

18 Individual Differences in Second Language Learning

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1 Introduction

An appropriate starting point for a discussion of individual differences in second language learning is what might be termed "the correlational challenge." This is that individual differences in second language learning, principally foreign language aptitude and motivation, have generated the most consistent predictors of second language learning success. Correlations of aptitude or motivation with language achievement range (mostly) between 0.20 and 0.60, with a median value a little above 0.40. Since aptitude and motivation do not show particularly high correlations with one another, they combine to yield multiple correlations which are frequently above 0.50.

Aside from age of onset, no other potential predictors of second language learning success consistently achieve such levels. Yet it is fair to say that learner differences, such as aptitude, style, and strategies, as a sub-area of second language acquisition, and applied linguistics more generally, have not been integrated into other areas of investigation, and have not excited much theoretical or practical interest in recent years. Other sub-areas, principally those associated with universal processes, have generated a much higher level of empirical research, for example, route of second language development, or features of input or interaction hypothesized to promote second language development. Other SLA areas have also been more central to theoretical developments, for example, processability theory. And finally, more universal areas have enjoyed clearer perceptions of practical, classroom-oriented relevance, for instance, task-based instruction.

This is a curious state of affairs. It is difficult, after all, to ignore such impressive correlations. We are left to conclude that the study of most areas of individual differences in language learning is simply not fashionable, and has

been avoided because other areas have appeared to have greater promise. It will be the aim of this chapter to try to redress this imbalance. We will survey work in several areas of individual differences, and will conclude that there are now signs that the study of areas such as aptitude and motivation is ready for reintegration into mainstream SLA, as well as being closer to generating active intervention in the language classroom. For reasons of space and duplication, some individual differences will not be covered in this chapter. The age factor is addressed by Hyltenstam and Abrahamsson (this volume). The broad sub-domain of personality is not explored here, partly because it is so extensive, and also because progress in this area has been slow, in terms of both methodology and systematic patterns of results. A recent review of the area can be found in Dewaele and Furnham (1999).

The chapter is organized into four main parts. We review research and theorizing in the areas of foreign language aptitude (sections 2-5), learning style (section 6), learner strategies (section 7), and motivation (section 8), in turn. It will be seen that research into aptitude has languished somewhat, but is now gathering pace again. A significant influence upon this is that aptitude researchers are now exploring relevant constructs against the sort of progress in SLA reported in other chapters in this volume. Learning style and cognitive style are still elusive concepts, and, not for the first time, are assessed as containing more promise than attested relevance. Learner strategies research, which was extremely active a few years ago, seems to be losing vitality somewhat. Finally, the study of language learning motivation, which has generated by far the most research in this area, will be seen to have changed character in significant ways in the last 10 years. A concluding section offers generalizations which indicate links between the various areas of individual difference research.

2 Foreign Language Aptitude

2.1 Preliminaries

The central claim in foreign language aptitude research is very simple. It is that there is a specific talent for learning foreign languages which exhibits considerable variation between learners. Expressed in these terms, it would be unremarkable in nature, and comparable to the myriad other domains where there is variation between human beings. The complexities with aptitude derive from a number of related questions:

- i Is such a talent innate?
- ii Is it relatively fixed?
- iii If it is not fixed, is it amenable to training?
- iv Is foreign language aptitude a distinct ability, or does it relate to more general abilities, such as intelligence, effectively functioning as a subset of a more general view of human variation?

- v Could such a talent be used as the basis for prediction of language learning success? If so, how effective might it be for such prediction, and how would predictions based on it compare with predictions made from other sources?
- vi Could such a talent be used as the basis for adaptation of instruction?
- vii Does such a talent always apply in a similar manner, without influence of:
 - a learning context (e.g., FL vs. SL);
 - b learning methodology;
 - c L1 to L2 combination?
- viii Is such a talent undifferentiated, or does it have sub-components?
- ix What *is* the theoretical basis for any such talent or sub-talents?

Finally, and in a sense, more importantly, and most mundanely:

- x Can such a talent be measured effectively?

This section will address these questions, providing answers to some, and at least surveying what is known about the others. It will be seen that the concept of aptitude, long regarded as out of date, has much to offer, but needs new conceptualizations to link it to insights and findings from SLA research. It also merits an active research program.

2.2 *Carroll's initial work*

It is appropriate to start the discussion of aptitude with a review of the work of the American psychologist J. B. Carroll. Rarely has a sub-area been so dominated by one person. Carroll researched foreign language aptitude (as well as an enormous range of other phenomena) and established the parameters within which the sub-field still operates. It is instructive to explore his ideas about aptitude, as well as his methods of inquiry.

Carroll conducted the relevant research during the 1950s. Together with co-researcher Stanley Sapon, he devised a practical (and commercially available) aptitude test battery (Carroll and Sapon, 1959). In the fullest account of the way this was done, Carroll (1965) reported how he and Sapon started by devising a large number of potential predictor tests of foreign language learning. They then administered these potential tests (over 40 of them) to learners, and gathered data on the achievement scores of the learners at the end of the course of instruction. Armed with those data, Carroll and Sapon then examined:

- i which potential aptitude sub-tests correlated with one another highly;
- ii which sub-tests actually correlated highly with end-of-course performance on achievement tests.

As a result of this work, those sub-tests which did not correlate with end-of-course performance were eliminated, along with those which correlated with

Table 18.1 Carroll's four-component model of aptitude

<i>Component name</i>	<i>Nature and function</i>
Phonemic coding ability	Capacity to code unfamiliar sound so that it can be retained over more than a few seconds and subsequently retrieved or recognized
Grammatical sensitivity	Capacity to identify the grammatical functions that words fulfill in sentences
Inductive language learning ability	Capacity to extract syntactic and morphological patterns from a given corpus of language material and to extrapolate from such patterns to create new sentences
Associative memory	Capacity to form associative bonds in memory between L1 and L2 vocabulary items

one another, whatever their correlations with achievement, since they were clearly duplicating one another. In other words, only the best of such "clusters" were retained. In this way, a small group of sub-tests was selected, each of which made sufficiently separate contributions to the prediction of end-of-course performance.

This entirely pragmatic aim of predicting language learning success went hand in hand with a parallel, and much more interesting and enduring, aim of understanding the components of foreign language aptitude. On the basis of an analysis of skills required in the groups of tests which survived the "statistical winnowing" in the research project, Carroll (1965) proposed the components shown in table 18.1.

Clearly, these four components have an intriguing relationship to one another, a relationship which has been clarified in a series of papers by Carroll (1973, 1979, 1981, 1991). Phonemic coding ability represents an interesting perspective on the auditory component of foreign language learning. Earlier approaches had focused on simple sound-discrimination tasks, based, essentially on minimal pairs. Carroll, in contrast, realized that perceiving sound discriminations was not enough. It was more relevant to focus on *stretches* of sound, and then on the coding (analysis) procedures which operated upon this sound, that is, the processes which made encoding and retrieval of material more likely. Thus, there was a memory link-up, even to the auditory component of aptitude. The second and third components are both concerned with the processing of language material. Grammatical sensitivity focuses on the capacity to analyze language material, and consequently has a rather passive quality. Inductive language learning is more active, in that it requires learners to go beyond the information given and to generalize, so that new language can be produced. Finally, associative memory concerns the linkages that are

formed in memory. Clearly, this component was strongly influenced by associationist accounts of memory prevailing in psychology when Carroll's research program was operating. The emphasis is simply on memory as bonds. As we shall see, this is a limited conception.

Surprisingly, in reading Carroll's work, one has the impression that the separation into components was a tactical affair, accomplished because the identification of related but distinct components had the most effective outcome in terms of prediction equations derived from regression analyses. The actual test battery which resulted from the research (Carroll and Sapon, 1959) consisted of five sub-tests, *but those sub-tests were mainly hybrid mixtures of the different underlying components*. In other words, understanding and construct validity were sacrificed in favor of predictive validity. This decision has occurred at other times with aptitude research (Petersen and Al-Haik, 1976), and while it has enabled more predictive tests to result, it has had a disastrous impact upon the place of aptitude within applied linguistics over the years. It has led to the lack of appreciation of the explanatory contribution that foreign language aptitude can make to the field of SLA.

2.3 Post-Carroll research

Since Carroll's influential work, the story of aptitude has not changed very much. In fact, it is only in very recent years that interesting and challenging reconceptualizations of aptitude have emerged. We will return to these below. First, however, it is worth briefly surveying how the fields of applied linguistics and of language teaching have positioned themselves with respect to aptitude, and what research has actually been completed within the framework established by Carroll.

Two major influences have caused the study of aptitude to become a marginal activity over the last 30-40 years. First, aptitude has been poorly regarded within language teaching. One reason for this has been that aptitude is perceived as anti-egalitarian, in that if a fixed, immutable interpretation of aptitude is taken, it is seen as potentially disadvantaging many learners, with no hope offered of overcoming the handicap of low aptitude. It may not be a logical reaction, but many researchers have turned away from the study of aptitude as a result of drawing essentially this conclusion. Another negative response within the language teaching profession derives from the place of learner differences more generally. Even though virtually all teachers would quickly agree that learners differ from one another (with the acceptable face of these differences often being referred to as "mixed ability teaching"), the bulk of language teaching materials have assumed that all learners are the same. Certainly a major feature of the language teaching profession over the last 20 years or so has been the rise and rise of the main coursebook series. These series, now produced with immense care and resourcing, necessarily assume that all learners are essentially the same (thereby maximizing sales potential), and so downplay how the individual learner may be catered for. As a result,

there has been something of a mismatch between the actual learner variation in real classrooms, and the homogeneity implied by most coursebooks (a mismatch which it has been the teacher's lot to cope with, as best she or he can).

