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## Retention and attrition of Irish as a second language

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## 2 Theoretical and empirical issues in second language attrition

Forgetting or losing language skills is well recognised as a problem for language maintenance. It is only in recent decades, however, that 'language attrition', defined as loss of skills in the individual over time (de Bot & Weltens, 1995), has become established as a separate area of research. This chapter traces the evolution of language attrition research from its origins in the fields of sociolinguistics and neurolinguistics to its recognition now as an important research topic in the fields of psycholinguistics and bilingualism. In assessing changes in language skills within individuals, the term 'language attrition' is considered preferable to the term 'language loss'. This is because 'loss' implies that linguistic information has been removed from memory. Evidence to be reviewed in this chapter suggests that such information may still reside in memory but becomes inaccessible for various reasons. It will be noted also that the term 'language retention' is often used instead of 'language attrition' when the focus is on the linguistic skills which remain intact.

A major issue in second language attrition research is how quickly attrition sets in and the impact which individual, social and affective factors have on the rate of attrition. In order to investigate such influences, empirical research will be reviewed under relevant headings. Three major studies considered particularly relevant to the present study of attrition in Irish because of their focus on the process of attrition in other school learned second languages will be examined in detail in section 2.2.

### 2.1 Emergence of a new field of study

The conference dedicated to the topic of Loss of Language Skills held at the University of Pennsylvania in 1980 provided a theoretical launching ground for research in the field of language attrition (Lambert & Freed, 1982). Prior to that, however, there had been a substantial amount of study relating to two particular aspects of language loss. Most notable was the tradition of research in the area of language shift i.e. intergenerational loss of skills in language contact situations. Language shift is generally indicated by a gradual decline in use of a language accompanied by a decline in competence in the language over generations and is typified by a reduction in lexical and structural aspects of the language. It is regarded as one of the normal features of linguistic change which occur in contact situations. The most extreme outcome of language shift is language death.

Although neurolinguistics is regarded as a relatively new discipline, a considerable body of research on aphasia (the loss of language arising from brain trauma) has existed for over a century (Paradis, 1977). The ability to link specific linguistic skills or performance to particular areas of the brain contributed greatly to the debate on cerebral organisation and hemispheric specialisation (Obler, 1993). Damage to

specific areas of the brain could be associated with a particular type of language deficiency. For example, left frontal lobe (Broca's area) trauma seemed to result in a type of aphasia characterised by short simple, often agrammatical, speech utterances resembling baby talk. In fact, the term 'regression', a well recognised psychoanalytic event attributed to Freud, was first used by him to refer to the linguistic peculiarities which he observed in Broca's aphasia (Freud, 1891).

The main thrust of research on non-pathological cases of language loss in recent years has focussed on the decline in particular skill aspects of the language affected as well as being concerned with the psycholinguistic processes and sociolinguistic conditions which give rise to such change (Hansen, 1999a; Seliger & Vago, 1991; Weltens, de Bot, & van Els, 1986). Common sense demands that the study of attrition cannot be divorced from the social environment in which the individual's language is undergoing change. Time alone cannot explain decline in skills, rather it is the combination of the lack of language contact and use during that time which brings about the change (de Bot, Gommans, & Rossing, 1991). According to de Bot (2001: 70) "the key to language loss is limited input/intake, on the one hand, and limited output, on the other".

### 2.1.1 A typology for research on language attrition

De Bot and Weltens (1995) provide a very useful typology for situations of natural (non-pathological) language attrition. These four categories are listed below along with references to relevant studies in the area:

1. attrition of first language (L1) skills in an L1 environment e.g. language decline due to ageing or dialectal loss (Coupland, Coupland, & Giles, 1991)
2. attrition of L1 skills in a second language (L2) environment e.g. deterioration in L1 in migrant populations, language shift and attrition in the case of endangered languages (Clyne, 1967; Hulsen, 2000; Waas, 1993; Yagmur, 1997)
3. attrition of L2 in an L1 environment e.g. decline in school learned L2 (Bahrack, 1984; Weltens, 1989) or decline in L2 following repatriation (Cohen, 1989; Hansen, 1999b; Olshtain, 1986)
4. attrition of L2 skills in an L2 environment e.g. loss of L2 skills in an aging population (de Bot & Clyne, 1989).

The research to be described in the case of the present study can be classified as Type 3: second language (Irish) attrition in a first language (English) speaking environment.

## 2.2 Three studies of attrition of school acquired L2 skills

This section describes three of the major studies which have investigated the process of attrition in school learned second languages after a period of non-use. Taken together the findings touch on some of the major theoretical and methodological issues in the area of attrition research. In particular, reference is made to onset and rate of attrition, importance of initial proficiency, contrastive effects, and the skills aspects lost. Some other smaller but relevant studies along with studies based on second

language acquired in naturalistic (or mixed naturalistic and instructional) environments will be discussed in later sections.

