptor ranges from 3 (6 types), through 4 (7 types), 5 (2 types) to the full 6 (1 type: ENTJ). Partial descriptors often allow suggestions from more categories (e.g. IxxJ allows through suggestions involving metacognitive, cognitive, memory and social strategies). Of course, students are free to examine descriptions and examples of *any* strategy; the suggestions are simply strategies which may feel more comfortable and natural to the individual, and easily understandable by them. This is important as LS-LS is designed mainly for situations where additional support is limited.

In summary: strategy suggestions are made to a learner in LS-LS:4. Those suggested depend partly on the student's learning style (identified in LS-LS:1), and partly on the strategies that a learner already uses (identified in LS-LS:3). The aim in LS-LS:4 is to make access to the concepts easier, and arouse student interest so that they are motivated to find out more. Currently students may discover more about language learning strategies from accompanying printed materials; readily available texts aimed at students (e.g. Rubin & Thompson, 1982); web-based materials (e.g. Franklin, 1999); locally available computer assisted language learning software (see Bull, 2000); group discussion; or by other mechanisms in place at their institution. Future development of LS-LS will allow strategy discussion to take place between a student and LS-LS (based on Bull, 1997; Bull & Smith, 1995).

4 Effectiveness of LS-LS

Two issues relating to the effectiveness of LS-LS are discussed in this section: the accuracy of LS-LS:3; and the utility of LS-LS:4. Since the SILL questionnaire has been found to be a useful tool in a variety of situations (Oxford & Burry-Stock, 1995), it will be useful to compare strategy use identified by SILL with that identified by learners in step 3 of LS-LS: if step 3 results in the identification of strategies that were not reported by the same individual on SILL, this may indicate a problem for LS-LS. If, however, LS-LS:3 underpredicts, this is less important since suggestions made to students will not be based on false assumptions. It is also necessary to examine whether the strategies suggested by LS-LS are useful to the learner receiving them (though it is not necessary that all strategies are subsequently adopted, since this is an awareness-raising rather than strategy prescription exercise).

The following descriptions are based on initial studies of 4 students from Mainland China, studying English in the U.K. Because of the small number, no generalisability is claimed. The aim at this stage was to concentrate on a group of students with educational backgrounds that did not stress learner autonomy, since such students may benefit especially from greater strategy awareness when they move to educational contexts where they are expected to take greater control of their own learning. Each subject had a strong academic background: all needed to improve their English before admission to various Masters degrees in the U.K. This was their first educational experience outside China. Three of these subjects agreed with their learning style descriptor identified in LS-LS:1 (H - ESxx; M - xSTx; P- ESTP). Learner T was unsure of her descriptor: xxTx.

4.1 Comparisons of SILL Results and LS-LS:3

In this section we compare the results of LS-LS:3–learner identification of their strategy use–with the same students' results on completing the SILL questionnaire. Exact one-to-one matching of strategies is not possible, since the ESL/EFL version of the SILL questionnaire contains 50 items, whereas there are 62 individual strategies in Oxford's strategy classification. Thus it is not important, nor is it to be expected, that there will be a close correlation between the SILL results and the results of LS-LS:3. However, it *is* important that the results of LS-LS:3 do not indicate strategies which conflict with those identified by SILL, unless such differences can be explained.

Method

Subsequent to their interaction with LS-LS, Oxford's (1990) SILL questionnaire: version for speakers of other languages learning English, was administered to the 4 Chinese students. In order to compare LS-LS:3 with the results of SILL, the SILL items were related to LS-LS's strategy descriptions. All strategies identified for each student in LS-LS:3 were then checked against strategies identified using SILL, for that student. Any which appeared in LS-LS:3, but not SILL, were noted.

Results

In general, it appears that LS-LS:3 underpredicts in all cases: LS-LS:3 identified fewer strategies per student, than SILL.