The second marginalizing influence concerns the putative link between aptitude and learning context. Many within the language teaching profession have associated foreign language aptitude with the methodologies that prevailed at the time of Carroll's research, methodologies which do not, any longer, survive scrutiny from SLA researchers. Krashen (1981), in particular, linked foreign language aptitude to *learning*, and to the sorts of activities which are teacher-led and occur exclusively in classrooms, that is, explicit rule-focus, non-communicative practice activities, and awareness of language items on the learner's part. Krashen proposed that aptitude was not relevant for *acquisition* and the subconscious induction and internalization of language rules that he advocated. For many years, this seemed the kiss of death for aptitude, since it associated the aptitude construct very strongly with the sorts of activities that were anathema to communicative classrooms. (In passing, it is worth noting that the claim was made without any evidence: simply guilt by association.) We return to this issue below.

Despite discouraging attitudes such as these, there has been a steady flow of aptitude research, albeit firmly within the framework established by Carroll. It is useful to review the studies which have appeared briefly. First, it is important to mention that there has been large-scale work aimed at the production of aptitude test batteries other than the MLAT produced by Carroll and Sapon. Working during the 1960s, Pimsleur produced the only alternative, commercially available battery, the PLAB (Pimsleur, 1966), targeted at high school students. This set of sub-tests is broadly similar to Carroll's MLAT, but places greater emphasis on auditory factors, and less on memory. It is also noteworthy that Pimsleur's interest in aptitude was connected with his belief that many language students in US high schools underachieve because of auditory difficulties. This accounts for the auditory emphasis built into the PLAB, and connects with Pimsleur's proposals that use of the PLAB could enable early diagnosis of remediable learning difficulties in high-school foreign language programs.¹ Such early diagnosis could then trigger remedial work, so that the purpose of the aptitude testing would be to facilitate instructional adaptation.²

Other attempts to produce complete aptitude batteries have had a more restricted quality. The Defense Language Aptitude Battery (Petersen and Al-Haik, 1976) was produced for the US military because it was felt that the MLAT did not discriminate sufficiently well at the higher end of the language aptitude range. The DLAB was intended to be more searching for high-aptitude learners. It emphasized Carroll's inductive language learning ability, and also phonemic coding ability and memory. Sub-tests, though, were not "pure" measures of particular aptitude sub-components, but rather effective predictive amalgams: pragmatically effective for the contexts in which they were used, but unenlightening otherwise. The battery did not really produce more effective predictions than the MLAT, and the "closed" nature of the research (i.e.,

restricted to military applications) has meant that the battery has not proved to be particularly influential. The same is true for subsequent developments with aptitude batteries produced in association with military contexts, such as VORD (Parry and Child, 1990). It will be interesting to see what happens with the latest of these ventures, the production of the CANAL-F battery (Grigorenko, 2002; Grigorenko, Sternberg, and Ehrman, 2000; Sternberg, forthcoming), a battery grounded in Sternberg's theory of human intelligence, which focuses on recall and inferencing with linguistic material under immediate and delayed conditions.

Most researchers have tended not to explore how new aptitude batteries can be produced, but instead to focus on particular aspects of the aptitude construct, or on particular contexts in which aptitude might operate. Regarding contexts, Reves (1983) demonstrated that aptitude functions as an effective predictor in second (acquisition-rich, with exposure to naturalistic language use) as well as foreign (acquisition-poor, with exposure only or mainly to classroom language) contexts. Reves administered aptitude tests to a group of Arabic L1 learners of Hebrew (SL context) and English (FL context). The aptitude tests generated the best prediction of language learning success in *both* contexts, and there was little difference in levels of prediction for each of the languages. This contrasts with Krashen's (1981) claims that aptitude is only relevant for instructed (learning-oriented) contexts. Reves's findings are consistent with Skehan's (1989) proposal that aptitude should be equally relevant in second language contexts precisely because learners have to confront situations in which there is not the pedagogic selection of materials which attempts to structure the sequences in which learning takes place. Naturalistic second language contexts do not offer the learner any protection, by way of sequencing or selection, with the result that the problem of extracting structure from data is more, rather than less, difficult, and learner differences may have more of an impact upon development. DeKeyser (2000), whose work is discussed more extensively below, has also reported that aptitude scores are an important predictor of achievement in acquisition-rich contexts.

Wesche (1981) studied how instruction can be adapted to take account of aptitude differences. Working in the context of a Canadian government language training program for civil servants, she categorized learners as analytic- or memory-oriented on the basis of the profiles of aptitude sub-test scores. She then explored the consequences of such learners being matched or mismatched with teaching methodologies, one of which was analytic in nature, and the other of which was audiolingual, and so regarded as memory-oriented. She reports that analytic learners matched with an analytic methodology did better than such learners matched with the audiolingual methodology, and also that they evidenced greater satisfaction with these conditions. Memory-oriented learners also did better with a memory-oriented methodology. These results, showing an interaction between learner characteristics and instructional conditions, are important, since they bring out the potential of aptitude information to go beyond global scores and to provide potentially vital diagnostic

information. Skehan (1986) also reported results suggesting that the same two learner types, analytic and memory-oriented, emerge from learner score profiles on aptitude test batteries, and that either sort of learner can be successful.

Other researchers have explored the relationship between foreign language aptitude and other variables, such as age and intelligence. Harley and Hart (1997) have shown that the predictive qualities of different aptitude components change with age. They researched grade 7 and grade 11 immersion children, and investigated which components of aptitude were most significantly implicated at these different ages. With younger children, the stronger correlations were with the memory components of aptitude. In contrast, with older learners, it was the language analysis sub-tests which had the higher correlations. Sasaki (1996) also took a more differentiated view of aptitude, and examined the relationship between foreign language aptitude and intelligence. At a first-order level of factor analysis (i.e., an analysis based on the matrix of correlations between the different measures), she showed that aptitude and intelligence were distinct. A second-order analysis (i.e., an analysis based on the factor loadings of the first-order analysis), however, did show connections between the two constructs. Interestingly, Sasaki demonstrated that this second-order relationship was strongest for what Skehan (1998) has termed the "central" component of aptitude, language analytic ability, but that more peripheral components (phonemic processing and memory) were more weakly related to intelligence.

3 Foreign Language Aptitude and SLA

The discussion so far has attempted to capture the way that aptitude has been perceived as a self-contained area, largely unrelated to broader issues in SLA. This has recently begun to change. For example, Skehan (1998) proposed that different components of aptitude could be related to stages of information processing. Phonemic coding ability can be related to input processing; language analytic ability (grammatical sensitivity, inductive language learning) can be related to central processing; and memory-as-retrieval can be related to output and fluency. Such a set of linkages shows how aptitude, at a fairly general level, is consistent with a cognitive view of SLA.

But this analysis can be extended, as table 18.2 shows, to incorporate putative SLA processes at a more detailed level. In the table, existing foreign language aptitude constructs are shown in normal text, while *potential* aptitude constructs are shown in italics. These are discussed further below.

The left-hand column in this table attempts to portray a range of processing stages consistent with an information-processing account of SLA. Most of these have been the focus for active investigation over the last 20 or so years. The list is not intended to be controversial - merely to reflect things that have preoccupied researchers. More important here is the right-hand column. If we assume the relevance of the processing stage implied in the left-hand column, the operative questions are as follows:

Table 18.2 SLA stages and aptitude constructs

<i>SLA stage</i>	<i>Corresponding aptitude constructs</i>
Input processing strategies, such as segmentation	<i>Attentional control</i> <i>Working memory</i>
Noticing	Phonemic coding ability <i>Working memory</i>
Pattern identification	Phonemic coding ability <i>Working memory</i> Grammatical sensitivity Inductive language learning ability
Pattern restructuring and manipulation	Grammatical sensitivity Inductive language learning ability
Pattern control	<i>Automatization</i> <i>Integrative memory</i>
Pattern integration	<i>Chunking</i> <i>Retrieval memory</i>

- i Is there relevant variation between learners?
- ii Is it justifiable to postulate an aptitude component in this area?
- iii Does an existing aptitude component apply, or do we need to explore the nature and measurement of additional aptitude constructs?

We can take noticing as an example. Schmidt (1990, 1994, 2001; Schmidt and Frota, 1986) has argued convincingly that noticing is a necessary precursor to development, a point of view which complements nicely current discussions of the need for a focus on form in foreign language instruction (Doughty, 2001; Doughty and Williams, 1998). Discussion in this area has generally implied that noticing is a universal process and that its effects will vary from individual to individual only as a function of factors such as salience and frequency in input, together with variations in task conditions, etc. (Schmidt, 1990). But it is possible that there are individual differences between learners in noticing abilities: other things being equal, some learners may be more likely to notice relevant qualities of input than others (Sawyer and Ranta, 2001). We could postulate a range of reasons why this might be so. Some learners might be able to segment the input stream better than others (VanPatten, 1996); some might have better working memory (Miyake and Friedman, 1999; Sawyer and Ranta, 2001; Walter, 2000); some might be more field-independent (Chapelle and Green, 1992). The point is that there may be relevant individual differences which bear upon the likelihood of noticing.

There is also a component of aptitude, phonemic coding ability, which might be relevant in this case. The component has been defined (see above) as the

capacity to code input material so that it can be retained over more than a few seconds. The questions we can now ask are these:

- i Does such an ability (assuming its existence) cover the same areas as the above SLA processes?
- ii Are there individual differences (IDs) in noticing which go beyond what is measured by phonemic coding ability?
- iii Can operationalizations of such IDs be produced which are reliable and valid and which go beyond simply the measurement of phonemic coding ability?

If the answers to these questions are positive (and it is central to this discussion that the questions are *empirical* and susceptible to experimental investigation), then it is clear that there is scope for relating the mainstream SLA construct of noticing to an individual differences construct which would then make a major contribution to explaining language development.

Noticing is taken here only as an example: all the other SLA stages shown in table 18.2 can be interpreted in similar fashion. Prior to the stage of noticing, we have the need to segment the input stream effectively, and to control attentional and perceptual processes so that the stream of noise which is encountered is handled in such a way that it can be subsequently analyzed. This links clearly with the construct of phonemic coding ability. Phonemic coding ability, it will be recalled, is the ability to code unfamiliar sound in such a way that it can be retained for more than a few seconds. This seems very close to the imposition of structure on the incoming speech stream that input processing strategies themselves are concerned with. Perhaps this needs to be supplemented with additional constructs from contemporary psychology, such as the phonological loop component of working memory (Baddeley and Logie, 1999; Baddeley, Gathercole, and Papagno, 1998; Gathercole and Baddeley, 1993). If this is the case, then the research motivation originating from SLA for the stages of information processing will have provided interesting input to clarify which aptitudinal constructs can fit in to this sequence, *and which additional aptitudinal constructs are needed*. Sawyer and Ranta (2001), for example, argue forcefully that working memory, as measured by a reading span test, should be represented in language aptitude test batteries.

