



Implications of Multiple Intelligences Theory for Second Language Learning

Elisabeth Smith

ABSTRACT Gardner's (1983) theory of Multiple Intelligences is causing some educators to reassess classroom practices, not only in Primary education, but also in other areas of teaching and learning. Through a literature review this paper outlines the current theory relating to child language acquisition and adult second language learning. It discusses the principle variables that affect adult language competencies. Gardner's theory of Multiple Intelligences is outlined and key features are discussed. A number of projects that implement the theory are described. Whilst Multiple Intelligence theory does not address adult second language learning directly, the relevance of the theory to this area of education is proposed.

WHAT IS LANGUAGE?

In order to understand the process of learning a second language as an adult it is useful to determine what it is that is being learned, and how an adult's language learning is different to learning a language as a child.

Language is fundamental to being human but a concise, accurate definition of language is difficult to find. The Shorter Oxford English Dictionary defines language as "the whole body of words and of methods of combining them used by a nation, people or race". Essentially language involves an arbitrary system of vocal and visual symbols, and gestures, by which ideas and feelings are communicated to others. Wolfgang (1979) suggests that communication takes place simultaneously on three levels: the verbal, the non-verbal and the cultural.

However, a simple definition does not capture the complexities involved in using a language. In order to communicate an idea or feeling verbally, people must first have the physical skills to produce the intricate sounds and sound patterns needed to make the words of which language is composed. They must understand semantics - the meanings of words singly and in combination - and know that a group of words can have a literal and a non-literal meaning (as with metaphors and idioms). It is also necessary to know that there are infinite potential combinations

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of words and word groups or phrases, but certain structural rules (syntax) must be followed when putting words together (Fromkin, Rodman, Collins & Blair, 1990). Furthermore, language exists within, and varies according to the context in which it is being used. Language taken out of context can have its meaning changed or lose its meaning entirely. A language can be subtly modified by the regional differences and social variations of its users. Yet, despite these complexities, most of us learn our first language effortlessly as small children.

CHILD LANGUAGE ACQUISITION

Children are not taught oral language, as they are not taught to walk. By about the age of four, according to researchers such as Brown (1973) and Halliday (1975), most children can comprehend complex language and use most of the major language structures, with no formal instruction. Their verbal skills continue to develop rapidly during the first eight to nine years of life. Over the last three decades there has been a great deal of psycholinguistic research into how this process takes place. Three major approaches attempt to explain child language acquisition: the behaviourist, nativist and the functional theories. These are now summarised.

1. Behaviourist Theory

The behaviourist approach contends that children learn language through imitation, repetition, and the reinforcement of the successful linguistic attempts. Mistakes are considered to be the result of imperfect learning or insufficient opportunities for practice. A problem with the behaviourist theory is that it fails to explain how children can understand utterances they have never heard before, or produce new and unique utterances. How is it possible to become competent in the complex process of language learning at such a young age?

2. Nativist Theory

The nativist approach proposes that language acquisition is a biologically innate ability, and that humans have a predisposition to language learning. Chomsky and McNeill (Smith & Miller, 1966) argue for the existence of a *language acquisition device* (LAD), a latent biological structure that allows children to systematically perceive the language around them, and internalise the language system. This would explain why children are able to learn the complexities of language in such a relatively short time. This approach suggests the concept of a basic language structure, a *universal grammar*, the principles of which underlie all human languages (Brown, 1994).

Lenneberg's concept of a *critical age* (Sacks, 1989) is an important aspect of the innateness proposal. He suggests that there is a biologically pre-determined

period of life during which language can be acquired most easily. Beyond this time language becomes increasingly difficult to acquire (Brown, 1994).

3. Functional Theory

More recently a third possibility to account for child language acquisition has emerged. The functional approach suggests that language development cannot be studied in isolation from other aspects of child development, and should not be separated from the intent of the language. Halliday's research (1975) indicates that children produce meaningful expressions well before the first recognisable words appear.

Language acquisition is an interactive process, and a child's two-word utterance can have a variety of meanings, depending on the context in which it is used. Lois Bloom (1971) uses the example "Mommy sock", which she found could have up to three meanings for the child. Bloom concludes that children learn the underlying structures of language, not the superficial word meanings.

The functional approach is a more holistic view of child language development. While accepting that language learning is an innate process, it suggests that the functional aspects of language, and the details that differentiate one language from another, are learnt by children through interactions with those around them.