### 2.2.1 Bahrck's study: Attrition of L2 receptive and productive skills

A landmark study in the field of second language (L2) attrition research is that carried out by Bahrck (1984). He assessed attrition in Spanish skills in a group of over 500 individuals whose instruction in the language had occurred from one to fifty years prior to being tested. They were further categorised according to level of training (courses taken) in the target language. One hundred and forty six students who at the time of testing were enrolled in a high school or college Spanish course, were used as a control group. A variety of language tests were used to assess reading, vocabulary and idiom recall, and recognition. Other background information on grades achieved at school and use of the language in the 'retention' period was collected via a questionnaire. The results showed that a portion of the knowledge acquired in Spanish classes is lost within the first few years (3-6) after training but that the remainder "was immune to further losses for at least a quarter century" while much of the content was thought to survive for "50 years or longer" (Bahrck, 1984: 111). Bahrck called L2 knowledge with a life span of over 25 years 'permastore-content'.

Grades received in courses continued to be valid predictors of performance for several decades after training. The larger the number of Spanish courses taken the greater the amount of content which is likely to be retained - training of a single course was likely to leave little if any permanent content. Bahrck also found that 'the total amount of content' to be forgotten during the first five years following training was relatively constant for individuals at different levels of training, but the amount lost became a progressively smaller portion of the individual's 'total' knowledge with higher levels of training. Attrition was also shown to affect smaller amounts of recognised vocabulary than of recall vocabulary. Recall of grammar declined most precipitously while recognition of grammar fared relatively better. Reading comprehension was maintained at a level determined by recognition vocabulary and grammar recognition. Finally, use of the second language or what Bahrck calls 'rehearsal' (e.g. watching TV programmes in Spanish or conversing in Spanish) seemed to have little influence on retention.

### 2.2.2 Weltens's 1989 study: French receptive skills

Bert Weltens's (1989) study focussed on attrition of French receptive skills among Dutch secondary school graduates after two and four years of non-use. A combination of a longitudinal and cross-sectional design was used. Two training levels were investigated representing four and six years or 400 and 600 hours of French training, respectively. Baseline data were collected from two groups of subjects who had just completed their study of French, one group after four years and the other after six years. A variety of receptive tests were used. These included a test of general proficiency (cloze), listening and reading tests, and phonological, lexical and morpho-syntactic subtests. Self-report data on attitude to French and proficiency were also collected by means of a questionnaire.

The results showed a very small amount of attrition and there were even gains on some tests. General receptive proficiency was quite different for the two training levels but remained unchanged over the intervals investigated. The listening and reading tests also revealed highly significant effects for training level, and even an increase in proficiency over time, particularly for the subjects of four years training. Scores on phonological tests also discriminated between the two training levels - they also increased over time. The results of lexical tests showed a small decrease in scores on written items, and cognates were more resistant to loss than non-cognates. Morpho-syntactic skills showed the most attrition, in particular items that contrasted greatest with the L1. However, the attrition was comparable for each training level and appeared in the first interval of two years. Interestingly, the self-rating data indicated that subjects at each training level overestimated the amount of actual loss which had occurred.

Weltens, van Els and Schils (1989: 214) refer to “the surprisingly small amount of attrition” even after four years of non-use. Attrition on the lexical and grammatical tests was regarded as small in comparison to the substantial gains on the listening and reading tests. They concluded that factors such as general cognitive maturation, further academic training and continued learning of other foreign languages have to be considered as potential explanations for this increase in global scores over time. The finding that attrition was independent of training level, fits in with Bahrick’s (1984) theory that a fixed amount of knowledge rather than a fixed proportion of knowledge is subject to attrition.

Weltens (1989) argued that larger falls in vocabulary scores might have been detected had a time pressure element been used in the tests in his study. A pilot study carried out as part of the investigation (Verkaik & van der Wijst, 1986) had used a lexical decision experiment and the results showed significantly slower times after two years of non-use. Weltens (1989: 93) concluded that the largely self-paced nature of the tests in the main study meant that “subjects had ample time to squeeze out of their memories anything that was still there, however vaguely or remotely”.

### 2.2.3 Grendel’s 1993 study: Attrition of lexical items in French

On the basis of Weltens’s (1989) findings, Grendel (1993) decided to use a lexical decision paradigm to investigate lexical attrition among Dutch learners of French. The design of the study was comparable to that used by Weltens. The tasks focussed on orthographic knowledge (written forms of words) and semantic knowledge (word associations). A lexical decision task, with French words and pseudowords containing high and low-frequency clusters, was used to test orthographic knowledge. A semantic priming task was used to test semantic knowledge. No attrition (decline in reaction times) was found in relation to subjects’ sensitivity to the French orthographic rule system or to the use of semantic knowledge. The absence of attrition over the four year interval lead Weltens and Grendel (1993: 154) to conclude that the preoccupation with recognition in language studies may be misplaced and that “future studies of language attrition should focus on language production”.

## 2.3 Linguistic aspects of second language attrition

This section looks at the linguistic features of second language attrition and the various hypotheses which attempt to explain the way in which features of a language change over periods of disuse.

### 2.3.1 The Regression Hypothesis

The Regression Hypothesis maintains that the sequence of language loss is the mirror image of the sequence of acquisition. It was first put forward by Jakobson (1941) who found universal regularities when comparing phonological progression in child language to regression in aphasia. However, the theory did not hold for all aspects of aphasic language loss. The use of pathological evidence to explain the dynamics of normal language in adults is questionable. As Berko-Gleason (1982: 17) points out, the type of agrammatism found in Broca's aphasia, though resembling a young child's productions, cannot be equated with language processing in normal children because the adult whose language is damaged is aware of the errors he/she is making – "metalinguistic awareness remains, even though performance is flawed".