Clearly, as we move through the first four stages outlined in table 18.2, there is a shift in emphasis from the processing of input, on the one hand, to what is done with material which has been extracted in this way. So the third stage, pattern identification, goes beyond the focus on "simple" noticing, and has more emphasis on wider-ranging patterns, where the learner is likely to wrestle with more complex language structures, with elements containing some degree of internal relationship. While there may still be some role for phonemic coding ability and working memory here, the emphasis shifts toward grammatical sensitivity and inductive language learning ability as relevant aptitudinal constructs. In other words, the presumption is that, given exactly

the same input/intake data, there will be differences in pattern-extraction capacities, that is, some people are able to analyze material and make generalizations based upon it better than others. Such learners will also then benefit from the greater degree of structuring of the input material into the form of rules (correct or not), and retain material more effectively.

In some ways, the fourth stage, pattern restructuring and manipulation, appears hardly any different from pattern extraction. The crucial difference, however, is that this stage concerns a *change* in existing rules in the interlanguage system. In other words, the acquisition problem consists not simply of the extraction of a rule from input data, but of the overhaul of an existing rule whose incorrectness or incompleteness has been (belatedly) apprehended. To look at this from another perspective, it is the “anti-fossilization” stage of development, in which the prospect of a previous and limited pattern persisting unhelpfully has been overcome.

We finally reach two stages which concern how control over an emerging interlanguage system is achieved. In the earlier of these, pattern control, the focus is on accuracy and automatization. The extracted pattern or generalization from earlier stages is, as a result, produced with less effort, and with avoidance of error. The focus is on production, in other words, and the way that perceived patterns can be the basis for effective speech or writing. The final stage, pattern integration, is even more production-oriented. Here, the existence of a rule, pattern, or generalization is presupposed, as is the capacity to use such a pattern largely without error and without undue effort. What is at issue in the final stage is that a different level of routinization may be achieved, in which a pattern may be used not simply as quickly produced, rule-based language, but as a lexicalized chunk, in that it can be accessed as a whole or “gestalt,” perhaps based on a formulaic piece of language (Pawley and Syder, 1983; Skehan, 1998). In this case, processing costs are significantly reduced, since internal computation is no longer necessary.

Clearly, this reinterpretation of aptitude and its linkage with SLA processing stages, goes beyond the models of aptitude which currently exist. The right-hand column in table 18.2 shows that some of the existing aptitude constructs may be serviceable starting points for this reconceptualization of aptitude, but may well need some operational updating. There are a number of other areas which are simply unrepresented at present, however, and which will need to be addressed at an operational level if SLA and aptitude are to come into a more satisfactory relationship. Table 18.2, in other words, implies a significant research program.

4 SLA-Informed Aptitude Research

There is already interesting work consistent with this framework which tries to link SLA at the process level with aptitudinal constructs. DeGraaf (1997) reports a study into the effects of rule explanation (and non-explanation) on

the performance of learners of eXperanto (an artificial language) and Spanish, with each of these represented by simple and complex versions of morphological and syntactic rules. In this regard, the study resembles many SLA studies where the focus is on the contrast between implicit and explicit learning. In addition, however, DeGraaf (1997) gave subjects in his study an aptitude test. This test correlated significantly with performance in both eXperanto and Spanish, and for the explicit *and* implicit conditions. Indeed, there was no difference in strength of relationship with aptitude between these two conditions.

Consistently with this, Robinson (1995) examined the level of correlation between aptitude measures (grammatical sensitivity and memory) and performance, for both an easy and a hard rule, for four conditions: instructed (where learners were given explicit instruction); rule-search (where they were provided with material and told to search for a rule); implicit (where learners were simply provided with material which was consistent with the rule in question, but where their attention was not drawn to this); and incidental (where learners were given a meaning-related task, but with the same rules built in to the material). There were significant correlations with the aptitude measures for all conditions except the incidental one, with correlations in all the significant conditions being above 0.50, for both easy and hard rules.

These two sets of results are intriguing. They suggest that aptitude is relevant not simply for conventional, explicit, rule-focused teaching contexts, but also when the learning is implicit, an interpretation consistent with the analysis of SLA stages presented in table 18.2. In fact, the one non-significant correlation in Robinson's (1995) study (for the incidental condition) is equally intriguing. This suggests that aptitude may not be so relevant when the focus is on meaning. As DeGraaf (1997, pp. 158-9) puts it, this suggests that "the evidence cannot be generalized to non-instructed learning without any focus on form." Aptitude, it would seem, presupposes a requirement that there is a focus on form, precisely the same claim made currently by a range of SLA researchers (Doughty and Williams, 1998).

This interpretation is also consistent with the findings of some aptitude research in naturalistic settings. Reves (1983, and see above) reports that L1 Arabic learners of L2 Hebrew (in naturalistic conditions) and L2 English (in instructed conditions) evidenced significantly and equally elevated correlations in each of the conditions. In fact, out of a range of predictors of language learning success, aptitude was the most effective in each condition. More recently, DeKeyser (2000), following Johnson and Newport's (1989, 1991) study of critical period effects (see Hyltenstam and Abrahamsson, this volume, for coverage of this area), has examined the effects of age on second language acquisition. Researching Hungarian learners in the Pittsburgh area, he has replicated Johnson and Newport's (1989) findings that:

- i there is a strong negative correlation between age on arrival, and level of attained proficiency, up till the age of around 17;

- ii there is no correlation between age on arrival and attained proficiency beyond that point.

In addition to gathering data directly comparable to that of Johnson and Newport (although with a few research design improvements), DeKeyser also administered an aptitude test to these learners. Very interestingly, he shows that:

- iii there is no correlation between aptitude scores and attained proficiency up till the age of 17;
- iv there is a correlation (0.60) between aptitude and attained proficiency after this age;
- v the few subjects who arrived in the US after the age of 17 but who have reached nativelike levels of English are all high aptitude scorers.

This research, too, is consistent with the interpretation that the concept of aptitude is complementary to general SLA research, and that its relevance is not confined to traditional instructed settings.

5 Aptitude: Conclusion

This seems a propitious moment to be discussing aptitude research. For many years, aptitude has been isolated from the wider area of foreign language learning and acquisition. It has been perceived as moderately effective as a predictor, but undemocratic with respect to learners, out of date conceptually, and of little explanatory value. The research over the last six years or so has indicated that this judgment is unwarranted. Aptitude may well be a central construct when there is a focus on form in SLA, precisely the condition many SLA researchers now call for. If we accept that there is a critical period for second language learning (see Hyltenstam and Abrahamsson, this volume), and that totally meaning-based acquisition is a hazardous undertaking, then aptitude may well represent a constellation of individual differences which bear upon the effectiveness with which learners are able to focus on form when the conditions for doing so are operative.

6 Cognitive and Learning Style

The study of cognitive and learning styles within SLA has long been an interesting puzzle. Studies of style represent a clear case of the importation of a concept from a neighboring discipline, psychology in this case, in a manner which has proved simultaneously attractive and unsatisfactory. Various factors combine to account for the attractiveness of style concepts to SLA researchers. First of all, in some contrast to aptitude, a predisposition to deal with learning situations or to process information implies that each of the different choices or styles may have strengths and weaknesses. As a result, *different* styles may

be equally valid and advantageous. This leads to a second attraction: that it is possible to envision all styles as making contributions, even if in different domains. From this viewpoint, it seems less appropriate, therefore, to think of someone as low in style (as one may well think of someone low in aptitude) than as having a characteristic style, with its strengths and weaknesses. Finally, there is also the attraction that style may concern attributes which do not have such a fixed status as aptitudes. A predisposition may be deep-seated, but it does imply some capacity for flexibility, and scope for adaptation of particular styles to meet the demands of particular circumstances.

Keefe and Perrell define style as: "A complexus of related characteristics in which the whole is greater than its parts. Learning style is a gestalt combining internal and external operations derived from the individual's neurobiology, personality and development, and reflected in learner behavior" (Keefe and Ferrell, 1990, p. 16). This definition can be developed slightly to bring out a contrast between cognitive and learning styles, a distinction sometimes left unclear in the literature. The former can be defined as a predisposition to process information in a characteristic manner while the latter can be defined as a typical preference for approaching learning in general. The former, in other words, is more restricted to information-processing preferences, while the latter embraces all aspects of learning.

The review which follows starts by focusing on cognitive style, and then moves to consider issues of learning style more broadly. The major interpretation of cognitive style has been through studies of the constructs of field independence and field dependence. Drawing on the original proposals of Witkin (1962), this view of style has contrasted an analytic predisposition to the processing of information with a preference for a more holistic approach. Field independents are seen as more likely to analyze information into its component parts, and to distinguish the essential from the inessential. Field dependents, in contrast, are more likely to deal with information structures as wholes, or "gestalts." At a personal level, field independents are portrayed as aloof, preferring to find solutions to problems for themselves. Field dependents, in contrast, are sociable and work well in groups. Each of these putative preferences could have advantages in language learning: the former should link with a capacity to analyze linguistic material, and perhaps learn systematically; the latter to engage in communicative language use, and to "talk to learn." The FI/D concept, in its original form, also includes, besides such an analytic predisposition, related contrasts between internal and external frames of reference, and between different interpersonal competencies (Chapelle and Green, 1992).

A range of studies motivated by the FI/D contrast has been conducted in the second language domain (see reviews in Chapelle and Green, 1992; Ehrman, 1996; Griffiths and Sheen, 1992; Reid, 1995; Skehan, 1989, 1998). Generalizing from the empirical results:

- i Coefficients obtained have usually indicated a low correlation between FI/D and language learning achievement, with a value of around 0.30 being typical.