LATERALISATION AND LANGUAGE ACQUISITION

There is a large body of neuro-linguistic research concerned with the links between brain structure and language. One outcome of this research has been the concept of brain lateralisation. As the human brain matures certain cognitive functions are assigned to either the left or right hemisphere of the brain. The left hemisphere is said to deal primarily with language and mathematical processes, and analytic, logical and intellectual functions, while the right hemisphere is involved with functions related to emotional and social needs, and music and visual processes.

Lenneberg suggests that the process of brain lateralisation starts at about two years of age (Brown, 1994), and is completed by puberty. However some researchers believe it may be completed even earlier. Krashen (1973) contends that it is finished by the time a child is five years of age, which explains why very young children are so linguistically fluent.

The concept of lateralisation will be further examined in the section discussing the neurolinguistic aspects of adult second language learning, as it has important consequences in this area.

ADULT SECOND LANGUAGE LEARNING

Most young children are able to learn languages naturally and unselfconsciously. However Krashen (1982) suggests that adults learning a second language require “the conscious knowledge of a second language, knowing the rules, being aware of them, and being able to talk about them” (p. 10).

Research into first language acquisition provides useful information about the process of second language learning in adults, but does not provide direct parallels. To identify factors that do affect successful adult language learning it is necessary to examine separate research into the process of learning a second language as an adult.

Krashen (1982) believes that there are two parts to the processes by which adults develop second language competence. They must first learn the rules of the language in an orderly, systematic way. To some extent, therefore, second language learning mirrors the first language acquisition process. Most adults learning a second language are already competent language users. The concept of a *universal grammar* assumes that they are familiar with, and use, the underlying structures of language even if it is at a subconscious level (Fromkin, et al. 1990).

However, competency in a second language does not simply depend on the ability to memorise new linguistic structures and vocabulary. Krashen also believes that adults acquire language at a subconscious level, and communication can “feel” right or wrong. Strozer (1994) also agrees that language rules become internalised, hence the learner is able to use them to construct new utterances.

Adults who are highly competent in the use of their first language do not necessarily become competent second language users (Brown, 1994). Successful second language learning is affected by a complex combination of affective and cultural variables. These variables are explored more fully in later sections in order to assess their influences. Cognitive differences are also important aspects of second language learning, and these are also examined more closely.

NEUROLINGISTIC FACTORS

The process of lateralisation may explain the cognitive differences underlying first language acquisition by children and adult second language learning. It appears that lateralisation is an ongoing process that begins in childhood, and is complete by puberty. The end of Lenneberg's critical age for language acquisition seems to coincide with the completion of lateralisation (Fromkin, et al. 1990). The unconscious process of language acquisition appears to be progressively replaced by the more conscious learning process of an adult.

All adult brains may have completed the process of lateralisation, but adults do not all learn languages at the same rate or with the same degree of competence. Neurological changes between childhood and adulthood may therefore explain some of the differences between the first and second language acquisition processes, but do not account for the differences between adult second language learning competencies. There must therefore, be other factors which affect successful adult second language learning.

AFFECTIVE VARIABLES

Although language, cognition and emotions can be examined individually, in reality they are difficult to separate. Language expresses emotions, and emotions effect language. Language is bound to, and reflects, every aspect of human behaviour. Some explanations for adult learning variations are found within the affective and socio-cultural aspects of human behaviour. For example, Horwitz (1995) argues that foreign language learning “demands a level of personal engagement unlike ... any other subject-matter studied in academic settings” (p. 573), and that the process of language learning challenges adults’ perceptions of themselves.

Within the affective domain there are a number of emotional variables that, in combination, form an individual’s personality. The main variables that have been found to affect second language learning success are self-esteem, inhibition, risk-taking, anxiety, empathy and motivation (Brown, 1994). Because of the highly subjective nature of emotions, and their effects, definitive research outcomes are difficult to establish. Humans are complex combinations of these and other factors, but a brief examination of each variable may indicate some of the reasons for second language learning success or failure.

Self-esteem is important when undertaking any new activity. Coopersmith has defined self-esteem as “a personal judgement of worthiness that is expressed in the attitudes that an individual holds towards himself” (Brown, 1994, p. 137). There seems to be a correlation between positive self-esteem and second language learning success. People have an in-built set of defences and inhibitions to protect their sense of self, but second language learning necessitates the making of mistakes, and mistakes can be threatening to one’s ego (Horwitz, 1995). Inhibition is difficult to measure, but second language learning seems to be more successful when levels of inhibitions are reduced.