Berko-Gleason (1982: 18) also highlighted three possibilities of the Regression Hypothesis which merited investigation: (i) that individuals lose skills not in the reverse order in which children learn them but, rather in the reverse order that they themselves learned them (e.g. in a language course) (ii) that forms that are acquired late are the most vulnerable to attrition and (iii) that parts of language learned earliest and best should be the most robust to attrition. Andersen (1982: 113) also suggested that "those linguistic features that took the longest for an individual to acquire and master will be the hardest to maintain".

Over the last decade, attempts have been made to empirically validate the regression hypothesis in relation to loss of natural language. The studies reviewed below do not give answers to all the issues raised but they do confirm some of these positions. Frequency of language use, markedness, saliency and stable competence of linguistic features prior to onset of attrition seem to be of critical importance.

### 2.3.2 Evidence for Regression and Linguistic Features Hypotheses

#### *Cohen's 1975 and 1989 studies: Attrition of productive vocabulary*

A small study by Cohen (1975) investigated L2 (Spanish) attrition among three immersion school children over a summer vacation. The children had little contact with the target language (Spanish) outside of the school environment. The results showed some support for the regression hypothesis in that certain vocabulary items that were last learned were the first to be forgotten "when learners are removed from the second language contact for a period of time". Opler (1993: 189) argues, however, that "it is because these late-learned items had been used less, rather than they were learned late, that they appeared to have been forgotten first".

Cohen (1989) also looked at loss of vocabulary (Portuguese) among two children (ages 10 and 14) who had spent one year in a Portuguese-speaking environment (Brazil). They were tested after 1, 3 and 9 months of non-use. A storytelling task was

used to elicit productive data. Cohen found evidence for loss in the productive lexicon, especially nouns. The same items, however, were recognised in an oral comprehension task but not in receptive comprehension. Various compensation strategies were noted: mother tongue (L1) based borrowing and intralingual strategies such as use of general word, approximation, circumlocution and word abandonment.

*Olshtain's 1986 study: Attrition of productive English (L2) skills*

Olshtain (1986; 1989) investigated attrition of L2 (English) in an environment where Hebrew is the dominant language. The subjects were children (ages 5-14) who had acquired English as a second language in an English-speaking environment where they had spent at least two years before returning to the Israel. Although Hebrew and Arabic are the official languages of Israel, English enjoys a special status being used as a language of wider communication. Therefore, there is a context encouraging a high degree of maintenance. In the study, semi-structured interviews, conversations, games, pictures etc. were used to elicit speech in English.

For all younger subjects (ages 5-8) there was evidence of reversal of the acquisition process in respect of plural formation of nouns and the irregular past tense forms of verbs. The older group who had all reached a near-native like proficiency in speech and English literacy after two years in an English speaking environment did not exhibit any clear case of a reversal of the acquisition process. Olshtain (1989: 163) argued that the loss of skills in the young group may have occurred because they had not "reached a sufficiently stable mastery of the regular/irregular rule application upon return to the Hebrew environment" and had still not "acquired true literacy ability in English". Olshtain (1989: 164) concluded that the regression hypothesis does exist but "is rather limited in nature" being "most likely to occur in cases where the criterion variable is a linguistic feature that is highly marked in the 'attrited' language, in contexts where there is a severe reduction in the use of the second language, and in cases where the 'attriters' may lack stable competence of that feature prior to attrition onset".

*Kuhberg's 1992 study*

Kuhberg (1992) demonstrated a systematic development in L2 attrition of German in two returned Turkish immigrant children aged seven and nine. The children had acquired German from age three in a naturalistic environment in Germany. Grammatical features such as verbs, prepositions, personal pronouns and plurals suffered more than vocabulary. First learned basic syntactic patterns were retained longest leading Kuhberg to conclude that "L2-attrition, at least for the linguistic phenomena that were investigated, is to a large extent the mirror image of L2-acquisition" (Kuhberg, 1992: 152).

*Hayashi's (1999) and Hansen's (1999) studies of Japanese negation*

Two recent studies looked at attrition of negation in Japanese acquired as a second language. Hayashi (1999) selected 25 elderly inhabitants of Micronesia who as children had been taught Japanese in the school system during the Japanese occupation. Hansen's (1999b) study involved 30 middle aged Americans who, in their early twenties, had learned Japanese while working (for 2-3 years) as missionaries in Japan. Ten were women who had spent two years in Micronesia while the remainder

were men who had spent between 30-36 months there. Both Hayashi and Hansen used the same negation elicitation task in their studies. Both sets of results were consistent with the Regression Hypothesis. Negation formed on verbs, predicted to be lost last, was most robust in terms of retention while negation formed on adjectives, predicted to be first lost, was least robust. Summarising the evidence, Hansen (1999b: 150) concluded that to gain an “understanding of the whole picture in developmental sequences, various factors, in addition to the sequence of acquisition, need to be explored, such as frequency in the input, perceptual saliency, features of the ‘attriting’ as well as the replacing language and considerations of markedness and language universals”.