The data for learner P shows no overpredictions in LS-LS:3–no strategy reported in LS-LS failed to appear in SILL. In the case of T, however, there were 2 overpredictions: *translation* and *requesting correction*; for H, one overprediction: *translation*; and for M, one overprediction: keeping a *language learning diary*. This is a minority of strategies: a total of 21 strategies were identified in LS-LS:3 by T, 50 by H, and 22 by M. (P identified his use of 26 strategies in LS-LS:3.)

Discussion

As explained above, underprediction is not an issue for concern. (The only negative effect is that LS-LS:4 might suggest trying a strategy which is already used by the learner.)

It is not clear whether the difficulty with the case of overpredictions lies with SILL or LS-LS:3. For *translation*, the item in SILL (number 22), is given as "I try not to translate word-for-word". This is the only item framed negatively in the SILL questionnaire. It is possible that this could be misread as "I try to translate word-for-word", especially given the very similar construction of item 20, shortly before: "I try to find patterns in English".

In the case of *requesting correction*, the SILL item (46) "I ask English speakers to correct me when I talk", and the description in LS-LS "Asking someone to correct your speech during a conversation, or to correct your writing", are very similar. It may be that T made a slip in answering this item of the SILL questionnaire, since her first interview transcript[5] (i.e. before any 'treatment') shows keen usage of *requesting correction*. For example, she states in this first interview: "I always like the tutorial. When I get the tutorial I can ask what's wrong with my homework, my writing." Alternatively, it may be that T does not request correction for speech, but finds it useful for improving her written English. The LS-LS:2/3 description includes writing in addition to speech, whereas the SILL item refers only to speech.

It is unclear why *language learning diary* was given as a strategy used in LS-LS:3, and not in SILL. The SILL item reads: "I write down my feelings in a language learning diary", and the explanation provided in LS-LS:2/3 is: "keeping a diary about your feelings and experiences with language learning".

Although caution should be applied, and the overpredictions should be further investigated, it does appear that these students are able to identify at least some of the strategies they use, without making many potentially false identifications.[6] This accords with the earlier findings of Bull et al (1993) with British students, upon which LS-LS:3 was based.

4.2 Utility of Strategies Suggested in LS-LS:4

This section explores the perceived utility of suggestions made in LS-LS:4.[7]

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[5] See Section 4.2.

[6] Both SILL and LS-LS:3 are self-report instruments, and therefore open to questions about how accurately students identify what they do; and whether they might, in an experimental setting, falsely report using strategies that they feel may be seen as 'better'. However, the study was independent of the courses the students were taking.

[7] It is not necessary that *all* learners find this early version useful, since it cannot be expected to be appropriate for all learner types. If potentially disinterested learners could be identified as early as LS-LS:1, different kinds of information might be offered as an alternative, in LS-LS:2.

Method

In order to determine whether strategy suggestions resulting from an interaction with LS-LS would be helpful to the recipient of the suggestions, a two-part questionnaire was administered. The questions aimed to:

(1) ascertain whether the learner thought any of the strategies suggested would be useful for their future learning (options: very useful/quite useful/not useful). Space was provided for explanations of responses;

(2) discover students' intentions of continued use of new strategies, once they had tried some of them. This part was open-ended.

Learner T was also involved in a separate case study examining the development of learner autonomy in self access learning (Ma, 1999). That study obtained learner diary and interview data which was also used here, as it provided introspective insights into T's consideration of new learning strategies.[8]

Results

(1) The results of part 1, whether any of the suggested strategies were considered useful, are given in Table 1.

Table 1: Initial perceived utility of suggested strategies

Student	*Strategy*	*very useful*	*quite useful*	*not useful*
H	Social strategies		x	
	Memory strategies		x	
	seeking practice	x		
	relaxation/deep breathing/meditation		x	
	using laughter to relax			x
	physical response		x	
	semantic mapping		x	
	skimming		x	
	summarising		x	
	self-evaluation		x	
M	Memory strategies		x	
	organisation			x
	planning		x	
	setting goals		x	
	deductive reasoning			x
	analysing expressions		x	
	self-evaluation		x	
	transfer			x
	using laughter for relaxation		x	
	analysing contrastively (across langs.)			x
	grouping information		x	
	associating/elaborating		x	
	skimming			
	summarising		x	
	semantic mapping		x	
	seeking practice	x		
P	Social strategies	x		
	Memory strategies		x	
	Cognitive strategies		x	
	Compensation strategies		x	