Closely connected to self-esteem is risk-taking, the capacity to be able to make mistakes without being too restricted by concerns about how others perceive these mistakes. High risk taking behaviour is not necessarily good for language learning. In fact Beebe (Brown, 1994), found that, because they make calculated,

thoughtful guesses, moderate risk-takers are the best language learners. Low risk-takers' answers are likely to be correct, but their progress will be slow, and high risk-takers may be somewhat thoughtless and wild in their communication attempts, according to Beebe (Brown, 1994).

Anxiety is closely related to self-esteem, inhibition, and risk-taking. However, as with risk-taking, there seems to be an optimal level of anxiety for successful second language learning. Bailey's study (1983) found that anxiety can have positive learning effects. Just enough anxiety discourages the learner from becoming too relaxed and helps to keep them focused.

Empathy is a variable that is closely linked to the social aspects of language. It involves the ability to identify, understand and feel what another person is understanding and feeling. Effective communication involves both verbal language and non-verbal interactions, and an understanding of the other person's cognitive and emotional state. As with the other affective factors, empathy is difficult to measure, but it is likely that a high degree of empathy is an indicator of second language learning success (Brown, 1994).

Motivation is often cited as the key to learning success in any field. There are two aspects of motivation that affect successful learning: intrinsic and extrinsic motivation. Intrinsic motivation takes place when feelings that are internally satisfying, such as pride, or increased self-esteem, provide the reward for the activity. Extrinsic motivation means that learning takes place in anticipation of some outside reward. Maslow (1970) claims that intrinsic motivation is more powerful than extrinsic motivation.

CULTURAL VARIABLES

Underlying the complex combinations of affective variables that make up an individual's personality are the cultural differences that an individual brings to the learning situation. Culture governs behaviour at a sub-conscious level. It is "an organised body of rules, allowing for individual differences, concerning the ways individuals bound together by such things as common boundaries, customs, institutions, values, languages, non-verbal behaviour, arts, should behave towards one another and toward objects in their surroundings" (Wolfgang, 1979, p. 162). Culture is not fixed. It is always changing and evolving. Language is an important manifestation of a culture, and learning a second language involves some degree of learning about the culture of which the language is a part.

Learners must discern important differences between their own culture and the culture of the language to be learned. Gardner and Lambert (1972) argue that a positive attitude towards the new language, and a desire to know the culture, are

related to higher levels of achievement in foreign language learning. Language learners need to recognise that cultural groups have different characteristics, and may have different sets of values and beliefs, but the learner also needs to be cautious not to stereotype these differences by oversimplifying them.

The process of learning a second language as an adult is therefore a highly complex and individual one. Whilst it is possible to identify some ideal states for the affective and cultural variables that are involved in second language learning, it appears that there is no one combination of these variables which will result in second language proficiency. As well as language and cognitive functions, affective and cultural aspects of communication are closely connected. Horwitz (1995) states that “successful language learning depends on the emotional responses of the learner as well as their cognitive abilities” (p. 576). Therefore the relationship between intelligence and the acquisition of second language learning needs to be examined.

LANGUAGE AND INTELLIGENCE

The concept of “intelligence” and the use of the term have become part of everyday life. It is the consequence of research that took place early this century and which has had lasting influences on how individual differences in ability are perceived today. Binet’s work, in 1905, in which he developed an individual test of intelligence in children, has been adapted and modified many times (Coleman, 1977). Early research by Spearman (1927) attempted to chart intelligence and abilities in whole populations, in order to establish a single measure of ability, that could be described as general intelligence, sometimes labelled the *g* factor (Morgan, 1996). The results of recent cognitive research by Gardner (1983) and Sternberg (1985), which offers different explanations of what constitutes intelligence, has begun to change the perception that intelligence is a single construct.

How intelligence is established, and what constitutes being “intelligent” has implications for second language learning. Why aren’t “intelligent” people necessarily better at learning a second language? There are many affective and cultural variables that have an important impact on second language learning success, but how are they related to cognitive ability? The traditional IQ-based view of what constitutes intelligence does not offer sufficient explanation for why some people, who may be considered to be highly intelligent according to test scores, are not successful second language learners.

Attempts to establish a scientific measure of intelligence began early this century. The *Binet-Simon Scale* was developed in 1905 (Coleman, 1977) and became the first intelligence testing apparatus. In 1916 it was adapted at Stanford University,

and the *Stanford-Binet Scale* introduced the concept of an intelligence quotient (IQ) (Coleman, 1977).

