# THE EFFECT OF THE INTEGRATED KEYWORD METHOD ON VOCABULARY RETENTION AND MOTIVATION

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# Abstract

This thesis investigated whether results in Keyword Method research, past and present, can be transferred to genuine classroom situations and whether the Keyword Method also effects the motivation of the learners. Since this thesis is concerned with the issue of vocabulary learning and teaching in the TESOL classroom, past and current research on this subject was examined together with the learning strategies that learners have at their disposal to achieve their learning target. Because the Keyword Method is a memory learning strategy that is supposed to utilise the workings of the brain, these workings were examined and an attempt was made to explain the beneficial effects of this method by linking theories of memory as advocated in the fields of psychology, philosophy and the neurosciences. The results of this cross-disciplinary literature research allow the conclusion that the apparent effectiveness of the Keyword Method is based on sound scientific principles. I then discussed the characteristics and properties of effective mnemonics, including the limitations and unrealistic use which have in the past contributed to their rejection. The concept of the mnemonic Keyword Method was then explored to establish its vital elements and the characteristics which are needed to make it effective in the classroom. I found that some of these are of lesser importance to the language classroom. Research into the effectiveness of the method on vocabulary retention has been carried out in the past in the laboratory and quasi-classroom situations with encouraging results. These investigations were carried out within the interpretive research paradigm. I conducted five experiments to obtain empirical evidence to try to answer the question of vocabulary retention and a questionnaire and three interviews to address the issue of motivation. I found that the Keyword Method enhances vocabulary retention to a great extent compared with comparison groups, and that it has a beneficial effect on the motivation of the learners. This led to the suggestion of further research into the Keyword Method and especially current teaching methodology, since available research so far tends to be inconclusive.

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# Background to the study

## 1. Introduction

When adult learners of a foreign language are unsuccessful and drop out of a course they generally blame themselves and are resigned to the fact that their memory is no longer what it used to be. This has, in my experience, the unfortunate effect that some of them abandon further education totally. Sometimes they blame the teacher. The teachers, on the other hand, are convinced that an appropriate presentation of the learning material is sufficient, and the teachers determine what appropriate is. If success is not forthcoming, some tend to blame the learners for their way of learning, lack of hard work and advocate more work, i.e. more of the same. The ball is in the learners' court. My teaching practice suggests that the method that underpins the teaching is normally not considered to be the cause, if it is considered at all. If it were, alternatives could be offered. In addition, *what* has to be learned is not in dispute, but the learners are rarely taught *how* they should learn the material on offer.

A small band of (mainly) cognitive psychologists have addressed the issue of learning in general during the last few decades and have tried to find ways of understanding the cognitive processes that a learner goes through, as well as to give teachers and learners better tools for learning (Sperber, 1989: 12). Amongst these is the concept of mnemonics and within it the *Keyword Method* (*KWM*), which is shown to be highly effective in helping to memorise learning material (cf. Ch. 6.4). Evidence for this effectiveness is mainly derived from research in the laboratory or quasi-classroom situations (ibid.) and not from genuine classroom situations over a longer period with research and instruction as an indistinguishable entity. This is also true for research into the effectiveness of current teaching methodology on vocabulary learning (cf. Ch. 2).

I attempt in this thesis to close this gap by providing empirical data on how effective both methods are (cf. Ch. 9). The wider aim is to give a coherent view of the concept of the mnemonic Keyword Method with all its facets, including its possible effect on motivation. From this emerge several specific research questions.

At present the *KWM* is a learning strategy that is preferred by some individuals but is not, to my knowledge, used systematically in language learning in general and vocabulary learning in particular. This is at least partly due to objections by applied linguists, educators and teachers who claim that the method is not scientific (cf. Ch. 6).

Research question 1:

Is it possible to provide a sound scientific foundation for the *KWM* by examining available theories and findings on the process of learning/ remembering?

Past research was mainly carried out in the laboratory (cf. above and Ch. 6.4). However, it showed that the *KWM* is generally superior to other methods of vocabulary learning.

Research question 2:

How effective is the *KWM* for the retention of vocabulary if adapted to a genuine classroom environment with intact classes over a period of one semester, compared with 'conventional' teaching, i.e. can the results of the laboratory be transferred to the classroom?

Surprisingly, very little research on the effectiveness of conventional vocabulary teaching, which consists mainly of teaching in context (cf. Ch. 1), is available. With the formation of comparison groups, a further question could be addressed:

Research question 3:

How effective is 'conventional' teaching for the retention of vocabulary?

I try to answer research questions 2 & 3 by conducting five quasi-experiments to obtain empirical data.

Classes are not arid places for the feeding of information but a social construct, part of which is, or at least should be, the enjoyment of learning, the facing of new challenges and the enhancement of self-esteem through success. It is in this respect

that the laboratory shows its clearest shortcoming when it comes to the investigation of learning strategies. This leads to another research question.

Research question 4:

Does the *KWM/iKWM* contribute to the enjoyment of learning (or not), i.e. is motivation affected by it and if this is the case, how?

To find some answers to these questions, which are not normally conducive to empirical research, I have used the research tools of the questionnaire and the interview.

When the research questions as formulated above have been addressed and some answers attempted, I hope that this thesis will provide a coherent view of the *KWM/iKWM*, since only the combination of all elements of the method makes it a valuable teaching tool. This is reflected in the structure of the thesis.

It is necessary to examine current teaching methodology and teaching/learning strategies (Ch. 2 & 3). Since mnemonics are part of memory strategies, an understanding of the workings of memory and the brain has to be arrived at (Ch. 4). I also describe the concept of mnemonics in general and the *KWM* in particular and suggest that there are limitations to the method in language teaching/learning. Some research is carried out to attempt to answer two questions which arise from this (Ch. 5 & 6).

The question of the research methodology for the study in this thesis is addressed in Ch. 7, with a description of research tools used and the paradigm in which this study is conducted (interpretive). Chapter 8 describes the study section, including a pilot study which prompted the following main research project (Ch. 9). A discussion about the research findings and a conclusion follows (Ch. 10).

# 2. Vocabulary learning

### Key terms

In this thesis there will be two different terms for the technique of the mnemonic KWM. When referring to the Keyword Method in general as described in the literature, the abbreviation KWM will be used. When the KWM is described as an integral part of the classroom procedure as described in this thesis, it will be called the *integrated Keyword Method* (*iKWM*), a term that is also meant to convey the notion that it is not seen as a competitor to existing teaching/learning methodology, but as a complementary element. Since *mnemonics* can be used for purposes other than vocabulary learning, this term is used when the issue of (language) learning in general is addressed; the terms *KWM* and *iKWM* are used when the more restricted issue of vocabulary learning is discussed.

To assess the effectiveness of the *iKWM*, the prevailing teaching orthodoxy concerning vocabulary has to be examined, including some methods as used in the past. This is done in this chapter with the attempt to provide comparison with the *KWM* method by consulting the literature. Since this proved to be unsatisfactory, I have attempted to look into the reasons why so few research results are available and why the available evidence points to some shortcomings of the 'learning in context' strategy. The issue of motivation as an inseparable element of learning is also addressed.

## 2.1. Retention

> *"...at this moment (1988) there is no lack of second-language acquisition theories, in fact, as Ellis suggests, there may be a 'superfluity of theorising (Ellis, 1985). Ellis describes seven of the most prominent theories in some detail, and we may note that five out of these seven make no specific comment about classroom learning, either as relevant data or relevant application. Of the remaining two, the Monitor Model suggests implications and applications of its various hypotheses for classroom procedures, and only Ellis' Variable Competence*

> *Model explicitly uses classroom data as analytical evidence (Ellis, 1984). We thus have the curious situation that most second-language acquisition theorising ignores the L2 classroom as a relevant source of data and as a relevant place to apply findings" (van Lier, 1988: 23)*

This thesis attempts to provide the abovementioned source of data (in connection with the *iKWM*) and to give a detailed account of how these findings are then applied for the benefit of the learners. In fact, the collection of data and the application of them cannot be separated. The distinction between *research* and *instruction* has become blurred to the extent that both have become complementary (see also below).

During the last century several teaching methodologies/approaches were tried by educationalists for teaching foreign languages, of which the main were

- The Grammar-Translation method (G/T)

The medium in the class was the native language of the learners. Emphasis was given to explicit explanation of grammar, paradigms to memorise and bilingual vocabulary list to learn (rote learning). Activities mainly consisted of translating of long text passages. Vocabulary instruction took place only if it could be combined with grammar (Zimmerman, 1997: 5/6). Learners were expected to use the thus obtained skills to read either classic literature or literature that was connected with their future academic life. Accuracy took precedence over fluency since it was assumed that (oral) fluency in a language could only be achieved by exposure to language in a native country.

- The Direct Method (DM)

As the name implies, an effort was made to obtain meaning from a language direct without the mediator of translation. Consequently, the target language was also the language of instruction. Explicit grammar and vocabulary teaching was avoided, along with the use of the dictionary. Known words, mime, demonstration and pictures were used to teach vocabulary (Richards & Rodgers, 1995: 9/10)

- The Reading Method/Situational Language Teaching (RM/STL)

For the first time, vocabulary teaching received particular attention. Vocabulary was seen as one of the most important aspects of second language learning (Zimmerman, 1997: 10). As a result of the effort to provide a scientific and rational basis for selecting the vocabulary content of language courses, word-frequency lists were compiled such as *A General Service List of English Words* (West).

- The audio-lingual method (ALM)

Habit formation (from Behaviourism) was the main goal of this method, achieved mainly through drills. Language teaching started with grammar (structure) and vocabulary acquisition took second place. Vocabulary items were chosen according to their simplicity and familiarity (Zimmerman, 1997: 11) and their value in teaching structure through drills ((Hockett, 1959, reprinted 1969)); cited in Richards and Rodgers (1986: 46)). “The linguistic student should never make the mistake of identifying a language with its dictionary” (Sapir; cited in Zimmermann: 1997).

- Communicative Language Teaching (CLT)

Under this term, several specific methods that concentrate on the teaching of communicative competence/proficiency are grouped, such as Krashen’s Natural Approach (see below). Fluency is given precedence over accuracy. Vocabulary teaching does not occur per se, but it is assumed that vocabulary acquisition is achieved by frequent exposure to the target language. In its strong form, the explicit teaching of structure and vocabulary is seen as superfluous (Gray, 2001), hence the term *acquisition* rather than *learning.*

One major shortcoming of the introduction of ‘methods’ is that “...they exist of packages of precepts which are imported into the classroom, rather than being derived from a close observation and analysis of what actually goes on in the classroom” (Nunan, 1991: 248). With the exception of the RM/SLT, all methods/approaches did not give vocabulary learning prominence. Most lacked a profound idea of how to teach vocabulary (Schmitt, 2000: 15). It was somehow expected that vocabulary would be acquired along the way .....”it would take care of itself” (Coady, 1993). Therefore, little emphasis was placed on the acquisition of

vocabulary (Zimmerman, 1997: 17) and it was largely ignored by most researchers (Meara, 1980; Singleton, 1999: XI). Furthermore, it has not been a priority in second language teaching methodology. “It is hoped that the central role occupied by vocabulary in the reality of language learning will *one day* (my italics) be reflected in the attention given to it in research and the classroom” (Zimmermann, ibid.). This statement was expressed as recently as 1997.

Teaching and learning of vocabulary “....have never aroused the same degree of interest within language teaching as have such issues as grammatical competence, contrastive analysis, reading or writing” (Richards, 1980). CLT with its emphasis on learning from/in context is still hugely influential in current teaching practice and the idea that lexical growth can best be achieved through extensive reading is central to this kind of input-dominant language acquisition theory. The most influential model in CLT is undoubtedly Krashen’s Monitor Model (Krashen & Terrell, 1984; Krashen & Terrell, 1983). McLaughlin, who is very critical of it, explains Krashen’ popularity among language teachers with its accessibility to these practitioners. “.... moreover, he has captured the *Zeitgeist* – the movement in the field away from grammar-based to communicatively oriented language instruction” (McLaughlin, 1995).

However, the pure form has given way to the realisation that some explicit teaching has to take place, hence the recent focus on grammar teaching. There seems to be a trend now to complement this with explicit vocabulary teaching (Dubin, 1989; Meara, 1980; Nation, 2001), not least because some research has shown that learners who receive formal instruction, generally do better than those who do not (Ellis, 1985; Long, 1983), which would confirm common sense. “Incidental learning via guessing from context is the most important of all sources of vocabulary learning. This is particularly true for native speakers learning their first language. It should also be true for second language learners, but many do not experience the conditions that are needed for this kind of learning to occur” (Nation, 2001: 234). Leaving the native speaker aside, this short sentence demonstrates the problems with learning in context in the classroom. Incidental learning is seen as learning of vocabulary from reading or listening .....while the main focus of the learner’s attention is on the text and that the learner either does not sit a test or exam later or is not aware of it. It basically means the learner acquires knowledge without thinking. Intentional learning,

on the other hand, is seen as the direct study of language items and the learner is aware of a future test/exam (Hulstijn, 2001: 266-7; Nation, 2001: 232). The learner thinks about learning.

