Chapter 3

Individual Differences, Learning Styles and CELL

3.1 Introduction

The argument being proposed in this work is based on the premise that learners differ in their approach to language learning in numerous ways, including their preferred channels of perception, the learning processes they activate, their background experience and education, their aptitude and motivation for language learning or learning in general, and their age and level of maturity. These differences in turn affect choices made by both learners and their teachers as to which materials, resources, teaching and learning approaches, and forms of interaction are most effective for language learning to proceed. Broadly speaking, these differences can be classified as being either internal or external to the learner, though there are areas of obvious cross-over such as learning styles where, as will be discussed below, external features of tasks, for example, can influence features of perception which are essentially internal to learners. The extent to which learner choices and differences can be accommodated within a learning environment has a critical influence on the level of success in language learning that individual learners achieve.

3.2 Relationship between CELL and learner differences

In a CELL environment, particularly where the computer resources are being used for self-access purposes, it is important to be able to identify possible sources of individual difference, in order better to tailor self-access resources and materials to cater for this range. In such an environment, where there is much less opportunity for teachers to mediate the learning processes directly, it becomes critical that individual differences which have been identified in the research literature are incorporated into the instructional design of computer-based resources. By implementing this approach, teachers can participate in the mediation of learning, to create an environment that does enhance language learning. The incorporation of multimedia (sound, video, graphics

and text) into a CELL environment also provides learners with access to a wider range of media in the self-access situation. In order for learners to take advantage of multiple channels of perception, they need to be aware of their preferred styles of perception, the extent to which the available media correspond to these, and how best to exploit this.

In addition, as mentioned in the previous chapters, the capacity for computers to be used by learners to work in their own time and at their own pace is one of the principal advantages in their use. However, in order for learners to use computer resources in this way, they need to be aware of the variations that have been identified as regards successful language learning, and to possess and be able to use skills in self-directed or autonomous learning. Some of these skills and understandings can be acquired by learners through awareness-raising and practice, while others cannot. The more information learners have of these differences and variations, the more chance they will have to make strategically effective choices in their language learning programs.

From a teacher's point of view, decisions on the investment of money for purchase of equipment, time for the training of staff and learners, or the development of materials, must be grounded in considerations of the effectiveness of computer technology over other media, or to complement them, and the implications of these factors for the language learning programme. In Chapter 1, issues surrounding the roles of computers, teachers, and learners, and the appropriateness of the use of technology in language learning, have already been discussed. In the following sections, the human side of the decision to incorporate computer technology in language learning programs will be examined, particularly as regards individual differences and learning styles. This will then be incorporated into the discussion in the following chapters of certain aspects of learners' awareness of these factors, and approaches to raising this awareness.

3.3 Individual differences and learning styles – what are they?

Individual differences can be defined as those features or factors within individual learners which influence differential success in language learning among learners, or which can be identified as accounting for such differences. As will be discussed in more detail in later sections, some of these features can be changed, modified, or developed through instruction and awareness-raising, whereas others are less amenable to change. This amenability to change becomes a critical component of a CELL, or indeed any, learning environment, as it raises the dual question of which changes are desirable, and whether such changes can be achieved through instruction.

The terms 'learning style' and 'cognitive style', though often used interchangeably, can be differentiated, with 'cognitive style' being seen as a subset of the more comprehensive 'learning style'. Thus cognitive style has been defined as:

> general characteristics of intellectual functioning that influence how one approaches a learning task (Brown, 1987); the manner in which people perceive, conceptualize, organize and recall information (Ellis, 1986).
>
> (Wenden, 1991: 36)

Learning style, however, includes:

> cognitive, affective and physiological behaviors that indicate learners' characteristic and consistent way of perceiving, interacting with and responding to the learning environment; more concrete than cognitive style (Willing, 1988).
>
> (Wenden, 1991: 36)

In their introduction to the discussion of explanations for differential success among second language (L2) learners, Larsen-Freeman and Long (1991: 153) start with the age factor as being 'one of the most obvious potential explanations for the comparative lack of success of second language learners'. L2 learners simply start later than first language learners. Larsen-Freeman and Long go on to say, however, that there is 'a

host of other factors which have been proffered to explain differential success among SL [second language] learners'. Among these other factors, they list: 'language aptitude, social-psychological factors [motivation and attitude], personality, cognitive style, hemisphere specialization, learning strategies, and a few others.'

In addition to these, Altman (1980) offers previous experience with language learning, sex of the learner, proficiency in the native language, and sense modality preference, as well as 'sociological preference', by which he means preferred level of social interaction (whether in groups, alone, or in pairs). These latter two factors correspond to features mentioned by Wenden (1991: 37) as comprising 'learning style'. Skehan (1989) also deals with most of these factors, though from the perspective of their implication in theories of second language acquisition (SLA). All of this has led Ellis (1994: 471) to comment that, while 'the study of IDs [individual differences] has attracted a lot of attention in SLA research, and has made considerable advances', the constructs used to interpret research findings 'are often vague and overlap in indeterminate ways', making it 'difficult to synthesize the results of different studies, and even more difficult to arrive at a coherent overall picture.'

While there is obviously some confusion and overlap among the findings of these approaches to research and theory in this area, as can be seen above, there is sufficient consistency on the main features for these to be considered and catered for in language teaching and learning. In the development of an effective CELL package, therefore, it is necessary to examine the factors within the individual which relate to success in language learning in general. Only then can we identify those factors of general language learning which impinge specifically on the use of computers to enhance language learning, particularly in self-access contexts.

3.3.1 Individual differences and developmental factors

The field of psycholinguistics has been a fruitful area of research into individual differences in SLA. In this field, the focus has been on individual variation in terms of developmental factors, both of cognitive maturity and 'stages' of acquisition of morpho-syntactic features of language. While cognitive maturity will be discussed in detail below in the section on age, developmental stages in morpho-syntactic acquisition require some examination here, for their relation to the issue of teachability and learnability mentioned above in section 3.3. In brief, developmental factors in SLA include such features as stages, rate or order of acquisition, natural sequences (usually of syntactic morphemes – Dulay and Burt, 1974; Meisel, Clahsen & Pienemann, 1981), and interlanguage (Selinker, 1969) development.

It was Selinker who first coined the term 'interlanguage' to describe the form of the target language (TL) produced by individual learners of it as comprising:

> (1) knowledge underlying production in his native language (NL); (2) knowledge – presumably at more than one level of consciousness – about the TL; and (3) knowledge underlying attempted production of a TL norm.
>
> (Selinker, 1971: 37)

Other terms which are used to refer to interpretations of interlanguage, as described above, include 'transitional competence' (Corder, 1967) and 'approximative systems' (Nemser, 1971). It can be seen, therefore, that researchers from a range of paradigms have recognised the importance of examining learners' perceptions of the target language, and their attempts to approximate the TL in production.

In 1974, two researchers into the emergence of natural sequences, Dulay and Burt, were able to confirm their hypotheses from earlier studies, that the 'same sequence of acquisition of 11 functors, obtained by three different methods, provides strong

evidence that children exposed to natural L2 speech acquire certain structures in a universal order' (1974: 50). Dulay and Burt call the process by which children are able to do this 'creative construction' in which, 'guided by universal innate mechanisms', they 'formulate certain types of hypotheses about the language system being acquired, until the mismatch between what they are exposed to and what they produce is resolved'.

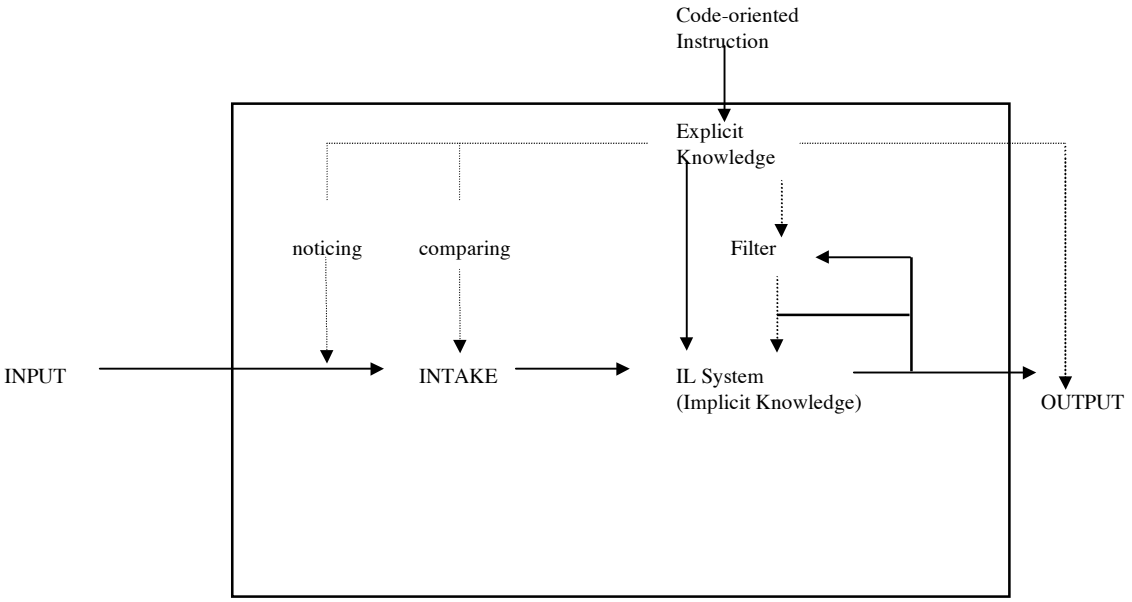
Meisel, Clahsen and Pienemann (1981) similarly, for adults learning German as a second language in natural settings, were able to identify developmental stages in their learners' acquisition which were subject to 'readiness' constraints. To account for the variations found among learners at the same developmental level, Meisel and his colleagues postulated the interference of socio-psychological factors such as group identification and acceptance of group values, as proposed by Schumann in his acculturation theory discussed below. In other words, the acquisition of some features is dependent on, for example, the learner being positively disposed towards, or valuing, linguistic accuracy.

On the basis of this and previous studies, Meisel and colleagues also suggested the implementation of staged instruction of morpho-syntactic features to match learners' developmental stages. This suggestion has subsequently been further developed by Pienemann as his 'teachability hypothesis' (1984: 35), whereby the order of presentation of morpho-syntactic features in classroom instruction is designed to correspond to the natural order of acquisition of those features. One of the major issues investigated in relation to classroom instruction and the teaching of syntax has been this complex question of the best way to teach learners syntactic rules, and which rules are learnt best in what way: in other words, whether it is better in language instruction to take an inductive or a deductive approach, or whether certain rules are better learnt by one approach rather than the other.