[8] Any new strategies tried by T may not be a result of using LS-LS, since information about language learning strategies was also provided during her autonomy training. She had also been recommended to use Ellis and Sinclair's (1989) 'Learning to Learn English'. However, our aim here is to discover whether strategy suggestions obtained from LS-LS:4 will be useful to the individual receiving them. If T reports successful use of any new strategy that was also suggested by LS-LS:4, this is a positive result for our purposes.

	organisation			x
	recombining		x	
	using laughter to relax		x	
	repeating	x		
	formal practice	x		
	deductive reasoning	x		
	cooperating with proficient speakers	x		
	requesting clarification	x		
	highlighting	x		
T	Cognitive strategies	x		
	organisation		x	
	deductive reasoning			x
	using linguistic clues		x	
	adjusting the message		x	
	analysing contrastively	x		
	getting help		x	
	coining words		x	
	grouping		x	
	visual imagery		x	
	keywords		x	
	physical response		x	
	recombining		x	
	association/elaboration	x		
	semantic mapping		x	
	skimming		x	

There were fewer strategy suggestions for H than for the other subjects, as H already used 50 individual strategies (as identified in LS-LS:3). She thought that the social and memory strategy group suggestions would be quite useful to her: social, to practise speaking and become more familiar with British culture; and memory, to help learn vocabulary. H also felt that most of the individual suggested strategies would be useful, in particular: *seeking practice*. Of all suggested strategies, H considered only one suggestion as unhelpful: *using laughter to relax*. H's explanation was: "I cannot laugh on my own".

M felt that 10 of the strategies suggested would be useful to his future learning, as would the memory group in general. He was especially interested in *seeking practice*. However, M stated that he did not understand *deductive reasoning, transfer* and *contrastive analysis*, and he did not respond for *skimming*. M believed that *organisation* would not be useful to him. His explanation is forceful, though not particularly enlightening: "I don't think organization is useful for my learning. I'm not interested in trying it."

P responded about only 9 of the 16 individual strategies suggested. He was positive about the utility of all but one of these, and felt that 6 in particular would be 'very useful': *repeating, formal practice, deductive reasoning, cooperation with proficient speakers, requesting clarification* and *highlighting*. P also felt that in general, the groups of social, memory, cognitive and compensation strategies would be helpful. P was unsure about how to use *organisation*, the one strategy receiving a negative response.

T considered that all but one of the suggested strategies would be useful for her learning, with particular interest in *contrastive analysis* and *association/elaboration*, and cognitive strategies in general. T's reason for considering *deductive reasoning* unlikely to be useful is: "Learning language is not like learning maths. It involves a lot of memorization."

(2) The results of part 2, plans for continued use of new strategies, are given in Table 2 below.

Table 2: Intentions for future use of new strategies tried

Student	*Strategy*	*often*	*sometimes*	*never*
H	Social strategies	x		

	self-evaluation		x	
	seeking practice	x		
M	Memory strategies		x	
	planning	x		
	setting goals		x	
	seeking practice	x		
	analysing expressions	x		
	using laughter to relax		x	
	grouping information		x	
	semantic mapping		x	
	summarising		x	
	self-evaluation		x	
P	formal practice	x		
	requesting clarification		x	
	repeating	x		
	cooperating with proficient speakers		x	
	highlighting	x		
T	Cognitive strategies	x		
	Memory strategies		x	
	organisation		x	
	using linguistic clues	x		
	adjusting the message		x	
	getting help	x		
	grouping		x	
	keywords	x		
	recombining		x	
	deductive reasoning			x
	representing sounds in memory	x		
	physical response		x	
	visual imagery	x		
	coining words			x
	analysing contrastively	x		
	setting goals		x	
	skimming		x	
	semantic mapping	x		
	association/elaboration	x		
	self-evaluation		x	