From this definition follows that incidental learning rarely takes place in the classroom since the learners normally expect to sit a test/exam. Moreover, the distinction between the two concepts is blurred (Hulstijn, 2001). More importantly, the vast majority who learn a foreign language in the classroom do so in monolingual classes, with their teacher a non-native speaker of English and with no English speaking environment outside it. The result is that the learners almost always learn vocabulary intentionally. When they encounter a new word in the text, they ask for the translation, either from their teacher or from their fellow learners. When there is no success because the other learners do not know the word either and the teacher refuses to translate, they use a dictionary. Whatever the rational behind incidental learning is, the teacher rarely refuses to translate. This can be observed even in multilingual classrooms, if the teacher speaks the language(s) of some of his/her learners. Learners will always find a way to translate, although in modern L2 pedagogy translating has been given a bad name. It has always been the 'whipping boy' for complaints about language learning and teaching (Heltai, 1989). But if rote learning is the 'hidden agenda' in the classroom (Sommer, 1978), translation also falls under this category (Bensoussan, 1992).

There is also the problem of misunderstanding in incidental learning from texts. Idioms, 'false friends' and words with multiple meanings etc. are prime candidates for misunderstandings. It is extremely difficult to 'unlearn' these false meanings (Hulstijn, 1992). It is even more difficult to 'unlearn' wrong pronunciation of a word that has only been read in context and not heard. These problems cause uncertainty with the learner (Eliy, 1995). An even more severe problem occurs when learners deduce wrong meanings from context but do not realise it, i.e. they are sure they have the correct one. This can have unfortunate results in later communication. Schatz & Baldwin state as early as 1986 that context clues are unreliable predictors of word meanings and that "some of the traditional assumptions about the teaching of context clues should be rigorously re-examined. There appears to be no alternative to intentional learning of a great many new words in a relatively short period of time (Groot, 2000).

Nevertheless, guessing from context is still a popular way of teaching vocabulary. It ties in with the concept of elaboration. Concentration on features of the new word and its text environment (the company it keeps) is supposed to facilitate retention. Learning-in-context relies heavily on recycling, re-presenting of vocabulary items by the teacher, and therefore re-noticing of them by the learner. For meaningful recycling to take place, a vast amount of vocabulary has to be encountered for particular words to occur again and again. In one semester (36 hours exposure to the target language – and only a fraction of this for reading), this is clearly limited and inadequate. There is another problem regarding the language teacher's/learner's point of view. The texts used in the classroom are preferably authentic (literature, newspaper articles etc.) and it is precisely the skill of a good writer to use *different* words to describe the same concept. This diminishes the opportunity for recycling further. Instruction compensates for this by adding an additional element. The *iKWM* is one of these instruction tools.

From the discussion above it can easily be seen why teachers regard the issue of intentional/incidental learning as mainly irrelevant and a matter that is only of passing interest outside the scientific domain. The very moment a teacher is involved in language learning, the issue of incidental learning largely disappears. This leaves the question of why the debate about intentional/incidental learning receives such dominance in educational literature. Still, the question remains of just how effective vocabulary learning from a written context is. Although there is some research on vocabulary acquisition through reading, to date there is, surprisingly, no empirical data available about the effectiveness of learning-in-context in the classroom over a longer period (at least one semester). SLA research on incidental learning through reading has not provided any insights regarding factors that facilitated successful incidental learning (Rott, 1999). A great proportion of it is concerned with the acquisition of vocabulary in the native language of the learners, and not with that of foreign vocabulary.

> *Although this may come as a surprise to teachers, many strategies endorsed by curriculum and instruction publications represent only conventional wisdom about the nature of teaching and learning and have never demonstrated their worth in objective experimental evaluations. Take, for example, the*

> *presumed benefits of semantic-context strategies for acquisition of vocabulary-definition associations. Teachers are typically advised to teach students to use new words in context, that is, to construct meaningful sentences containing new vocabulary, to generate synonyms, or to practice semantic mapping of a word, including specifications of related terms and opposites. These methods of vocabulary acquisition share one problem, however. They do not work. Quite a few experiments conducted during the last 15 years compared these methods to that of simply giving students words and their meanings to study. None of the semantic-context procedures produced better learning of vocabulary-meaning associations than the no-strategy control procedures (see Pressley, Levin, & McDaniel, 1987). Many strategies that have traditionally been recommended, simply lack research support (Pressley & Harris, 1993).*

The situation has not changed much since then. The way vocabulary is learnt is still a mystery (Coady, 1993). In this context it should be mentioned that teachers are rarely asked to participate in decisions concerning the curriculum. Most take it on trust that the teaching method as demanded from their authorities has been rigorously tested and found effective.

Literature on vocabulary acquisition through learning-in-context mainly avoids the issue. This is probably due to the multitude of uncontrollable variables in such research, which, in some researchers view leaves them exposed to criticism on grounds of validity. Some writers have conducted short-term experiments and the results are not encouraging for the language teacher. The vocabulary retention of new words ranges from 5.88% (Pitts, White, & Krashen, 1989), 7.69% (Hulstijn, 1992), 6,66% (Day, Omura, & Hiramatsu, 1991) to approx. 20% (Dupuy & Krashen, 1993; Horst, Cobb, & Meara, 1998, using the novel 'Clockwork Orange' as text).

Hermann (2003) found that ."...reading literature is at least as effective as – and perhaps is more effective than – rote memorisation for the purpose of promoting longer-term lexical retention". Saragi, Nation & Meister (1978) deduced that "extensive reading results in a substantial amount of vocabulary learning", a

conclusion that is hardly surprising. Tudor & Hafiz (1989) and Hafiz and Tudor (1990) could not find better vocabulary retention compared with the control groups. It has to be said of these experiments that they have limited relevance to the classroom. The subjects were mainly university students. Researchers tend to work with small selected group of learners and they prefer to have time to "...refine their instruments and (to) undertake quite elaborate analyses of their test results" (Read, 2000: 151). Because of their short-term nature, there was no meaningful opportunity for recycling, as happens in the classroom. In addition, these experiments ignore several factors that influence the learner's performance in the classroom, such as background knowledge (the schema) (cf. p. 100), motivation depending on the texts, and not least the teacher, whose task it is to provide adequate texts which take into account the learners' level of proficiency and his/her general support. Longitudinal research in genuine classroom settings should therefore generate better results (cf. Ch. 8).

"The fact remains that little evidence is available so far to show the merits of in-context-learning relative to other forms of instruction. Data of this nature should prove especially useful in illuminating the debate between those at one end of the spectrum (e.g. Krashen, 1989, 1993) and others (e.g. Horst et al., 1998) who call for more direct, explicit instruction of high-frequency vocabulary words. Also of interest would be additional studies such as that of Joe (1998) which investigate hybrid approaches wherein vocabulary is taught through reading in conjunction with pre- or post-reading activities such as summary or root recognition" (Hermann, 2003). As Meara (1982:109), one of the earlier advocates of explicit vocabulary teaching, pointed out, vocabulary acquisition research "...concentrates on what is basically a problem to do with the management of learning, rather than with the learning process itself, i.e. the object of this type of research is to decide what words are to be taught, not to find out how words are actually learned". "We cannot argue with the claim that for a given word the quickest way to impart thorough knowledge of its meaning is via direct instruction" (Nagy, Herman, & Anderson, 1985). Nagy et al. write mainly about learners trying to improve their *native* vocabulary. For the purpose of foreign language learning, it should not be forgotten that one form of direct instruction is translating, one element of the *KWM*. Explicit instruction *may* accelerate the *rate* of development and increase the learners' proficiency, although research on this matter is woefully inadequate. It seems that researchers have generally equated *effect* of

instruction with *duration* of instruction (hence the issue of how often a learner has to re-notice a word to learn it), rather than with *quality* or *intensity* of instruction, or any number of other variables which might come to light if classroom instruction *itself* had been a source of data (van Lier, 1988: 25). The research project in this thesis tries to combine research and instruction in this vein.

Finally, the underlying rational of learning in context seems to be that understanding *is* remembering. This is a fallacy (Russel, 1979); and the (unsatisfactory) research so far tends to confirm this.

## 2.2. Motivation

Motivation is perhaps the single most important concern to language teachers and they are always trying to include motivational activities in their class even when their actual learning value is minimal. The ultimate goal – and difficulty – is to develop activities which have both high motivational and learning value. “The *KWM* is truly impressive for providing both” (Singer, 1977).

Motivation is not static but varies over time and is influenced by a multitude of external factors (Ellis, 1994: 36). That it is instrumental in learning is acknowledged by many writers, but what it consists of has not been finally established, and probably never will be. Agreement exists regarding the concept that motivation has two interdependent parts, i.e. that it can be causative (an effect on learning) and resultative (e.g. influenced by learning). The popular saying that ‘success breeds success’ describes the latter’s influence when it is positive. Positive motivation provides a virtuous circle. However, it is impossible to establish by research which of the two forms is responsible for the success of learning, i.e. whether motivation is to be seen as the cause or the result of success in L2 learning or both (ibid. 514). There is intrinsic motivation which comes from within the learner and his/her perceived personal needs, such as satisfying one’s curiosity or just the desire to ‘grease one’s grey matter’. There is also extrinsic motivation which influences the learner from ‘outside’, e.g. material awards such as gaining or retaining a job because of acquired new knowledge or using evening classes to improve one’s performance in mainstream education to pass school exams. Integrative motivation, which occurs when a learner wishes to identify with the culture or group of the L2 plays little role in

the monolingual language classroom outside an English-speaking community. Learners see the need to learn English, but have no intention of getting involved in Anglo-Saxon or even Western culture in general. (Most people who actually fight this culture, speak excellent English.) (adapted from Ellis, 1994:471-528)

In adult education, other than in mainstream education, no authority forces the learners to learn. They come on their own volition. In this case, the Internal Cause Hypothesis applies, i.e. learners bring to the classroom a certain quantity of motivation as given (Ellis, 1994: 509). It follows that it is the role of the teacher to prevent de-motivation and to 'break the spiral of declining enthusiasm' (Littlejohn, 2001), rather than to build up motivation from the start.

Ellis (1994: 514) reports that there is little research on extrinsic motivation and cites two, one from 1948! (Dunkel) with an inconclusive result and one from 1991 (Gardner & MacIntyre), in which learners were offered monetary rewards in a vocabulary test. The students offered the rewards did significantly better than the ones without this offer. Gardner & MacIntyre see this as a weakness of extrinsic motivation, i.e. the learners cease to learn when the reward stops. This can be confirmed by my own observation. Learners who come to evening class to learn English to enhance their chances to obtain a job, mostly dropped out immediately after they had been offered one.

There is some research on resultative motivation. Spolsky, (1989: 153) in a review of studies on motivation, states that 'while greater motivation and attitudes lead to better learning, the converse is not true'. Savignon (1972) reported that students' motivation increased with gains in (French) proficiency. Hermann (1980) also suggests that success contributes to motivation rather than vice-versa, resulting in the 'Resultative Hypothesis'.

Intrinsic motivation has been examined mainly in research on teaching procedures. McNamara (1973) and Rossier (1975) see communication practices as conducive to this kind of motivation. Bachmann (1964) found that the involvement of learners in decision-making tended to lead to increased motivation. Gardner, Ginsberg & Smythe compared traditional (lockstep teaching with emphasis on grammar) with innovative teaching (individualised instruction and communicative tasks). The latter group developed a more positive attitude to French (the above examples are cited in Ellis (1994: 513-517)). A taxonomy of intrinsic motivations for

learning can be found in Malone & Lepper (1987). Among those they list 'Fantasy Relevance', which they define as 'evoking mental images of physical or social situations not actually present'. One form of this is endogenous, in which the skill being learnt and the fantasy depend on each other. The skill is exercised in the fantasy context. The *KWM* with its sometimes 'fantastic' images seems to fit the requirements.

There are not many studies on second language acquisition and motivation, and the few that exist are relatively old. Some of the more recent and influential books on vocabulary learning and pedagogy do not mention motivation at all (e.g. Coady & Huckin, 1997; Nation, 2001; Schmitt, 2000; Schmitt & McCarthy, 1997).

Research on motivation in connection with mnemonics and the *KWM* is equally not plentiful, although Gruneberg (i.p.c.) sees the effect of the method on motivation as important as its effect on retention. Gruneberg & Jacobs (1991) asked learners about the Linkword courses (*KWM*) and found that they thought they were faster, easier and more enjoyable. Kasper (1993) also found evidence for increased motivation. Teachers reported that the method was 'easy to use' and that their students enjoyed using it. She also suggests, incidentally, that the *KWM* should be incorporated into foreign language curricula, a sentiment I share. In two articles (1990; 1994) Higbee found that, compared with control groups, students thought the mnemonic method, in this case the rhyming pegword method, was easier and more fun and more interesting – in short, more enjoyable.

In a survey I conducted in the past (unpublished) in a class of 15 learners after 5 months instruction, they were asked:

"Notwithstanding the (retention) results, was the *KWM* fun compared with the conventional method?" All learners answered that the *KWM* was more fun or much more fun. To the direct question of whether the *KWM* increased their motivation to learn, all learners answered that it had increased their motivation or had increased it very much.

As with the question of retention, research on the *KWM* and motivation has mainly been carried out over relatively short periods and in situations in which research and instruction were different entities. This thesis attempts to examine how

the motivational effect is seen by learners after instruction with the *iKWM* for three semesters.

# 3. Mnemonics within the taxonomy of learning strategies

In the literature there are several learning strategy taxonomies available. This chapter examines whether mnemonics are included as a memory strategy, and which place they occupy within these various taxonomies.