The *Wechsler Intelligence Scale for Children-Revised* (WISC-R) test, devised by Wechsler in 1974, is based largely on the Binet scale. It is commonly used for screening children aged between six and sixteen to decide on placements in giftedness and special needs programs

Although this type of testing is useful, recently there has been dissatisfaction with the test results and the ways in which they are used. IQ tests can predict school performance with some accuracy, but do not reflect post-school professional and personal performance as effectively. They mostly assess logical-mathematical and linguistic skills, which are only part of the range of skills and abilities that any person has. Their design favours people who have had a Western-type schooling, in which language and mathematics are the main focus. Using such tests to place students in schools according to test outcomes disadvantages students whose language and socio-economic backgrounds are different to those for whom the test was designed.

In the 1960s Guilford (Coleman, 1977) developed an elaborate model by which intelligence was separated into one hundred and twenty independent components, and tests were designed to assess each of them. The results of these tests can be combined to form single estimate of general intelligence; however, this model is unwieldy and difficult to use as a measurement tool.

Recently two more manageable descriptions of what constitutes intelligence have been put forward by Howard Gardner (1983) and Robert Sternberg (1985), in an attempt to overcome the shortcomings of previous models.

Gardner suggests a theory of *Multiple Intelligences* (1983). He identifies seven categories of skills and abilities which he considers to be individual intelligences: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal and intrapersonal. He believes that these discrete abilities operate together in complex ways, and provide a much more comprehensive view of what constitutes human intelligence.

Sternberg (1985) proposes a *Triarchic* view of intelligence which takes into account the cultural aspects of intelligence and its underlying mechanisms. He proposes three subtheories which, viewed together, constitute intelligence. The contextual subtheory suggests that intelligence is a reflection of people's ability to adapt and shape their environment to make it fit their skills, interests and values. Different adaptive behaviours will be valued in different cultures. The experiential subtheory suggests that the ability to deal with novelty is an important part of intelligence. The

componential subtheory deals with the mechanisms by which intelligent behaviour is accomplished. Sternberg (1985) identifies three components, or cognitive structures and processes, which underlie intelligent behaviour. They are metacomponents, performance components and knowledge acquisition components.

Both these theories are valuable because their broader, context-based explanations of intelligence take into account the cultural and environmental aspects of people's lives. However, it is Gardner's theory, and his more recent work focusing on its educational implications, that seems to be having the greatest impact in the area of primary and secondary education. The theory of Multiple Intelligences is also beginning to influence second language learning programs. In my opinion, his explanation of intelligence is important because it offers a rationale by which the cognitive, affective and socio-cultural variables which affect proficiency in second language learning as an adult can be more easily explained.

GARDNER'S THEORY OF MULTIPLE INTELLIGENCES

Gardner's work during the early eighties investigating human cognition led him to develop his theory of Multiple Intelligences. Gardner (1993) believes that intelligence is not just a single construct, as it has been perceived and measured in the past, and that the notion of intelligence must be viewed within a cultural context. Intelligence involves the "ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (p. 15).

CRITERIA FOR IDENTIFICATION OF INTELLIGENCES

Gardner (1983) established eight criteria, which provide a theoretical foundation for identification of individual intelligences. Each group of skills or aptitudes must meet all, or most of the criteria in order to be considered an intelligence. The criteria are:

Potential isolation by brain damage: brain lesions can selectively impair one intelligence while leaving others intact.

The existence of savants, prodigies and other exceptional individuals: Some individuals exhibit highly uneven profiles of abilities.

An identifiable core operation or set of operations: each intelligence has one or more basic information processing mechanism that deals with a specific kind of input e.g. a sensitivity to pitch for musical intelligence.

A distinctive developmental history and a definable set of expert "end-state" performances: intelligences have an identifiable developmental profile, some recognisable milestones, and, in exceptionally talented or highly trained individuals, an *end-state*, the highest level of competence.

An evolutionary history and evolutionary plausibility: each intelligence has historical roots in the evolution of the human species, and even in the evolution of other species.

Support from experimental psychological tasks: cognitive psychologists are able to study specific skills, such as memory, perception or attention, in isolation from other cognitive functions, indicating the autonomous nature of each intelligence.

Support from psychometric findings: Gardner suggests that a reinterpretation of standardised test findings, such as the WISC or *Coopersmith Self-Esteem Inventory* (Armstrong, 1994) may provide support to the concept of multiple intelligences.

Susceptibility to encoding in a set of symbols: each intelligence has its own culturally originated symbol or notational system.

THE SEVEN INTELLIGENCES

With these criteria in mind Gardner (1983) identifies the main skills and abilities which constitute each of the seven intelligences. The following section lists the major features of each of the seven intelligences.