In an attempt to specify which morpho-syntactic rules might be easier to learn as explicit knowledge, Green and Hecht (1992) examined a group of German learners of English as the L2. They found that, in terms of explicit knowledge instruction, rules relating to easily recognised categories, that lend themselves to mechanical application, and are independent of the larger context, are easy to learn. Alternatively, when rules were not subject to 'simple exhaustive descriptions', or were governed by features of the broader context, such as aspect rules, they were found to be much more difficult to learn.

Figure 3.1 **The Role of Explicit Knowledge in L2 Acquisition**

(Ellis, 1992: 97)



Studies such as this lead Ellis (1992: 97-8) to hypothesise a weak interface model to explain the role of explicit knowledge in SLA. According to this model, illustrated in Figure 3.1 above, explicit knowledge helps learners 'to notice features in the input that might otherwise be ignored' (Ellis, 1992: 97), and as an 'acquisition facilitator' (Seliger, 1979) also assists learners to notice the gap between the input they are exposed to and their own interlanguage output.

Another researcher, Schmidt (1990; 1993), goes even further to suggest that 'noticing is the necessary and sufficient condition for converting input to intake' and that 'paying attention is probably facilitative, and may be necessary if adult learners are to acquire redundant grammatical features' (1990: 129). This issue of conscious noticing will be discussed in greater detail later in section 3.4.4.4 on the development of the concept of strategies. As Slimani (1992) found in her studies of 'uptake recall', 89 percent of 'uptaken' items recorded on her student classroom charts were focussed upon at some point during instruction. However, viewed differently, 11 percent of uptaken items only occurred as part of classroom discourse, among peers, and even within the 89 percent, there was considerable individual variation regarding which aspects of items were attended to by her students. Taken altogether, Slimani's findings seem to provide further evidence for the sociocultural construction of meaning, as discussed in Chapter 1, in that it is within the interaction among *users* of the language, even novice users, that the construction of meaning emerges. The combination of teacher and peer discourse in the classroom provides both the context, and language and discourse models, for learners.

Also in the area of classroom acquisition of syntactic structures, Felix (1981) found that the acquisition of his German high school learners of English as a second language paralleled L1 and naturalistic L2 acquisition. However, because of the constraints of classroom instruction, his learners 'were continuously forced to produce structures for which, developmentally, they were not yet ready' (1981: 87). To compensate for this, they adopted 'two basic strategies: (a) they followed principles of naturalistic acquisition; or (b) they randomly selected any one structure from a finite repertoire'.

From this range of studies on developmental stages or natural sequences, it can be seen that instruction or teaching has minimal effect on acquisition of morpho-syntactic features, unless the learner is developmentally ready to acquire those features. As these

stages are seemingly so unamenable to change, they do not warrant further discussion in this work, except to the extent that learners and teachers alike need to be informed of the existence and nature of this phenomenon. In addition, as the focus here is not morpho-syntax, but rather the development of strategic listening, through the use of authentic materials, the introduction of morpho-syntactic features is not controlled.

In this sense, the materials simulate a more 'naturalistic' acquisition environment. If learners are at the appropriate stage to make meaning from a piece of authentic material, and use the structures that appear in it, then they will be able to learn or acquire those structural elements. While some of the listening tasks focus on specific functional features of the language presented, such as distinguishing language used to express cause and effect, for example, there is no explicit focus on syntactic elements. From the evidence found in the research studies discussed above, however, this focus on functional features and the negotiation of meaning required of learners in this CELL environment should make it possible for them to form tenable hypotheses, whether conscious or not, about the rules relating to the syntactic elements of such features.

As Schmidt (1990: 149) found, 'incidental learning is certainly possible when task demands focus attention on relevant features of the input'. In addition, Ellis (1994: 89) stresses that 'many formal language lessons are not directed at teaching new properties but at enabling the learners to use features they have already partly acquired with greater accuracy'. The listening and viewing material in the program described in this work is thus not graded to cater for the progressive emergence of morpho-syntactic features, but is rather directed at focussing attention on models of language as it is used, on the assumption based on Schmidt's findings above, that morpho-syntactic features can be learnt incidentally under these circumstances.

3.4 Some individual difference characteristics less amenable to change

Though considerable discussion continues about the identification and distinctiveness of the various individual differences introduced earlier in section 3.1.1, the main interest we have in these is the extent to which they influence learners' capacity to learn from the computer-enhanced materials being designed. It is therefore necessary to attempt to identify, among these areas of difference, those features which are more amenable to change. In order for optimal learning to be promoted for different learners using the CELL materials, these features will need to be taken into account in the design of the CELL program, and also it is these features that will need to become the focus of awareness-raising within the materials themselves.

This process will also allow us to move away from those features which are less amenable to change. It is necessary for us to be aware of their existence and the influence they have in order to choose more appropriate materials, or direct learners to make use of the materials in certain ways. In addition, as will be discussed in the next chapter, through education and awareness-raising in a range of learning strategies, it is possible to help learners compensate for less desirable or less effective characteristics which they may have. However, within the materials themselves, and within a program of instruction or learning little change can be effected in learners with regard to these features. A learner may, for example, be beyond an age when language learning can easily be achieved through the use of certain techniques, but he/she can be made aware of, and encouraged to employ, other techniques or strategies which have been shown to be more effective for older learners.

The factors or characteristics being discussed here are specific to individual learners, and include age and maturity, personality, aptitude for language, hemispheric processing orientation, motivating influences, learning and cognitive styles, and strategies. As mentioned above, some of these individual and developmental factors are obviously more amenable to being changed, developed, or influenced through

education than others. Furthermore, the techniques learners use which have been identified in the literature as 'learning strategies' are the most changeable or 'trainable' features. Broadly speaking, these include metacognitive strategies used to organise and plan learning, cognitive strategies used to process language, and socio-affective strategies employed to promote language learning through interpersonal interaction. Language learning strategies will become the focus of the next chapter.

Specifically, developmental factors discussed earlier, and age, personality, language aptitude, and hemispheric orientation are less changeable, while attitude, motivation, possibly learning and cognitive style, and learning strategies are more open to influence. As features less amenable to change have an effect on language learning, however, it is important to outline briefly why this is so, and what these effects are, before discussing in greater depth those aspects of individual learners which can become the focus of education and awareness-raising. The area of learning strategy identification and training will then form the major part of the discussion in the following chapter, as such training forms an integral part of the development of learner autonomy which is necessary to the efficient use of a learner-centred CELL package.

3.4.1 Age as an unchangeable factor

As outlined by numerous researchers and theorists in SLA, age is a contentious factor when it comes to language learning (McLaughlin, 1987: 29; Genesee, 1988; Skehan, 1989: 137; Larsen-Freeman & Long, 1991: 154). For younger learners, age may be a positive factor, not from the simplistic point of view that younger learners learn languages better (Dulay & Burt, 1974), but rather from the view that they have a longer period of time to learn when starting younger (Genesee, 1988: 105). In addition, when children start learning a language at a younger age, their cognitive maturation (Donaldson, 1978) is developing simultaneously with their language learning.

Some researchers see the lack of cognitive maturity as an advantage, claiming that the absence of Piagetian 'formal operations' allows children to learn their second language using processes much like those involved in learning their first language (Krashen, 1982a). Others, however, find that the cognitive maturity of older learners favours the way languages are generally taught in schools, using more abstract processes, and decontextualised language (Genesee, 1988: 104). Genesee also concludes that naturalistic approaches to language teaching produce superior learning regardless of the age of learners, while matching instructional style with the cognitive development and interests of learners (Stevens, 1983) also improves ultimate achievement.

A considerable number of research studies has been undertaken in an attempt to determine if there is an optimum age to start learning a language (Genesee, 1976; Snow, 1983; Ellis, 1985), and if so, what this age might be (Snow and Hoefnagel-Hohle, 1978; Dulay and Burt, 1974), whether there might be a point beyond which language learning abilities stultify (Snow, 1987; Penfield and Roberts, 1959; Lenneberg, 1967; Krashen, 1974; Neufeld, 1979), the differing approaches to language learning employed at varying ages (Skehan, 1986, Wong-Fillmore, 1979; Chesterfield and Chesterfield, 1985; Krashen, 1982; O'Malley *et al.*, 1985), and the relative effectiveness of beginning to learn a language at an age that is not the 'optimum' (Skehan, 1989: 137; Hatch, 1983; McLaughlin, 1984; Krashen, Long and Scarcella, 1979).

To date, the conclusions seem to consistent with the oft-cited adage 'older is faster, but younger is better' (Krashen *et al.*, 1979; Larsen-Freeman & Long, 1991: 155), where 'faster' refers to short-term gains found with older learners, while 'better' refers to the ultimate attainment of native-like proficiency that is possible for younger learners to eventually approximate. However, there have been several studies, particularly in early and later bilingual programs, that indicate that early adolescence may be the optimum time to begin (McLaughlin, 1984; Swain and Lapkin, 1982). In relation to types of instruction, as mentioned above (Genesee, 1988), on the basis of data from immersion

programs in Montreal, naturalistic language learning environments have been shown to be more successful, regardless of the age of the learners.

Studies of the differences between child L2 learning and that of older learners have frequently hypothesised the existence of a critical or sensitive period, after which native-like competence in a second language learning is difficult, if not impossible. Many of these studies have used data collected from immigrants learning their L2 while living in the target culture, where the age of arrival provides a clear reference point. Several of these have indicated that age of arrival in the target language culture is inversely proportionate to ultimate level of proficiency (Oyama, 1976; Fathman, 1976). In terms of phonology, other studies indicate that it may even be impossible to achieve native-like speech if language exposure begins after the age of about six years (Payne, 1980; Tahta *et al.*, 1981; Major, 1987), though some exceptions have been found (Neufeld, 1979).

In his examination of the role of consciousness and attention in language learning, Schmidt (1990: 145) was intrigued to note that the age range during which the shift occurs from child to adult consciousness 'approximates to the sensitive period for language acquisition'. Whereas child consciousness is characterised by 'a passive mode that includes an open awareness of the environment', adults exhibit a 'more controlled mode that includes the strategic allocation of attention'. Schmidt used studies by Ceci and Howe (1982) and Miller (1985) on strategic attention and incidental learning in children, together with his own 1983 study of adults' failure to learn grammar through communicative activities, and compared these with the observation of McLaughlin *et al.* (1983) that 'children learn the rules of grammar as a by-product of trying to communicate'. From these, he proposes the hypothesis that it is children's lack of strategic attention which causes them to notice grammar features that are communicatively less important. Adults, therefore, having more control over their focus

of attention, tend not to pay attention to 'redundant and communicatively less important grammatical features'.

Several other explanations have been offered for the age-related changes in capacity for language learning referred to above. Larsen-Freeman and Long (1991: 163-7) classify these explanations as follows:

1. socio-psychological (involving ethnic and group identification, acculturation, and accommodation theories, which will be discussed in more detail in section 3.4.3 on personality)
2. input-dependent (based on features of the input and discourse models discussed below)
3. cognitive (involving Piaget's maturational stages mentioned earlier)
4. neurological (implicating a sensitive or critical period mentioned above and discussed in detail in section 3.4.2).