H gave some indication of intended continued use of 2 of the individual strategies suggested for her, and of social strategies in general. These were all positive, but as this is such a small percentage, little can be inferred. Nevertheless, examination of H's explanations does show strategy understanding:

social strategies: I use social strategies to improve my English. I go to Church to attend Bible lessons, sometimes go to pub with English friends. I try to pay attention to how they express the same idea I want to express.

self-evaluation: I set time to check if I have remembered what I've learned, e.g. once a week. I found it encourage me to learn more and help me make greater progress.

seeking practice: I try to make use of every opportunity to practise such as while I'm working in the restaurant, talking to customs, making English friends, going shopping. When I use English, it starts to make sense to me as a lively language for use, not only individual words and sentences.

P also provided information about intended future use of a few of the new strategies tried. He expected to use 2 of these sometimes (*cooperating with proficient speakers* and *requesting clarification*), and 3 often (*formal practice, highlighting* and *repetition*).

M and T provided more extensive information. M did not expect to find 4 of the suggested strategies useful (Table 1), and omitted these (presumably negative) responses in part 2 of the questionnaire (Table 2). He also omitted *skimming*, about which he provided no information on expected utility (Table 1). M also did not respond about *association/elaboration* (expected to be 'quite useful' in Table 1). M intended continued use of all other new strategies tried, in particular: *planning*, *seeking practice* and *analysing expressions*. In total he successfully tried, and intended to continue to use, at least 9 of the 15 individual strategies originally suggested.

T's case is more complicated: her trial of new strategies was not confined to those suggested–she also tried *setting goals, self-evaluation* and *representing sounds in memory*. This may be because of her involvement in the second study, or due to general exploration of strategies in LS-LS:2. Fifteen strategies were suggested for T, by LS-LS:4. From the diary and interview data, it was seen that T used 8 of these new strategies extensively, and found them to be useful for her learning. The following are excerpts from T's diary and interviews:

> Before, I remember the vocabulary. Just remember, remember [i.e. repeat]. Now I tried the new way. You know the vocabulary in your real life, then you can remember it. So when I work, when I use the hoover, I think of another word for hoover. When I clean the floor I think about dustbin, dustpan, brooms, something like that.
>
> [To learn vocabulary] I always use a small card, but I don't think it a very good way. I think there is a good way. Maybe just put the vocabulary into a sentence and then you use the sentence to put in your real life.
>
> I always had difficulty distinguishing words like 'mental' and 'metal'. Now I try to associate the words with those I've already known to help me remember. For 'mental', I connect it with 'men', only humans has brains, so it is easier to remember the meaning of 'mental'.

These excerpts illustrate T's developing awareness of the utility of language learning strategies.

T's responses to the second part of the questionnaire (Table 2) show that she also started using other strategies suggested in LS-LS:4. T intends to continue to use 13 of the 15 suggested strategies, about half of these 'sometimes', and half 'often', as well as 3 additional strategies explored. T does not wish to use 2 of the suggested strategies again: *coining* and *deductive reasoning*.

Discussion

This section has explored the perceived utility of LS-LS in two parts: initial acceptance of recommendations, and uptake of suggestions 8 weeks later. Both aspects are important: students must perceive the system as useful at the outset, otherwise they will not investigate strategy suggestions further. There must also be some uptake, or more appropriate application of strategies, by at least some students.

H felt that most of the 8 suggested individual strategies, and the groups of memory and social strategies, would be 'quite useful', with one strategy: *seeking practice*, likely to be 'very useful'. However, *using laughter to relax* was considered inappropriate. Nevertheless, H's explanation shows an awareness of why *laughter* is not appropriate for her ("I cannot laugh on my own") and, furthermore, another suggestion for relaxation was considered likely to be beneficial: *progressive relaxation / deep breathing / meditation*. Of this suggestion, H states that this will help "refresh myself and start again".

In general, H's explanations of her responses to the suggestions showed a high level of awareness of the function of each of the strategies suggested, together with an awareness of her own learning. However, her descriptions of new strategies tried, although also very insightful, are too few to draw conclusions as to the extent of help provided by LS-LS. Clearly H has benefited from *self-evaluation, seeking practice* and social strategies in general, but she provided no information about her experiences with, and plans for the other 6 strategies suggested–despite initially expecting to find many of these useful. It may be that, as she already used a wide range of strategies, H ultimately did not feel a need to adopt more than those explicitly mentioned in Table 2.