Linguistic intelligence: is the capacity to use words effectively both orally and in writing. It comprises a sensitivity to the sounds, meanings and functions of language.

Logical-mathematical intelligence: is the ability to use numbers effectively, manage long chains of reasoning and involves an awareness of logical and numerical patterns.

Spatial intelligence: is the ability to form a mental model of the visual-spatial world, and to be able to manoeuvre the model. It also includes sensitivity to colours, lines, patterns, spaces and forms, and the relationships between them.

Bodily-kinesthetic intelligence: is the ability to solve problems or form products using all or part of one's body.

Musical intelligence: is the ability to perceive, transform, discriminate between and express musical forms and includes a sensitivity to rhythm, pitch and timbre.

Interpersonal intelligence: is the ability to understand the feelings, motivations and moods of other people, and respond appropriately to them.

Intrapersonal intelligence: is the ability to understand oneself, to assess one's strengths, weaknesses and emotional states, and act effectively using this knowledge. It is the intelligence most difficult to define, as its expression often depends on the use of other intelligences, such as music or language.

IMPORTANT ASPECTS OF MULTIPLE INTELLIGENCES THEORY

All people from all cultures possess "core abilities in each of the intelligences" (Gardner, 1993. p. 28). How the intelligences function in individuals will vary, from the extreme of high-level functioning of most intelligences in exceptionally talented

individuals, to people with extreme disabilities, whose whole range of intellectual capacities is severely damaged. Gardner believes that most people function somewhere in the middle, with one or two highly developed intelligences, moderate development of another couple of intelligences, and the rest relatively undeveloped.

Gardner (1983) proposes that each intelligence has a *developmental trajectory*, that is, a natural process of development. Intelligences move through stages beginning with a *raw patterning ability*, which appears universally, to experience of a *symbol system*, and then to a *notational system*, such as mathematical numerals and symbols or musical notation. During adolescence and adulthood the intelligences are expressed through *vocational and avocation pursuits* such as accountancy, or economics for logical-mathematical intelligence.

Gardner believes that there is different time of commencement and a different developmental trajectory for each intelligence, and developmental peaks occur at varying times during a person's lifetime. Prodigies give a clear indication of the developmental profiles of each intelligence. Linguistic intelligence develops early and with great rapidity in very young children, while mathematical ability emerges later but generally peaks relatively early.

Gardner also considers that most people develop each intelligence to an adequate level of competency. However, given the right set of circumstances, such as exposure to the raw materials of an intelligence, and appropriate training, such as the Suzuki method of music training, everyone has the potential to develop the intelligence to a higher level of functioning (Gardner, 1993).

During early childhood, in particular, but at any time during a person's life, experiences occur through which particular interests and abilities can be discovered. Gardner (1993) refers to these as *crystallising experiences*. They are turning points in the development of talents and abilities, and mark a special affinity to a domain within an intelligenc.

Although Gardner identifies and examines the seven intelligences separately he does this only in order to point out the important features of each intelligence. Gardner maintains that it is only in very rare instances that one intelligence exists by itself, such as in the case of savants. Intelligences interact in complex ways, and nearly every cultural role requires several intelligences. Gardner (1993) believes that it is important to perceive individuals as "a collection of aptitudes" (p. 27), rather than being identified by the conventional single IQ measure.

Because Gardner believes that intelligences operate within cultural contexts he maintains that there are many skills and abilities that are indications of particular intelligences. No one set of attributes, activities or products indicate intelligence in

a specific area. Linguistic may be expressed through the writing of a best selling novel or, in a society with no written tradition, through the passing on of oral history.

Intelligence seen in terms of an IQ factor, or *g* factor, tends to assume that this measurement remains constant throughout a person's life. According to Gardner's theory intelligence is not fixed. Individuals will differ in the intelligence profiles with which they are born, and in the profiles they develop as adults, due to a combination of opportunities to explore materials that elicit particular intelligences, encouragement and appropriate training. The *surrounding culture* has an important role in determining which aspects of a particular intelligence will develop, and the extent of that development (Gardner, 1993).

Gardner concedes that through further investigation the list may expand to include other intelligences, or an intelligence may be rejected because it no longer meets the criteria.¹ Armstrong (1994) suggests a list of proposed intelligences, which includes spirituality, moral sensibility, sexuality, humour, intuition, creativity, culinary ability, olfactory perception, and the ability to synthesise the other intelligences. However these, and any others that may be suggested, must be able to meet the eight criteria in order to be considered to be intelligences in the theoretical framework that Gardner suggests.