Input-dependent explanations (point 2. above) derive from the observed differences in the classroom environments and teacher/learner interactions among various levels of education, namely pre-school and primary, contrasted with secondary and adult contexts (Curtain and Pesola, 1988; Wankowski, 1973). In pre-school and primary learning environments, language play is encouraged, and learners are exposed to more input that is concrete and meaningful, providing simple syntactic models for them to follow.

Another argument that is advanced to explain the perceived advantages of the kinds of input to which younger learners are exposed, particularly in naturalistic learning environments, is that the second language input experienced by younger learners more closely approximates that of their first language (Krashen, 1981; Larsen-Freeman & Long, 1991). The latter argument is premised on the principles that, as children acquire

their L1 in naturalistic settings, if teachers can set up an L2 learning environment that approximates the characteristics of a L1 environment, the learners could then acquire their L2 using processes similar to those activated in the acquisition of the L1 (Krashen and Terrell, 1983; Larsen-Freeman and Long, 1991: 140).

Explanations based on principles of cognitive maturation (point 3 above) hinge on developmental features as represented in Piaget's concrete and formal operations stages. Children and adults would therefore learn second languages differently: the former, still having access to the Language Acquisition Device (LAD - Chomsky, 1965) used for L1 acquisition, could utilise this in much the same way for their second language; the latter, having more mature cognitive skills, could approach the second language as a series of problems to solve (Larsen-Freeman and Long, 1991: 163).

This problem-solving element is manifest in the cognitive inductive, deductive, analytic, and reasoning strategies adolescents and adults use in higher frequency and number than children (O'Malley & Chamot, 1990). Particularly in instructed learning environments, problem-solving has been identified as one of the two basic processes, along with memorisation, involved in the acquisition of explicit knowledge (Ellis, 1994b: 90). This strategic approach has been considered in the choice and design of tasks in developing the taxonomy of listening comprehension skills discussed in the last chapter and Chapter 4, as some researchers claim that such ability can develop quite early (Karmiloff-Smith, 1986).

Currently, however, insufficient investigation has been carried out into the differences between children and adults as regards the language learning processes operating. As Larsen-Freeman and Long comment, 'longitudinal child-adult interlanguage comparisons will clearly be the key, yet are virtually non-existent to date' (1991: 166-7). Larsen-Freeman and Long acknowledge that biological constraints on SLA, such as that espousd in the *critical* (Penfield and Roberts, 1959; Lenneberg, 1967) or *sensitive*

(Krashen, 1973; Lamandella, 1977; Seliger, 1978; Scovel, 1988; Breathnach, 1993) period hypothesis, might exist as a plausible explanation for the 'maturational constraints on child language development' found in numerous studies. However, they maintain that, in the absence of interlanguage comparisons, and the 'lack of any known neurological changes clearly coinciding with changes in SLA ability', they cannot assume that child and adult SLA processes are different.

3.4.2 Hemispheric orientation and lateralisation

Information on the preferred modes or channels of perception and processing of different learners helps us to ensure that the language learning materials we design cater for these preferences, thereby providing as many learners as possible with optimal learning opportunities.

Studies of neurological factors in second language acquisition are hampered by the difficulty of obtaining reliable data on the mechanisms and processes involved (Jacobs, 1988). An unfortunate factor in many of these studies is that the investigation of the cause of subjects' neurological dysfunction is frequently the purpose behind the investigation of their processing. While this has to be borne in mind as regards the applicability or transferability of the findings to normally functioning people, conclusions and speculations emerging from these studies illuminate an area of interest to us: hemispheric lateralisation.

Several researchers (Joiner, 1984; Fountain & Fillmer, 1987; Danesi, 1988; Curro, 1995) into the effects of hemispheric lateralisation on language learning advocate activities and a learning program that promote the integration of processing from both hemispheres of the brain, in order for learners to realise their maximum potential. At the same time, these researchers and others (Walsh & Diller, 1981) maintain that older learners can take greater advantage of the 'higher-order' language functions that develop with cognitive maturity. As Walsh & Diller comment (1981: 18): 'As people

grow older and cognitively more mature, their increasing higher-order cortical functions [such as semantic relations] allow them to do more than they could before with their lower-order aptitudes and functions'. This provides further evidence for the importance of the awareness-raising for metacognitive and cognitive learning strategies incorporated into the software package presented in this work.

However, as mentioned earlier, the exact nature of any relationship between neurological changes and differing processing techniques in language learning remains speculative. This is because, despite advances in the area, equipment for measuring neural activity is still not accurate enough, and because tests are so indeterminate. Thus, for example, even though the most modern techniques for mapping the activity of language areas of the brains of healthy, normally-functioning human beings can confirm the earlier findings of much of the research based on brain-dysfunction individuals (Begley, *et al.* 1992; Damasio, 1992), this information cannot yet tell us how or why the events and activity identified relate to the actual learning process. In addition, in the collection of their data, researchers are necessarily restricted to investigating neural activity in living, breathing people, and are therefore constrained in the range and nature of tests they can conduct. There remains, therefore, no reliable means of determining what exactly they are seeing, and how this relates specifically to language learning.

Nevertheless, it is important to examine other factors involved in hemispheric lateralisation, both for the purpose of demonstrating the range of such factors that contribute to individual differences among learners, and to eliminate some of these from our scope in the design of a learner-centred software package. In addition to those mentioned above, studies of hemispheric lateralisation have focussed on the influence of lateralisation on modes of teaching and learning, script nature and direction, and type of first or second language. It is the first of these areas of focus that interests us here for the design of a software package that caters for individual differences.

On the issue of mode of teaching/learning, Genesee (1982) proposes, for example, that '(w)hat distinguishes bilinguals from monolinguals when neurolinguistic differences occur, is their use of strategies that deploy the specialised processes of the two hemispheres differently'. Specifically, late L2 acquirers deploy left- and right-hemisphere-based processes differently, and these strategy differences may characterise both L1 and L2 processing.

The research suggests that children exhibit more right hemispheric involvement in language processing than adults, and that this is also true for beginning second language learners. In addition, it is hypothesised from the studies that while left hemisphere processing always predominates for language functions, there left hemisphere processing seemed greater in formal learning contexts than in informal ones. Therefore Genesee (1988) both cautions that such studies examine language *processing*, not *learning*, and cites evidence for greater left hemisphere involvement in more formal learning contexts, with greater right hemispheric processing in more informal contexts.

Possibly the most important aspect of the research into hemispheric lateralisation and differential processing is the implications of these findings for teaching and learning. Curro (1995), frames her discussion of this as the necessary consideration of bimodality in syllabus planning and task selection and design. As she explains, on the basis of research findings (Goldberg & Costa, 1981; Danesi, 1988; Palotta, 1993):

> the right hemisphere has a more compatible anatomical structure for new material. Given its intricate network of neuronal connectivity, it can accommodate information for which no preexistent codes or schemes are available. [...] According to Danesi, the construct of bimodality does not constitute a syllabus format or method. 'It simply alerts the teacher to certain fundamental requirements of human learning, such as the need to start a novel learning task in a sensorial and concrete way and to end it in a more formalized fashion (the learning flow principle)' (Danesi, 1991: 28).
>
> (Curro, 1995: 88)

Furthermore, a bimodal approach is also indicated because of the differential perceptual processing in the right and left hemispheres, and particularly in teaching and learning involving both listening and viewing. As Danesi (1987, citing Sperry) reminds us, while neuroscience has fairly clearly established that verbal thinking is represented in the left hemisphere and non-verbal thinking in the right, our current teaching and learning practices tend to neglect the non-verbal. This again reinforces the findings of Hurley (1992) and Kellerman (1992) that language learning materials incorporating the non-verbal or co-verbal aspects of language need to be provided for learners. This applies equally to computer-enhanced language learning materials, particularly those incorporating multimedia.

3.4.3 Personality and aptitude

These two areas of individual difference will be dealt with together in this section, as several researchers have observed certain correspondences between personality characteristics such as extroversion/introversion with aptitude and classroom language learning success (Hamayan *et al.*, 1977; Wong-Fillmore, 1982). Furthermore, teachers and researchers have hypothesised about the desirability of matching teaching style and the nature of classroom interaction with the personality characteristics of individual learners. While it is proposed that such matches will promote learning, little evidence has been provided for any consistency in the findings (Hamayan *et al.*; 1977; Wong-Fillmore, 1982).

In addition, personality and aptitude are both features which are relatively difficult to influence or change (Skehan, 1989: 38 - 39; 71 - 72) within a language programme. A further complication resides in the experience of researchers that tests of the existence and nature of personality traits are unreliable (Larsen-Freeman & Long, 1991; McLaughlin, 1985). Despite these difficulties, studies of personality and aptitude provide us with valuable information on the range of influencing features in the

learning process, and which characteristics might be more desirable in the promotion of learning than others, particularly as they relate to individual learning. This information then enables us to make provision in language learning programs and materials for the range of characteristics that learners bring to them.

3.4.3.1 Personality

The personality traits which occur most frequently in the literature surveyed are extroversion/introversion. In studies on the desirability of these traits in relation to success in general academic performance, it was predicted that introversion would show higher correlations with academic achievement (Entwistle and Wilson, 1977). This prediction was based on the assumption that introverted learners would be more self-reliant and more prepared to study alone. This had, in fact, been shown to be the case (Entwistle and Entwistle, 1970), though the cross-cultural applicability of the inventory used (the 'approaches to studying' inventory developed by Ramsden and Entwistle, 1981) has been questioned (Watkins, 1982). In Hattie and Watkins' (1981) study of Filipino tertiary students, for example, the researchers failed to find evidence of the study dimensions upon which the inventory is based.

In a study of the relative advantages of extroversion and introversion at primary and secondary school, Wankowski (1973) found that before puberty, extroversion was associated with higher academic achievement, with introversion being more dominant an indicator after puberty. The explanation he offered for this was that after puberty, or at high school, the nature of the teaching and testing approaches changed to favour introverted learners. In the primary school, tasks were more often oriented towards group work, while at high school, with greater subject specialisation, the emphasis was more on individual work and homework. In a self-access environment for learners of secondary and post-secondary ages, these findings indicate the necessity to provide activities that range across contexts of working alone, in pairs, and in groups, and to provide activities which help extroverted learners develop strategies for working alone.

In the field of language learning, particularly in naturalistic or communicative language learning contexts, extroversion seems to be the desirable trait, because of the emphasis, discussed in Chapter 1, on interaction and communication. Where successful language learning is gauged by the proficiency with which the learner can negotiate meaning and interact in the target language, characteristics such as sociability and seeking out occasions for interaction with speakers of the target language assist in the acquisition of the target language (Strong, 1983; Krashen, 1985; Long, 1985).