The other students had lower levels of strategy use at the outset, as measured in LS-LS:3.

M indicated in the first part of his questionnaire response that *organisation* would not suit him, though he did not explain his reason clearly. It is not known to what extent he understands the function of this strategy, or whether he has an awareness of how it might be applied. M also did not understand *deductive reasoning*, *transfer* or *contrastive analysis*. However, he did feel that 10 of the individual strategies suggested might be useful to him, as well as memory strategies in general. He shows understanding of these strategies in his responses, for example he

states: "Setting goals force me to teach [i.e. learn] it and makes my study purposeful"; "Laughing gets rid of my pressure". M has found the memory group in general, and 3 of the individual suggested strategies (*planning*, *setting goals* and *self-evaluation*) especially useful in practice, and states that he now uses them frequently. These individual strategies are metacognitive strategies, a group which was not represented amongst the strategies he identified himself to already use in LS-LS:3. Thus, M appears to have learnt to better regulate, and become more autonomous in his learning. Although M's results are in part negative (i.e. there were 3 suggested strategies that he did not comprehend), this was outweighed by many suggestions that he did understand, and did find useful, as indicated by his intention to continue using 9 new strategies tried.

P provided information about only 9 of the 16 individual strategies suggested. Nothing is known about his feelings regarding the other strategies. P's responses about the expected utility of these 9 strategies are in all but one case positive, with 5 strategies expected to be 'very useful'. P believes that two of these will complement strategies he already uses (as identified during LS-LS:3). First, *cooperating with proficient speakers* will help in his *development of cultural understanding*. He explains that *cooperation* of this kind will help him "learn foreign country's culture background, slangs". Second, his explanation of how *requesting clarification* will help, refers to the assistance he might obtain from *peers* when he has questions about his writing. In addition to an awareness of the function of individual strategies, P demonstrates an understanding of how new and existing strategies can be used together, to support each other.

P was unsure of the function of organisation, the only negative reaction to the suggested strategies. However, his other explanations demonstrate full understanding of the strategies suggested, for example: "laughter can release the pressure and give oneself more energy"; "if I don't know the exact word to express myself, compensation strategies help me in getting others to understand me".

In Table 2, P commented on his expected future use of 5 of the strategies tried, and intends to 'sometimes' *request clarification* and *cooperate with native speakers*, and 'often' use *formal practice, repetition* and *highlighting*. These are all strategies that he expected to find 'very useful' in Table 1. P did not mention any of the other suggested strategies. As with H, although there were clearly some benefits, there is too little information to assess the extent of LS-LS's help.

T felt that cognitive strategies in general would be 'very useful' in her future learning. Two other specific strategies were also expected to be 'very useful': *analysing contrastively* and *association/elaboration*. One strategy, *deductive reasoning*, was considered inappropriate. T's reason ("learning language is not like learning maths") shows a clear understanding about how *she* learns a language (or perhaps, about how she does not learn a language), and an awareness of *why* this kind of approach is unsuitable in her case. This suggests that LS-LS might also benefit from information about learner beliefs about language learning in its knowledge base, since these have been suggested to influence strategy use (Abraham & Vann, 1987; Horwitz, 1987; Wenden, 1987). T thought she would find the remaining 12 suggested strategies to be 'quite useful'.

Data from T's diary and interviews shows that 8 of the 15 strategies suggested for her in LS-LS:4 were found to be useful in practice. Other strategies were also found to be helpful, as indicated in T's questionnaire responses of planned future strategy use, where she states that she expects to continue using 13 of the 15 suggested strategies. Although not necessarily attributable to the interaction with LS-LS itself–recall that T was also involved in another study–the important point is that a large majority of the LS-LS:4 suggestions were *appropriate* for this individual. This finding is sufficient according to our aims.