One of the most important aspects of the theory of Multiple Intelligences is the emphasis it places on the cultural context within which the intelligences operate. Also of importance is Gardner's belief that most activities and pursuits require the interaction of a number of intelligences (Gardner, 1983). This has important implications for education because it challenges the logical-mathematical/linguistic emphasis of current Western educational practice. Gardner is interested in developing the creative intelligences in school programs, and the Arts PROPEL project in which he is involved is discussed in more detail in the section detailing applications of Multiple Intelligences theory. However, while some educationalists (Lazear, 1990 & 1994; Armstrong, 1994; Campbell, 1994) have developed materials to assist in the implementation of Multiple Intelligences theory in primary schools, it seems to have little an impact on secondary education so far.

A limitation of the theory of Multiple Intelligences for this project is that it seems to be mainly concerned with children and adolescents, and makes little reference to possible applications of the theory to adult learning, or to the much more specific field of adult second language learning. It is therefore necessary to examine the work of other researchers (Brown, 1994, Diaz & Heining-Boynton, 1995) and to

¹ Since this project was completed Gardner has identified another intelligence, the Naturalist intelligence. Checkley, K. (1997) The first seven... and the eighth intelligence: A conversation with Howard Gardner. Educational Leadership: Teaching for multiple intelligences. *ASDC* 55 (1), 8-13

make my own interpretation of some aspects of Multiple Intelligences theory as it relates to adult second language learning,

MULTIPLE INTELLIGENCES THEORY AND ADULT SECOND LANGUAGE LEARNING

Language learning would seem to be essentially a linguistic process, but someone with a highly developed linguistic intelligence, as measured by conventional IQ tests, is not necessarily a successful second language learner. Gardner's (1983) theory of Multiple Intelligences, with its broad, culturally based view of what constitutes intelligence, indicates that, as with all human activities, language learning is a complex interaction of a number of intelligences. This model offers a cognitive explanation for the differences in adult second language communicative competence, which the traditional views of intelligence do not.

Language is a social interchange, and interpersonal and intrapersonal intelligences interact in complex and subtle ways during the communication process. Interpersonal intelligence can be seen to play a key role in second language learning. Empathy is an aspect of interpersonal intelligence involving the ability to understand people and respond to them appropriately, and those with a high degree of empathy seem likely to more successful second language learners. Language is one of the ways in which people respond to each other. Effective communication calls for empathy, which allows an ongoing assessment and modification of what is being said, how it is being said and the body language that accompanies it.

Equally fundamental, but more difficult to quantify because of the difficulties in measuring and expressing aspects of self-knowledge, is the role of intrapersonal intelligence in second language learning. Intrapersonal intelligence is highly involved in adult second language learning. Many of the affective variables that are important factors in second language mastery, such as self-esteem, inhibition and anxiety, are aspects of intrapersonal intelligence. Horwitz (1995) considers that "successful second language learning depends on the emotional responses of the learner" (p. 576). A well-developed intrapersonal intelligence enables one to understand both personal strengths and weaknesses, and recognises the way in which these are challenged by second language learning.

Gardner considers that competencies in all intelligences may be improved at any time during a person's life. Language learning programs, which take into account the emotional needs of the students, may offer a means by which interpersonal intelligence may be enhanced and result in more successful second language competencies.

Learning a language is learning about a culture. The cross-cultural aspects of language learning are closely linked to interpersonal intelligence through the expression of the positive or negative attitude of the learner towards the culture of the language to be learned. Horwitz (1995) notes that of the learner's desire to assimilate into the new culture is an important motivational factor that enables them to move beyond rudimentary communication skills. According to Diaz and Heining-Boynton (1995) authentic cultural understanding can be acquired through the interactions of a variety of intelligences, but particularly by the engagement of the intrapersonal and interpersonal intelligences.

Non-verbal communication plays an important part in the communication process. Wolfgang (1979) states that language and non-verbal language are "interdependent, used simultaneously, and are largely culturally bound" (p. 162). He argues that communication requires an understanding of such "non-verbal signals as gestures, spatial relations, touch and temporal relationships" (p. 161). There are many subtle differences in facial expression, gesture, posture, and head movements used in communication between cultures. Bodily-kinesthetic intelligence may improve awareness of, and enhance the learner's ability to use appropriate body language.

The way space is used, and degrees of physical contact in interpersonal interactions vary between cultures. Spatial intelligence may enhance sensitivity to attitudes about personal space, and allow the learner to assimilate culturally appropriate behaviours more quickly. Brown (1994) also suggests that spatial intelligence may effect the degree to which learners are able to become comfortable in new surroundings.