A study by Swain (1985) also indicates that not only is it necessary for a language learner to have useful or comprehensible input (Krashen, 1982) from speakers of the target language, but that it is equally important for the learner to experiment with communicating meaning in interactive encounters ('comprehensible output' – Swain, 1985). Such behaviours are typical of extroverted personalities. As the 'Good Language Learner' studies of Naiman and colleagues (1978), and others (Wong-Fillmore, 1979; Rubin, 1975; 1987) have indicated, being active and pursuing occasions for interaction are common characteristics of successful language learners. These and other characteristics will be discussed in more detail in the next chapter.

Alternatively, where language proficiency is gauged by more decontextualised means such as discrete point grammar tests, pronunciation and standardised reading tests (Suter, 1976; Busch, 1982), the correlations favour characteristics of introversion over extroversion. As communicative language teaching, which favours learner interaction, production, and engagement with the second language has been the major teaching approach since the early 80s (Swan, 1985a, b), we would expect higher correlations with language proficiency for learners with stronger extroversion than introversion characteristics. It may be the case that the relationship between extroversion and introversion and language learning has not yet become clear, because studies are hampered by the predominantly decontextualised nature of the tests of language

proficiency usually employed in such studies (Skehan, 1989). Although more communicative tests have been developed, such as those of Ingram (1984) and McNamara (1996), these have not been the tests used in studies of extroversion/introversion. Until such communicative tests are included in comparative studies of these traits in relation to language proficiency, the conclusions remain questionable. Indeed, both Skehan (1989) and Ellis (1994) argue for studies using a more naturalistic methodology in that, in addition to showing 'the dynamic nature of the interaction between the more malleable aspects of individual difference', these can 'provide measures of learning based on natural language use rather than on tests or ratings' (Ellis: 1994: 524).

Aspects of gender have also been studied in relation to personality factors in language learning environments involving computers. Abraham and Liou (1991), Underwood *et al*. (1991), Dye (1995), and Meunier (1996) have all found that females tend to be dominated by males in mixed-gender language learning activities. However, as Meunier comments (1996: 50): 'the poor performance of female students seems to be related more to interaction styles and personality differences than to their level of computer literacy'. In her study of mixed- and single-gender dyads working at a computer, Meunier finds personality to be a stronger predictor than gender of language learning and keyboard control, and, together with 'position at the computer', personality was also a stronger predictor of verbal interaction.

As a result of these findings, she recommends that (1996: 67): 'foreign language software designers should attempt to integrate more than one path of data exploration along with a large diversity of information to accommodate personality and gender differences'. Additional recommendations include: pairing linear and non-linear learners in hypertext environments 'for the purpose of being exposed to other cognitive styles' (Meunier, 1996: 67); and incorporating a 'road map' to provide linear learners with some structured support in their exploratory learning. While issues of cognitive

style will be discussed in more detail in section 3.4.4, in relation to Meunier's findings, the software package described in Chapters 5 and 6 of this work has been designed to make provision for learners' different cognitive styles and to take into account the difficulties linear learners can experience in exploratory multimedia and hypertext environments. This is achieved partially through transparent menu and navigation systems, and partially through the division of the package into three progressively less structured layers between which learners can alternate as their needs determine.

3.4.3.2 Related personality characteristics

Apart from the introversion/extroversion trait, other affective or personality characteristics, many of which are inter-related, have been investigated for their influence on second language learning. The ones which will be dealt with here include: self-esteem, anxiety, risk-taking, sensitivity to rejection, empathy, inhibition, and tolerance of ambiguity (Larsen-Freeman and Long, 1991). Anxiety in particular is mentioned by Ellis (1994: 524), along with motivation, as being one of the 'more malleable aspects of individual difference'. These will be discussed below.

Self-esteem and anxiety have been shown to have only low to moderate correlations in predicting language learning success, a certain level of each characteristic being necessary, and too much being deleterious. **Self-esteem** can be defined as 'self-judgement of worth or value, based on feelings of *efficacy*' (Scarcella & Oxford, 1992: 57), and, in common with anxiety described below, can be either a trait or global characteristic, or a task- or situation-dependent state. For example, self-esteem has been found to be relatively task- or instructor-dependent (Hyde, 1979; Chastain, 1975; Scovel, 1978), with different ratings emerging for the same learners with different teachers and subject areas. For learners with low global self-esteem, it can be built up through the use of such affective learning strategies as 'taking your emotional temperature' and 'encouraging yourself' (Oxford, 1990:21), as well as the various

metacognitive strategies involving planning and organising learning (Oxford, 1990: 20).

In a self-access CELL environment, such as the one described in Chapters 5 and 6, the issue of low self-esteem is addressed by providing a context in which learners can succeed at their own level. Referred to in the literature as 'individualised learning', this is one aspect of the oft-cited advantage of computers: that they allow learners to work at their own pace and level (Underwood, 1984: 38; Batley & Freudenstein, 1991: 10, 12-13; Weible, 1987: 81; Wyatt, 1987: 91). However, this can only apply if the appropriate materials and activities are provided and if the learner has an understanding of how to choose appropriately, as illustrated in Chapters 5 and 6.

Anxiety in language learning follows the patterns already illustrated in mainstream learning, where a critical point is reached at which learning and anxiety are at an optimum balance in relation to one another (Biggs and Telfer, 1981: 113 - 5). After this point, performance drops off rapidly as anxiety increases. Researchers in the area of language learning have defined anxiety as being either *facilitating* (Scovel, 1978), or *debilitating*. The former characteristic, which can also be described as 'positive tension' (Scarcella & Oxford, 1992: 54), promotes learning, while the latter can produce worry and self-doubt, causing the learner to participate less and perform less well. Horwitz (1990) sees the role of facilitating anxiety as being limited to simple tasks which may, therefore, exclude language learning (Williams, 1991). Other researchers (Scarcella & Oxford, 1992: 54) argue that 'a certain amount of positive tension is helpful for language learners'. In this light, Scarcella and Oxford make a claim for the use of the term *anxiety* to be restricted to negative contexts only, as this is how it is normally construed.

Performance anxiety, engendered by having to produce language or 'perform' in front of others, is most commonly exhibited in classroom contexts This is considerably eased

in a self-access situation as there are no witnesses to a learner's performance. Where the only 'witness' to one's language interaction and performance is a computer, it has been suggested that learners build a special relationship with the computer, experiencing a sense of privacy, and increasing their motivation to learn and their sense of achievement (Batley & Freudenstein, 1991: 11). It is in contexts such as this that working with computers is regarded as being less threatening than public (i.e. classroom) performance.

In common with anxiety, **risk-taking** can be a valuable characteristic in language learning (Rubin, 1975; Ely, 1986), although it may result in reduced performance when over-used (Beebe, 1980, 1983). Risks here are exemplified variously by guessing meanings, producing spoken utterances in an attempt to communicate, even though mistakes are also produced, and initiating conversations with native speakers of the target language. Such risks are a normal part of learning a language in naturalistic settings, and have been shown to characterise successful language learners (Oxford, 1990; O'Malley & Chamot, 1991). They are also an essential component of the hypothesis-testing approach to language learning (Bialystok, 1983) which is consistent with SLA research findings in studies of learners' development of their interlanguage (Selinker, 1969; 1971; 1972). Naiman (1978), on the other hand, has found little correlation, either positive or negative, between sensitivity to rejection, a trait intrinsic to risk-taking, and language learning success. One possible explanation for this could be that the test of language proficiency is not an appropriate instrument for measuring the usefulness or otherwise of this characteristic.

As well as being difficult to test accurately, **empathy** has produced mixed correlations when matched with language learning. In 1972 (b), Guiora and others hypothesised the 'permeability of language ego boundaries' in an attempt to explain the strong facility found in children for accurate pronunciation, mentioned earlier. Children, who have low ego boundaries, have less difficulty with, and attain greater accuracy in,

pronunciation of a second language than older learners. In fact, as ego boundaries increase in strength with age, this facility for accurate pronunciation diminishes. Guiora and colleagues also investigated the influence of inhibition (Guiora *et al*. 1972a) but found little firm evidence for this in either direction. Variations of both these characteristics are implicated in theories of acculturation and assimilation, which will be discussed further in the section on socio-psychological factors.

Lastly, **tolerance for ambiguity**, together with risk-taking, seem to exhibit the highest correlation with success in second language learning (Naiman, 1978; Chapelle and Roberts, 1986). Interestingly, it is this tolerance which underpins success in humanistic, top-down, or holistic approaches to language learning where the focus is on the meaning of a whole text or discourse of a text (Canale & Swain, 1980; Canale, 1983), rather than that of individual words. In order to be able to function on such a holistic basis, a high tolerance for ambiguity is necessary to avoid the anxiety which might ensue when the meaning of individual words within the text may be unknown. Tolerance for ambiguity has also been linked to self-esteem (Scarcella & Oxford, 1992), in that learners with high self-esteem are more likely to feel confident enough to accept initial lack of total comprehension or possible mismatches between their existing schema and the input they are experiencing.

If we accept this, the development and encouragement of compensation strategies such as paraphrasing and guessing (Oxford, 1990: 19) may help minimise the perception of risk on the part of students with lower self-esteem. On the other hand, too high a tolerance for ambiguity might actually inhibit language learning by not allowing learners to perceive and analyse some rules of language. As will be discussed in more detail in the next chapter, such learners need exposure to cognitive strategies such as practising, analysing and reasoning, and creating structure for input and output (Oxford, 1990).

It can be seen, therefore, that while elements of all of the characteristics mentioned in this section are typical of successful language learners, moderation in each seems to produce the best effects. Thus, while some anxiety, in the form of 'positive tension', seems to assist performance, it cannot be allowed to reach debilitating levels. Whereas good language learners have sufficient self-esteem to take risks in interpreting and producing their own utterances, they also need to cultivate a critical internal monitor of the language to which they are exposed, in order to formulate the appropriate hypotheses about its structures and functions.

3.4.3.3 Aptitude

When we come to the question of the role of aptitude in language learning, Skehan (1989: 136) comments: '(s)ome people are endowed with better cognitive/linguistic ability than others'. But what constitutes aptitude for language learning, and can it be improved through instruction, experience, acculturation, or some other means? Skehan's understanding of language aptitude can be defined in terms of learners' ability to deal with disembedded or decontextualised language – the kind of language, in fact, that was typical of traditional grammar-translation language classes and tests. Based on Carroll's (1965) comprehensive testing in the area, Skehan goes on to claim that:

> Aptitude is multi-componential [...] there are (fairly) independent components of aptitude [... such as] a language analytic capacity; memory ability; and phonemic coding ability.
>
> (Skehan, 1989: 137)

Though Skehan lists the above three components as being the most critical, Carroll also mentions a fourth component, *grammatical sensitivity*, which he interprets as the capacity to benefit from grammatical instruction when it is offered. There does, however, seem to be a close relationship between the processes inherent in grammatical sensitivity and those of a language analytic capacity, and all four components seem to

be related to cognitive perception or learning styles, which will be discussed in the next section.