Only 4 subjects were studied in detail, and for two of these (H and P) there was insufficient information to determine the extent of help provided by LS-LS. The data available is positive, but nothing is known about the strategies that were not mentioned by these subjects. Therefore results must be interpreted with caution. M had some difficulties, though his responses showed many more positive reactions than negative. T was very positive.

Although some students may face some difficulties (e.g. M), there is initial evidence that many of the suggestions made in LS-LS:3 will be considered appropriate by learners, and that some of the strategies suggested will subsequently be found helpful in practice. Indeed, despite not understanding the function of all the strategies suggested, M still adopted other new strategies, and found them useful. Except for T, who was a subject in a related study, the students had no further support after completing their interaction with LS-LS. In a more realistic setting, some limited support would be recommended (e.g. at least a class discussion subsequent to students' interactions with LS-LS). The investigation undertaken here now needs to be repeated with more students.

5 Summary and Further Work

This paper examined the potential for LS-LS: a program designed to promote student awareness of language learning strategies in a manner that takes account of their learning style, and the strategies they already use, thereby

making information more meaningful to the individual. It does not attempt to prescribe new strategies for an individual, but aims to engage their interest by making suggestions of strategies that they may wish to *consider*. LS-LS is based on the findings of Ehrman and Oxford (1990) that learning style may to some extent influence a student's choice of learning strategies. It also uses a *strategy similarity measure* as an additional means of selecting new strategies for student consideration. Its strengths are in exploiting the capacity of the computer to maintain links between large amounts of given and new information, and then presenting relevant information to individual users to enhance learner reflection, in a manner impossible for human teachers. Thus LS-LS should be useful in situations where resources are restricted, but may also be employed as an additional resource in other contexts.

A potential limitation of LS-LS is that LS-LS:1 and LS-LS:3 both rely on self-report, and are therefore subject to the usual criticisms of accuracy. However, since accuracy is not crucial to *raising awareness*, the aim of LS-LS, the possibility of some inaccuracy is not considered problematic. What is more important is to recognise that this particular form of awareness-raising may not be suitable for some learners, e.g. those who dislike formal analysis.

There is much useful further work to be undertaken in this area. For example, how generalisable are Ehrman and Oxford's results? If these were found to be widely applicable, more weight could be placed on the style-strategy aspect of LS-LS. Presentation of information in LS-LS:2/3/4 could also be varied according to the result of LS-LS:1. Presentation of suggestions in LS-LS:4 could also be influenced by the results of LS-LS:3, e.g. a more graphical presentation could be available for visual learners. Since this kind of information is all collected in the program during an interaction, it is an obvious step to develop its use further.

It might also be useful to investigate further the relationships between individual strategies and factors currently not taken into account in LS-LS, e.g. proficiency and gender (see Green & Oxford, 1995); cognitive aptitude, age, motivation, anxiety (see Ehrman & Oxford, 1995); culture (see Oxford, 1996).

It would be useful to have a version of LS-LS which uses simpler language, to allow it to be used also by students with a lower level of English. This is particularly applicable for contexts where students are neither native English speakers, nor is English their current target language. Versions in other languages would also be useful, as would specific, targeted versions: i.e. for speakers of Language X learning Language Y. Such specific versions, although less widely applicable, would enable strategy explanations and suggestions to be accompanied by more relevant examples.

The following extensions to the program are currently being considered: to take into account learner beliefs about how languages are learnt; and to allow students to *discuss* their future use of learning strategies with LS-LS. The knowledge base of LS-LS will, in the latter case, be extended to encompass an ability to negotiate strategy suggestions according to the student's decisions about whether they think a certain strategy will be useful to them, and why (or why not). Such work is described in Bull and Smith (1995), with reference to the use of a specific CALL program. Here we wish to apply those ideas more generally.

Finally, allowing students to indicate their *degree* of use of each strategy in LS-LS:3, and the *extent* to which they identify with the learning style components in LS-LS:1, will allow weightings to be assigned to the new strategies suggested. This will enable suggestions to be made in a sequence which more likely reflects the relative utility of the suggestions, to the individual.

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