- ii Despite the claims that each different style has its advantages, the significant positive correlations are always in favor of the FI style.
- iii Not all studies report significant correlations.
- iv The correlations are lowered when intelligence scores are partialled out, leading to the allegation that the FI/D interpretation of cognitive style is simply a disguised measure of intelligence.

Two general difficulties, with the construct of field independence itself and with operationalizations thereof, have bedeviled work in this area, and understanding these difficulties may point to ways forward. With respect to the underlying construct of field independence, the case against has been forcefully put by Griffiths and Sheen (1992). They have argued that:

- i field independence is now outdated within psychology, its origin;
- ii it does not translate well to the language domain;
- iii it is indeed a surrogate measure of intelligence;
- iv it has generated no results that are impressive.

It is a powerful case that they make.

Chapelle and Green (1992; Chapelle, 1992) have offered a spirited defense of the construct. While acknowledging problems of measurement (see below), they follow Witkin and Goodenough (1981) in analyzing it into the three components: (whether people rely on internal (self-reliant) referents, or external (other-oriented) referents); cognitive restructuring, (i.e., ease with analysis and capacity to manipulate and organize cognitive structures); and interpersonal competencies (i.e., capacity to work effectively with other people). The first of these, frame of reference, is seen as fundamental, and "remains the value-neutral cognitive style, denoting that individuals differ in how they perceive rather than how accurately they perceive" (Chapelle and Green, 1992, p. 50). The remaining two components are then associated with the two poles of the underlying construct. Restructuring links directly with the field-independent end of the continuum, and has connections with constructs of ability. Interpersonal competencies then connect with the field-independent end of the continuum, and link with interactional style. This implies that, while the restructuring component of field independence may be linked to intelligence, the frame of reference and interpersonal components do still have separate research promise. It appears, therefore, that if the measurement problem can be solved, a style-linked predisposition to deal with problem solving in different functional ways may be established, a predisposition which in turn is derived from style.

Skehan (1998), in slight contrast, critiques the bipolar status of field independence, that is, the fact that the "classic" interpretation of FI/D is in terms of a contrast between analytic and holistic processing, implying that one of these has to be at the expense of the other. He proposes instead that the contrast should be between an analytic orientation and a memory orientation (see section 2.3). This would imply capacities in each of these areas, *as well as*

predispositions to process information in one way or the other. This, he argues, is more consistent with the literature on individual differences in the second language field. One could therefore envision learners who have strong analytic abilities and strong memory, or learners who are weak in either case, or learners who are mixed, with stronger ability in one domain than the other. While there may be a tendency for people to prefer a style which complements their own strengths and weaknesses, it does not follow automatically that they will take this approach. Hence it may be that someone with strong analytic abilities will prefer a memory orientation. To recapitulate, this approach has two parts. First, there is the distinction between ability and style. Second, each of the two dimensions of ability/style is a continuum in its own right: in other words, it is possible to do well in analysis, and also in memory. In this way, memory/holistic processing is not at the expense of analysis: it is simply another option.

The second major difficulty with FI/D constructs is measurement. The most widely used (but clearly unsatisfactory) measure is the Group Embedded Figures Test (GEFT), a convenient but flawed method of assessing cognitive style. Although very easy to use, the measure lacks validity (see Cronbach, 1970, for review), relying as it does on an excessively visual interpretation of style. There are also questions to be asked about cultural bias in the GEFT. More valid, but probably less practical, is a computer-based measuring instrument developed by Riding (1991; Riding and Cheema, 1991). This approach distinguishes between an analytic-holistic dimension of style, and a verbalizer-imager dimension. Crucially, it is possible to score highly *on each pole of each dimension*, so that, unlike with the GEFT, a holistic style is not simply the absence of an analytic style. This implies that it is also possible to have low scores on each dimension, suggesting that someone can be "low" in style options. The computer-based administration system also enables latency of response to be recorded, allowing more sophisticated scoring systems to be developed which base style decisions on processing preferences.

Any balanced assessment of cognitive style would have to conclude that it is not a construct which has generated robust and impressive findings. But the concept does have its attractions, and our understanding of the construct itself, and the pitfalls in its measurement, have improved considerably. There is still a case to be proved, but it would seem that because of the current promise of the reconceptualizations and new measurement tools, there may be scope for additional research where, just a few years ago, the area looked very unpromising.

So far, we have restricted the discussion to *cognitive* style. But the concept of style also applies to other domains, and to other applications than processing information. In terms of domain, Reid (1995), for example, goes beyond the cognitive domain to include such areas as sensory preference and personality. Regarding the sensory domain, she proposes auditory, visual, kinesthetic and tactile preferences.

Oxford and Anderson (1995) take an even broader perspective. They state that individual learners have a composite of at least 20 style dimensions, of which eight seem to be particularly important for L2 learning:

- i global vs. analytic;
- ii field dependent vs. field independent;
- iii feeling vs. thinking;
- iv impulsive vs. reflective;
- v intuitive-random vs. concrete-sequential;
- vi closure-oriented vs. open;
- vii extroverted vs. introverted;
- viii visual vs. auditory vs. hands-on (or tactile/kinesthetic).

More generally, they argue that learning styles have six interrelated aspects: *cognitive* (concerning the preferred or habitual patterns of mental functioning), *executive* (concerning the degree to which the person seeks order, organization, and closure, and manages his or her own learning process), *affective* (concerning values, beliefs, and attitudes that influence what an individual pays attention to in a learning situation), *social* (concerning the preferred extent of involvement with other people while learning), *physiological* (concerning at least partly the person's anatomically based sensory and perceptual tendencies), and *behavioral* (concerning the extent to which someone actively seeks to satisfy his or her learning preferences).

But if we broaden the concept of style to embrace learning, rather than simply cognition, the interpretation that seems to enjoy the most current attention is that of Kolb (1984), especially as this relates to the place of the individual learner and the development of learner autonomy, two issues of some significance to SLA. Kolb (1984) proposes that there is an ideal learning cycle, which starts from concrete experience (CE), moves to observation and reflection upon that experience (RO), then conceptualizes the experience at a more abstract level, as a result of the reflection (AC). The learner then uses the results of the conceptualization to achieve a deeper level of understanding. This conceptualization is used to transform the underlying experience in such a way that the learner acts and "experiments" to change the nature of experience (AE). After this, the entire cycle is repeated, with (the newly arrived at) concrete experience setting the whole process in motion again.

This cycle can be applied to learning in a number of domains, from higher education, and the learning of, for example, geography (Healey, 1999), to management and the business domain, and to teacher education (Barduhn, 1998). There are several potential applications to acquisition. One could consider the CE stage to represent exposure to input, which would be followed by observation and reflection (RO). If we were dealing with the past tense form in English, this could be the *noticing* of the existence of a wide range of past tense forms indicated by the morphological "-ed" ending. This observation and tentative generalization might lead to the conceptualization that the past tense in English

is invariably formed in this way (AC). Then, the conceptualization, reflecting its tentative status, might provoke the learner to choose to use this form for the past tense while observing the reactions of others (AE). In other words, the learner would come back to concrete experience having transformed this experience in some way, with the result that the experience itself would be different. In this case, highly idealized as it is, the learner might overuse the regular past, and then, at a later RO stage, reflect on the consistently raised eyebrows that its application to verbs such as "go" or "give" had provoked. This, in turn, might lead to a new conceptualization of past tense formation, and so on.

Two opposing dimensions supposedly underlie the Kolb cycle. The first concerns the way we perceive, grasp, and represent experiences, and contrasts the CE and AC stages of the cycle. The second takes the remaining two stages, RO and AE, and concerns how we process and transform experience. This leads to the central insight of Kolb's work in terms of learning style. In the present discussion, movement through the four stages of the cycle has been idealized. But in reality the different stages do not take equivalent amounts of time: some learning problems may require longer periods of RO, for example. In fact, Kolb proposes that different learners may *characteristically* linger at particular points of the learning cycle, with the result that whatever point of the four-stage sequence they prioritize will overly influence how they learn. In an ideal situation, it is important to pass through all stages of the cycle in a reasonably complete way, because learning is an iterative process. Consistently focusing on one stage is therefore likely to be disadvantageous and inefficient, because the necessary contributions of the other stages are not being sufficiently exploited. This can again be illustrated through the past tense example. Not to reflect at all will seriously retard progress. But to spend too much time simply observing and reflecting and never to get around to theorizing (or, in SLA terms, focusing on form) would also slow progress. Equally, to experiment remorselessly without taking stock often enough would generate considerable "busy" work, but would not produce sufficient cumulative progress.

The emphasis in the Kolb model is on learning in general, not acquisition specifically. Indeed the applications of the model are not at all confined to the language learning domain, as the earlier examples made clear. Even within language learning, the focus need not be on acquisition, since areas such as teacher education, learner autonomy, and many others would be equally appropriate for application. The attractions of the model are that, unlike the concept of cognitive style, the research foundations in this case do give some basis for encouragement, even though it is necessary to go outside the language domain for such findings (see Robotham, 1999, for review). Interesting results have been published, for example, relating to the effects of matching and mismatching students with instructional programs (Hayes and Allinson, 1996). Indeed, there is a significant literature on how educational programs can be adapted to cater for differences in learning style, and overcome learning style difficulties. There is a significant additional advantage: the Kolb cycle

does seem to be accompanied by measuring instruments which are valid and reliable as well as fairly stable in the results they deliver at the individual level. Kolb (1976, 1984) himself published the *Learning Styles Inventory*. In addition, there seem to be widely accepted derivative measures, such as Honey and Mumford's *Using Your Learning Styles* (1986; see also Honey and Mumford, 1992). This instrument, which is easy to administer, provides useful norming data, and may be a practical method of obtaining learning style information.