The fact that these components of aptitude are identifiable provides strong grounds for the design of instructional materials that would cater for the range of individual learner needs represented. In commenting about the strong relationship found by Cummins and Nakajima (1987) between the L1 and L2 reading skills of Japanese immigrant students, McLaughlin (1990) makes the claim that some of the strength of this relationship is based on general aptitude. However, he goes on to argue that:

> [...] aptitude should not be viewed as a static personality trait; novices can become experts with experience. I believe there is an interdependence between first and second language in the cognitive/academic domain because experience with one language gives the learner strategies and metacognitive skills that generalize to subsequent languages. [...] Teachers, in my view need to do more than provide "comprehensible input". They need to make these strategies and metacognitive skills available to learners.
>
> (McLaughlin, 1990: 173)

McLaughlin's comments here are echoed in the research reported in Chapter 1 of this work in the area of socio-cultural 'apprenticeships' in the learning of a second language through adopting the social norms, practices, and patterns of the target culture, and thereby also the target language (Lantolf, 1994; Donato & McCormick, 1994). For McLaughlin, then, aptitude can improve with experience that derives from transfer of skills from the first language, and also through the development of strategies and metacognitive skills. As we will see in the next chapter, most researchers in the field of strategies have found metacognitive skills or strategies to be particularly susceptible to training (O'Malley & Chamot, 1991). This being so, there is a place for education or awareness-raising among learners in the utilisation of more productive metacognitive strategies.

In their discussion of aptitude, Larsen-Freeman and Long (1991) cite earlier work of Politzer and Weiss (1969) and Carroll (1979) as showing evidence of aptitude being unamenable to training, while Neufeld (1978) found aptitude to be dependent on experience. However, while accepting the difficulty of training learners in certain skills in order to improve their aptitude, Carroll (1965) recognises that some improvement can be achieved with high quality instruction. As Larsen-Freeman and Long (1991) argue, when instruction is of lower quality, learners are forced to fall back on their own resources, and it is in these cases that higher aptitude makes a difference.

In a study of adults studying French in Canada, Wesche (1981) found positive effects for matching learners with appropriate teaching methods and materials based on their learning style preferences exhibited in personality profiles. On the basis of this and Carroll's findings above, there seem to be clear advantages for a range of learners in using multimedia CELL materials which are learner-driven. These materials should vary in the channels of perception they activate (visual, textual, auditory), and learners should be able to choose the types of tasks and materials they feel most comfortable using. In this model, more challenging tasks and materials would be those which exploit less preferred channels of perception or strategies. As will be discussed in Chapters 5 and 6, the software package developed as a prototype of this model, for example, makes available to learners three levels of working through the material: a highly structured level, a level which focusses on cognitive demand, and an exploratory level for more autonomous learners.

Given that aptitude is an important factor in language learning, and that learners' aptitude varies, it is important that language learning materials reflect an accommodation for this variability. For a learner-centred CELL package to make such accommodation, and in keeping with Meunier's (1996) 'road map' suggestion mentioned earlier, it is necessary for learners to be able to see an overview of the structure of the lessons so that they can make informed choices about activities

appropriate to their needs. Similarly, it is important for the instructions to indicate clearly the choices and options available. In addition, the feedback mechanisms within the package need to be task- and choice-specific and to give learners access to information about the right and wrong answers and the context of and background to these.

3.4.4 Learning Styles

Much work has been done in the area of learning or cognitive styles and strategies in both general learning and second language learning. Work by Hartnett (1975 – cited in Larsen-Freeman & Long, 1991: 210) has also shown that cognitive style may, in fact, be related to hemispheric specialisation as discussed above. Most of this research has been driven by the same motivating force that lies behind research in the other areas of individual difference discussed so far: to determine what level of interaction can be found between modes of instruction and learning or cognitive style. Similarly, the impetus behind the work on learning strategies has been the extent to which educating learners in the use of more effective strategies enables them to improve their learning. As a prelude to this latter area of research, it has first been necessary to identify and, usually, classify, such strategies. Subsequently, having identified and classified the desirable strategies, it is proposed that learners of lower aptitude, or those who do not normally employ such strategies, can then be educated in their efficacy and use.

The distinction between styles and strategies has only been articulated since studies were begun on the differing performances of students on inventories of 'approaches to studying' (Ramsden and Entwistle, 1981) in study, school or learning contexts (Marton and Säljö, 1976; Svensson, 1977; Laurillard, 1979), rather than in the previous 'natural' contexts (Biggs, 1976; 1978; Entwistle *et al.*, 1979). Questions on the existence of cognitive or learning styles, their nature, and their capacity for being influenced through teaching or training, have been the subject of inquiry since the early work of Witkin (1954; 1967), Witkin *et al.* (1967; 1977) and Goodenough (1976; 1981) on

field-dependence/independence, one of the most frequently researched bipolar cognitive styles, discussed in detail below.

It is important that learning or cognitive *styles*, which refer to 'the student's preferred way of tackling learning tasks in general' be distinguished from learning *strategies* which, as will be discussed in detail later, 'concern the way a student elects to tackle a particular learning task' (Watkins, 1982: 78). It is only since the mid eighties that this distinction has begun to clarify, with the work of Oxford on language learning strategy identification and inventories (1986; 1990), Willing (1985) on learning style identification, Dickinson (1987), Holec (1987), and Wenden (1991) on strategies useful for self-instruction and autonomy, and O'Malley and Chamot (1990) on the relationship between learning style, strategies, and classroom instruction.

Early studies of learning and cognitive style began to show that there were similar, identifiable, dichotomous dimensions to cognitive style, in both the study and natural contexts, but that another dimension 'characterized by a highly organized approach to study and high achievement motivation' (Watkins, 1982: 77) also seemed to be operating. Thus, for example, in a qualitative study of student descriptions of how they approach learning tasks, Marton and Säljö (1976) were able to classify the responses generally according to whether the students were employing *surface* or *deep* levels of processing. These levels were characterised by a mechanical approach, focussing on parts rather than the whole in *surface* processing; and a holistic, structure-oriented approach in *deep* processing. However, another dimension relating to achievement orientation and attitude also emerged as an influencing factor in this and other studies examining students' approaches to learning. Aspects of achievement orientation and attitude will be discussed in detail in section 3.5.

As illustrated by the variety and nature of terms used by researchers into learning styles, a lot of confusion resulted from early analyses of learner approaches to study.

This confusion derived from problems of identification, measurement, and defining the nature of these styles: whether they were innate and fixed, or whether they were task- or context-dependent. Many of these problems arose because researchers had not yet realised the differences and interactions between 'perceptual' and application or 'strategic' processing, discussed in the following sections, which had not yet been adequately described.

The dichotomous 'surface <–> deep' dimensions mentioned above have now been clarified further, and redefined as cognitive or learning styles, while an additional dimension fits the description of what we now call learning strategies, which will be discussed in detail in the next chapter. As will become clear by the next chapter, even though the recognition and accommodation of learning styles and strategies is now fairly widely accepted as playing a crucial role in the teaching and learning process, we are still not certain of their exact nature and the interaction between them. First, however, let us examine the critical features of cognitive and learning styles as identified in various research studies.

3.4.4.1 Perception vs application

As will be discussed in detail below, early research in the area of cognitive or learning styles was focussed on modes of perception and differences in style among individuals for making meaning from input gathered by the senses, particularly sight. Later studies attempted to extend the implications of these perceptual studies into an application or implementation phase, by examining students' approaches to learning tasks (Brumby, 1982; Lam, 1982). In these studies, the basic premises were that the differences in cognitive style would affect individuals' performances and/or modes of processing or working through learning tasks. It was at this stage that clear discrepancies began to emerge as to whether learning styles are stable and static, or variable and dynamic (Brumby, 1982), as well as whether they are conscious or unconscious (Bialystok, 1985).

The implication of the latter concern is that, if conscious, they can be trainable or changeable. The emergence of these discrepancies has led to the distinction being made between *learning styles*, which have come to be regarded as mostly unconscious and innate in individuals for particular contexts (see also Larsen-Freeman & Long, 1991), and *learning strategies*, which are, or can become, conscious, and which therefore could be trainable. As Bialystok (1985: 256) states: 'Consciousness itself is not a criterion in the identification of strategies of learning. [....] [but] those strategies which are under conscious control are of course easier to identify, to discuss, to manipulate and to teach.'

Schmidt (1990: 133), on the other hand, argues that consciousness and intentionality need to be separated, as 'we often become aware of things we do not intend to notice'. While denying the possibility of subliminal perception from his data, Schmidt makes a strong claim for the possibility of incidental learning taking place while the focus of learning is on other, relevant and salient points. His necessary criterion in this process is understanding of the material encountered. Therefore, while accepting Bialystok's point about consciousness being critical to the teaching of strategies, Schmidt's refinements to the phenomenon of consciousness allow the possibility, for example, of new learning strategies being acquired by learners when the focus of material presented is listening comprehension tasks *incorporating* such strategies. This is, in fact, the paradigm underlying the simultaneous presentation of learning strategies and listening and viewing comprehension tasks in the CELL package described in Chapters 5 and 6.

3.4.4.2 Perceptual studies

Initially, Witkin's conception of cognitive style was as a bi-polar dichotomy for perception. These poles, which he termed field-dependence (FD) and field independence (FI), were identified as tendencies only, though quite stable over time. Females were generally represented slightly more highly at the dependent end, possibly

because of socialisation factors (Witkin, *et al.* 1977). Characteristics of a global, FD cognitive style included perception being 'strongly dominated by the surrounding field', a low capacity for segregating the self from the non-self, greater use of social frames of reference which influence attitudes and feelings, an orientation to be 'with people', and closer personal space. The articulated, FI cognitive style, on the other hand, was characterised by a sense of separate identity, more impersonal orientation, not being 'sensitive to social undercurrents', and individualism.

More recently, in the SLA field, FI/D has been defined as 'a cognitive style, a bipolar, stable trait affecting how one thinks, feels, and behaves'. Field Independent people are characterised as being 'analytic, confident, and self-reliant', whereas Field Dependent people are holistic, uncertain, and dependent upon others' (Chapelle & Green, 1992). Chapelle and Green go on to note that it is important to distinguish cognitive style from ability because, among other reasons, 'a cognitive style is a bipolar trait, indicating equal value for each pole' (1992: 79).