## 3.1. Mnemonics: methods, strategies or techniques?

The term ‘strategy’ is notoriously difficult to define and is sufficiently vague to encompass a multitude of learners’ cognitive activities (see below). It has no ‘specificity’ (Alexander & Judy, 1988) and is rather ‘fuzzy’ (Wellman, 1983: 31-51) Learners engage in strategic time-monitoring (e.g. Ceci & Bronfenbrenner, 1985), the time-honoured rehearsal (e.g. Ornstein, Stone, Medlin, & Naus, 1985), mnemonic devices (e.g. McDaniel & Pressley, 1989), elaboration (e.g. Pressley, 1982), labelling (e,g. DeLoache, Cassidy, & Brown, 1985) and revision techniques (e.g. Beal, Garrod, & Bonitatibis, 1990).

The *KWM* has been called all manner of available classifications, such as ‘strategy’ (e.g. Ott, Butler, Blake, & Ball, 1973), ‘procedure’ (e.g. Raugh & Atkinson, 1975), ‘method’, (Pressley, Levin, Hall, Miller, & Berry, 1980), ‘technique’ (Paivio & Desrochers, 1981), and ‘approach’ (Stoller & Grabe, 1993). The picture is even more confusing when one considers that researchers use these terms interchangeably, often in one and the same paper. Kaminska (2002: 18) blames the confusion partly on the situation that psychologists and educationalists have different conceptions of these terms.

Since the subject of this thesis is the Keyword *Method*, emphasis has to be put on what these terms mean and how the *KWM* is placed within these frameworks. There are several suggestions about these terms. Anthony (1963), in Richards and Rodgers (1995: 15-16)), makes a distinction between approach, method and technique.

> *“[.....,] approach is the level at which assumptions and beliefs about language and language learning are specified; method is the level at which theory is put into practice and at which choices are made about the particular skills to be taught, the*

*content to be taught, and the order in which the content will be presented; technique is the level at which classroom procedures are described" (ibid.).*

Others have criticised this as too narrow and imprecise (Larsen-Freeman, 1986; Richards & Rodgers, 1995) with Richards & Rodgers substituting *technique* with yet another term: *procedure*, to avoid Anderson's supposed narrowness. They also make a useful contribution by placing *approach* and *method* at the level of design. Here, objectives, syllabus and content are determined. Procedure encompasses classroom techniques, practices and behaviours observed when the method is used.

Hubbard et al. (1990) explain *technique* as a procedure used in the classroom, while a *method* is a *set* of procedures or a collection of techniques used in a systematic way. This is an important definition for the *KWM*. It could be argued that the use of mnemonic devices such as *keywords* by individual teachers in a non-systematic and sometimes haphazard way and without deeper understanding of the machinations of mnemonics can be seen as t*echnique.* On the other hand, if the *keyword method* is used in a systematic way as described in this thesis and founded on systematic scientific inquiry (cf. Ch. 1), it can be seen as a method. Theories of memory from psychology and evidence from the neurosciences justify, in my opinion, the name Keyword *Method.*

## 3.2. Learning strategies

While the questions as discussed above have mainly concerned psychologists and educationalists (and teachers), the question of strategy is in the domain of the learners, although the distinction is a blurred one. During the last decades there has been renewed interest in learners and learning, rather than in the teacher and teaching. Teachers suggest and impose strategies, learners use strategies they are used to or find useful (Grenfell & Harris, 1999: 87). If the latter happens with the Keyword Method, it is undoubtedly a strategy, a mnemonic strategy (Baddeley, 1985).

Not surprisingly, several definitions for the term *learning strategy* have been put forward. Learner strategies are the behaviour or actions that learners engage in, in order to learn or use the L2. They are generally considered to be conscious - or at

least potentially conscious - and, therefore, open to inspection (Ellis, 1994: 712). Some others have enlarged and embellished this definition to be more specific, e.g. Rubin (1975: 43; 1987: 23), Weinstein & Mayer (1986), Schmeck (1983: 234), Oxford (1990a: 8), Mayer (1998: 21), Stern (1992) etc.

## 3.3. Metacognitive and cognitive learning strategies

To put it simply, knowing a language is to have it stored in memory, and to speak is to select data from memory on-line. Within the cognitive approach, the language system is treated and explored as a sub-domain of memory (e.g. Baddeley, 1982; Persson, 1995: 25). The language learner has to use strategies to commit new language(s) to memory, whether they are already existing ones or newly acquired ones (by one's own effort or that of the teacher or a combination of both).

When discussing these learning strategies below, it has to be acknowledged that it is extremely difficult and unclear how to explain the separation of one from the other (eg. Cavenaugh & Perlmutter, 1982; Garner & Alexander, 1989; Jacobs & Paris, 1987). Brown defines *metacognition* by its two components *knowledge about cognition* and *regulation of cognition* (Brown & DeLoache, 1983; Brown, 1975; 1977; Brown & Palincsar, 1982). However, in 1987, she asks herself whether the construct of metacognition merely describes a range of cognitive functions 'elevated and dignified with a new title' (p. 7). Others do not have these doubts.

According to O'Malley & Chamot (1990: 44), cognitive strategies are learning strategies that 'operate directly on incoming information, manipulating it in ways that enhance learning'. They involve such operations as rehearsal, organising information, inferencing, while metacognitive strategies enable the learner to think consciously how they learn and how successfully they are learning. Metacognitive strategies involve planning, learning, monitoring the process of learning, and evaluating how successful a particular strategy is (Ellis, 1994: 696/714).

Some authors are in favour of a third 'executive' strategy, *metamemorial* strategy (Flavell, 1971, 1978, 1981). The learner is conscious of the shortcomings of memory in general and his/hers in particular, especially in adult education, where the complaint "my memory is not what it used to be" is familiar. Consequently, the learner selects the (individually) most useful and effective learning method/strategy, thereby

self-monitoring cognition itself (Cavenaugh & Perlmutter, 1982). Tversky & Teiffer's (1976) opinion that memory strategies are used as a means of encoding material to enable later retrieval, is not helpful. Learners expect this from any teaching/learning strategy.

Mnemonics seems to be a prime candidate for metamemorial strategy, but the issue is divided, not least because some authors do not separate memory strategies from cognitive ones (e.g. O'Malley, Chamot, Stewner-Manzanares, Küpper, & Russo, 1985; Rubin, 1987: 24). Therefore, mnemonic strategies are seen as part of cognitive strategies. Others, such as Oxford (1989; 1990a) see mnemonic strategies as specific memory strategies.

Whatever the cognitive *strategies* of the learners are, the adoption of these is a strong indicator of cognitive *performance* and skill in different situations such as rehearsal (e.g. Weinstein & Mayer, 1986), labelling (e.g. Vlietstra, 1982), organisation (e.g. Bjorklund & Marchena, 1984), persistence at task (e.g. Corno, 1986), attention (e.g. Schiff & Knopf, 1985), motivation (e.g. Gottfried, 1990) and retrieval (e.g. Ornstein et al., 1985). Not surprisingly, since they are still at the developmental stage of cognitive strategies, most research has been carried out on children.

If one accepts that second language learning is a cognitive process like any other learning process, one has to question the *strong* CLT approach such as Krashen's Monitor/Acquisition hypothesis (1984; 1983), which states that language cannot be learnt but has to be 'acquired' in a natural way (natural communication). This would, of course, mean that learning strategies are of no importance for learning a second language. As popular and influential as the CLT approach still is, the *strong* version has gone out of fashion, as demonstrated by renewed interest in explicit grammar teaching. If the *iKWM* were adopted, this would add explicit vocabulary teaching without hindering the subsequent communicative activities.

## 3.4. Taxonomy of language learning strategies

After definition, attempts of classification followed (mainly by the same authors as above). The differences between these attempts at classification are minimal and mainly display different emphases. The broad agreement is that learning goes beyond mere cognitive processes and includes social and communicative strategies

(Hismanoglu, 2003). There is a plethora of strategy classification systems which can be divided into approx. 5 groups:

1. Systems related to successful language learners (Rubin, 1975)
2. Systems based on psychological functions (O'Malley & Chamot, 1990)
3. Linguistically-based systems concerned with guessing, language monitoring, formal and functional practice (Bialystok, 1981)
4. Systems related to separate language skills (Cohen, 1990)
5. Systems based on different styles or types of learners (Sutter, 1989) (Oxford, 1994).

Three taxonomies will be introduced here, with Oxford's in more detail since she is an influential figure and one who includes specific memory strategies. For the sake of completeness in this thesis, other learning strategies will be mentioned but not discussed further.

**Weinstein & Mayer** (1986) propose eight different learning strategies:

a) Basic rehearsal strategies
b) Complex rehearsal strategies
c) Basic elaboration strategies (includes the *KWM*)
d) Complex elaboration strategies (includes the *KWM*)
e) Basic organisational strategies
f) Complex organisational strategies
g) Comprehension monitoring strategies
h) Affective (motivational) strategies

Not surprisingly, the *KWM* was classified as being part of the elaboration strategies.

**Rubin** (1987) proposes three types of strategy that contribute directly or indirectly to language learning:

a) Learning strategies

b) Communication strategies

c) Social strategies

Learning strategies are divided into:

I. Cognitive learning strategies

- Clarification/ verification
- Guessing/ inductive inferencing
- Deductive reasoning
- Practice
- Monitoring
- Memorisation strategies such as associations or grouping (phonetic, semantic, visual, auditory, kinesic, olfactory, sensory)
- the use of keywords
- directed physical response (physical mnemonics)
- mechanical storage of information (non-mnemonic)
- selective attention (non-mnemonic)

II. Metacognitive learning strategies

Oxford (1990a) distinguishes between direct learning strategies (1990b: p.71), “which directly involve the subject matter” and indirect ones “which do not directly involve the subject matter itself, but are essential to language learning nonetheless”.

## I. Direct strategies

- **Memory**

  creating mental links

  grouping

  associating/elaborating

  placing new words in context

  applying images and sound

  using imagery

  semantic mapping

  using keywords

  representing sounds in memory

  reviewing well

  employing action

  using physical response or sensation (physical mnemonics)

  using mechanical techniques

- **Cognitive**

  practising

  receiving and sending messages strategies

  analysing and reasoning

  creating structure for input and output

- **Compensation**

  guessing intelligently

  overcoming limitations in speaking and writing

## II. Indirect strategies

- **Metacognitive**

  centering your learning

  arranging and planning your learning

  evaluating your learning

- **Affective**

  lowering your anxiety

  encouraging yourself

  taking your emotional temperature

- **Social**

  asking questions

  co-operating with others

  emphasising with others

The strategies of interest here, memory strategies, “are used for forming and revising internal mental models and receiving and producing messages in the target language”. Some of the examples given by Oxford for these strategies seem to confuse some sub-strategies (Kaminska, 2002: 24/5).

### Associating/elaborating

Oxford gives the example of the German word *Wissenschaft* (science) with the association of the English words *wise* and *shaft,* therefore forming the thought of a “shaft of wisdom”, representing the concept of *science*. This is the classic *KWM*.

### Representing sounds in memory

This is described as linking the new word with the familiar words or sounds from any language. (Oxford, 1989: 63). Again, this is the keyword principle. As Kaminska points out, the example given by Oxford (English: car; Spanish carta/letter) is a well-known word pair from *KWM* experiments (e.g. Wenden & Rubin, 1987: 134).

A third example uses a combination of rhyme and keyword in learning French, p*oubelle* (waste bin) and *plus belle* (more beautiful) to create the memorable rhyme *la plus belle poubelle.* Incidentally, apart from including rhyme in the association, this is also a good example that keywords do not have to be words in the mother tongue.

From these examples it can be seen that Oxford's sub-strategy *using keywords* is treated by her too narrowly. Consequently, she had to put them into different categories, thereby causing confusion.

The taxonomies as described above deal with general language learning strategies, i.e. with the learning of all aspects of the target language, not just vocabulary.

## 3.5. Use of mnemonics

Several researchers have tried to establish what kind of learning strategies are used by language learners. It is therefore useful to examine how mnemonics fare in this respect.

In one study (O'Malley et al., 1985) it was found that out of 297 beginners not one used keywords, and out of 149 intermediate learners only one did so. In another study (1990) the same authors found that only 4% used elaboration, keywords, deduction, grouping and recombination. Schmitt (1997) surveyed 600 Japanese students to find out their use of and satisfaction with a list of 40 learning strategies. In the table *most/least used strategies,* mnemonics do not appear, in the table m*ost/least helpful* strategies the *KWM* appears in 38th place. However, it should be noted that in some cultures, and Japan is among them, there is a heavy reliance on repetition, and this survey has been criticised for its narrow focus. This is not to say that the *KWM* is more often used in other parts of the world. Sperber (1989) conducted a survey in Western Europe and North America among teachers of foreign languages to establish how mnemonics are used. Sperber 'estimates' that at least 10,000 teachers were contacted (he sent his questionnaires to institutions and expected them to distribute these, without any control of whether they did so or not). The positive return, i.e. teachers reporting that they used some form of mnemonics, was 2%. Sperber equates this low figure with the poor treatment mnemonic techniques suffer in modern teaching material.

Griffith and Parr (2001) conducted research with learners *and* teachers. There were 569 questionnaires for learners to express their view on their own use of learning strategies (according to Oxford's (1990a) Strategy Inventory for Language Learning (SILL)). Memory strategies came last. The teachers' survey confirms that the perceptions of teachers and learners can vary widely because they ranked memory strategies as 'most frequently' used by their students. The teachers seem to be blissfully unaware of the learning strategies of their students. O'Malley et al. (1985) arrived at a similar conclusion.