There are some important features of language that may have strong links to musical intelligence, and are even described using the same terms. The most important of these are pitch or tone, intonation and stress. Speakers of all language modify the pitch of their voices when they talk. The majority of languages are tonal languages, languages which vary pitch on individual syllables to change the meaning of the word. In some languages, such as English, the pitch contour or intonation of a phrase changes the meaning of the whole sentence, or indicates the attitude of the speaker. In many languages one or more of the syllables in words are stressed, or receive more emphasis. When words are combined in sentences, one of the syllables receives greater stress than the others (Fromkin et al. 1990).

It is difficult for someone whose native language is tonal to become familiar with, and competent in using pitch changes to give meaning to a whole phrase rather than individual syllables. Alternatively, for those whose first language is based on the use of intonation, distinguishing between tonal variations can be difficult. Musical intelligence might explain the difficulties some learners have in perceiving

changes in pitch, differences in intonation, and stress patterns, and the apparent ease which others seem to manage this aspect of language learning.

Brown (1994) suggests that bodily-kinesthetic intelligence may also be important for learning the phonology, or the sounds, of a second language. Speech involves the use of several hundred muscles that control the tongue, mouth, larynx and throat. During childhood children develop the control necessary to make the complex sound combinations used in speech. Brown (1994) points out that it is often difficult for adults to acquire authentic pronunciation of a second language. It takes much practice and repetition to learn how to make unfamiliar sounds, and to use them fluently. However, some individuals are able to learn to speak a second language with little or no accent, and it may be that having a highly developed bodily-kinesthetic intelligence assists in the control of speech muscles to reduce first language accent interference.

Many adult learners of second languages find that is not enough to hear the words and sentences, but seeing the written aspects of the language is beneficial in remembering vocabulary. Because spatial intelligence involves sensitivity to shape and forms in space, the visual reinforcement of language is important to people who use spatial intelligence to solve problems.

Linguistic intelligence plays a part in the complex process of communication, but interpersonal, intrapersonal, musical, bodily-kinesthetic and spatial intelligence are also highly involved in the process of learning a second language. There may be aspects of logical-mathematical intelligence involved in second language learning, but these are less apparent than the other intelligences. The single construct view of intelligence has not provided an explanation for the differing levels of mastery that adults achieve when learning a second language. Gardner's multi-faceted theory of Multiple Intelligences, with its underlying recognition of diversity in human skills and abilities, which combine to produce a unique intellectual profile, provides a more satisfying explanation for these variations in communicative competence.

APPLICATION OF MULTIPLE INTELLIGENCES THEORY

Projects involving Howard Gardner

Gardner considers that the a "principle value" of the theory of Multiple Intelligences will be its potential contribution to educational reform (Gardner & Hatch, 1989), particularly through a broadening of the curriculum to allow for the variations in student intelligence profiles, and by diversifying assessment methods.

Since publishing *Frames of Mind* (1983) Gardner has been closely involved in a number of projects in the U.S.A., which investigate the implications of his theory. One of these is Project Spectrum, which has been developed with teachers to

enable pre-school and kindergarten children to explore various intelligences and interests (White, Blythe & Gardner, 1992). Another is Arts PROPEL which operates at the junior and senior high school level to develop an approach to assessing artistic learning. This is an area that Gardner feels has been neglected by school assessment measures in the past (Gardner & Hatch, 1989).

Another important project is the Practical Intelligence For School project (PIFS) (White et al. 1992). It is aimed at students in the middle school (eleven and twelve year olds) who might be at risk of school failure. The PIFS model is multi-faceted and based both on Gardner's Multiple Intelligences theory and Sternberg's Triarchic model of intelligence. It focuses on practical skills such as being organised and understanding individual working styles, that is, the metacognitive aspects of learning, and helps students take more responsibility for their learning (White et al. 1992).

Further Implementation in Primary and Secondary Schools

A number of educators have taken up Gardner's theory since 1983. The greatest impact seems to have been in the U.S.A. Many books and articles have been written, most notably by Lazear (1990, 1994), Armstrong (1994) and Campbell (1994), describing methods for implementing Multiple Intelligences theory in the primary school classroom, and suggesting assessment methods.

In Britain, Gardner's work does not seem to have had as much impact as in the U.S.A. However a three year pilot program in Birmingham for 11 to 13 year olds (Klein, 1996) in which the children are introduced to multi-sensory learning, is based on the principles of Multiple Intelligences theory. The program is yet to be evaluated, but it is hoped that it will complement the National Curriculum.