As can be seen in Figure 3.2 below, other researchers in the area of cognitive style have used various terms to describe FD, including global (Witkin, 1977), holistic (Pask and Scott, 1972), intuitive (Bruner, 1960), intuitive/random (Scarcella & Oxford, 1992), and divergent production (Guilford, 1967). These are contrasted with articulated style (Witkin, 1977), serialist (Pask & Scott, 1972), analytic (Bruner, 1960), sensory/sequential (Scarcella & Oxford, 1992), and convergent production (Guilford, 1967) respectively. One aspect on which all researchers seem to agree with regard to cognitive style is that extremes of the dichotomy are equivalent in learning potential. In other words, individuals can achieve equally on intellectual tasks, regardless of which cognitive style they exhibit, though their means of achieving the same end product may differ.

Figure 3.2 **Cognitive Style Dimensions**

Witkin (1967)	**Field Dependent**	**Field Independent**
Bruner (1960)	intuitive	analytic
Guildford (1967)	divergent production	convergent production
Pask & Scott (1972)	holistic	serialist
Witkin *et al*. (1977)	global	articulated
Scarcella & Oxford (1992)	intuitive/random	sensory/sequential

However, some researchers in the SLA field (Felder & Henriques, 1995) believe that this equality can be compromised when mismatches occur between the learning styles of members of a class and the teaching style of the teachers, where the teacher's cognitive style predisposes him or her towards presenting, teaching, illustrating, and testing in certain ways. Other researchers, while recognising the need for awareness on the part of teachers of their learners' preferred styles, emphasise the importance also of challenging their learners to experiment with and acquire new styles or extensions of their preferred styles (Smith & Renzulli, 1984; Reid, 1987; Larsen-Freeman & Long, 1991).

Although there has been some agreement on the existence of bipolar cognitive styles, other researchers are less convinced of the distinctiveness of field dependence/independence as a construct (Vernon, 1972; Griffiths & Sheen, 1992). Vernon, for example, began by questioning the effectiveness of available instruments to measure the construct. On the basis of the variety of tests used to measure FD/I, Vernon

(1972: 386), though ultimately positive, cautioned that 'it is doubtful whether different versions of the commonly used [FD/I] tests measure the same thing, and whether they do not also involve general intelligence', with only the Rod-and-Frame test[1] possibly showing the involvement of a distinctive visuo-kinesthetic factor. This comment was made in response to the conflicting findings of researchers attempting to link Locus of Control (Rotter, 1966), male-female role identification (Sherman, 1967; Vaught, 1965), cultural or ecological differences (Berry, 1966; Vernon, 1969), and personality differences, to measures of FD/I.

Along similar lines, Griffiths and Sheen (1992: 145) make the claim, on the basis of 'so few substantive findings' and the lack of consistency in measurement instruments, that FD/I 'is a wasteland, bereft of meaningless hypotheses for L2 researchers'. In addition, Reid (1987) has questioned the cross-cultural validity of the construct on the grounds that, in her study of ESL learners, differing educational backgrounds produced a different range of learning style preferences. However, she uses these findings to advocate greater variety of teaching and learning styles in classrooms. Finally, in response to Griffiths and Sheen, and after a comprehensive overview of the nature of the construct and the instruments for measuring it, Chapelle concludes that:

> life is both too short and too complex to ignore concepts such as cognitive style which express some of our intuitions about students and which facilitate appreciation for the divergent approaches to thinking and learning. [...] But, personally, I believe that the most important and relevant human constructs are those which are neither interesting to 'authorities' nor measurable at present.
>
> (Chapelle, 1992: 381)

[1]The apparatus used here was Oltman's (1968) portable daylight test as described in Vernon (1972: 369).

The general conclusion to be drawn from this and other findings discussed above therefore seems to be that the original construct of Witkin *et al.* (1977) should be approached circumspectly, and that careful consideration should be given to the applicability of various methods postulated to test FD/I. Furthermore, most researchers have acknowledged that there do seem to be certain characteristics among learners which conform to the FD/I distinction, or some similar form of these characteristics.

3.4.4.3 Application studies

In spite of the equivocation over the exact nature of the FD/I construct, numerous researchers have applied the construct in various studies. Some of the most prominent include examinations of male-female differences in cognitive style related to second language achievement (Hansen, 1984), cognitive style nurtured by socio-culturally-determined education systems (Hansen, 1984; Berry and Dasen, 1974), advantages for one cognitive style rather than the other on certain kinds of second language tests (Readance *et al.*, 1980; Stansfield and Hansen, 1983), and possible impacts of mismatch between cognitive styles of teachers and learners (Frank and Davis, 1982; Hansen and Stansfield, 1982). This last issue of cognitive style mismatch is of most interest for us in the context of providing self-access CELL materials. Particularly in a self-access context, in order for learners to feel comfortable using the materials and to be able to progress at their own pace, it is important that the organisation of the materials and the navigation through them correspond to their expectations.

Hansen and Stansfield (1982: 263), for example, discuss the finding that 'field independence, as opposed to field dependence, has been shown to play a helpful though minor role in the development of second language proficiency in a formal environment'. However, from the perspective of cognitive style affecting teaching effectiveness, 'little evidence exists that either style, in and of itself, produces better all-round teaching or learning' (Hansen and Stansfield, 1982: 264). While urging further investigation of the causal factors in their study, Hansen and Stansfield found that the

most significant advantage emerged for FI females working with an FI instructor, with only minor advantages for FD males working with an FD instructor. Alternatively, in their study, Frank and Davis (1982) found that teachers with FI preferences produced much better performances among both FI and FD learners than did teachers with FD preferences. These researchers hypothesised that FD learners were more aware of the stylistic differences between them and their (FI) teachers, and therefore attempted to model those characteristics to compensate for the absence of these characteristics in themselves.

Three major conclusions to emerge from the studies mentioned above are that analytic, inferencing tasks of the kind represented by cloze tests favour FI-style learners, that these kinds of tests are therefore culturally biased against members of some societies which are more FD-oriented, and that teachers should be more aware of the variety of their own learning style preferences and of those of their learners. As Witkin and Goodenough (1981) found, people in agrarian and authoritarian societies are generally more inclined towards FD than FI. Hansen (1984) also found that, of the five Pacific Island cultures he studied, learners from Hawaii, the least agrarian society, showed the highest incidence of FI. One additional point made by Readance *et al.* (1980) was that although FD-style learners experience more difficulty than FI-style learners in analysing information to solve a problem, they can be trained to use an analytical, hypothesis-testing approach in appropriate situations. These findings fit very comfortably with learning strategy training, and principles of learner-centred and communicative language teaching which favour greater focus on learners as individuals. Thus, materials reflecting a range of different cognitive styles will be beneficial for both types of learners, by providing them with opportunities both to work within their own stylistic comfort zones, and to extend themselves in new ways.

In an early investigation of the interaction between cognitive style and learning strategies, in a learning environment involving computers, Jamieson and Chapelle

(1987) used computerised spelling and dictation lessons. The learners in this study were from diverse L1 backgrounds learning ESL. Jamieson and Chapelle, in common with Poulisse (1989-90, found that strategy use was task-specific in that more strategies were evident for the more difficult task of dictation. Only one strategy, monitoring input, was used more by lower proficiency learners, when they listened repeatedly and carefully to the dictation passage. As regards cognitive style, the findings showed that FI learners used less advance preparation and more output monitoring (self-reflection) than did FD learners, while another individual difference factor, impulsivity/reflectivity, showed reflective learners employing advance preparation and output monitoring more than impulsive learners.

Jamieson and Chapelle collected their computer data records on learners' working styles and learning strategies, using a record-keeping program running in the background to their computerised spelling and dictation lessons. Advance preparation was inferred from the length of time a learner took to respond to a question, output monitoring was inferred from the number of times answers were edited, while the number of times learners chose to have the audio segment repeated was used to infer input monitoring. However, these findings should not be extended to apply to all tasks involving computers, and should be considered with caution from two viewpoints.

Firstly, the tasks used for this study were very restrictive and computer-managed. A different model of instructional design such as the one advocated in Chapters five and six would produce different data. Secondly, as discussed by Pusack and Otto (1995), computer records such as key strokes and time between strokes provide much extraneous data that is very uninformative. In addition, such records do not have the capacity to record more useful information such as the reasons for students' repeated listening to a particular audio segment, or the source of their difficulty. Information on these reasons could only be collected using the kinds of prompt questions and learner

self-report protocols employed, for example, by Liou (1995), in her examination of learning strategies discussed in detail in the next chapter.

3.4.4.4 Development of the concept of strategies

When other researchers (Pask, 1976; Brumby, 1982) attempted to expand the application of cognitive style dimensions from merely *perception* to the actual *implementation* of tasks and more generally to learning and memory (Goodenough, 1976), they found that other factors were operating, though it was not until later that these other factors were identified as strategies which could possibly be trained. Though he distinguished between styles and strategies, and identified that underlying his 'holistic' and 'serialist' strategies lay distinct learning styles, *comprehension* and *operation* learning respectively[2], Pask (1976) failed to specify elements of his strategies in such a way that they could be classified. For Pask, for example, the difference between learning styles and strategies was that *styles* were more generally exhibited, while *strategies* are exhibited in strictly constrained circumstances in the form of his 'conversational' systems (Pask, 1976: 133.).

Schmidt (1990) examines the relationship between language processing and learning from the perspective of consciousness. While assuming that both conscious and unconscious processing takes place in language learning, Schmidt separates

---

[2] Marton and Säljö (1976), following Craik and Lockhart (1972), make the distinction between 'surface' and 'deep' processing in memory and learning. In this approach to depth of processing, perception is built up through a progression or series of processing stages, where increased semantic or cognitive analysis is referred to as having greater depth. Greater depth of processing, in turn, produces a stronger memory trace. For Marton and Säljö, the level of processing brought into operation depends on students' perception of the demands of assessment: 'the type of test expected affects the kind of processing that subjects engage in' (1976: 115). Pask, on the other hand, claims that the requirement for understanding is 'as strong as, or stronger than, the requirement for deep-level processing' (1976: 133). He goes on to hypothesise that in classroom or self-study contexts, the requirement for understanding is relaxed, allowing learners to be more flexible in their approach, choosing to act like 'holists' (*comprehension* learners) or 'serialists' (*operation* learners), or varying their approach, depending on the subject matter.

consciousness into three different types: awareness, intention, and knowledge. This separation helps to clarify some of the dilemmas faced by second language researchers. Within consciousness as awareness, in turn, three crucial levels can be distinguished: perception, noticing (focal awareness), and understanding. From an earlier study (Schmidt & Frota, 1986) Schmidt concludes that, while there is a close association between noticing and emergence in production, the evidence is inconclusive that noticing is a sufficient condition for learning (Schmidt, 1990: 141).