This depicts a lack of training in this field. Teachers should be aware of their students' strategies, to suggest a change of strategy to their less successful ones. This means, of course, that they have to be aware of a variety of strategies.

Mnemonics could be used in teacher-training courses to teach technical terms in linguistics which are not always easy to remember. This might also alert them to the possibility of use in the classroom. Teachers are more prepared to advise others if they have had positive experience with a method themselves.

For instance:

onomatopoeic = *oh no mate, it's not poetic.*

In teaching material or books for teachers, the *KWM* is conspicuous by its absence (e.g. Allen, 1991; Harmer, 1991; Hubbard et al., 1990; Larsen-Freeman, 1986).

Mnemonics needs the attention of the educationalists to be included in the teaching of learning strategies to teachers before they can become widely accepted. The puzzle is that mnemonics, and here the *KWM*, is probably one of the best examined learning strategies for vocabulary, albeit mainly in the laboratory of the psychologists. This research should be taken into the classroom to gain credibility among teachers. After all, Rubin and Thompson (1982) recommend *mnemonics and other memory strategies* among 14 other characteristic strategies for good learners.

# 4. Memory

**Key terms**

A distinction has to be made between verbal and visual paths into memory. The term verbal is used throughout the thesis as referring to the path described by the spoken word (loud or silent). Other 'auditory' categories (e.g. sounds) will be explicitly mentioned if and when they occur. The term visual is meant to depict pictorial representations, real or imagined. Any other form will be pointed out separately.

Since the KWM is regarded as a strategy that utilises the workings of the memory systems, theories of memory as put forward (mainly) by psychologists are introduced and discussed including the findings of the neurosciences. In the evolving discussion I try to establish whether the known effectiveness of mnemonics can be explained by these findings, thereby giving mnemonics and the *KWM* a firm scientific foundation.

## 4.1. Theories of memory

The first known theory of memory was provided by Plato (427-347 BC). He used the metaphor of the 'wax tablet' to explain its workings. The wax tablet takes imprints (indentations) of information to be stored (another metaphor). Repetition increases these 'grooves'; neglect makes them gradually disappear. This is not too far away from the model the *connectionists* advocate (cf. Ch. 4.2.) Forgetting, then, is a kind of 'wear and tear'. Length of memory depends on the consistency of the wax. The harder the wax, the harder it is to get information indented on it, but memory lasts longer. If the wax is softer, it is easier to indent, but the memory is short lived. There are certain pitfalls with this 'template' theory of memory. For it to work, memory has to be exact, which it is not. Stimuli that are repeated would need separate imprints since no stimulus is exactly the same as the one used before. This model does not explain the ability of the brain to use memory to access new information (going to an unfamiliar dentist). Retrieval is not addressed. For this, a separate theory is needed - that of a bird cage. Distinct, bigger birds are more easily retrieved from the cage than smaller, blander ones (Morris, 1978: 3-6). This first theory of

memory is mentioned here because it is also the most persistent. In my schooldays the teachers explained this model to us to encourage rote-learning.

In modern times there has been extensive research on memory, mainly by psychologists, with the appearance of several theories. During the last few years, the neurosciences have shed light on the functioning of the brain.

Experimental study of memory is linked with Ebbinghaus (1850-1909) and Wundt (1832-1920). Ebbinghaus is also remembered for being the first to use nonsense syllables in his studies. Ebbinghaus proved the existence of distinct functions of memory with the use of strictly controlled independent variables and showed the close relationship between learning time, amount of mental repetition and durability of memory. He could also show that regularities exist, e.g. in the rate of forgetting with its initial rapid loss of information, slowing exponentially over time (Morris, 1978: 12). This had the unfortunate effect that the concept of mnemonics, which was well known in the 19$^{th}$ Century, was no longer pursued for learning purposes and research. Instead, rote learning became the main object of inquiry in memory research, because nonsense syllables were the perfect means of eliminating any mediators, i.e. additional information such as images, meaning, elaboration, etc. (Paivio, 1971: 1).

This artificial material (nonsense syllables) and therefore the absence of meaning, as well as the concentration on serial learning, limited the research. Bartlett included meaning in his research, using a more natural context (Bartlett, 1932). He also found that subjects tried to give meaning to details they tried to remember unsuccessfully. This was later confirmed by others, e.g. Alexander & Judy (1988), also confirming the general understanding that meaning is central to human memory and that it is essential for most cognitive and mnemonic learning strategies. The 1940s and 50s were ‘arid’ years (Richardson, 1980), effectively putting an end to research on memory and imagery. Behaviourism concentrated on the stimulus-response paradigm. “Remembering in imagery has neither unique instigating stimuli nor unique behavioural signs. Learning to use imagery terms would therefore derive mainly from induction or stimulus generalization” (cited in Bower, 1972). This school of thought dismissed mentalistic concepts in favour of habit forming as a learning strategy (Paivio, 1971: 1)

The era of the Behaviourist Blitzkrieg in psychology (Hrees, 1985: 2444), which made it almost impossible to conduct memory research (Nilsson, 1979), came to an end in the late 1950s when cognitivism was reintroduced, and with it a new interest in memory and its associative functions (e.g. imagery and metaconcepts). Brown (1958) and Peterson and Peterson (1959) suggested that cognition had to do with two separate storage systems, a long-term store, where retention is affected by interference, and a short-term store where retention is affected by the decay of the memory trace.

From then on memory research blossomed to the extent of a 'veritable explosion' (Nilsson, 1979) and the coming of a 'new era' (ibid.). Several theories of memory developed which could later not be sustained (see below), e.g. the library theory which assumed that memory is organised like a library and needs (several) relevant references for retrieval (Lindsay & Norman, 1981), see below. The human memory is obviously much more flexible than a library system (Metzig & Schuster, 1998: 22). Waugh & Norman (1965) and Atkinson & Shiffrin (1971; 1968) proposed a model for short-term memory (STM), suggesting that it stored verbal information only. The STM has limited capacity and information can be lost because of decay or interference. Rehearsal was seen as the key method of keeping information in this STM and for transfer to long-term memory (LTM). This model was later seen as unsatisfactory (Gathercole, 1994: 51).

### 4.1.1. Working (short-term) memory

The short-term memory keeps information for seconds or, at the most, minutes. The duration as stated in the literature varies considerably. Building on Pollack's experiments (1952) with sound, Miller (1956) suggested that the STM cannot process more than 7+/-2 single items of information. He suggested, again referring to Pollack, that there is a way to increase this limited capacity – chunking, i.e. grouping information. If one accepts that the STM is the gateway to LTM (Schacter, 2001: 27), then information to be taught/learnt should be presented in a form that takes account of this theory, i.e. vocabulary lists should be presented in appropriate blocks of 7+/-2 items.

Baddely and Hitch (1974) and Baddely, Lewis & Villar (1984) offered a theory that built on previous ones, and replaced the term *short-term memory* with *working*

*memory* (WM), with its components *central executive*, *phonological loop*, and *sketchpad*. Salame & Baddely (1982) later added another aspect, the *primary acoustic store*. The *central executive* is responsible for co-ordinating the flow of information and for dealing with processing and storage. It is a short-term processor with the added capacity to have higher cognitive functions, including problem-solving and reasoning (Baddeley, 1985, 1990, 1992, 1995; Baddeley & Hitch, 1974) or metacognitive functions (Brown & DeLoache, 1983; Brown, 1978; Flavell, 1971).

The other 'slave' systems retain verbal material in terms of its speech-based characteristics (the phonological loop, retaining small amounts of linguistic information temporarily), which is sometimes referred to as 'the inner voice' and the system that specialises in processing material that can be represented in terms of either visual or spatial characteristics (the sketchpad), the 'inner eye' (Gathercole, 1994: 51). Experiments with children have shown that there is a clear link between the phonological loop and word learning (ibid. p. 59). "The phonological loop turns out to be a gateway to acquiring new vocabulary. The loop helps us to put together the sounds of novel words" (Schacter, 2001: 30). It seems WM is heavily involved in language acquisition. It allows short-term maintenance of sequence information, and short-term rehearsal of sequences promotes the consolidation of long-term memories of language sequences (Ellis & Sinclair, 1996). From the terms 'inner voice' and 'inner eye' one can see the advantages of mnemonics with their reliance on imagery. When learning vocabulary, imagery uses an additional 'slave system' in addition to the phonological loop. The primary acoustic store stores auditory input directly and visual input through the detour phonological loop. This is sometimes called the 'inner ear'. Whenever we speak or understand speech, the WM is involved in varying degrees (Bechtel & Abrahamsen, 1991; Just & Carpenter, 1992; Just, Miyake, & Carpenter, 1994; Petrides, Alivisatos, Meyer, & Evans, 1993).

This model of the WM has the advantage of being flexible by assuming that there is a system responsible for general purposes and two systems that are more specialised and therefore leave more capacity for the *central executive* to support a range of higher-level cognitive activities (Gathercole, 1994). It can also be seen as supporting the dual-task theory. To find out which of the WM components is mainly at work, tasks that interrupt learning (e.g. two unrelated tasks at the same time) were designed (ibid.).

The theory is adaptable, which is demonstrated by the fact that the theory has been developed and changed over time without losing its original appeal. There is also the generality of the theory. It has been tested on a wide range of subjects from pathological cases to normal children and adults. As Gathercole (1994: 53) states "... the convergence of results across experimental, neuropsychological and developmental populations lends considerable weight to the resulting model" (Gathercole, 1994).

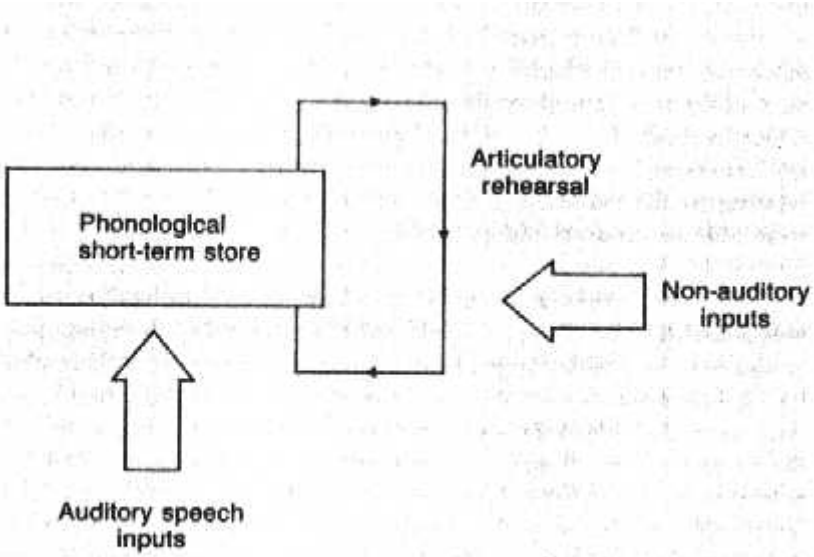


*Figure 3.2* The phonological loop model.

Fig. 1: (Gathercole, 1994)

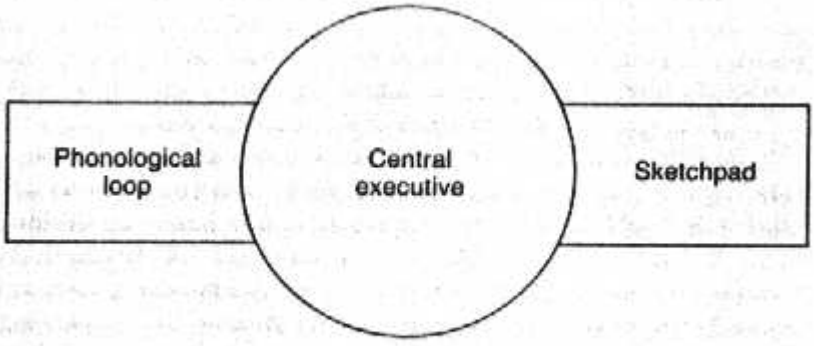


*Figure 3.1* A schematic representation of the general structure of the working memory model.

Fig. 2: (Gathercole, 1994)

Spitzer (2000) makes the connection with neuropsychology and neuronal networks (cf. Ch. 4.2). He demonstrates this by using the Elman network, which consists of the main input units and output units plus units in between (the hidden units) linked with “context units”, which he interprets as the seat of the working memory.