### 2.3.3 Linguistic skills affected in attrition

#### *Differential rate of attrition of various linguistic skills*

If it is generally accepted that receptive skills precede productive skills in acquisition (Ellis, 1994; Harris & Murtagh, 1999) then according to the Regression Hypothesis the reverse should be the case in attrition. The bulk of the available evidence suggests that for the relatively competent bilingual this is indeed the case (Bahrck, 1984; Cohen, 1989). Bahrck’s (1984) study, described earlier, clearly showed more attrition in recall tasks than in comparable recognition tasks. In discussing the process of attrition, De Bot and Weltens (1995) state that “vocabulary is supposed to be lost fairly easily, as are syntactic aspects of a language that have been acquired late in the process”. However, the studies reviewed in section 2.2 above suggest that the evidence is equivocal in respect of lexical versus grammatical features in L2 attrition. One of the difficulties lies in the fact that many of the relevant studies involved subjects whose L2 system may not have been fully developed when L2 learning ceased.

Andersen’s (1982) Linguistic Features Hypotheses were intended to guide researchers in selecting linguistic attributes on which to focus their attrition research. Among these are the premises that (i) L2 features that contrast with the L1 are more vulnerable to attrition than the ones that are similar in both languages and (ii) features of the ‘attriting’ language which are less frequent, carry a low ‘functional’ load or are ‘marked’ are all more vulnerable than features which are more frequent, have a high functional load or are unmarked. Some of the evidence showing attrition for marked and less frequently used features of the L2 has already been discussed in previous sections (see section 2.2 above).

It is generally considered that the less the second language resembles the mother tongue, the more difficult it will be to acquire. It will be recalled (see section 2.2.2) that Weltens (1989) found contrasts between the native language and the target language to be an important determiner of retention. Results of his lexical tests showed non-cognates to be more susceptible to attrition than cognates. The morpho-syntactic tests also indicated that “contrasting grammatical phenomena” were “more difficult to retain than phenomena that the target language shares with the native language” (Weltens, 1989: 95).



## 2.4 Rate of attrition, initial proficiency and critical threshold

### 2.4.1 Rate of attrition

Applying the traditional view of forgetting (Ebbinghaus, 1885) to the area of language, it would be predicted that attrition sets in quickly and then declines exponentially and is proportionate to the individual's initial proficiency level in the language. The dearth of longitudinal studies in this field makes it difficult to test the actual rate of attrition over time. However, Bahrck's (1984) major study described above (see section 2.2.1) has indicated that though attrition started within the first few years it levelled off after six years or so for a period of up to 25 years. This knowledge which appears resistant to loss he called the 'permastore content'. The small amount of attrition that Weltens (1989) noted in his study seemed to occur during the first two years of the four year interval studied. A study of graduates of an immersion Spanish programme by Snow, Padilla and Campbell (1984) found no language loss after two years of non-use but after two more years significant loss was detected in speaking, listening, reading and writing skills measured globally. Many of the other studies focussing on specific aspects of L2 attrition described earlier (see section 2.3.2) indicated much more rapid attrition. However, the subjects involved were children who had moved from one language learning environment to another. In the Olsthain (1986) study, the older children showed much less attrition of linguistic features than the younger children. It was suggested that the level of proficiency prior to onset may have been the critical variable i.e. there may be a critical level beyond which attrition is slowed down.

Ebbinghaus's hypothesis that loss is 'proportional' to original proficiency was not upheld in either Bahrck's (1984) or Weltens's (1989) studies. Bahrck (1984) noted that the total 'amount' of content to be forgotten during the first five years of non-use was relatively constant for individuals at different levels of training. Weltens's study (1989) also supported the notion of a fixed amount of language being lost in the early years. Nonetheless, Bahrck also showed that after the first five years the amount of loss becomes a progressively smaller proportion of total knowledge with higher levels of training. So it seems that in the long term, higher levels of proficiency confer an advantage in terms of retention or immunity to attrition.

### 2.4.2 Critical Threshold

Neisser (1984) was one of the first to propose the notion of a 'critical threshold' for linguistic knowledge. Bits of knowledge that reach this critical threshold were considered to become immune to forgetting (interference or decay). Neisser believed that the plateau effects found in Bahrck's study reflected the body of knowledge which had reached this critical threshold. He claimed that information was retained because it was integrated into an "extensive and redundant cognitive structure" which "is sharply resistant to forgetting". Isolated pieces of information, in contrast, are regarded as being more vulnerable (Neisser, 1984: 34). Pan and Berko-Gleason (1986: 204) support this idea, proposing that there may be a "critical mass of language that, once acquired, makes loss unlikely".

De Bot and Clyne (1989) suggested that the reversion by some older Dutch immigrants in Australia to their first language (Dutch) in later years may be explained in terms of the critical threshold hypothesis. It was claimed that a combination of low proficiency and restricted use meant that these immigrants never reached the critical threshold in the L2 (English) or acquired the kinds of schemas or structures which resist decay. They may have had “an unstable, unstructured set of knowledge which tends to disintegrate rapidly” (de Bot & Clyne, 1989: 174).

In the study of returned missionaries who had acquired Japanese in a naturalistic setting (see section 2.3.1 above) Hansen (1999b) also found evidence for the critical threshold hypothesis. Women who had spent just two years in the target culture were only able to produce a few numbers and formulaic expressions in the language. Men who had spent 36 months retained it best. She concluded that attaining the critical threshold “requires more than two years of daily language use in the target culture” (Hansen, 1999b: 151).