It is Schmidt's contention that it is at the *understanding* level of consciousness that problem solving, and all types of metacognition, belong. This becomes a crucial distinction for the discussion in the next chapter on whether, and to what extent, learning strategies can be taught. As much of the research in this area shows, it is the metacognitive and problem solving strategies that lend themselves to successful instruction, and these strategies are also implicated in successful language learning.

In his discussion of consciousness as intention, Schmidt provides a useful corollary to Bialystock's (1984) argument against consciousness as a criterion for strategic action, by clarifying the ambiguity between passive awareness and active intent. For Schmidt, as for us, 'intentions may be either conscious or unconscious [...] and we may become aware of things we do not intend to notice' (1990: 133). Thus, learners may act strategically, with unconscious intent, or only become aware of their strategy use when it has noticeable positive or negative effects. In other words, 'unconscious learning [...] may be seen as an unintended by-product of communicative interaction' (Schmidt, 1990: 135).

Later, Brumby (1982), as a result of her research, saw the dichotomies of cognitive style as falling into two groups: those relating to the perception of a problem; and those involved in the process of integration with existing knowledge. While dichotomies in the former group, as mentioned earlier, were assumed to be equivalent in effectiveness,

those in the latter group were perceived as being hierarchic, with one pole being distinctively more effective than the other. In this latter group, Brumby (1982: 245) lists Wertheimer's (1945) 'rote-memorising' versus 'productive thinking', Ausubel's (1968) 'rote-learning' versus 'meaningful-learning', Marton's (1975) 'surface- and deep-processing' and Pask's (1976) 'operation learning' versus 'comprehension learning'. Thus, as illustrated in Figure 3.3 below, characteristics in the right-hand column are hierarchically 'higher' in that they are regarded as producing 'better' learning outcomes than those in the left-hand column.

Figure 3.3 **Integration-based cognitive styles (Brumby's Group 2)**

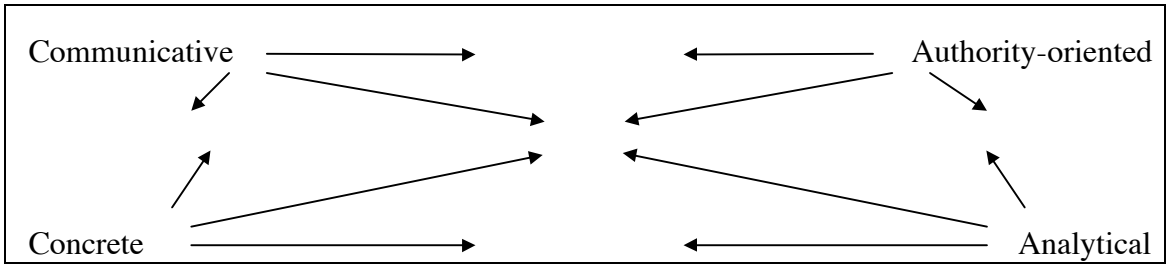
rote-memorising (Wertheimer, 1945)	productive thinking (Wertheimer, 1945)
rote-learning (Ausubel, 1968)	meaningful-learning (Ausubel, 1968)
surface-processing (Marton, 1975)	deep-processing (Marton, 1975)
operation learning (Pask, 1976)	comprehension learning (Pask, 1976)

Brumby, however, could not overcome her dilemma of whether cognitive styles were innate or learnt. In the light of the findings by Readance *et al*. (1980) that certain 'styles' can be trained, and considering that by 'styles' they were referring to what we would now call strategies, it can be determined that while *styles* may be innate (though subject to variations as described earlier), at least some *strategies* can be trained. Based on the research of Willing (1989: 139 - 146), it may in fact be the case that there are learning strategies that can be categorised as, and that are used for, becoming consciously aware of one's preferred learning styles in various language learning

contexts, which in itself is an application of *metacognitive strategies* (Oxford, 1990:21), as outlined in the next chapter.

Willing (1985, 1988) has identified four major learning styles as being useful for ESL teachers of migrants to help them develop sensitivity towards their students' individual needs and learning styles. He classified these styles as: communicative, authority-oriented, concrete, and analytical, where a person may change styles, but generally tends more toward one of these styles than another (see Figure 3.4 below). Inherent in an identification of teachers' tendencies towards any of these styles is the expectation that they will then be able to modify consciously their behaviour towards students and choose tasks for their classes that cater for a range of learning styles in addition to their own preferred styles.

Figure 3.4 **Willing's learning style classifications and their interaction**



Other researchers have focussed on sensory preferences such as visual, auditory, kinesic and tactile, particularly as regards cultural norms, values, and expectations (Wesche, 1981; Soudek & Soudek, 1985; Reid, 1987). Four major points which emerge from Reid's study of cross-cultural learning style preferences among ESL learners are that: 1) learners learn best when their styles match those of their teachers, 2) learning style preferences show strong cultural determinants, 3) because learners differ significantly in their preferences of sensory mode, so that these need to be catered for, and 4) the optimal approach is to provide learners with a range of activities incorporating different learning styles. Meanwhile, Soudek and Soudek (1985: 113) conclude that 'much of

non-verbal communication is culture-specific' and that 'by accumulating and sharing knowledge of the non-verbal dimensions of communicative competence, we endeavor to help our students not only switch from language to language, but also to switch kinesic and proxemic patterns'.

Felder and Henriques (1995) also support the need for multiplicity of exposure to different learning styles, having first identified what those styles might be in any given classroom. As they show:

> matching teaching styles to learning styles can significantly enhance academic achievement, student attitudes, and student behavior at the primary and secondary school level (Griggs & Dunn 1984; Smith & Renzulli 1984), at the college level (Brown 1978; Charkins et al. 1985), and specifically in foreign language instruction (Oxford et al. 1991; Wallace & Oxford 1992). This is not to say that the best thing one can do for one's students is to use their preferred modes of instruction exclusively. Students will inevitably be called upon to deal with problems and challenges that require the use of their less preferred modes, and so should regularly be given practice in the use of those modes.
>
> (Felder & Henriques, 1995: 28)

For Gremmo and Riley (1995), it is important that we avoid categorising learners, but instead concentrate on using the research findings on learning styles to help us set up a range of appropriate learning tasks, or a learner-friendly learning environment. In this way, we can 'help learners come to terms with their strengths and weaknesses, to learn a language efficiently in ways which are compatible with their personalities' (1995: 158). Similarly, Ehrman and Oxford (1995: 70) advocate learners 'using strategies that are not necessarily directly related to their preferred styles' and that 'indeed, to learn effectively, every student must be able to do this some of the time'. This also reflects

Kumaravadivelu's (1993) insistence on the need to design learning environments that are learning-driven in order to cater for learner diversity.

This, then, is the approach taken in the software package discussed in Chapters 5 and 6: a range of tasks and media are provided, and these tasks are designed to incorporate a diversity of learning styles as well as give learners practice in numerous learning strategies, some of which may not come naturally to them. Returning to the question of the distinction between 'styles' and 'strategies', it may be the case that styles, which emerge at the perceptual level, are innate and unchangeable preferences, but that learners can be trained to become aware of, *though not prefer*, different styles. Other 'styles' emerge at the application level and can be varied by any individual learner, according to the tasks and context. As identified above, these styles are better identified as 'strategies'. From a teacher's or material designer's point of view, instructional materials need to be designed to cater for differences in perceptual style. For application styles or 'strategies', however, learners can be trained, or made aware of, the range of more effective strategies that can be used when dealing with tasks of varying cognitive or contextual demands (Oxford, 1993). Lawrence (1984) and O'Malley and Chamot (1993: 109) also make the claim for 'a tendency to use certain learning tools (learning strategies) and to avoid others', as one interpretation of the term *learning style*.

As Scarcella and Oxford comment:

> when left to their own devices, and if not overly pressured by their environment to use a certain set of strategies, students typically use learning strategies that reflect their basic learning style (Ehrman & Oxford 1989). They can, however, learn to develop additional learning strategies and test the value of ones they already use.
>
> (Scarcella & Oxford, 1992: 63–4)

Which strategies are trainable and to what extent will be discussed in the next chapter on learning strategies. Scarcella and Oxford's comment above raises critical questions of how additional learning strategies can be developed, how learners can be brought to want to develop or change strategies they already use, which strategies can and should be developed, and whether, or to what extent, this can be achieved.

More specifically, as some of the researchers mentioned above comment, motivation, orientation, and attitudes towards and beliefs about language learning, or the learning of the language of a specific culture, are also critical in the use of learning styles and strategies for successful language learning. In fact, according to Gremmo and Riley 'it is important to keep in mind the fact that any form of self-directed learning scheme is an intervention in the social knowledge system, that is, in the set of structures and functions through which a society manages the creation, organization, distribution, legitimization and storage of knowledge' (1995: 161). The next section will deal with some aspects of these factors in relation to their susceptibility to change or training.

3.5 Characteristics more amenable to change

Having reviewed some of the characteristics of learners that are less amenable to change, we now turn our discussion towards more changeable characteristics. Prominent among these are learners' attitudes towards each other, and towards the target language and target language culture, as well as their motivations to learn. For our purposes in designing a learner-centred CELL instructional design model, these changeable characteristics are equally important, if not more so, than those that are less amenable to change. Where there is the possibility for learners to make changes within themselves, and for the software program to enhance this process, the functions of the instructional design model change from that of providing flexibility and variety, to more awareness-raising and pedagogic functions.

3.5.1 Attitude and motivation

Motivation is generally regarded by teachers, researchers in SLA, and learners as a necessary, if not sufficient, condition of language learning. As Scarcella and Oxford point out: 'regardless of whether we believe motivation to be the single primary factor, one of several equally important factors, or an intermediary factor, it is impossible to dismiss the importance of motivation in language learning' (1992: 52). Crookes and Schmidt (1989) define motivation as comprising two equally important factors: *external or behavioural*, and *internal or attitudinal* factors. The behavioural features include: decision-making (to participate in an activity or not), persistence (both over time and after interruptions), and activity level. Four factors characterise the internal perspective on motivation, namely: interest (based on learners' attitudes, experience, and background knowledge); relevance (to learners' personal needs such as achievement); expectancy (of success or otherwise); and outcomes (rewards perceived by learners, which may be intrinsic or extrinsic).

Both motivation and attitude are important to the learning process, whether before, during, or after formal instruction (Scarcella & Oxford, 1992; Skehan, 1989). In turn, there are a variety of factors which have been shown to influence motivation, though questions as to the direction of this influence are frequently raised. Thus, while studies have included parental and teacher attitudes (Feenstra, 1969; Schumann and Schumann, 1977; Buttjes, 1991; Keller, 1991), politics (Byram, 1991), and materials orientation (Risager, 1991), it is still unclear whether these factors increase or decrease motivation, or, alternatively, whether it is the level of motivation which affects the factors studied.