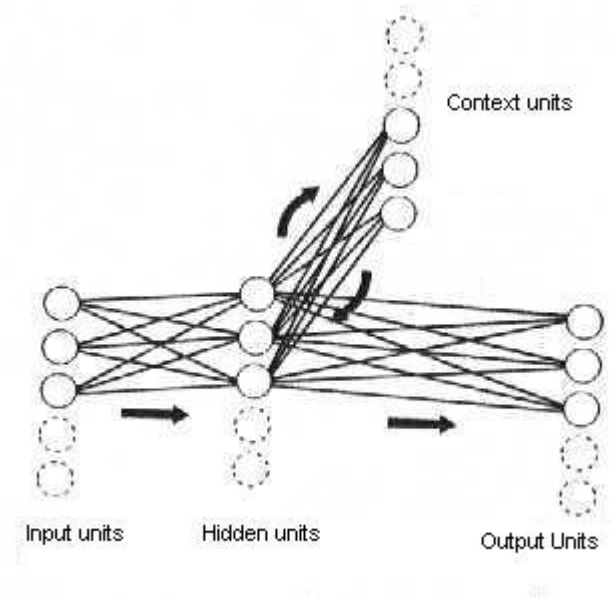


Fig. 3: (Spitzer, 2002: 190)

He sees the context units as the seat of the working memory, since these keep immediately relevant information ‘on-line’. Experiments with animals have resulted in the realisation that the WM functions with participation of the frontal cortex and that the neurones there store behaviour-relevant information for a short period (e.g. Funahashi, Bruce, & Goldmann-Rakic, 1989). The same process has been observed in humans, using *functional Magnetic Resonance Imaging* (fMRI) and *Positron Emission Tomography* (PET) (Cohen et al., 1994; Jonides et al., 1993; McCarthy et al., 1994; Petrides et al., 1993) and, lately, a new brain imaging technique, *Voxel-based Lesion-Symptom Mapping* (VLSM) (Nature Neuroscience, 2003). It therefore seems that theories conceived by psychologists are increasingly confirmed by other branches of science, such as neuropsychology, neurolinguistics, neurology etc. (see below).

### 4.1.2. Long-term memory

Language learners need all the information of the language to be learnt transferred into long-term memory (LTM). It has therefore been of interest to the cognitivists how this 'encoding' process could be achieved, how LTM operates and how information can be retrieved from this store, reversing the path and transferring information from LTM to STM. To this end learners need appropriate strategies to achieve success (Mayer, 1998). The main way of transferring from WM to LTM is by finding some pre-existing information in the LTM to attach the new information to. In the case of vocabulary, it means finding some element already in the mental lexicon to relate the new lexical information to (Schmitt, 2000: 132). The native keyword is such an element. LTM should also be divided into active memory for information to be retrieved and inactive memory for information only to be recognised (Rohrer, 1984: 16-17). This has some relevance for language learning since we distinguish between the active and passive lexicon.

Tulving (1972) proposed two kinds of LTM, *semantic* and *episodic* memory, building on Quillian (1967). Both are part of the declarative memory which is assumed to depend on propositional representations that can be contemplated introspectively and questioned about veridicality (Neuropsychologia 2003: Editorial). However, Tulving did not see these two categories as strictly independent short and long-term ones.

The semantic memory is for meaning (Reber, 1995: 449). Tulving defines it thus: a system for receiving, retaining, and transmitting information about the meaning of words, concepts, and classification of concepts (Tulving, 1972). In other words, it is something that one has learnt consciously – such as foreign languages. Episodic memory is responsible for information which is stored with 'mental tags', about when, where, and how the information was picked up (Reber, 1995: 447), i.e. feelings and events like first love or a recent holiday. Two other categories - the *procedural memory*, which is responsible for the gradual acquisition of sensory, motor and cognitive skills that have become automatic, such as riding a bike, and *priming*, the (subconscious) triggering of specific memories by a specific cue, e.g. 'river' will prime one meaning of 'bank' (Reber, 1995: 597), the facilitation in the

processing of an item due to prior exposure to the same item - are also part of the memory system.

It seems that different kinds of memory are not represented by different brain regions, but that there are common prefrontal activations during working memory, episodic memory as well as semantic memory (Nyberg et al., 2003). There are also findings that prefrontal activity is associated with working memory and episodic long-term memory, i.e. the same prefrontal regions implement reflective processes that support both WM and LTM (Ranganath, Johnson, & D'Esposito, 2003).

### 4.1.3. Storage model

The concept of the human memory as a storehouse is an old one. The first known treatise on memory describes it as a treasure vault (Auctor ad Herennium, 1st Century BC), Locke (1632-1704) saw it as ‘the storehouse of our ideas’ and Head (1920) described the sensory cortex as ‘the storehouse of past impressions’ (both cited in: Marshall & Fryer, 1978).

Atkinson and Shiffrin (1968) are mainly connected with the storage model of modern times. The German cognitive psychologist Rohrer (1984) also provided theoretical support. The storage models distinguish between ultra-short-term, short-term and long-term memory. The ultra-short-term memory receives all sensory information, e.g. visual and acoustic, hence the name sensory information storage, given by Lindsay & Norman (1981). It also filters out irrelevant information such as a passing car. Useful information is passed on to the short-term memory. For discussion of the STM see above.

From the STM, information is passed to the LTM. It has, to all intents and purposes, unlimited capacity. Although there is ‘of course’ a limit, this is so high that it is practically irrelevant (Lindsay & Norman, 1981). This should be borne in mind by those who criticise the *KWM* on grounds that it puts additional burden on the memory, i.e. the keyword and imagery has to be ‘learnt’ in addition to the target word. It has also been shown that information that has been stored in the LTM might stay there indefinitely (Lindsay & Norman, 1981; Rohrer, 1984; Vester, 1986). It might be ‘buried’, but it is still there. Hypnosis sometimes shows remarkable success in retrieving ‘buried’ information. It is stored but resistant to retrieval under some testing

and other conditions (Rohwer & Dempster, 1977). Cognition has the potential to store ‘massive’ amounts of information. (Baddeley, 1990). The ‘library’ model (see above) tries to find an answer to the question of how stored information is retrieved. The more references (memory traces) are available (author, title, keyword etc.), the better and faster the retrieval.

Apart from the shortcoming that this model concentrates too much on verbal information, memory is much more versatile than this. It also stores much more information, as discussed above. In this context, Kaminska (2002) sees the tip-of-the tongue phenomenon as an indicator that buried information could be retrieved more easily if it was learnt with mnemonics in the first place. People have often experienced not being able to remember a word that they are normally familiar with, even though they can remember many of its characteristics, e.g. meaning, gender, number of syllables etc. (Brown & McNeil, 1966). It is only when they put all this information together that there will be complete retrieval – eventually. With the *KWM* words are encoded with the help of different memory traces, such as the keyword itself, imagery and pronunciation of at least parts of the target word. When retrieval is needed, this process is reversed and the word found.

The question remains of how this information is processed and stored in the LTM. Opinions are divided on the subject of rehearsal. Some advocate ‘maintenance rehearsal’, the action of continuous vocal or sub-vocal repetition of the material (Craik & Lockhart, 1972; Dark & Loftus, 1976; Seamon, 1980), others found evidence that did not support this (Craik & Watkins, 1973; Jacoby & Bartz, 1972). Still others believe that it is the linking of to-be-learnt material with information already in the LTM which facilitates safe storage. Since this latter thinking supports the *KWM*, it will be discussed in more detail later.

### 4.1.4. Depth (levels) of processing theory

Craik & Lockhart (1972) introduced the ‘levels of processing’ model which built on Broadbent’s (1958) work on computer processing and the concept of memory as information flow between a series of sub-systems. They suggested that it is the ‘depth’ at which information is processed which determines its long-term retention, not the transfer from one type of memory store to another, but “a continuum from the transient products of sensory modalities to the highly durable products of semantic-

associative operations" (Craik & Lockhart, 1972). This model caused a minor revolution and succeeded in explaining away some of the inconsistencies of the 'structural theories'. The unitarists saw no incompatibility between this theory and one-type processing theories (Postman, 1975).

The metaphor 'depth' of processing means the way and intensity with which information is organised, analysed and manipulated. Three qualitatively different levels of processing are assumed. The lowest level is that of sensory processing at reception. The intermediate level consists of phonological (acoustic structure) processing, which is superior to the first level but inferior to the highest level, semantic processing. This means, basically, elaboration, of which mnemonic elaboration is one form. The importance of elaboration within the levels-of-processing theory is recognised by, among others, Craik & Tulving (1975), Eysenck (1979) and Jacoby & Craik (1979).

Craik and Lockhart (1972; 677-679) cite experiments to support their theory, e.g. Tresselt and Mayzner (1960), who found that, of 3 groups, the one that used semantic processing performed conspicuously better. Schulman (1971) provided similar results.

Rehearsal has a role to play but repetition alone is not a sufficient processing tool (Craik & Watkins, 1973). Nevertheless, it sustains the material over a longer period, which in turn facilitates deeper processing (Woodward, Bjork, & Jongeward, 1973), thereby explaining why rehearsal/repetition is an indispensable part of any learning strategy, including the *KWM*. The level of processing theory does not necessarily assume a separate STM/LTM. Because of the possible existence of a primary processing unit, some have seen this as evidence of two underlying memory systems, e.g. Baddely (1985).

### 4.1.5. Critique of the depth (levels) of processing theory

Since no model goes unchallenged, some criticism has arisen. And since critique normally follows closely on the heels of the introduction of concepts, the debate pro and contra the *depth of processing model* was mainly conducted in the 1970s and 80s. The first problem is that this model – and many others – cannot account for the fact that, frequently, totally unimportant and unprocessed information

can be recalled at will or under influence of hypnosis. This could be the result of an (autonomic) memory system which works without the individual's conscious perception. This also raises the question of how the trace-decay or interference theory accounts for this (Booth, 1991; Penfield, 1969). There seems to be a mechanism at work which often bypasses the STM. Findings from the disciplines of the neurosciences are beginning to shed light on this phenomenon (cf. Ch. 4.3).

Visual or verbal memory traces with the same or comparable depth processing should generate independent traces of equal or comparable strength (Hyde & Jenkins, 1969; Johnston & Jenkins, 1971). There is, of course, the problem that there can be no objective measure of encoding depth (Winograd, 1976). Studies concerned with maintenance rehearsal suggest that information can be semantically encoded without depth processing (Graf & Mandler, 1984; Nelson, 1977).

As much as the idea of hierarchically structured levels appeals to common sense, these levels are not susceptible to exact specification. The unanswered questions are: How many levels exist? Do levels develop as the human being develops, i.e. do adults have more levels than children? Can there be different levels between adults? How is information retrieved from each level? (Morris, Bransford, & Franks, 1977). To address these issues, Craik et al. modified some of their original hypotheses (Craik & Jacoby, 1975; Craik & Tulving, 1975; Lockhart, Craik, & Jacoby, 1976) but still did not provide a coherent theory (Baddeley, 1990). Nevertheless, the theory proved to be adaptable.

Some have tried to provide medical evidence to support the level-of-processing theory, e.g. Cermack (1979), but other studies have not supported this (Baddeley, 1978). According to the theory, the inability of amnesiacs to remember would be due to their inability to commit material to deeper levels (Cermack, Butters, & Moreines, 1976), but this could not be verified (Mayes, Meudell, & Pickering, 1985).

Eysenck (1978) summarised in an influential paper the problems related to the levels-of-processing theory. There is no objective 'indexing' and specification of the assumed levels and, similarly, there are no objective measures which might identify the specific relationship between encoding depth and strategic encoding. He also sees the theory as too simple since it assumes that the major determinant of subsequent recall is 'merely' the encoding depth.

Lockhart & Craik (1978) acknowledged the cited limitations but did not see the theory as invalid, rather than as a construct that is under constant revision and evolution. Similar views had been expressed before (Craik & Tulving, 1975; Fisher & Craik, 1977; Lockhart et al., 1976).

It has been shown that the assumption of a connection between levels and encoding depth cannot be upheld. However, this model was not discarded; the focus merely changed, namely the relationship between meaning and encoding received attention (Baddeley, 1985).

This has some relevance for mnemonics in the context of foreign language learning. If one accepts that the committing of material to deeper levels enhances retention, it can be seen that mnemonics, and in our case the *KWM*, facilitates this. "...Words for which meaningful decisions are made show higher levels of retention" (Jacoby & Craik, 1979). Material associated with the *KWM – Goths riding on goats –* (for a detailed description of this example see Ch. 6) causes deeper traces of memory through elaborate de-coding and subsequent re-coding, thereby forming additional traces at the time of association and each recall attempt. The *KWM* facilitates deep processing due to the additional meaning generated by association with the learning material. Mnemonics cause additional – and different – processing. The brain sees the to-be-learnt information from different angles, links the familiar with the new, engages in deep processing, and can therefore anchor it more easily in memory. The levels approach suggests that proactive and retroactive interference between items is minimised because the semantic associations so formed are sufficiently 'rich' or 'distinctive' (Craik & Jacoby, 1979; Klein & Saltz, 1976) for interference not to occur. This has subsequently been confirmed at both visual (Einstein, McDaniel, & Lackay, 1989) and auditory (Moscowitch & Craik, 1976) levels of information reception.

### 4.1.6. Dual coding theory

As with other theories of memory, the idea that the brain has separate processing systems is not new. Augustine distinguished between verbal and visual storage systems (cited in: Marshall & Fryer, 1978), Jackson (1874) was of the then revolutionary opinion that verbal information is stored in the left hemisphere of the brain and visual-spatial information in the right (ibid.). The important question is

whether the processing of information takes place in a single or, depending on the way information is perceived, in two distinct systems of encoding and storage.

Paivio is connected with the idea of two distinct but interactive ways of processing information, the ‘independent but richly interconnected symbolic systems’ (Paivio, 1979). He advocates a dual-process-system (Paivio, 1971, 1978), based on extensive research. Milner (1970) showed that injury to the left brain hemisphere affected verbal performance and to the right visual and spatial performance. Baddely and Warrington (1973) examined amnesiacs who possessed normal linguistic capabilities but impaired visual processing. This was due, they assumed, to amnesic injury to one ‘channel’ but not to the other. Findings such as these two are seen as supportive of the dual processing theory, but research on this topic seems to have lost its momentum, probably due to the occurrence of new technology at the disposal of the neurosciences.