## 2.5 Retrieval failure theory: Lost but not gone

Hansen (1999a: 10) suggests that the process of forgetting is akin to a person being unable to find something which they have misplaced somewhere. What is missing may be ‘lost’ but not necessarily ‘gone’. In information processing models of language (Anderson, 1980, 1982) speed of access to the lexicon is of critical importance in determining language competence and fluency. In situations of language attrition it is considered that there is a decrease in the “ability to have immediate access to a word in production and perception” (Hulsen, de Bot, & Weltens, 2002: 33). Information processing models view attrition as just a problem of inaccessibility or reduced activation of target items rather than complete loss of L2 skills. This section looks at evidence for a retrieval failure model of language attrition. It examines the kinds of compensation or communication strategies (e.g. codeswitching, circumlocution, approximation etc. observed after periods of non-use) which are thought to be indicative of lexical retrieval difficulties. Some experimental work is also presented in relation to the notion of reduced activation for a second language which has not been used for a long period of time.

### 2.5.1 A psycholinguistic model of bilingual processing in attrition

An information processing view of language development (Anderson, 1980, 1982) sees language as the product of a system of procedures integrating elementary pieces of linguistic or declarative knowledge. In efficient language processing, this declarative knowledge is rapidly transformed into ‘procedural’ knowledge - a system of routine procedures (see also de Bot, 1991). In the early stages of second language development, the whole system may be slow because a good deal of attention or controlled processing is needed. With practice, however, the execution of such processes becomes routinised. Little attention is needed, processing becomes more automatic and speech appears more fluent.

The bilingual is perceived as having two subsystems within a unitary language system and certain items and subsystems are seen as being more available than others in the brain. Paradis (1985) assumes that the more available item has a stronger trace or threshold of activation. Availability in this framework is considered to be a function of frequency and recency of the item's activation. A system of inhibition and disinhibition is involved in selection of items or subsystems: inhibiting alternatives and disinhibiting the item or language to be executed. This inhibition and disinhibition consumes processing resources and can slow down access (Hyltenstam & Stroud, 1993: 237). Grosjean (2000: 468) believes that the activation of units that are specific to one language increases the overall activation of that language network and speeds up recognition of words in that language. This may explain the 'din-in-the-head' phenomenon described by Krashen (1983) who claims that several hours of comprehensible input will increase the chances of successful retrieval of both receptive and productive language knowledge.

In situations of non-use of a language, it is likely that 'procedural knowledge' and the automaticity of access and retrieval in that language will be the first to suffer. There may be inhibition as a result of interference from a more dominant language. The specific case of language distance or contrast has already been discussed. The combined effect of lack of automaticity and inhibition will result in slower processing all round. In cases where a critical threshold in a language was not attained by the time that language ceased being used, the language system will be even slower when it is reactivated. Hyltenstam and Stroud (1993: 239) suggest that an incompletely acquired language has a lower degree of automatised, less appropriate structuring and relies more on controlled processing (see also de Bot & Clyne, 1989).

### 2.5.2 Lexical retrieval

In language production tasks, subjects frequently report feelings of knowing the required or desired feature but experiencing problems in accessing it. Such 'word finding' difficulties are common in bilinguals who are not fully proficient in the target language (see section 1.5.2). Of course, this can even be a feature of normal language processing e.g. 'tip of the tongue' phenomenon. In Weltens's (1989: 93) study, subjects' self-reports of vocabulary loss did not reflect actual test results. Weltens argued that the subjects may still have been "absolutely right, in the sense that the accuracy may not have suffered yet but the speed has". He believed that tasks which had an inbuilt time pressure element might reveal attrition where other self-paced responses might not. However, as pointed out earlier, Weltens and Grendel's (1993) lexical decision experiments which involved a time restriction failed to find a significant level of L2 attrition.

De Bot and Weltens (1995: 155) suggest that L2 speakers may tend to avoid words that are 'hard to find' but not lost. They also claim (de Bot & Weltens, 1995: 157) that the whole process of attrition "can be explained by a change in processing procedures". The key role, they believe, may just be a matter of availability or the speed with which the language 'attriter' is able to access information. It is claimed that in normal speech rates, a speaker processes words at a phenomenally high speed - up to 300 words a minute or five words per second (Levelt, 1989: 199). In cases of

language attrition the process is slowed down considerably and it may prove difficult to access the right word in time. In such instances, the speaker may use a variety of strategies to circumvent the retrieval deficiency or may actually abandon the search.

Cohen (1989: 142) in his study of productive vocabulary attrition identified seven different communication or compensation strategies during the story telling task which indicated production difficulty. The first two were L1-based strategies: lexical borrowing and 'foreignizing' of words. The others were intralingual strategies: use of a general word, approximation, circumlocution or word abandonment. Cohen also found evidence for what he termed a process of 'progressive retrieval' - a search that would start with an inappropriate choice in the target language or in one of the subjects' dominant languages and eventually arrive at the correct form. He noted eleven instances in the data where subjects' verbal behaviour revealed progressive retrieval processes at work. Of these, seven involved the shift from an approximation of the word to the appropriate word in the same sentences or shortly thereafter. Other studies by Yoshitomi (1999) and Tomiyama (1999) have linked retrieval difficulties with dysfluency as indicated by hesitations, repairs, false starts or repetitions.