Skehan (1989: 49) hypothesises a distinction between Intrinsic motivation, which stems from an inherent interest in a given task, and Resultative motivation, which is influenced by the success or otherwise achieved on a task, or in a subject area. Results from the latter area of research have been relatively inconclusive, with surprisingly low correlations found between motivational levels and success. One explanation for these

varying results may actually be the range of contexts and types of instrumentally motivating factors investigated. Many of these studies have also been criticised for their lack of rigour in method and design (Skehan, 1989: 64–7). Such studies have, for example, examined factors as diverse as dominance of interaction (Strong, 1984), working with Spanish kindergarten children, to Hermann's (1980) comparison of the attitudes of first and fifth year students towards the target culture (German).

Gardner (1980) has postulated various models to account for influencing factors in motivation, including instrumental versus integrative orientation, and motivation being a sum of three factors: effort, desire to achieve a goal, and attitudes (Gardner, 1985: 9–10). For Gardner, integrative motivation, the desire to achieve integration into the target culture through learning the language, was preferred over instrumental motivation, or learning the language to achieve a goal more effectively. However, he has since (1985:169) modified this preference in favour of a more general advocacy of the importance of motivation being aroused, regardless of its source. More recently, Gillette (1987) has shown that Rubin and Thompson's (1982) argument for pragmatism (i.e. instrumental motivation) may be well-founded, particularly, as is the case of learning Indonesian in Australia, where the second language is being learnt in a foreign language context, that is, the language being learnt is not the language of the majority population.

In a comprehensive overview of the relationship between autonomy and motivation, Dickinson (1995 166) finds evidence that 'learning autonomy increases motivation and consequently increases learning effectiveness', both from theories of extrinsic/intrinsic motivation (Deci & Ryan, 1985) and attribution theory. In addition, he cites the claims of the Carnegie Project (deCharms, 1984) that 'motivation can be enhanced through encouraging learners to exert personal control over their learning and to take responsibility for it' (Dickinson, 1995: 166). As has been shown earlier, learners can achieve this through an understanding of the values of such an approach, an awareness

of techniques available to them to take advantage of self-direction and autonomy, and a supportive environment.

However, the issue of orientation (positive or negative) and attitude towards the target language and the target language culture remains a strong influencing factor in extrinsic or instrumental motivation, and to a lesser degree in intrinsic or integrative motivation. The latter, however, is more difficult to define, with researchers differing in their attributions of the same factors. Attitude and orientation are the most extensively researched aspects of this problematic area, though Peirce (1995) has strong arguments for a redefinition of the terms under which these aspects are investigated, to include the multiple social identities of the individual. Peirce (1995: 11–12) argues that 'although muted, there is an uneasy recognition by some [SLA] theorists that current theory about the relationship between the language learner and the social world is problematic'.

She then extends this statement to cite the ambiguities found in various studies of anxiety (Scovel, 1978), and personality variables and language achievement (Gardner and McIntyre, 1993), as deriving from the fundamental misapprehension that 'language learners can choose under what conditions they will interact with members of the target language community' (Peirce, 1995: 12), and that this choice is learner-motivated. However, for Peirce, many of these ambiguities can be addressed when the learner's multiple social identities, across time and different sites, are taken into account. Before taking full consideration of Peirce's theory, and its conjunction with the sociocultural model proposed earlier in this work, we need to look at the other major theories purporting to account for, or in part explain, the findings in studies of attitude, motivation, and orientation.

3.5.2 Acculturation and Accommodation Theories

Considerable research has been carried out in the areas of learners' identification with, attitudes towards, and perceptions of, the values and beliefs of the target culture and the

extent to which these factors influence learners' achievement and level of proficiency in the language of this culture. Thompson (1991), for example, in a study on pronunciation and the Critical Period Hypothesis, suggested Weinreich's (1953) 'interlingual' identification as a possible explanation for the fact that some learners just do not want to sound like native speakers of the target language. She also proposed learners' desire to maintain their L1 as another possible cause. Two major hypotheses have emerged to articulate an understanding of these findings of Thompson and others: Speech Accommodation Theory (Giles & Byrne, 1982; Beebe, 1988) and Schumann's Acculturation Model (1978, 1986).

Speech Accommodation Theory has developed to help account for the degree to which different individuals are able to integrate with the target culture, by 'explaining the interaction between speakers in terms of their feelings, values, and motives' (Beebe, 1988: 62). According to this theory, broadly speaking, the degree of learners' identification with the people of the target culture is in direct proportion to the degree of accommodation to the target language made in learners' speech. As learners become more linguistically proficient, that is, closer to the speech of the target culture, the more they are accepted by or integrated with that culture. This in turn produces the desired social and communicative advantages, as, being accepted, they come to be regarded as part of the in-group (Tajfel, 1974), thereby benefiting from more positive attitudes on the part of native speakers of the target language.

Similarly, Schumann's Acculturation Model (1978) focusses on identification with, and the relative desirability of, the target culture and language (Schumann uses the terms *social* and *psychological distance*) as determining factors in the degree of language proficiency acquired. Social distance is used to refer to an individual's membership of one social group, and the degree of contact between this group and another, the members of which speak another language. Psychological distance, on the other hand, involves affective factors more central to the individual such as culture shock, different

kinds of motivation as discussed above, and ego permeability as studied by Guiora and his colleagues (1972a).

As McLaughlin puts it: '[...] social and psychological distance influence second-language acquisition by determining the amount of contact learners have with the target language and the degree to which they are open to the input that is available' (1987:111). Thus, when the distance is perceived to be great, the learner may miss out on the necessary native-speaker input, leading to fossilisation in language development, and therefore the learner's interlanguage (Selinker, 1971) develops no further in the direction of the target language. However, the validity of this argument is questioned as to the direction of causality between attitude and motivation. It remains unclear, and, indeed, may vary with individuals, as to whether a positive attitude motivates a learner to become more proficient, or whether proficiency produces a positive attitude – or indeed, whether the two factors are mutually supportive. This remains a contentious issue, while also being difficult to test.

For the purposes of the present work, and the determination of the influences of motivation on success in language learning in a CELL environment, this problem with the direction of causality diminishes the value and applicability of Schumann's model for us. Namely, if it cannot be determined whether motivation or proficiency is the causal factor, no effective action can reasonably be taken to improve one or the other. In other words, there is insufficient evidence to support taking action to increase proficiency by trying to build more positive motivation in learners. In the meantime, as advocated by theorists in the field such as Oxford (1994), Gardner and Tremblay (1994), MacIntyre (1995; 1995a), and Sparks and Ganschow (1995), we must await further empirical research in the area to test the various aspects of theories currently being propagated.

Nevertheless, social/psychological studies have identified several trends in the relationship between various social and psychological factors and language learning. Macnamara (1973) and Genesee and Hamayan (1980), for example, found evidence that younger learners are less prone to fixed attitudes which affect their language learning than older learners. From his studies of Anglophone students learning French in bilingual contexts in Canada, Gardner (1980) suggests that attitude seems more critical in second, as against foreign, language learning contexts, where much more contact is possible between learners and speakers of the target language. In a contrastive study of learners in a foreign language context, Dörnyei (1990) finds that for such learners, beliefs about, and attitudes towards, the target culture are less specific, and integrative motivation (see section 3.5.1) is much lower than for learners in a L2 context. He also finds that integrative motivation may be necessary for learners to progress in their language development beyond an intermediate level.

Both these trends are supported by Oxford (1994a), Dörnyei (1994), and Oxford and Shearin (1994). Oxford and Shearin also explore the implications of motivational factors from other discipline areas, including Need Theories (Maslow, 1970), Instrumentality Theories (Atkinson, 1964), Equity Theories (Pritchard, 1969), Reinforcement Theories Landy (1985), and Social Cognition Theories (Locke & Latham, 1990). As a result of their analysis, they suggest a number of ways in which teachers can increase their learners' motivation, including identifying their motivational forces, encouraging a positive classroom environment, and informing learners of a range of (instrumental) motivational factors that may correspond to the needs and aspirations of different learners. As suggested by these and other researchers in this field, these are fertile areas for future empirical and ethnographic research. For the purposes of our CELL instructional design model, these issues of motivation are addressed through the provision for learner control over the materials. As will be discussed in detail in the following chapter, learner motivation to learn has been shown to increase when learners have control over the paths their learning takes (Nakhoul,

1993), and, when learners are aware of how to use this control (Stevens, 1984; Robinson, 1991).

To sum up, in the words of Scarcella and Oxford '[...] the arguments about instrumental vs. integrative motivation that have dominated the research literature might be less important than the absolute degree of motivation possessed by the individual learner' (1992: 53). As illustrated by Oxford and Nyikos (1989) mentioned above, and Genesee, Rogers and Holobow (1983), motivation can often be the catalyst needed to progress in one's language learning, by stimulating the search for, and acquisition of, more effective learning strategies. Although some individual difference factors may be necessary conditions, others may merely constitute 'typical' or 'graded' conditions (Ellis, 1994).

3.6 Conclusion

To reframe this discussion of individual differences within a sociocultural framework, it is useful to return to the contentions of Peirce (1995), that individuals differ, not only from one another, but also within themselves from one point in time to another, and from one context to another. Having reviewed the literature on individual differences from perspectives of age, maturation, hemispheric differentiation, personality, aptitude, learning styles, and motivation, we see that social factors, as much as psychological or neurological factors influence a learner's capacity for, and success in language learning.

Three critical elements emerge from this wide-ranging discussion. Firstly, that learners can be assisted in compensating for characteristics less appropriate to successful language learning by helping them develop stronger characteristics in other areas. Secondly, that learners need to move out of their individual 'comfort zones' in order to participate productively and effectively in the learning process, and to carry the learning beyond the immediate task to novel situations. Thirdly, that learners need information, support, and the infrastructure to negotiate this development – that they

need not only to be given control, but also to be provided with the means by which to take control on their own terms.

Because of the indeterminacy pervading most of the findings in these areas, we cannot, therefore, afford to be overly specific or restrictive in the way we conceptualise learner differences, or in the approaches from which we design instructional or learning materials purporting to recognise these differences. It is therefore necessary, in a Computer-*Enhanced* Language Learning package, to cater for this range of diverse influences in order that language learning can be enhanced for as many learners as possible. In a multimedia CELL environment, this can be achieved through the provision of materials based on a variety of media and content, and utilising a range of task responses which favour different learning styles and sensory preferences.

As mentioned earlier, the mobilisation of learning strategies, particularly metacognitive strategies, and more particularly strategies appropriate to individual learning style preferences, plays a significant role in helping learners towards language learning success. In the following chapter the conceptualisation, existence, identification, and teachability of language learning strategies will be examined in the light of research and theory. When we combine this with our understanding of individual differences, listening and viewing comprehension theories, and the concept of learner- and learning-centred instruction, we will then be able to construct the framework for the multimedia CELL package described in subsequent chapters.