In view of what has been said so far and will be discussed in detail later, it is apparent that mnemonics, and the *KWM* as one of its forms, utilise both systems efficiently since the *KWM* has a strong element of visual information and interaction with verbal information. Information to be learnt enters the brain via two channels. Which one of the two systems is primarily engaged depends on the concreteness of the information received (Paivio, 1971: 16-28). Concrete words such as *goat* have the tendency to produce a mental picture of the object, while a visual representation of the object results in producing the name. Paivio therefore sees the positive influence of concreteness on memory storage in the fact that concrete information is stored dually (visually and verbally), whereas purely abstract information is stored in its original occurrence, e.g. *peace* as a rather hazy notion. The conclusion is obvious. The learner has to link abstract words with concrete words to utilise both storage systems. This is one of the central tenets of mnemonics (cf. Ch. 5.3.6). Besides, it is a daily occurrence in the classroom that students demand that the teacher write the word they have just heard on the blackboard. They want verbal AND visual information for the same item, which means, in this case, graphic.

> *“Imagery is relatively better than the verbal system for representing and coping with the concrete aspects of a situation, with transformations, and with parallel processing in*

*the spatial sense. The verbal system is superior in abstract and sequential processing tasks (Paivio, 1971: 38).*

Paivio and Desrochers (1979; 1980; 1981) carried out some research and interpreted the results as showing that mnemonic devices increase the availability of multiple retrieval routes, involving both imagery and verbal associations. Subjects in the mnemonics groups fared better than those in rote repetition groups. If rote repetition subjects follow the instructions closely – and that is a big *if* (see below) – they rely only on the formation of episodic inter-verbal associations. The better performance of the mnemonics groups is seen as a direct result of the utilisation of two distinct retrieval traces.

Some researchers do acknowledge the benefits of imagery but find it unnecessary to try to explain this through the dual coding theory, advocating a common coding theory. Richardson (1980: 82) states that "... both approaches tend to interpret the effects in terms of enhanced relational organisation" and that 'parsimony' dictates that, in this case, the common coding theory should be preferred. Crowston (1991) conducted an experiment to find out whether dual coding was beneficial. He formed two groups who had to learn low-imagery French adjectives. The first group used rote rehearsal plus translation, the second one rote rehearsal plus translation plus a non-interactive mental image representing the meaning of each adjective. The results showed no superiority for the group using images (dual coding strategy), which resulted in Crowston's conclusion that visual elaboration does not increase retention. However, as Richardson pointed out, this kind of empirical evidence is not conclusive. I would add a comment: As discussed above, the verbal stimulus, in this case the translation, triggers an image which means that both groups had the image of the relevant adjectives at their disposal and, as discussed in Ch. 6.6.5, translation provides meaning, therefore the non-interactive image was superfluous. In addition, in all the experiments dealing with comparisons of learning strategies, no researcher can exclude the possibility of imagery in the course of the experiment. Indeed, if translation triggers images, in all experiments involving translation, the control groups might inevitably engage in imagery. After all, an ancient authority such as Aristotle expressed the belief that it is impossible to think without mental images. The question whether there is a common

coding system or a dual one remains unanswered, while the benefit of imagery is not in dispute by the cited researchers.

For the sake of completeness, the idea of a third ‘amodal’ code has to be mentioned (Pylyshin, 1973). This ‘code’ is assumed to be responsible for the regulation of the co-operation of the visual and verbal encoding. However, this has been rejected (Anderson, 1978; Richardson, 1980: 4-24) and has achieved no prominence.

### 4.1.7. Gestalt psychology

This philosophy assumes that sensory information is processed as whole units (Gestalt) and represented as such in cognitive structures, i.e. there is a ‘natural propensity’ to combine cognitive and environmental information with the result that recall happens through the activation of the target information together with the information that had been obtained simultaneously and associated with it. This ‘universal aspiration/quest’ is independent of experience or individual differences and only dependent on the way the relevant information is presented. The overriding principle of Gestalt psychology is that separate units of information are grouped together in concise form (Laws of Gestalt), such as closeness (proximity), similarity, sameness etc. (Koehler, 1969, 1970; Reber, 1995). The memory trace was assumed to have the same form as the perceptual experience that caused it, and is therefore subject to the same laws of spatial organisation. There was also the rather vague idea that the laws of temporal organisation and spatial organisation are essentially the same. If events spread out in time (such as notes played by a violin), and become organised according to Gestalt principles, then the principles must necessarily apply to memory, because it is only in memory that the past events continue to exist (Hintzmann, 1978: 259). Gestalt theory did not have much to say about the nature or function of imagery, but it influenced the cognitivist movement (Gardner, 1987).

Individual learning strategies show the need to organise information. Mnemonics combine this need with the natural cognition processes. The understanding derived from the Gestalt psychology is also relevant for the acquisition of vocabulary (Koehler, 1980: 147-164). Koehler states that memorable connections can be made between normally unconnected words such as ‘lake – sugar; boot –

plate; girl – kangaroo, if the relevant word pair can be seen as a whole. His example to demonstrate this is very familiar to adherents of mnemonic techniques:

> *"When I read those words I can imagine, as a series of strange pictures, how a lump of sugar dissolves in a lake, how a boot rests on a plate, how a girl feeds a kangaroo, and so forth. If this happens during a reading of the series, I experience in imagination a number of well organized, though quite unusual, wholes (ibid.: 158)".*

The idea of wholeness as expressed in the Gestalt psychology is clearly represented in the way mnemonics help to learn words or word groups as units, linked with interaction (Sperber, 1989: 69).

### 4.1.8. Forgetting

The study of memory is also the study of forgetting. It is claimed that forgetting information in the sensory register is caused by spontaneous decay and that in the STM it is caused by the arrival of new information. However, it is the aim of the teacher to anchor vocabulary in the LTM. In LTM the main cause for forgetting is probably because information falls into disuse, which is the result of lack of repetition (Gairns & Redmann, 1993: 89). This, of course, would confirm the work of the connectionists (cf. Ch. 4.2). Another view is that interference is the main cause of forgetting (ibid). Since information in the LTM is believed to be permanent, this 'forgotten' information is better described as 'buried alive'. Forgetting can be caused by proactive interference (previously stored information) or retroactive interference (information added later) (Spear, 1978: 44). In the classroom it is mainly the latter that inhibits learning.

This view asserts that the information is not lost, but that the problem lies in the recalling; this is the notion of *cue-dependent forgetting*. The problem is therefore not one of storage, but of retrieval (Gairns & Redmann, 1993: 89). Very often there is no (organised) cue that prompts retrieval.

The *KWM* provides this organised cue/retrieval path. Once the target word has been learnt with the *KWM*, the retrieval process is a reversal of this learning in four stages.

1. L1 word = Ziege
2. What were the image and the interaction that went with this animal?
3. The animal has something to do with Italy and ***Goths*** riding on them.
4. The phonetic overlapping of **Goth/goat** provides the target word = goat

When one discusses the currently prevalent theories of memory with their heavy reliance on metaphors and circumstantial evidence, one should not forget that they are just that – theories. There is also the feeling that, at least at the moment, this approach has reached some point of saturation/exhaustion, hence the reliance in this chapter on references which originate mainly from the 1970s, 80s and early 90s. Until recently, it was impossible to look 'inside' to observe the workings of the brain directly, apart from the occasions when these observations were by-products of the treatment of the sick and the injured. This has changed during the last few years due to modern technology. However, there is one approach that took its inspiration from both psychology and the neurosciences, a neurally inspired cognitive theory (Persson, 1995) – *connectionism*.

## 4.2 Connectionism

Generally, *connectionism*, *parallel distributed processing* or *neural networks* (and the *Parallel Distributed Lexical Processing* PDLP within it) is seen as a general framework of cognition, not a specific or unitary model (Persson, 1995: 15). It relies heavily on new technology such as the computer. The models as developed by connectionists aim to simulate brain processes. The neural network is mirrored by the computer networks with units (neurons), connections (axons and synapses), although, as with all good models, simplified. These networks are able to learn. This learning consists in changing the weights (strength) of connections between units, so as to alter the way in which the network will process inputs on subsequent occasions (Bechtel & Abrahamsen, 1991: 70), i.e. input causes learning, the lack of it forgetting.

As far as language acquisition is concerned, the past-tense acquisition model of Rumelhart & McClelland (1986) has shown that a simulation is possible. The model

displays some well-known language acquisition features in humans, such as stage-like learning, over-regularisation, U-shaped learning, etc., including variability during the transition between stages. A later model (Plunkett & Marchman, 1989) arrived at similar conclusions. Taraban et al. (1989) simulated the acquisition of German definite articles in German children.

All the available models of language acquisition in the field of connectionism deal with general language learning, not the learning of a foreign language. However, connectionists would see the learning of foreign languages as other learning, as associative, strengthening the connections (synapses) between nodes. This strengthening occurs with repeated input of the relevant stimulus, e.g. listening to sentences with a certain structure repeatedly. Explicit teaching (explaining) of grammar, for instance, would not be sufficient, since it does not occur in sufficient frequency (Gregg, 2001: 172). Many of these models make the link to aphasia (e.g. Persson, 1995; Schade, 1999). Connectionists need mathematical prowess and their subject is therefore a very specialised one in the view of the average teacher; their reports are consequently difficult to understand. This is a pity, since this seems to be an interesting road of enquiry to follow. However, there are some publications in a more general vein and aimed at the wider public (e.g. Markowitsch, 2002; Spitzer, 2000, 2002).

This discipline is in its infancy and a technological boost is needed which is expected in the near future (Grolle & Traufetter, 2003), when scientists will be able to convert processing principles in the brain which we are beginning to understand into computer architecture. This necessitates a different hardware since this cannot be done with conventional digital computers. Chips are needed that function similar to nerve cells, i.e. they have to compute analogously. It is expected that this will lead to systems which are more user friendly and more error tolerant and will recognise better patterns and language (ibid.)

Theories of memory as advocated by psychologists seem to have reached their peak, with nothing groundbreaking having been put forward since the *deep processing* model and the *dual processing* theory. *Connectionism* incorporates knowledge obtained from the neurosciences in computer models, but it is the field of neurosciences which promises to provide major contributions to the understanding of memory in the future.

## 4.3. Neurolinguistics/ neuropsychology/ neurology

Neurological evidence that interests linguists and psychologists is often unearthed as a by-product of clinical treatment. The latest findings are no exception (Fell et al., 2001). During the treatment of epileptics, involving brain probes, it was discovered that apparently not only the hippocampus is responsible for committing information to long-term memory (if badly damaged, information obtained before this damage is still retained, but not information received after it) but also the neighbouring rhinal cortex, likewise active in memory tests. Patients were asked to try to remember a string of words and then to count backwards from 69 in sections of three. If they could remember words after this counting, the words must have been stored in memory. When patients remembered words, the two regions fired synchronously (Gamma oscillation range 40 hertz). Words that passed the 'bottleneck' between hippocampus and rhinal cortex without causing synchronous firing were forgotten. This process was so reliable that the neurosurgeon could predict from the firing of the areas which words the patients would remember later. Phase-synchronisation determines which information will be stored in long-term memory. It was known before that the brain fires with 40 hertz synchronously when processing visual information, but the fact that it also does so when activating memory is new. This could be an indication that most co-ordination and communication relies on this frequency. A fellow scientist (Wagner, 2001, in the same journal issue) regards these findings as a 'landmark', especially as these seem to explain some known phenomena. If visual input causes firing in the 40 hertz band and also the activation of memory, the amount of firing might increase.

Mnemonics provide visual information (images) and are very efficient for remembering things (e.g. vocabulary). This involves several brain areas through the process of elaboration. The researchers found that the more brain areas were active, the higher the synchronic activity of the hippocampus and the rhinal cortex when processing this information. Moreover, recent functional imaging and electroencephalographic (EEG) studies in humans implicate medial temporal lobe computations in mnemonic encoding (Schacter & Wagner, 1999). Prefrontal activity is associated with working memory, semantic memory and long-term episodic memory (Nyberg et al., 2003; Ranganath et al., 2003)

It is also known that emotions enhance memory. This could also be confirmed by these experiments. The amygdala is located directly above the ‘bottleneck’ the information has to pass. When the amygdala is active and sends electrical activity in the direction of the hippocampus and the rhinal cortex at the same time as they are firing synchronically, their activity intensifies. The amygdala is a very old but complex system of approx. one dozen neuronal core areas. It assumes the role of janitor by judging new incoming information according to its emotional value, whether it excites negatively or positively. If it does, the information is seen as important and stored in the archive of the LTM. Unimportant information that does not cause any form of emotion passes without leaving a memory trace.

It seems (see above) that synchronisation is the key to memory. Since synchronisation is frequency-specific, this allows parallel processing within the relevant frequency bands (Weiss & Müller, 2002; Weiss, Müller, & Rappelsberger, 2000). Apparently, complex cognitive processes are based on such oscillating processes of large, frequently clearly separated, neuronal formations.

Neurological research seems to confirm psychological theories of memory, especially the *Deep Processing Model*. Elaboration causes simultaneous and parallel firing of the rhinal cortex and the hippocampus, which enhances memory. If the elaboration also causes some emotional involvement, the amygdala also fires and strengthens the remembering process (see above). Apparently, from the point of view of the neuroscientist, it is not ‘deep’ but synchronic processing that is responsible. If we accept the neurological evidence – and much points to its validity - models of memory have to take this into account.