De Bot and Weltens (1995:156) argue that the best way to provide conclusive answers to the problem of lexical retrieval is to conduct "well controlled on-line experiments where subjects are forced to apply rules that they are uncertain about".

### 2.5.3 Relearning

Language data collected from individuals under hypnosis (Campbell & Schumann, 1981) indicated that languages, once learned to a certain level of proficiency, remain stored and should be potentially available. Cohen (1986: 144) suggested that if such information is stored then all that may be needed "is the proper stimulation to regain it".

A recent study by De Bot and Stoessel (2000) has been the first to try to reactivate a language (Dutch) learned in early childhood and which had not been used for 30 years. A relearning task based on the 'savings' approach was used to test for the existence of residual knowledge of Dutch in two subjects (brother and sister), both now fluent in German, English and Finnish. 'Savings' was defined by Nelson (1978) as a relearning advantage of old items over new items. A basic assumption of the 'savings' approach is that decay of knowledge is asymptotic, so that even after a long time some residual activation is left for a given item. For items to be recognised their activation will have to be raised to a certain level and even higher if they are to be fully retrieved. It is believed that through relearning, old items will reach these thresholds more quickly than new items.

The results of De Bot and Stoessel's study showed that subjects retained quite a substantial amount of residual knowledge even after 30 years of non-use. The data on relearning, however, were inconclusive. On average, the two subjects' relearning of Dutch vocabulary was better than 'controls'. However, some individuals in the control groups actually had higher relearning scores than the subjects. Furthermore, the female subject proved to be an exceptionally 'efficient learner' and would, according to the authors, have outscored most 'controls' on any language. De Bot and Stoessel concluded that future studies need to control for individual differences such as learning

strategies, aptitude and response strategies. In addition, they advise that more exact data on previously learned material be collected.

## 2.6 Relevant variables in the study of second language retention

This section examines the role of individual factors such as attitude/motivation and language use in attrition within the larger context of relevant situational and societal factors. Studies by Kennedy (1932) and Bartley (1970) demonstrated that intention to keep studying a second language was associated with more positive attitudes to that language. Edwards (1977: 102) in his study of bilinguals (French and English) in the Public Service in Canada concluded that long term retention of linguistic and communicative competence in a second language depends on “successful prior or initial learning, opportunity to use the information acquired and interest in using the linguistic resources initially acquired”. Other studies have confirmed the importance of attitudes and motivation not only for achievement but also because of their potential to influence learners’ (i) participation in the second language class (Gliksman, 1976; Naiman, Fröhlich, Stern, & Todesco, 1978), (ii) perseverance in language study (Gardner, Smythe, Clément, & Gliksman, 1976) and (iii) effort in seeking opportunities to use the language (Clément, Gardner, & Smythe, 1977; Gardner, Lalonde, Moorcroft, & Evers, 1987). Harley’s (1994: 708) interviews with graduates of French language programmes revealed that those who retained high contact with the language used a mix of metacognitive, affective and social retention strategies e.g. planning occasions to use French, immersing themselves in a French environment, monitoring mistakes, maintaining and making social contacts in the French speaking community.

Recent models of motivation emerging from the field of applied linguistics emphasise the dynamic and temporal nature of individual motivation (Crookes & Schmidt, 1991; Dörnyei & Ottó, 1998; Tremblay & Gardner, 1995; Ushioda, 1996). It is considered that motivation is not a stable phenomena but one which fluctuates according to the changing circumstances of the learner and the learning environment. Factors such as personal goal setting, learning strategies, perseverance and self-regulation are considered important in predicting success in maintaining a language. This concept of motivation is particularly suited to qualitative case studies (Dörnyei, 2001: 238) where changes in motivation can be monitored over time and related to psychological changes in the individual and changes in the learning environment.

### 2.6.1 Attitude/motivation and use: The work of Gardner and colleagues

The role of home use of Irish and learner motivation in relation to school achievement in Irish has been discussed in the previous chapter (see section 1.5). It will be recalled that even moderate home use had a positive affect on achievement and on pupil motivation to learn Irish (Harris & Murtagh, 1999). Motivation was also shown to play a direct role in relation to achievement in Irish. Gardner (1982: 27) argued that if attitudinal/motivational variables are related to second language proficiency, it seems “reasonable to predict that these same variables would be related to retention”.

Gardner, Lalonde and MacPherson (1985) designed a study to empirically assess the role of attitude/motivation and use in attrition. Scales from their Attitude Motivation Test Battery (AMTB) (Gardner, 1985a) were used to measure aspects of attitude/motivation and use. The subjects were adults who had attended a six-week intensive French (L2) course. Achievement in receptive and productive skills (at the beginning and the end of the course) was assessed by subjects themselves retrospectively in a series of 'can-do' statements. Motivation was assessed by adding scores on three AMTB-based scales – Attitudes toward Learning French, Attitudes towards French Canadians and Motivational Intensity. Language use was measured in terms of the amount of time subjects spent each month using French in a variety of situations.