The different approaches to "learning style" demonstrate that the term has been used very broadly in the literature to cover a wide range of learning patterns or orientations at various psychological and behavioral levels. In this respect, learning styles are very similar to learning strategies, sharing their basic theoretical shortcoming of a lack of precise definition, which results in a somewhat openended and eclectic list of potential components (see below). Indeed, Schmeck (1988) argues that learning styles and learning strategies are closely related, as a learning style refers to a habitual, cross-situational use of a class of learning strategies. This being the case, however, it is difficult to decide whether learning styles are independent individual difference factors or if the term is merely a convenient way of referring to certain patterns of information-processing and learning behaviors whose antecedents lie in a wide range of diverse factors, such as varying degrees of acquired abilities and skills, idiosyncratic personality traits, and different exposures to past learning experiences.

As concluded by others (Skehan, 1989; Griffiths and Sheen, 1992), it appears from a review of findings on style that such concepts may not deserve high research priority, but they have not been eliminated as potentially relevant second language linked measures. What is now needed is more evidence of educationally linked applications of such concepts. If such evidence is forthcoming, style concepts may become more central in SLA once again.

7 Language Learning Strategies

Three books published at the beginning of the 1990s, by O'Malley and Chamot (1990), Oxford (1990), and Wenden (1991), indicated that the concept of "language learning strategy" - reflecting the learner's active contribution to enhancing the effectiveness of his or her own learning - had reached mainstream recognition in the L2 field. Indeed, right from its introduction in L2 research in the late 1970s, the notion of "learning strategy" was intuitively very appealing to researchers and was also embraced with enthusiasm by language teachers. The initial phase of strategy research focused primarily on what could be learned from the "good language learner," that is, what characteristics made some learners more successful than others in learning a second language (Naiman, Fröhlich, Stern, and Todesco, 1978; Rubin, 1975; Stern, 1975; Wong Fillmore, 1979). The results indicated in a fairly consistent manner that it was not merely a high degree of language aptitude and motivation that

caused some learners to excel, but also the students' own active and creative participation in the learning process through the application of individualized learning techniques. Following this early research, the study of language learning strategies was taken up by a number of scholars in the 1980s. By 1987, Wenden and Rubin were able to compile a rich collection of research studies on "learner strategies," which underlined the important role they played in the acquisition of an L2. The publication of the three summary books mentioned above further added to the general momentum, so that in an article describing a social psychological model of strategy use published in the mid-1990s, MacIntyre (1994) started his discussion by stating that "One of the most fertile areas of research in language learning in recent years is the topic of language learning strategies" (p. 185).

Looking back, it may seem peculiar that virtually nobody has examined the theoretical soundness of the concept of "learning strategy" critically, particularly in view of the fact that the definitions and conceptualizations offered in the L2 literature were rather inconsistent and elusive. Oxford (1989) provided a seemingly straightforward functional definition for language learning strategies - "behaviours or actions which learners use to make language learning more successful, self-directed, and enjoyable" (p. 235) - but when she described the scope of these strategies in her well-known taxonomy (Oxford, 1990), she also included cognitive and affective strategies that involved *mental processes* rather than "behaviours or actions." In order to eliminate this inconsistency, the 1990 volume simply replaced the phrase "behaviours and actions used by the learner" with the more general "steps taken by the learner," which could accommodate both behavioral and mental steps. Oxford's strategy taxonomy was made up of six strategy classes: cognitive, memory, metacognitive, compensation, affective, and social strategies. This division raises further questions inasmuch as (i) "compensation" (i.e., communication) strategies are primarily related to language *use* rather than language *learning* (and were included on the basis that language use leads to language acquisition), and (ii) cognitive and memory strategies are treated as separate categories of equal status, even though the latter is obviously a sub-class of the former.

An alternative definition of language learning strategies was offered by O'Malley and Chamot (1990), according to which these strategies involve "special thoughts or behaviours that individuals use to help them comprehend, learn, or retain new information" (p. 1). This conceptualization differed from Oxford's functional definition in that it highlighted the *cognitive* aspects of strategy use. Even though the cautious wording of the definition did actually allow learning strategies to be "behaviours," the addition of "thoughts" was an important alteration, as was the restriction of the purpose of strategy use to comprehending, learning, and retaining new information. All these reflected the fact that O'Malley and Chamot attempted to ground learning strategy research in Anderson's (1983, 1985) general cognitive psychological theory. However, when the authors listed concrete examples of learning strategies, we find an inventory that is not at all dissimilar to Oxford's (1990). O'Malley and

Chamot distinguish three main classes of strategy: *cognitive*, which correspond to Oxford's "cognitive" and "memory" categories; *metacognitive*, which have a direct equivalent in Oxford's system; and *social/affective*, which correspond roughly to Oxford's "social," "affective," and "communication" categories. The odd one out in O'Malley and Chamot's taxonomy is clearly the last group, "social/affective strategies," which includes diverse behaviors, such as "cooperation," "questioning and clarification," and "self-talk." These strategies are not related to the cognitive theoretical basis outlined by the authors, and they admittedly represent a "broad grouping" (p. 45), a miscellaneous category that appears to have been introduced simply to accommodate all the strategies that did not fit into the first two types but which could not be left out either. Also, it is interesting to see that in order to eliminate the problematic issue of the relationship between "behaviours" and "thoughts" in their definition, O'Malley and Chamot (1994) followed a strategy similar to Oxford's (1990) by replacing these words with the more general formula of "methods and techniques that individuals use."

In spite of the different emphases and concerns in the approaches by Oxford and O'Malley and Chamot, their strategy systems are highly compatible. If we make three justifiable changes to the two taxonomies - (i) exclude communication strategies from the scope of learning strategies (for a justification, see Cohen, 1998; Tarone, 1981), (ii) combine Oxford's (1990) memory and cognitive strategies, and (iii) separate O'Malley and Chamot's (1990) social/affective strategies - we end up with two matching typologies, each comprising four main classes of learning strategy:

- i *cognitive strategies*, involving the manipulation or transformation of the learning materials/input (e.g., repetition, summarizing, using images);
- ii *metacognitive strategies*, involving higher-order strategies aimed at analyzing, monitoring, evaluating, planning, and organizing one's own learning process;
- iii *social strategies*, involving interpersonal behaviours aimed at increasing the amount of L2 communication and practice the learner undertakes (e.g., initiating interaction with native speakers, cooperating with peers);
- iv *affective strategies*, involving taking control of the emotional (affective) conditions and experiences that shape one's subjective involvement in learning.

Although the theoretical inconsistencies of the learning strategy literature in general were quite obvious, leading Ellis (1994) to conclude that "(D)efinitions of learning strategies have tended to be *ad hoc* and atheoretical" (p. 533), it was not at all unreasonable that the L2 field showed remarkable tolerance of these shortcomings. After all, learning strategies represented one of the hottest topics in the broader field of educational psychology in the 1980s and - what was just as important - research studies that included language learning strategies as either dependent or independent variables produced very interesting results. There was an increasing body of research evidence that learning strategies

contributed to the effectiveness of L2 attainment, and the practical significance of this claim was further augmented by the emerging view that learning strategies could be specifically trained/taught to language learners (cf. Cohen, 1998; Nyikos, 1996; for a critical exchange on the teachability of learning strategies, see Chamot and Rubin, 1994; Rees-Miller, 1993, 1994). Strategy research also contributed to the growing awareness of cross-cultural differences in SLA, as attested by a collection of papers edited by Oxford (1996) that examined the varying importance of certain strategies across diverse sociocultural contexts.

L2 strategy research appeared to constitute such an important advance in our understanding of how the actual process of "learning" took place that it was easy to put aside any doubts by saying that significant developments are often accompanied by a theoretical muddle that will eventually be cleared away by the subsequent restructuring of our existing knowledge. Skehan's (1989) summary of the learning strategy research illustrates the research climate well:

If, now, we review the whole of the learner-strategies research, we have to say that the area is at an embryonic stage. Conflicting results and methodologies proliferate. There are few hard findings. Even the causal role and intervention potential of strategies could be disputed . . . Yet the area of research has considerable attractions. A lot of useful and suggestive research has now been reported. There are the beginnings of systematicity in the categorisation schemes for strategies, so that new investigators need not gather information blindly . . . This suggests that we are ready for the first attempts at theorising within the learner-strategies field. (p. 98)

Regrettably, the "clearing away" process never happened and the conceptual ambiguity about learning strategies prevailed. This resulted - in the educational psychology literature - in the abandonment of the term "learning strategy" in favor of the more versatile concept of "self-regulation." Researchers in the L2 field have not made this transition yet, and "learning strategy" is still a frequently used phrase. Because of its shaky theoretical foundation, a significant change in L2 strategy research paradigms appears inevitable.

7.1 Learning strategies in the psychological literature

In one of the more recent theoretical overviews of learning strategies in mainstream educational psychology, Weinstein and Meyer (1994) state that learning strategies include "thoughts, emotions, and behaviours that facilitate the acquisition of knowledge and skills, or the reorganisation of one's knowledge base" (p. 3335). This is a precise summary that clearly reveals the weaknesses of the concept: how can something be either cognition or affect or behavior? How can it contribute to the acquisition of both knowledge and skills, and even to the reorganization of existing knowledge? To satisfy all these criteria, either learning strategies must be some sort of superordinate magic tools, or the term has been used in far too broad a sense, including a number of different things that do not necessarily belong together.

In a theoretical discussion of the concept, Schmeck (1988) indicates that "strategy" was originally a military term, referring to procedures for implementing the plan of a large-scale military operation, and in non-military usage has come to refer to the implementation of a set of procedures (tactics) for accomplishing something. Thus, a *learning strategy* in a more general sense is a "sequence of procedures for accomplishing learning" (p. 5). Kirby (1988) took Schmeck's reasoning further by trying to specify the relationship between "strategies," "skills," and "abilities." As he argues,

skills are existing cognitive routines for performing specified tasks, and *strategies* are the means of selecting, combining, or redesigning those cognitive routines. Skills range from *knowledge skills*, the accessing by stimulus patterns of stored representations and associations (e.g., knowing that "7" says "seven") to *action skills*, the transforming of input information to obtain desired results . . . Skills are fundamentally related to *abilities*, to the extent that the latter sets some sort of upper limit to the development of the former. (p. 230)

Thus, broadly speaking, skills are the things we can do (constrained by our ability), whereas strategies and tactics involve the conscious decisions to implement these skills. Although this appears to be an adequate clarification, it leaves the exact level of analysis of strategies and skills open. At which conceptual level are the processes governed by strategies and skills best conceived? Are we talking about neurological, cognitive, or behavioral processes? And how do knowledge systems, emotional states/processes, cognitive operations, and motor skills interplay in leading to action? To answer these questions - and therefore to be able to use the term "learning strategy" in a scientifically rigorous sense - we would need to produce a coherent neurobiological account of behavior, which is a formidable task yet to be achieved.