The familiar addition in scientific papers that ‘further research is needed’, is particularly true in memory research involving neurology. However, although some research has been carried out, a ‘breakthrough’ provided by cognitive neuroscience has not yet materialised, due to the infancy of the discipline. Until new, non-invasive technology closes the available ‘keyhole’, there remains the hope that more advances will be available. Applied linguists are well advised to co-operate with the neurosciences and, if they do, I am convinced that hitherto unimagined progress will be possible. It might well be that human cognition and the issue of human language ability will be the central subject of the human sciences of the future (Müller, 2003, 2003, i.p.c.).

Psychology, philosophy, computer science and the neurosciences all have in common that they try to investigate and explain phenomena that have been known for millennia. Scholars of antiquity and scientists of today not only devised theories of memory, but also tried to find ways of applying these findings to improve it, i.e. to find ways of keeping needed information more or less permanently available. They found that mnemonics are one means of achieving this.

# 5. Mnemonics or the art of memory

Mnemonics have to have certain characteristics to be effective. These and some of the mnemonic techniques are listed and explained in this chapter. I also examine whether some of the previous findings, although of relevance for the scientist, are also of relevance for the teacher. Since mnemonics have their limitations, these are acknowledged and a case made to avoid unrealistic use.

## 5.1. History

Throughout history a good memory has been seen as an invaluable asset, and numerous attempts have been made to explain memory functions and how to improve them. These attempts can be traced back to antiquity.

In Greek mythology it is the mother of the nine Muses, Mnemosyne, who personifies the art of memory. It is Mnemosyne who prevents the heroes and the dead from falling into oblivion and who keeps the glory of the gods and the memory of past times alive. From this is derived the Greek word *mneme,* “to remember”. Our modern term ‘*mnemonic(s)*’ is a variation of this.

This myth probably results from the realisation that in times without external means of storing information (e.g. writing on wax tablets, papyri, later paper and computers), memory alone could preserve (oral) literary tradition. Even after the monumental invention of writing, a good memory was still vital since the new art was confined to priests and scholars. The rest of the population was still illiterate and had to use their memory to pass on information to others orally. This also meant that the few who could read and write had to present information (poetry, religious texts etc.) in a way that facilitated its retention.

With the advent of the art of writing, more information could be stored and disseminated. Storing information externally diminished the importance of a good memory and it was feared that this would have an adverse effect. Information could be obtained by consulting a written text. This fear proved to be unfounded. The art of memory is as much valued today as it was in the past.

Mythology dictates that the Greek poet Simonides of Ceos was the inventor of the mnemonic technique (Yates, 1966). He used the *loci* method (cf. Ch. 2.4) to remember the names of guests at a banquet whose bodies were mutilated beyond recognition after the roof had collapsed. This may be or may not be the case, but from then on the *art of memory* was formally established.

Our knowledge of mnemonic techniques in antiquity is based mainly on three sources: Cicero (106-43 BC), (De Oratore, approx. 55 BC), an anonymous author (Ad Herennium, between 86 and 82 BC, normally referred to as "Auctor ad Herennium"), and Quintilian (ca. 30-96 AD, "Institutio oratoria", 1st Century AD).

Of the three sources, Auctor ad Herennium is the most influential and all subsequent accounts of the art of memory begin with this author. ".....It was not on Quintilian's rational and critical account of it (the classical art of memory) that the later Western memory tradition was founded, nor on Cicero's elegant and obscure formulations. It was founded on the precepts laid down by the unknown rhetoric teacher" (Yates 1966:41).

Ad Herennium already advocated some of the criteria for mnemonics as discussed below. However, it is interesting to notice that he fell into the same trap that practitioners are unable to avoid to the present day. He got carried away. His instructions to memorise fairly simple things are so elaborate that most people would abandon the task before it had really started. He cites, for instance, an elaborate mnemonic device to enable a lawyer to remember very basic facts of a court case. A lawyer who needs that kind of 'crutch' would have chosen the wrong calling. The simplicity, as demanded by my students (cf. Ch. 6.5.6), is lacking. It is easy to believe that these elaborate devices developed into something that only the initiated could practise – and the *art of memory* developed over time into an obscure, esoteric and occult practice as Yates (1966) describes. The largest collection of texts on mnemonics until 1985, with emphasis on mathematics, is probably that of Hrees (1985).

## 5.2. Mnemonics today

In modern times, mnemonics are described as 'the art of refreshing, improving, or developing the memory, esp. by artificial aids; a system of precepts and rules

intended to aid or improve the memory' (OED), 'systematic procedures for transforming difficult to remember stimuli into more easily remembered stimuli' (Pressley, Levin, & Delaney, 1982), 'unusual artificial memory aids' (Higbee, 1978), an effective technique for memorising (Bellezza, 1987: 34), 'a strategy for organising and/or encoding information through the creation and use of cognitive cueing structures' (Bellezza, 1981: 260), or simply 'any technique that helps people remember things better' (Russel, 1979: 123). In the language classroom mnemonics are mainly associated with rhyme and imagery, although there are many other techniques available. Hrees (1985) and Kaminska (2002) give a detailed description of these.

Finally a voice from the beginning of the 19th Century:

> *"By an Artificial Memory is meant, a method of connecting in the mind, things difficult to be remembered, with things easily remembered; so as to enable it to retain, and recollect the former, by means of the latter. For this purpose, various contrivances have been proposed, but I think the foregoing definition applies to all of them." (Steward, 1829: 335).*

This rather general description shows that memory enhancing techniques had not fallen into disuse; but it was the second half of the 20th Century that took their use seriously again and began to investigate their effectiveness with the means of scientific enquiry, mainly in the laboratories of the psychologists. This has also resulted in enquiry into the concept of mnemonics itself, what mnemonics consist of and how they can be described.

## 5.3. Principles and properties of effective mnemonics

Mnemonics can be divided into two classes. In both classes there are purely verbal mnemonics, purely visual mnemonics – imagery mnemonics, and mnemonics that incorporate both verbal and visual – imagery skills.

### 5.3.1. Free mnemonics

The class of free mnemonics requires no further preliminary preparation prior to applying any of its members, therefore they are ‘independent’ or ‘free’. They are sometimes also called ‘naive’ mnemonics.

For example:

- **Coincidental mnemonics**

  Franc**E**s is a name for a woman (h**E**r).

  Franc**I**s is a name for a man (h**I**s).

- **Mnemonic acronyms**

  (cf. Ch. 5.4.)

- **Mnemonic acrostics**

  (cf. Ch. 5.4.)

### 5.3.2. Bound mnemonics

This class of mnemonics is seen as more powerful than the former and requires the practitioner to engage in the process of memorisation. The name derives from the idea that they are dependent on an intermediate code and/or sequencing. They are sometimes also called ‘technical’ mnemonics.

For instance:

- **Hookword technique**

  (cf. Ch. 5.4.)

- **Method of loci**

  (cf. Ch. 5.4.)

- **Keyword method**

  (see Ch. 6)

The assumption that our visual sense is the sharpest and best developed was already unquestioned in antiquity. Aristotle was even of the opinion that thinking without concrete images is impossible and that memory consists of a collection of pictures ('De anima' and 'De memoria et reminiscentia'). More than two thousand years later, Wundt (1832-1920) still believed that 'higher' mental processes such as thought and memory needed mental images, including verbal imagery and mental speech. The development of the art of memory was and is therefore based on this visual memory with the help of imagery. Abstract concepts are more difficult to remember than concrete ones and should be avoided (cf. Ch. 5.3.6.). The most important and indispensable aspect is that of association. The basic principle of association for memory purposes however, is the linking of new information with the old and familiar. Aristotle formed his 'Laws of Associations' which say that enlargement of memory can only be achieved through associations (Yates, 1966: 34). These laws are still valid today (Higbee, 1977; Hunter, 1972). In the early years of the 20th Century there occurred briefly an 'imageless thought' controversy (Würzburg school), but it had no lasting impact.

Modern mnemonic techniques are mainly based on the principles of *recoding, relating* and *retrieving* (Levin, 1983), the *three Rs* (Mastropiery & Scruggs, 1991).

1. **Recoding –** to treat information in a way that it is better imaginable, a process of making it concrete or in the case of extensive information, simpler.
2. **Relating –** to bring together two or more pieces of information with the aim of remembering one piece of information through the other (association and elaboration).
3. **Retrieving –** a mechanism to remember. This can be achieved through the interaction of recoding and relating, but also through other, sometimes additional, means.

(Sperber, 1989: 29) See also Ch. 6 for these three principles in connection with the *KWM* and examples.

Success in learning with mnemonics depends on the interaction of the first two principles and their strength. Several examples are given throughout this thesis.

### 5.3.3. Elaboration

One of the advantages of mnemonics in general and of *KWM* in particular, a transformational elaborative strategy (McPherson, 2000: 143), is that it leads to elaboration or links, i.e. the adding of additional meaning to the material to be learnt. It is an encoding procedure. This is recognised even by opponents of the method who dispute the role of imagery but who attribute the apparent success of mnemonics to the elaboration process (e.g. Müller, 1996). Seel (2000) sees the inherent elaboration technique of mnemonics as crucial for its effectiveness.

> *"...in order to get information into long-term memory, we must elaborate it. ....the best way to understand elaboration is to think of it as a process that forms connections – either within the material to be learned, or between the material to be learned and other things we already know. The more connections the material has, the more likely we are to be able to remember it. We might think of an elaborated memory as a satchel with lots of handles. The more handles it has, the easier it is to get hold of." (Hayes, 1981: 83).*

Maintenance rehearsal, "the action of continuous vocal or sub-vocal repetition of the material" (Craik & Lockhart, 1972), is not sufficient to put information into long-term memory. Elaborative rehearsal is necessary (ibid.). Long and complicated sentences are better remembered than short and simple ones (Craik & Tulving, 1975), but it is the distinctiveness of the sentences and their elaboration that facilitates remembering. It is the nature of information processing which primarily determines retention. The more a learner pays attention to all the aspects of a word (elaboration), the more the likelihood is increased that this word will be better and longer remembered (Hulstijn, 2001). Imagery, i.e. mnemonic elaboration (Bower & Reitmann, 1972), is a powerful additional code to assist remembering.

With the *KWM*, the *elaboration* component is the *linking* component (Mastropiery & Scruggs, 1991: 50-1). It follows that the *KWM* is not just about providing students with the *keyword* – the teacher has to make sure that the elaboration component is included. It is then a question of how this is constructed.

### 5.3.4. Vividness

One of the important elements of imagery is vividness, i.e. full of life; vigorous, active, or energetic on this account; lively or brisk. More vivid material is more emotional, colourful and forceful. The imagery associated with such material should be more graphic (Montague & Carter, 1973).

Experimental results seem to be decisively in favour of the concept that vividness enhances remembering. Anderson & Hidde, (1971) asked 24 participants to rate vividness in 30 to-be-remembered sentences, and consequently they performed over three times better than those rating the pronounceability of words. Bowers' (1972) experiments showed beneficial results of increased vividness in paired-associative learning. Similar results are known from Rohwer (cited in: Reese, 1977: 133), Paivio (1969), Kroll, Schepeler & Angin (1986) and Holmes & Murray (1974). Delin (1969) reports that words from lists were better remembered if participants were told to create vivid images rather than accepting mental images from the instructor. Ritchey and Beal (1980) found that images enlarged and detailed were better remembered than those smaller and uninteresting. Montague and Carter (1973) asked 44 participants to remember paragraphs with varying degrees of vividness. The more vivid the paragraph the better the recall of the words it consisted of. Standing (1973) used pictures instead of words and also found that vivid pictures were better remembered than non-vivid ones (crashed plane/flying plane). Although this is not very relevant for the classroom, Carney & Levin's experiment (1998) is. They added sound to visual imagery ("keysound" plus "keyword"; the keyword/image of a "lamb" giving the sound "baa, baaing"). Although they found no difference in performance between this group and the comparison "normal" keyword group, it is too early to arrive at a conclusion. On several occasions I substituted a keyword for a keysound, often through necessity as there was no suitable keyword. For instance, the word to be learned was "booth" and the image was a cow in a telephone booth booing at the learner. The imagined sound triggers the image. It was well received and I was told that "we will never forget that", a sentence that often arises in an *iKWM* classroom. Further research is needed to establish whether the effect of a "keysound" can be a beneficial addition to the *KWM*. It might add to the vividness.

However, there is at least one source that does not find a relationship between imagery vividness and memory performance (Dickel & Slak, 1983). 30 participants had to recall 40 pairs of nouns out of 45 pairs presented. Neither the main effect of imagery nor the interaction was significant (p. 124).

The danger with vividness is that this concept can easily be confused with interaction. A learner who is asked to form a vivid image might automatically add interaction, which would blur the results of experiments. In experiments participants are frequently asked to rate the degree of vividness (as well as bizarreness, concreteness etc.). This poses the difficulty that we have "...no way to ask whether different subjects mean the same thing by any particular number" (Reisberg, Culver, Heuer, & Fishmann, 1986). As important as self-reports are, they are not too reliable and - more to the point - not generalisable, even when experimenters use devices such as the "Vividness of Visual Imagery Questionnaire (VVIQ), a 16-item questionnaire (Marks & Russel, 1985). The issue is whether we can find any differences in the cognitive behaviour between people who report vivid visual imagery compared with those who report only faint visual imagery. For instance, Marks (1972) tested the recall of pictorial stimuli in several experiments. Subjects were rated as good/poor visualisers prior to the experiment. 'Good visualisers' produced significantly better results. 'Poor visualisers' produced in one of these experiments 36% more errors. "Evidently, persons who report vivid imagery can utilise a source of information which may not be available to those who report imagery which is vague and dim" (ibid.). The possibility exists that this could have something to do with self-assertiveness.