In Australia too, some valuable work is being done in primary schools (Vialle & Perry, 1995, McGrath & Noble, 1995) to develop curriculum and assessment methods that apply Multiple Intelligences theory. Vialle (1994) also discusses the potential applications of Multiple Intelligences theory in the area of Special Education. However, there seems to be little evidence of Gardner's work having an impact on programs in secondary schools in Australia or the U.S.A.

Facilitating Adult Learning

Much of Gardner's work has focused on child learning and teaching. However, there is a small but growing body of work, which incorporates the theory of Multiple Intelligences into the area of adult learning and teaching, particularly in the area of workplace training and on-going adult education. Billington's research findings (1990) support Gardner's proposal that intelligences are not fixed constructs, but that they can continue to change and develop throughout a lifetime, given exposure to appropriate materials and opportunities.

Adult Second Language Learning

A lot of writing in the area of second language learning and teaching focuses on individual differences in learners, and the need to develop more pupil-centred learning programs. However, I found only a small amount of writing, most of which is based in the U.S.A., which examines the implications of the theory of Multiple Intelligences in the field of second language learning and teaching. Christison (1995-6 & 1996) discusses Gardner's theory, and suggests that its implementation in a second language classroom can have a number of benefits. Firstly, language learning activities may be more successful when they encourage the use of several intelligences, because of the various strengths that students will have in the seven intelligences, allowing different opportunities to understand new material or concepts. She also suggests that by becoming familiar with their own intelligence profiles, and how the intelligences work, students' metacognitive skills are improved (1996).

Hancock (1994) discusses alternative methods of assessment for second language classrooms. Language, particularly verbal language, is a context-based behaviour. He believes, along with Gardner, that assessment should "acknowledge the effect of context on performance" (1994, p. 2), and performance should be assessed within contexts that are relevant to the skill being examined. Language assessment should therefore be as authentic as possible, and allow students of second languages the opportunity to demonstrate their language competence in a variety of situations.

Diaz and Heining-Boynton (1995) discuss the importance of teaching culture in second language classrooms, and propose that teaching strategies which engage not only linguistic intelligence, but a variety of intelligences, allow students to become immersed in the culture of the language to be learned, thus encouraging greater communicative understanding.

Gardner's theory of Multiple Intelligences is becoming an important influence on contemporary educational program development, particularly in the U.S.A., but also to some degree in the U.K. and Australia. At present most of the work being done to implement Multiple Intelligences theory is taking place at primary school level, but it is also beginning to have an impact on other areas of teaching and learning, including adult training and second language learning.

CONCLUSIONS

As a theoretical construct the theory of Multiple Intelligences suggests an explanation for intelligence which embraces human diversity and emphasises the importance of the cultural contexts within which intelligence operates.

At the cognitive level Multiple Intelligences theory develops a framework which assists in explaining individual variations in adult second language learning proficiency. Gardner's (1983) definitions of interpersonal and intrapersonal intelligence provide a cognitive explanation for the affective factors that impact on adult language learning success. Musical, spatial and bodily-kinesthetic intelligences are also important influences in the language learning process.

Multiple Intelligences theory also has practical applications in the second language classroom. This theory does not prescribe a particular educational methodology, however, of fundamental importance is the recognition of diversity in intellectual profiles. Educational programs that implement the theory must allow for, and ultimately encourage, individual differences by offering multiple entry points to new concepts or information, and assessment procedures that are authentic and learner centred.

For adults the linguistic activity of second language learning can also result in the strengthening and development of intrapersonal intelligence. As Billington (1990) argues, education should be a lifelong process, and should have personal development as a major goal as well as knowledge and skills instruction. Multiple Intelligences theory supports this belief. Given access to appropriate information, materials and training, adults can awaken and amplify their intelligences.

Because of the conscious nature of adult learning, the metacognitive processes - the thinking about thinking - are being recognised as important elements of the learning process. Strategies which involve teaching with, and for, multiple intelligences are some of the most interesting aspects of implementing Gardner's theory.

Educational practice which acknowledges the differences in students' skills, abilities and personalities must result in educational programs designed to support and enhance these differences. Multiple Intelligences theory offers a cognitive explanation for diversity, and suggests some educational practices that will help students, both child and adult, to capitalise on their skills. As Crawford-Lange & Lange (1995, p. 616) state: in second language learning "sensitivity to multiple intelligences may ... insure that linguistic intelligence is operating in an optimal fashion with other intelligences that participate in the communication process".

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