In order to extricate themselves from this deadlock, educational psychologists in the 1990s took an alternate route. They simply dropped the term "strategy" (which seemed to cause most of the confusion) and focused instead on what was seen as the essence of strategic learning: the learner's conscious and proactive contribution to the enhancement of her or his own learning process. The new term introduced to cover this learner-specific perspective was *self-regulation*.

7.2 *Self-regulatory learning*

Self-regulation refers to the degree to which individuals are active participants in their own learning; it is a more dynamic concept than "learning strategy," highlighting the learners' own "strategic efforts to manage their own achievement through specific beliefs and processes" (Zimmerman and Risemberg, 1997, p. 105). The notion of *self-regulation of academic learning* could also be perceived as a multidimensional construct, including cognitive, metacognitive, motivational, behavioral, and environmental processes that learners can use to

enhance academic achievement. Thus, self-regulation is clearly distinct from measures of mental ability, and the self-regulated learner can be portrayed as "calling on a library of information and applying a suite of varied skills during studying activities in which achievements are forged" (Winne, 1995, p. 173). By switching to this new concept, researchers had not, by any means, solved the theoretical problems undermining the term "learning strategy," but they had successfully shifted the emphasis from the product to the process, thereby creating more leeway for themselves. This is well demonstrated by the fact that in the lead article of a special issue of the journal *Educational Psychologist* entirely devoted to the topic of self-regulation, Winne (1995) set out to define the concept by providing a description of the self-regulating *learner* rather than of *self-regulatory mechanisms*. This is indeed an appropriate validation of the term, because the existence of "self-regulating learners" is well documented in educational psychology. As Winne summarizes:

When they begin to study, self-regulating learners set goals for extending knowledge and sustaining motivation. They are aware of what they know, what they believe, and what the differences between these kinds of information imply for approaching tasks. They have a grasp of their motivation, are aware of their affect, and plan how to manage the interplay between these as they engage with a task. They also deliberate about small-grain tactics and overall strategies, selecting some instead of others based on predictions about how each is able to support progress towards chosen goals. (p. 173)

It is almost as if the magic term "learning strategy" had been replaced by the superhuman person of the "self-regulating learner."

Self-regulation is a very active field of research in educational psychology (for a recent summary, see Boekaerts, Pintrich, and Zeidner, 2000). Using the new paradigm, researchers attempt to synthesize learner-initiated cognitive, metacognitive, and motivational processes and strategies. These are strongly linked to the subject of the final section of our review, which focuses on language learning motivation. Indeed, from a self-regulatory point of view, learners can enhance the effectiveness of their learning not only by means of applying creative cognitive operations that suit their particular learning styles, but also by generating motivation to learn and finding ways of maintaining their commitment when persistence appears to be flagging. In a more general sense, therefore, self-regulation and motivation are inextricably bound together, as they both concern the antecedents of increased learner achievement.

8 Motivation

The concept of "motivation" is just as surrounded with theoretical controversies as is the concept of learning strategy, yet motivation research during the past 10 years or so has shown a very different pattern of development: rather

than gradually going into decline, the study of L2 motivation reached an unprecedented boom in the 1990s, with over 100 journal articles published on the topic and a wide array of alternative theoretical constructs proposed (for reviews, see Clement and Gardner, 2001; Dornyei, 1998, 2001). This difference in development is, to a large extent, due to the differing historical backgrounds of the two fields. In contrast to the study of language learning strategies, which goes back to exploratory observations of the "good language learner," L2 motivation research was characterized by a well-articulated and theoretically explicit position right from the start, as represented by the influential work of Wallace Lambert, Robert Gardner, Richard Clement, and their associates in Canada (e.g., Clement, 1980; Clement and Gardner, 2001; Gardner, 1985; Gardner and Lambert, 1972; Gardner and MacIntyre, 1993). This position was firmly grounded in social psychology, which allowed the researchers to adopt a range of well-researched terms and metaphors to describe L2 motivation, and to adapt the elaborate quantitative research repertoire of social psychological measurement to the needs of L2 motivation testing. As a result, L2 motivation research soon developed a special data-based research tradition in which the various theoretical propositions were explicitly operationalized and empirically tested.

8.1 *The Canadian social psychological approach*

A key tenet of the Canadian social psychological approach is that *attitudes* related to an L2 community exert a strong influence on one's L2 learning. This makes sense, since few learners are likely to be successful in learning the language of a low-status community. Gardner (1985) also assumed that language learners' goals fall into two broad categories: (i) an *integrative orientation*, which reflects a positive disposition toward the L2 group and the desire to interact with and even become similar to valued members of that community; and (ii) an *instrumental orientation*, whereby language learning is primarily associated with the potential pragmatic gains of L2 proficiency, such as getting a better job or a higher salary. Although these two orientations have become widely known in the L2 field, the most elaborate and researched aspect of Gardner's theory is not the integrative/instrumental duality but the broader concept of the *integrative motive*. This is a complex construct made up of three main components: (i) *integrativeness*, subsuming integrative orientation, interest in foreign languages, and attitudes toward the L2 community; (ii) *attitudes toward the learning situation*, comprising attitudes toward the teacher and the course; and (iii) *motivation*, which according to Gardner is made up of motivational intensity, desire to learn the language, and attitudes toward learning the language. In an important addition to Gardner's motivation model, Clement (1980; Clement, Dornyei, and Noels, 1994) has introduced the concept of *linguistic self-confidence* as a significant motivational subsystem, which is very much in line with the increasing importance attached to self-efficacy in mainstream psychological research (see below).

The Canadian social psychological approach dominated the field of L2 motivation research for over two decades, and, interestingly, the real challenge to it did not originally come from L2 researchers but from the field of mainstream psychology. The 1980s brought about a cognitive "revolution" resulting in a range of exciting new motivation theories, and the emerging new paradigms found a particularly fertile ground within educational psychology. The study of student motivation became a topical issue, with virtually all the leading motivational psychologists taking an active interest in it. Therefore, L2 motivation researchers who followed the mainstream psychological literature could not help noticing the range of interesting developments. This growing recognition was accompanied by the fact that by the 1990s, the initial research inspiration and standard-setting empirical and theoretical work coming from Canada had borne fruit by educating a new generation of L2 motivation researchers, who were ready to test their muscles by experimenting with novel paradigms and applying their acquired expertise in diverse contexts and in creative ways. As a consequence, within a few years, a series of position papers, new theoretical constructs, and alternative theoretical approaches was published, resulting in an unexpectedly colorful and confusing scene (e.g., Brown, 1994; Crookes and Schmidt, 1991; Dornyei, 1994; Julkunen, 1993; Oxford and Shearin, 1994; Schmidt, Boraie, and Kassagby, 1996; Skehan, 1991; Tremblay and Gardner, 1995; Ushioda, 1994; Williams, 1994).

It is a reflection of the strong theoretical basis of Gardner's work that virtually nobody in the "reform movement" wanted to discard the established findings of the social psychological approach. Rather, most researchers tried to extend the existing paradigms. Naturally, such a supplementation process is not at all simple, since it requires an overall restructuring of the existing knowledge. Therefore, an increasing number of researchers decided that in order to be able to make progress, one first needed to go back to the basics of motivation research. (See box 18.1)

8.2 *What is motivation?*

In the most general sense, motivation research addresses the basic question of why humans think and behave as they do; that is, motivation concerns the direction and magnitude of human behavior, or, more specifically (i) the choice of a particular action, (ii) the persistence with it, and (iii) the effort expended on it. In broad terms, motivation is responsible for *why* people decide to do something, *how long* they are willing to sustain the activity, and *how hard* they are going to pursue it.

The range of potential influences on human behavior, that is, the range of possible motives, is very broad, so motivation psychology has traditionally expended a great deal of effort on producing "underlying constructs." These are models of motivation in which the multitude of potential determinants of human behavior is reduced by identifying a relatively small number of key variables that are assumed to subsume or mediate other motivational

Box 18.1 Gardner et al. (1997)

Research question: What is the interrelationship of a large number of learner characteristics (including various attitudinal measures) and language achievement in a unified framework?

Methodology:

Subjects: 102 Canadian university students enrolled in introductory French (although 86 percent of them had at least nine years of prior French training).

Task: Three self-report questionnaires were issued, focusing on a total of 34 variables within the domains of attitudes, motivation, achievement, perceived French competence, anxiety, learning strategies, aptitude, field dependence/independence, and language history. Participants were offered \$15 for volunteering to take part in two data-collection sessions (90 minutes each), and their French grades were also obtained.

Results: Both factor analysis and structural equation modeling were carried out (the former will not be reported here), the latter by means of the Amos 3.51 program. The modification indices of the Amos program suggested one added link to the initially proposed model, and having taken this into account, a causal model with reasonable goodness of fit indices was obtained.

main results are as follows:

- "Language attitudes" were seen to cause "motivation" (the latter referring to a combination of "attitudes toward learning French," "motivational intensity," and "desire to learn French.")
- "Motivation" caused both "self-confidence" and "language learning strategies."
- "Motivation," "language aptitude," and "language learning strategies" were all seen as antecedents of "language achievement."
- "Field independence" correlated significantly with "language aptitude."
- "Language achievement" caused "self-confidence."
- An unexpected result is the negative path between "language learning strategies" and "Language Achievement," suggesting that strategy use, as measured by the "SILL" (Oxford, 1990), is associated with low levels of achievement. The authors argued that this was due to the psychometric shortcoming of the self-report measurement of learning strategies.

components, and so are able to explain a significant proportion of the variance in people's actions. Thus, the main difference between the various competing theories in motivational psychology lies in the selection of the principal factors on which to anchor the underlying theory. Let us briefly summarize the dominant contemporary approaches.