The results of the study showed no attrition in self-assessed reading skills. In the case of self-perceived speaking and understanding, those with very favourable attitudes and motivation reported some attrition while those with less favourable attitudes and motivation indicated significantly greater attrition. Self-assessed speaking declined with 'low use' but not with 'high use'. Rather surprisingly, 'use' and 'attitudes' "were found to be virtually independent" (Gardner et al., 1985: 537). It was suggested that an explanation might lie in Bahrick's (1984) concept of 'permastore' or initial proficiency i.e. those with more positive attitudes had reached a critical level of proficiency which rendered the language more resistant to attrition.

Two years later, Gardner, Lalonde, Moorcroft and Evers (1987) looked at the role of motivation and use in predicting change in second language achievement over a summer vacation period. The subjects were Grade 12 students with an average of seven years of French instruction. Subjective and objective measures of achievement were used: the former involved a series of 'can-do' statements and the latter comprised a word production test, a written essay and a listening comprehension test. Five scales were used to assess language attitudes – Attitudes towards French Canadians, Degree of Integrativeness, Interest in Foreign Languages, Evaluation of French Instructor and Evaluation of French Course. Integrative Motivation was assessed using just two scales – Attitudes toward Learning French and Motivational Intensity. The Language Use scale (9 items related to use in different contexts) assessed use at the beginning and end of the target period.

The results of testing showed little attrition over the period studied – only in the case of grammar was there a significant change. In fact, there was even a suggestion of growth e.g. in vocabulary use. There was also great individual variation in terms of change scores. Only two of the correlations using the change scores were significant and both of these involved Language Use. A causal model was used to explain the relationship between variables. Achievement at Time 1 was by far the strongest predictor of achievement at Time 2 ( $\beta=.91$ ), confirming once again the role of initial proficiency. The contribution of Use ( $\beta=.22$ ), though much smaller, was, nonetheless, significant. The results also showed that Language Attitudes seemed to 'cause' Motivation ( $\beta=.94$ ) which itself, in turn, was a causal factor in determining achievement in French at Time 1 ( $\beta=.48$ ) and 'Use' ( $\beta=.40$ ) of the language. Though 'Motivation' did not directly explain change, Gardner et al. (1987: 42), nonetheless, argued that it is important for retention "because it not only influences acquisition of

skills but also because it determines the extent to which individuals use the language during the incubation period". It should be pointed out, however, that 'Use' was reported as being at a generally low level among all students. Perhaps this just reflects overall lack of opportunity to use the language rather than unwillingness to do so. In the next section, we will assess new methods used in the area of first language attrition research which show the importance of strong social networks in facilitating opportunity to come in contact with and use the language.

So far, it seems that there is more evidence for the significance of use in retention than there is for that of attitude or motivation. However, the outcomes of the two studies just described are limited in terms of generalisability. First, based on the results of studies reviewed in earlier sections (Grendel, 1993; Weltens, 1989) which showed little change over two years, it would seem that the time intervals in the two studies carried out by Gardner and his colleagues were much too short to be able to draw any reliable conclusions. And as the authors themselves point out, the short interval may also have allowed a test practice element to influence test scores.

## 2.6.2 The role of social, institutional and cultural factors in maintenance

In order to use the language outside of formal language learning, an individual must have access to a community of language users, be it family, friends, or other social network. The choice of network may be more restricted for some than for others, depending on socio-economic, geographical, cultural, educational and age factors.

### *Social networks*

Social network theory suggest that the ways in which an individual creates personal communities may be a significant factor in language retention. Milroy (2001: 43) believes that an individual's personal social network will "systematically affect both the vitality of the community language and the speech community's vulnerability to language shift". For bilinguals, being part of a social network can be important in forming or reinforcing attitudes towards one or other of their languages.

Three recent studies demonstrate the importance of social networks in maintenance of a first language in immigrant populations. In particular they show that use in the family (as opposed to the home) network and intensity of links with the target language-speaking community are important for language retention. A study of three generations of Dutch migrants living in New Zealand (Hulsen, 2000; Hulsen et al., 2002) found that the number of L1 contacts in the primary social network (e.g. relatives) is positively related to maintenance and use of the language. Stoessel's (2002) study of ten immigrant women in the US showed that social networks, in the form of speakers in the local community, were important for L1 maintenance. In relation to second language maintenance, Smith's (2002) study of expatriates living in Southeast Asian cultures also found a strong positive association between frequency of interaction with the host community and communicative competence in the second language. The denser the social network the greater its influence is likely to be on an individual's behaviour. Not only the number of language contacts but the quality or intensity of those contacts is also important.

### *Ethnolinguistic vitality*

In minority language situations, identification with and participation in the minority language culture would seem to be positive factors in its maintenance. This contact is often measured in terms of ethnolinguistic vitality. The vitality of an ethnolinguistic group is defined as “that which makes a group likely to behave as a distinctive and active collective entity in inter-group situations” (Giles, Bourhis, & Taylor, 1977: 308). The more vitality an ethnolinguistic group is assessed as having, the more likely it is to survive collectively as a distinctive community within a multilingual or bilingual context (Bourhis, 2001). Groups with low vitality are likely to experience language shift. Yagmur (1997) in a study of L1 attrition among Turkish immigrants in Australia concluded that ‘low’ vitality perceptions combined with ‘low’ language status and negative attitudes towards the mother tongue impede language maintenance. Such ‘low’ vitality is likely to adversely affect the second generation’s attitudes to that language and encourages assimilation to the majority language. Bourhis’s (2001) overview of French in Quebec shows how a combination of demographic, institutional supports and status factors can improve the vitality of an ethnolinguistic group.