Expectancy-value theories assume that motivation to perform various tasks is the product of two key factors: the individual's expectancy of success in a given task and the value the individual attaches to success in that task (for reviews, see Brophy, 1999; Wigfield, 1994). Within this framework, we can identify a variety of sub-theories that attempt to explain the cognitive processes that shape the individual's expectancy of success: *attribution theory* (Weiner, 1992)

places the emphasis on how one processes past achievement experiences (successes or failures); *self-efficacy theory* (Bandura, 1993) refers to people's judgment of their capabilities to carry out certain specific tasks; and *self-worth theory* (Covington, 1998) claims that the highest human priority is the need for self-acceptance and to maintain a positive face.

Goal theories (Ames, 1992; Locke and Latham, 1990) propose that human action is triggered by a sense of purpose, and for action to take place, goals have to be set and pursued by choice. Accordingly, the key variables in goal theories concern goal properties. The underlying principle of a third main direction in current motivation research, *self-determination theory* (Deci and Ryan, 1985; Vallerand, 1997), and the accompanying intrinsic vs. extrinsic motivational paradigm, is that the desire to be self-initiating and self-regulating is a prerequisite for any human behavior to be intrinsically rewarding, and, therefore, the essence of motivated action is a sense of autonomy. Finally, the key tenet in *social psychological theories of action* (Ajzen, 1988; Eagly and Chaiken, 1993) is the assumption that it is attitudes that exert a directive influence on people's behavior, since people's attitude toward a target influences the overall pattern of their responses to the target.

None of the available theories in motivational psychology offers a comprehensive overview of all the critical motivational factors, in the sense that their absence can cancel or significantly weaken any other existing motives, whereas their active presence can boost learning behavior. Furthermore, there are some basic challenges that most motivation theories have failed to address adequately, such as accounting for unconscious motives (since the emphasis has traditionally been on conscious, rational ones); integrating emotional influences into the primarily cognitive paradigms; addressing the interplay of multiple parallel influences on human behavior (rather than treating one type of action and the underlying motives in isolation); explaining the complex interrelationship of the individual organism, the individual's immediate environment, and the broader sociocultural context; and accounting for the diachronic nature of motivation, that is, portraying motivational processes as they happen in time (for a detailed discussion, see Dornyei, 2001).

8.3 *Motivation in education*

Along with a number of researchers (e.g., Graham, 1994; Stipek, 1996; Weiner, 1984), Dornyei (2001) argues that in order to account for the intricate motivational life of classrooms, comprehensive rather than reductionist models that cover a wide range of academic and social motives are needed. Only such multifaceted, and most probably eclectic, constructs can explain the relationship between (i) general motives concerning L2-related values, beliefs and attitudes; (ii) learner-specific motives, such as self-confidence and self-esteem; (iii) motives rooted in the social micro-context of the language classroom, such as the informal class norms designated by the peer group; (iv) the teacher's motivational influence; (v) the motivational characteristics of the curriculum

and the teaching materials; (vi) the distracting effects of alternative actions; and (vii) the learner's self-regulatory activity to control his or her own motivational state. Although this list is incomplete, it shows that the complex of student motivation subsumes a number of facets.

Besides the multifaceted nature of student motivation, motivation to learn in educational settings has another significant aspect, namely the important role played by "time" in it. During the lengthy process of mastering certain subject matters, motivation does not remain constant, but is associated with a dynamically changing and evolving mental process, characterized by constant (re)appraisal and balancing of the various internal and external influences that the individual is exposed to. Indeed, even within the duration of a single course of instruction, most learners experience a fluctuation of their enthusiasm/commitment, sometimes on a day-to-day basis. In Ushioda's (1996) words, "within the context of institutionalised learning especially, the common experience would seem to be motivational flux rather than stability" (p. 240). In order to account for the daily "ebb and flow" of motivation (i.e., the level of effort invested in the pursuit of a particular goal oscillating between ups and downs), an adequate model of student motivation needs to have a distinct temporal dimension that can accommodate systematic patterns of transformation and evolution in time (Dörnyei, 2000).

One influential theoretical approach in motivational psychology, proposed by the German psychologists Heinz Heckhausen, Julius Kuhl, and their associates (for reviews, see Heckhausen, 1991; Kuhl and Beckmann, 1994), offers a framework with a prominent time component. A central feature of Heckhausen and Kuhl's theory, often referred to as "Action Control Theory" (see Robinson, this volume), is the separation of the *predecisional phase* of motivation, referring to the pre-actional stage of deliberation associated with planning, goal setting, and intention formation, and the *post-decisional phase* associated with influences that come into force when action has started and therefore concern motivational maintenance and control, perseverance, and overcoming various internal obstacles to action. Heckhausen (1991) argued that these two phases are energized and directed by largely different motives: "Why one wants to do something and that one wants to do it is one thing, but its actual implementation and successful completion is another" (p. 163).

8.4 *A synthesis of L2 motivation research: a dynamic perspective*

In an attempt to address the challenge of time in theories of student motivation, Dörnyei and Otto (1998; Dörnyei, 2000, 2001) proposed a process-oriented conceptualization of motivation. They define it as the dynamically changing cumulative arousal in a person that initiates, directs, coordinates, amplifies, terminates, and evaluates the cognitive and motor processes whereby initial wishes and desires are selected, prioritized, operationalized, and

(successfully or unsuccessfully) acted out. They argued that such a dynamic perspective is a potentially fruitful method of interpreting and integrating the manifold motivational factors that affect the student's language learning behavior in classroom settings. Using *time* as an organizing principle offers a "natural" way of ordering the relevant motivational influences into various distinct stages of the motivational sequence along a temporal axis. In fact, because the different sub-phases of the motivation process may be associated with different motives, ignoring "time" in motivation models can (and often does) result in a situation where two theories are equally valid and yet contradict one another - simply because they refer to different *phases* of the motivation process. In fact, Dornyei (2001) maintains that the differences between the traditional, social psychological conceptions of L2 motivation and many of the subsequent "reform" conceptualizations are largely rooted in the different perceptions of the temporal reality of motivation, and that by adopting a dynamic model, the various approaches can be successfully synthesized.

Figure 18.1 shows the schematic representation of a motivation construct offered by Dornyei (forthcoming) that is based on process-oriented principles. Following Heckhausen and Kuhl's approach, the construct separates three phases of motivation: *choice motivation*, associated with the pre-actional phase; *executive motivation*, associated with the actional phase; and *motivational retrospection*, which involves the learner's final analysis of the actional process once it has been completed or terminated. The figure summarizes the main motivational functions and influences, broken down into the three phases.

How does such a process-oriented construct relate to Gardner's (1985) established social psychological conception of L2 motivation? The Canadian approach has traditionally targeted the more general and stable aspects of motivation, such as language attitudes, beliefs, and values. From a process-oriented perspective, these motivational aspects are primarily associated with the pre-actional stage of motivation and are, therefore, particularly useful in predicting issues such as *language choice* or the initial intention to *enrol in a language course*. They are less adequate for predicting actual L2 learning behaviors demonstrated in the classroom (e.g., rate of attendance, level of attention paid, degree of task engagement), because learner behaviors during the actional stage tend to be energized by executive motives. These are largely rooted in the situation-specific characteristics of the learning context and show few overlaps with motives fueling the pre-actional stage. This was demonstrated in a study focusing on the motivational background of student engagement in communicative L2 tasks by Dornyei (2000), who also found that even within situation-specific motives, two clusters can be distinguished: (i) course-specific motives (associated with the appraisal of the L2 course), and (ii) task-specific motives (i.e., attitudes toward a particular task).

Although Gardner and his colleagues have included certain aspects of the learning situation in their paradigm - namely the appraisal of the L2 teacher and course - these were fairly general measures that were selected to provide a broad index usable across various contexts (Gardner and MacIntyre, 1993).

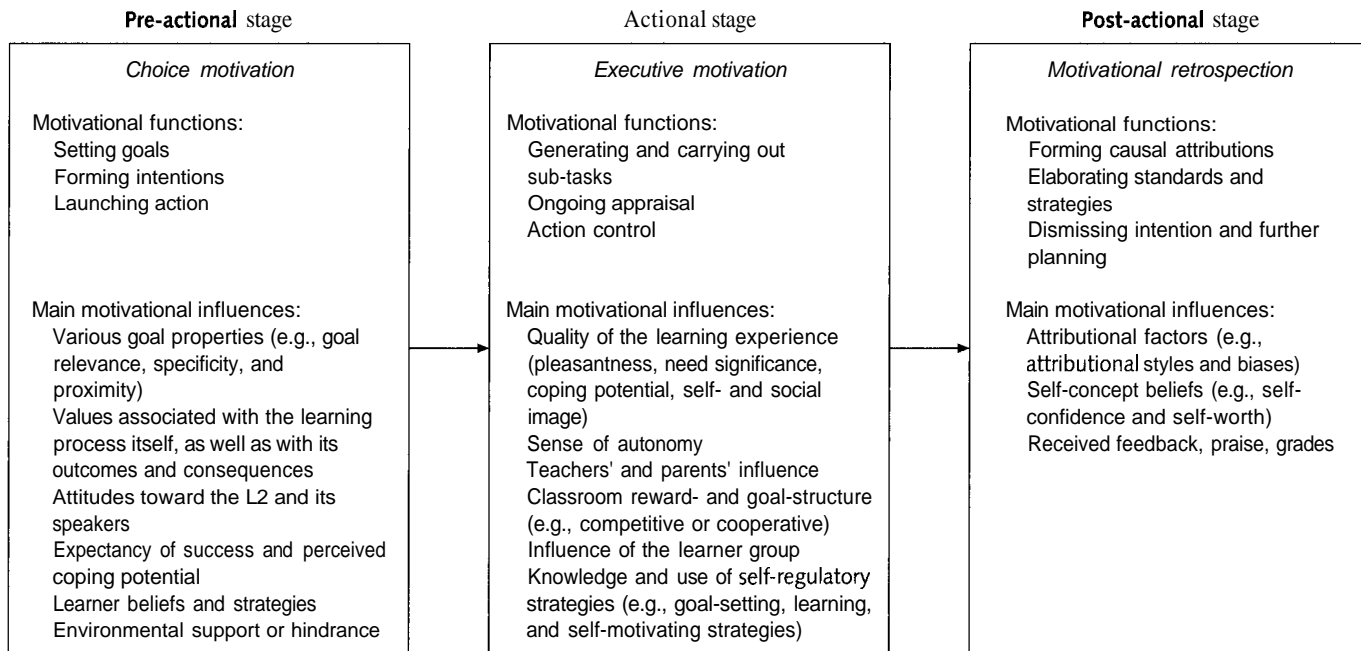


Figure 18.1 A process model of learning motivation in the L2 classroom

Source: Dörnyei (2001)

More specific executive motives were the target of a great deal of research in the 1990s, resulting in what can be seen as an "educational shift" (e.g., Crookes and Schmidt, 1991; Dornyei, 1994; Oxford and Shearin, 1994; Skehan, 1991). Some perceived the initial articles promoting this more situated approach as attacks on Gardner's theory, whereas from a temporal perspective they can be seen as playing a merely complementary role by focusing on the actional phase of motivation, which had not been the main focus of previous research. This line of investigation, which is aimed at examining the situation-specific motivational underpinnings of language learning as an ongoing social activity, is likely to be further pursued in future motivation research, particularly because it can accommodate a wide range of novel emerging themes and approaches. The following lines of research are representative.

Schumann's (1997) neurobiological research: This was one of the first attempts in the L2 field to incorporate the findings of neuroscience and to link the study of language to this particularly dynamically developing discipline within cognitive science. The key constituent of Schumann's theory is *stimulus appraisal*, which occurs in the brain along five dimensions: *novelty* (degree of unexpectedness/familiarity); *pleasantness* (attractiveness); *goal/need significance* (whether the stimulus is instrumental in satisfying needs or achieving goals); *coping potential* (whether the individual expects to be able to cope with the event); and *self- and social image* (whether the event is compatible with social norms and the individual's self-concept). Thus, stimulus appraisal can be seen as a key process underlying executive motivation. Recently Schumann (2001) has broadened his theory by outlining a conception of learning as a form of *mental foraging* (i.e., foraging for knowledge), which engages the same neural systems as the ones used by organisms when foraging to feed or mate, and which is generated by an incentive motive and potentiated by the stimulus appraisal system.

Self-determination theory in L2 motivation: Because learning an L2 almost always involves a combination of external and internal regulatory factors, Kim Noels and her colleagues (Noels, 2001; Noels, Clement, and Pelletier, 1999; Noels, Pelletier, Clement, and Vallerand, 2000) set out to explore how the orientations proposed by self-determination theory (see above) relate to various orientations that have traditionally been identified in the L2 field, such as instrumental and integrative. Noels argues convincingly that applying the intrinsic/extrinsic continuum can be helpful in organizing language learning goals systematically, and that the paradigm is particularly useful for analyzing classroom climate in terms of how controlling or autonomy-supporting it is.

Willingness to communicate (WTC): A recent extension of motivation research that has both theoretical and practical potential involves the study of L2 speakers' *willingness* to engage in the act of L2 communication. Originally inspired by research in L1 communication studies (e.g., McCroskey and Richmond, 1991), Peter MacIntyre and colleagues (e.g., MacIntyre, Babin, and Clement, 1999; MacIntyre, Clement, Dornyei, and Noels, 1998) have conceptualized *willingness to communicate* (WTC) in the L2, attempting to explain an individual's

"readiness to enter into discourse at a particular time with a specific person or persons, using a L2" (MacIntyre et al., 1998, p. 547). The L2 WTC construct thus conceived is made up of several layers and subsumes a range of linguistic and psychological variables, including linguistic self-confidence (both state and trait); the desire to affiliate with a person; interpersonal motivation; intergroup attitudes, motivation, and climate; parameters of the social situation; communicative competence and experience; and various personality traits. Thus, the model attempts to draw together a host of learner variables that have been well established as influences on second language acquisition and use, resulting in a construct in which psychological and linguistic factors are integrated in an organic manner.

Motivational self-regulation: This is an intriguing new area within motivational psychology, exploring ways by which learners can be endowed with appropriate knowledge and skills to motivate themselves. Motivational self-regulation involves self-management skills that help to overcome environmental distractions and competing/distracting emotional or physical needs or states. Ushioda (1994, 2001) has conducted some pioneering analyses of the positive motivational thinking patterns that help someone to keep going even in adverse learning conditions, and on the basis of Kuhl's (1987) and Corno and Kanfer's (1993) typologies, Dörnyei (forthcoming) has proposed a taxonomy of self-motivating strategies made up of five main classes: commitment control strategies, metacognitive control strategies, satiation control strategies, emotion control strategies, and environmental control strategies. Some of the actual techniques listed under these categories are very similar to the "affective learning strategies" conceptualized by Oxford (1990) and O'Malley and Chamot (1990).

In sum, the study of L2 motivation reached an exciting turning point in the 1990s, with a variety of new models and approaches put forward in the literature, resulting in what Gardner and Tremblay (1994) have called a "motivational renaissance." The pioneers of the field have been joined by a new generation of international scholars, and the scope of motivation research has been extended to cover a variety of related issues. As a result, there is now a colorful mix of approaches to the understanding of L2 motivation, comparable on a smaller scale to the multifaceted motivational arena in psychology. The renewed interest in L2 motivation is at the same time indicative of a more general trend in applied linguistics, whereby an increasing number of scholars combine psychological/psycholinguistic and linguistic approaches in order better to understand the complex mental processes involved in SLA.

9 Individual Differences: Conclusions

An assessment of individual difference research has to portray a mixed picture. First of all, it is difficult to avoid the conclusion that the study of learning and cognitive style is a problematic area. That is not to say that it is without

interest, but simply that the promise that the concepts contain has not been fulfilled. There is a need for more than a seductive account of how people differ; it is also important to ground claims in research, and better still, to show how the ideas which may be relevant to educational settings generate reliable and robust findings in such settings. Similarly, the current formulations of learning strategies, while containing pedagogic promise, seem to lack a clear theoretical basis. The classification schemes which have been proposed have pragmatic utility, but do not stand up to serious scrutiny. It appears that the sub-field needs to renew itself by returning to its original roots within psychology and then exploring how self-regulated learning can be facilitated in the context of second and foreign language learning.

The two individual difference areas which show signs of immediate promise and the capacity to generate research programs are aptitude and motivation. The interest with aptitude is that it may now reintegrate itself within mainstream SLA, a move which could be to the benefit of both areas. The crucial development here is that aptitude constructs are being related to acquisitional processes. A theory of aptitude can lead to the exploration of the extent to which putative SLA processes can be linked to differences between learners, for example, in areas such as noticing, or with different types of learning. If such linkages can be established, aptitude will function significantly in a wider range of accounts of SLA success, across a wider range of contexts. This would allow a different perspective on pedagogic application, since it would be feasible to undertake analyses at a more micro-level of research. It is also striking here that this new approach to aptitude is grounded in a more cognitive view of SLA, with connection through constructs such as working memory to mainstream psychology.

The new orientation to the study of motivation shares some of these qualities. This renewal, too, has been partly stimulated by developments in mainstream psychology, which have been more able to capture the fluidity of the operation of motivation. There is also the common factor that a concern for classrooms, as the arena within which such fluidity operates, is central to the revised perspective: action control theory, while incorporating "orientational" approaches to motivation, also treats rather distinctly what is happening inside the classroom. The result may well be that more direct routes to offering practical advice will become available, as effective means of managing motivation and sustaining learning duration and intensity are understood and exploited.

There are also some interesting connections among the individual differences variables covered in this chapter. It is clear that foreign language aptitude and cognitive style have some degree of relationship (see, e.g., Gardner, Tremblay, and Masgoret, 1997). It has been argued (Chapelle and Green, 1992) that this connection is accounted for by the way each draws upon the common underlying factor of intelligence. In slight contrast, Skehan (1998) argues that the connection arises because within aptitude, one can propose an analytic learner type and a memory-oriented learner type. This is related to, but not identical with, the analytic-holistic contrast in the style literature. As indicated above,

Skehan argues that if cognitive style is interpreted as not one continuum but two, this, combined with a style vs. predisposition interpretation, can accommodate, separately, both aptitudinal and style concepts. We also saw above that Schmeck (1988) argues that learning style is connected to learning strategies, in that style relates to consistency of strategy use across contexts.

More interesting, perhaps, is the potential connection between motivation and learning strategies. If one accepts the distinction between pre- and post-decisional stages in the operation of motivational variables, then it may be the case that the operation of learning strategies is, in effect, a subset of action control strategies. In other words, the effective use of learning strategies may be precisely the sort of behavior that causes motivational levels to be sustained within the learning situation (Dörnyei, 2001). Their use may give encouragement to the learner, provide benchmarks for evaluation and progress, and enable motivational goal setting to be accomplished. If strategies are viewed in this way, they may re-emerge within a more elaborated theoretical framework.

NOTES

- 1 A distinguished applied linguist once said to one of the authors at a conference: "I like your interest in aptitude. But I always feel: aptitude is there, but what can you do with it?" Pimsleur's work is an interesting early approach which begins to answer this question.
- 2 In many language testing textbooks, it is traditional to consider that there are four test types: aptitude, achievement, proficiency, and diagnostic. The viewpoint taken here is that diagnostic tests are not a separate category, but rather a use that any sort of test may be put to. Pimsleur, in other words, was using aptitude tests diagnostically. The information derived from them, in other words, would be obtained prior to a language course, and therefore could be a design factor for such a course. Aptitude, that is, would give information for pre-emptive course design decisions which would predict learning difficulties to come, *and do something about them*.

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