### *Reading and the media*

Well developed literacy skills are thought to be an important factor in helping to attain the critical threshold beyond which it seems there is more resistance to attrition. The importance of engaging in extensive reading (and writing) in helping to achieve Academic Language Proficiency as opposed to Conversational Language Proficiency has been emphasised by Cummins (2000: 98). The former type of proficiency is associated with higher order cognitive/linguistic processing and, once achieved, would be assumed to be indicative of a high level of overall linguistic competence. It will be recalled from Olshtain’s (1989) study (see section 2.3.2 above) that the younger group of subjects (5-8 years old) who experienced more attrition than the older group, had poorly developed literacy skills. Hansen (2001: 66) also refers to the importance of literacy in language retention. On the basis of a series of three studies (Hansen & Chantril, 1999; Hansen & Newbold, 1997; Shewell & Hansen, 1999), she noted that literacy emerged as a “robust predictor of language retention over periods spanning forty years”. It must be acknowledged, however, that when assessing the impact of literacy on proficiency it may be difficult to distinguish between the effect of literacy skills *per se* and any advantage conferred by additional time spent on the language through engagement with these literacy skills (see also Hansen, 1999a: 16).

In general, there is a dearth of objective information on the impact of the media on proficiency or maintenance. However, Harley’s (1994) interviews with adult Canadians show that the media may play an important role in retention of school learned L2 (French). Specifically, in terms of listening and speaking skills, “the more recently respondents had listened to TV or spoken to francophones, the more they tended to feel that they had maintained or improved these skills since their formal education” (Harley, 1994: 699).

The role of the media in social interaction is growing rapidly. It follows that the traditional notion of personal community, as one based largely on family, neighbourhood, school or workplace, must be expanded to include this new domain. Kelly-Holmes (2001: 4) argues that in some areas “the media may have taken over



from the family as the primary instrument for learning about the world and about society". Access to the broadcast media and the internet in human communication has also created a new dimension in social networks. Through the internet, linguistic communities can now exist via a type of 'virtual' social network. As De Bot and Stoessel (2002: 5) point out "e-mail (including spoken versions of it) makes the concept of 'language contact' different from what it was in the past". For minority languages the internet may be useful not only in maintaining the speech community but it can also help to integrate new members or even reintegrate those who for various reasons have not been able to maintain contact with the language. However, it may be too early yet to assess its impact on maintenance.

## 2.7 Methodological issues in second language attrition research

A recurring theme in the attrition literature is the difficulty in drawing conclusions due to conflicting empirical methodologies and findings. A conference at the Vrije Universiteit, Amsterdam in August, 2002 was dedicated to the topic of methodological issues in relation to first language attrition research. One of the recurring themes of the conference was the need to establish some kind of common methodological standard which would facilitate comparisons and conclusions across studies. The intention of such an enterprise is to adopt a more scientific or rigorous approach to the issue of measurement in attrition. Many of the same issues may apply to second language attrition research but there is at least one major difference. In first-language attrition it is relatively easy to establish a baseline for skills. In normal circumstances, it can be assumed that in selecting adolescent or adult mother tongue speakers, their 'initial L1 proficiency' or baseline level reflects that of a competent or proficient user i.e. they possess the requisite declarative and procedural knowledge for efficient language processing. In second language attrition such assumptions cannot be made about initial levels of proficiency. The issue then is how best to define an individual's level of L2 competence prior to a period of non-use. One could select only highly proficient or near native-like L2 users and focus on their loss of skills. However, second language attrition research is not only concerned with one time advanced or highly proficient users but with the whole range of initial proficiency levels (including interlanguage speakers).

Many of the large scale studies of L2 attrition make certain assumptions about initial proficiency of their subjects based on information from control groups (see section 2.2 above). It is assumed that such control groups represent baseline levels of proficiency equivalent to that of the target groups. However, the number of factors which can vary in such cross-sectional studies are much greater than in longitudinal studies. It follows that conclusions drawn from cross-sectional studies are less reliable than from longitudinal studies. From a practical point of view, however, it is easy to understand the dearth of large scale longitudinal studies. Identifying suitable subjects to track can be quite problematic. And, it may not be easy to find language researchers or institutions willing to pursue such long term research projects. Longitudinal type studies measuring short term attrition over school holidays (e.g. Gardner et al., 1987) can provide useful feedback for both teachers and students in terms of the focus of

instruction, learning strategies etc. However, the extent to which findings from these studies can be generalised to the process of long term attrition is questionable.

Even when long-term longitudinal studies are feasible, there are other considerations which must be taken into account. For example, if skills are to be assessed at regular intervals using the same tests there is a danger of a practice effect emerging. Parallel forms can be used but for obvious reasons such an approach would not be suitable for testing specific items of vocabulary. And as has been pointed out earlier, attrition or retention is not necessarily constant for individuals with the same level of initial proficiency. Just as background and individual factors can affect the rate of second language learning, so too it seems they can influence the rate of attrition. Controlling for even just a small proportion of such factors in longitudinal studies would necessitate very large samples of subjects for statistical analyses purposes.