### 5.3.5. Interaction

A major (and probably crucial) element of the keyword technique is the practice of linking the keyword and the target word by some form of interaction even if it is not in a logical or natural context (Sperber, 1989: 77), e.g. the example given in Ch. 5.3.6. shows that 'Conan the Barbarian' is not imagined as *being* unconscious but as *hitting* somebody unconscious. Even when two concrete words are used, disconnected images do not work well. It should be noted that the term interaction can be confusing. An elephant sitting on a sofa or a cigar lying on a piano (Wollen,

Weber, & Lowry, 1972) is seen by many as not interactive. For teaching purposes I would strongly advocate movement, e.g. an elephant kicking a sofa.

Experience seems to suggest that there is a certain automatic forming of interaction when learners use the *KWM* method. Wollen, Weber and Lowry (1972), although not finding any effects of bizarreness (cf. Ch. 5.3.7), found strong evidence that interaction effected recall, whether the image was bizarre or not.

Bower (1972: 80) asked an experimental group to connect the images of two words with interaction, while the control group was asked to form the images separately with the result that the experimental group performed 54% better than the control group (46% to 71%). Bergfeld et al (1982) presented subjects with pairs of line drawings and reports that those that were given interactive imagery instruction recalled the most pairs at a longer retention interval.

The long-term effect of interaction has not been examined satisfactorily to be of significance for the teacher who is concerned with much longer periods than the psychologist in the laboratory – and more research is needed here (Reese, 1977). However, for shorter periods the effect of interaction has well been documented to the extent that Higbee (1979) is of the opinion that more research is not needed. Instead, he suggests that this phenomenon still needs a theoretical explanation. Several have been attempted. Bower (1970; 1972) attributes the effectiveness of interaction to the way information is organised. Interactive information is supposedly much better organised than the information stored by 'mindless' rote learning. The memory trace is stronger.

This has a certain similarity with the theory of 'Deep Processing' (Craik & Lockhart, 1972). Within this theory semantic processing is seen as particularly 'deep'. (see Ch. 4.1.4). Sperber (1989) gives the example of the word pair *tram-ape* and suggests that the image of all passengers being apes or even apes driving the tram needs creativity which facilitates remembering. Sperber also tries to link the concept of interaction with Miller's (1956) 'magic number 7+/-2' and the 'chunking' of information to be learned (chunks consisting of several 'bits'). However, it is not quite clear how Sperber makes the link of interaction and chunking in the context of the *KWM*. In addition, Miller's paper deals with short-term memory (his "span of immediate memory"), which is only a starting point for the teacher.

Debates on the theoretical explanations of the effectiveness of interaction were largely held in the 1970s and 80s. Since then, the relatively new discipline of neurolinguistics has tried to provide neurological evidence. It seems that an interactive image activates numerous different unconnected brain areas. The image of **Conan** hitting somebody unconscious causes the brain to process concepts such as fury, violence, a giant, a cudgel, blood, a corpse on the floor, etc. and it has been shown that it is beneficial for memory if as many areas as possible are involved in the processing (Weiss, 1997b; Weiss & Rappelsberger, 1996).

### 5.3.6. Concrete vs. abstract

One of the first observations of the ancient practitioners of the art of memory was that for words to be remembered they have to be concrete – and therefore abstract words have either to be avoided or, since this is not often possible, connected with something concrete, although as late as 1978 Richardson (p. 378) acknowledges the importance of concreteness but is not sure how to deal with abstractness. Concreteness is "real, sensually observable, and factual, whereas abstract words are detached from reality, conceptually generalised, only thought and not vivid (Duden, 1961). Concrete words such as apple, car, book, horse etc. are easier to visualise than abstract words such as nourishment, liberty, justice and happiness (Higbee, 1977: 83). Thus, concreteness can be defined by how easy it is to form a mental image of the concept (McPherson, 2000: 70). Paivio (1971: 177-297) arrives at the conclusion that concreteness is the most important factor for achieving memory enhancement, compared with frequency, meaningfulness and familiarity.

Since the keyword method uses imagery, it is necessary to use a concrete keyword to learn an abstract target word. One way of achieving this is to substitute a concrete word for an abstract word, e.g. a dove for peace or a warrior for courage and then link them with the target word: warrior = **courage:** a warrior fights his enemies with **curry**.

A second, and probably the most used, technique is to find a concrete keyword that sounds like the target word (phonetic encoding) e.g. salary – Sellerie (celery) or (un)conscious - **Conan** the barbarian (Arnold Schwarzenegger in a film), leading to the image that **Conan** hits the learner un**conscious.** This example was chosen in

one of my classes as the best of several presented (cf. interview 3). It also demonstrates that not only nouns can be treated this way, although they are given prominence in the literature. Raugh, Schupbach & Atkinson (1977) report that, using the *KWM*, nouns and verbs were better remembered than adjectives and are of the opinion that this is due to the greater possibility of adjectives being abstract. In short, concrete images help the remembering of abstract concepts

Paivio (1971: 78-90) asked a group to classify a list of 925 words according to their *concreteness* and *imagery value* and found that the correlation between the two was high. He also speculates, without being specific, that there could be an underlying common factor governing the two properties of words.

When conducting experiments that are concerned with memory performance *per se*, experimenters try to exclude variables like concreteness or meaningfulness, hence the practice of presenting subjects with nonsense syllables, but some experiments (e.g. Clark & Paivio, 1987: 10-12; Paivio, 1971: 305-319) have shown that subjects try to make even nonsense syllables concrete. There seems to be an in-built subconscious awareness that concreteness is a vital factor in learning.

Recently, neurolinguistics has provided evidence of why this is the case. It has been shown that the processing of concrete nouns coincides with a short but wide-spread neuronal activity which includes brain areas that are responsible for different perceptions (Weiss, 1997a; Weiss & Rappelsberger, 1996). Abstract nouns activated more narrowly-defined, language-relevant brain areas. This can be explained by what a person associates with the word. A rabbit, for instance, could be associated with touch (fur), taste (meal), movement (hopping), cuddliness etc., whereas the word ‘peace’ is a rather hazy notion. The former causes a wider neural network to fire than the latter (Müller, 2003). This might also be the reason why patients with neurological language impediment often have more problems with abstract nouns than with concrete ones (Weiss, 1997a). Electrophysiological experiments have shown that there are clear differences in learning between concrete and abstract nouns as above (Weiss, 1997a; Weiss et al., 2000). This has been discovered by using EEG coherence analyses which report the electrical activity of neuron clusters (cell assemblies) by way of frequency-band-specific synchronisation. This contradicts the idea of localised areas that are responsible for specific language tasks (although they exist for motor and sensory functions).

The consequences are clear. As far as the *KWM* is concerned, the task of the teacher and the learner is to use concrete words as links to learn abstract ones. However, this is not confined to the *KWM*. The fact that concrete material is better remembered than abstract material has been common knowledge since teaching and learning began, but it is only now that neurolinguistics is beginning to explain why lessons that use situational contexts, authentic material (and emotional aspects) are comparably successful. Situational contexts and 'real' action cause the activation of several brain areas and facilitate storage, memory and retrieval processes (Müller, 2003).

For those who see the consequent substitution of abstract words with concrete words as sometimes too radical, there is always the alternative of teaching concrete words with the *KWM* and abstract words through 'verbalising' i.e. explanation, depending on the situation. No learning strategy is the sole answer to all learning problems. The *KWM* is no exception. However, the notion that the *KWM* is of little use with abstract vocabulary (Ellis, 1997: 137) has to be qualified. It is the quality of the keyword that counts (Gruneberg, Beaton, & Hyde, 2000).

### 5.3.7. Bizarreness

Bizarreness means that the image of the keyword is, in addition to the other necessary qualities (see above), weird, fantastic, far-fetched, exaggerated, unusual, weird, incongruous, or ludicrous – i.e. not plausible. This debate is given some room here because it is probably the most contentious one between researchers and practitioners.

The concept of *bizarreness* probably came into being because of the impossibility for the vast majority of target words of finding a keyword that interacts logically, e.g. a whale and a piano (Higbee, 1977: 618), and it was then discovered that these non-logical and non-plausible images helped remembering. For this reason, the debate about the effectiveness of bizarreness is a matter for the psychologist, not the educator. If the *KWM* is taught *systematically,* a large bank of vocabulary will inevitably result. This would not be possible without resorting to bizarre keywords.

Bizarreness was seen by the practitioners of the art of memory in antiquity to enhance memory (Blum, 1969: 31-2; Yates, 1966) and this has not changed over the millennia, being used by several modern practitioners (e.g. Lorayne & Lucas, 1981; Luria, 1969; O'Brien, 1995). Participants in experiments (Kroll et al., 1986) and my own students (subjectively) confirm this ‘widespread conviction’ (Cornoldi at al. (1988) .

**Survey**

I asked 48 students “The keywords and the images are frequently rather silly and far-fetched (bizarre). Are you of the (subjective) opinion that this helps learning/retention?”

The answers:

| | *no.* | *%* |
|---|---|---|
| *yes, absolutely* | *29* | *60* |
| *sometimes* | *8* | *17* |
| *no difference* | *3* | *6* |
| *I don’t think so* | *3* | *6* |
| *makes it difficult* | *0* | *0* |

The results are conclusive. From the learners’ point of view, a decisive majority is of the opinion that bizarreness helps their learning of vocabulary (see also the interviews).

However, contrary to this belief, existing research does not confirm this. There are findings for both positive and no noticeable effect. One study suggests that bizarre images may be (slightly) detrimental (Kroll et al., 1986).

Positive effects where found, for instance, by Delin (1968), Perenski & Senter (1970), Andreoff & Yarmey (1976), Merry (1980a), Pra Baldi et al. (1985), McDaniel & Einstein (1986), as well as Gombrich (1972), who suggests ”the more bizarre and unlikely the better”, a sentiment which is echoed by my students in the interviews. McDaniel & Einstein used lists (partly plausible and partly bizarre; plausible only and bizarre only) and this resulted in a clear superiority of bizarreness when the former list was used. The superiority seems to result from the distinctive contrast between

bizarre and plausible items. This could have ramifications for the classroom, since any large *KWM* vocabulary list will inevitably have both elements.

There is also research with conflicting results e.g. Senter & Hoffmann (1976), Wollen et al. (1972) and Paivio (1971). Paivio has provided a list of research on this subject.

Some research has also resulted in findings that bizarreness is not only not necessary, but even detrimental to success, e.g. Collyer et al. (1972), who suggest that it is the vividness of the interaction and not bizarreness that is responsible for good results (Bergfeld et al. (1982) and Kroll et al. (1986)). O'Brien and Wolford (1982), with presented mnemonics, found that the use of bizarreness showed superior results only if recall was attempted after a period of one week.

The findings that bizarre images are ineffective contradict reports from antiquity to the present - and from practitioners of mnemonics; Postman's statement that "...the unimportance of bizarreness was one of the few established conclusions of recent research on imagery" (1975) is met with incredulity. I therefore agree with Hrees (1985: 28) and Neisser (1976: 140) and advise scepticism. Since there has to be a reason for this discrepancy, numerous researchers have addressed this issue.

An obvious candidate for inquiry is the distinction between experimenter-generated and subject-generated (cf. Ch. 5.3.8) bizarre images. Having changed the design of a previous experiment and having eliminated the effects of experimenter-instruction, Nappe & Wollen (1973) arrived at the conclusion that if subjects had autonomy in selecting learning material, there was no appreciable difference between either type of imagery. Indeed, bizarre imagery took appreciably longer to form than plausible imagery (also Neisser, 1976: 140). For the teacher, it is not the time (a few more seconds more or less) in forming the images that is important but the time the material to be learnt stays in the memory.

Other studies contradict this, e.g. Jamieson & Schimpf (1980), Merry & Graham (1978) and Merry (1980a). In the last two studies, schoolchildren who rated bizarreness themselves showed superior learning, which was then confirmed by other studies, e.g. Jacoby (1978), Glover at al. (1982), McDaniel (1984) and Pressley at al. (1987). It should not be overlooked that the involvement of participants in the

rating of bizarreness adds a further element of elaboration, which could be at least partly responsible for the superior outcome.

The material used in experiments to address the plausible-bizarre problem consists typically of the association of word pairs, either provided by the researcher (experimenter-generated), or by the subjects themselves (subject-generated), rather than free recall or recognition tasks. Cornoldi et al. (1988) differentiated between an imagined situation that is ”strange because it is unusual and yet possible” (e.g. the dog suckles the car) and an impossible situation outside the imagination (e.g. the dog gives a lecture), a distinction known from Collyer et al. (1972). Cavedon et al. (1984) and Cornoldi at al. (1988) reject the effectiveness of bizarreness in favour of the unusual because, in their opinion, unusual associations are more susceptible to processing because of their feasibility than less feasible bizarre items. Merry (1980a) has tried to define what a bizarre sentence is. There are ‘anomalous’ sentences which may contain ‘several discrepancies’, and *truly* ‘bizarre sentences’ which contain one anomaly only. One can only speculate that multiple bizarre associations may compete for ‘distinctiveness’, whereas a single bizarre association is less likely to be affected. This is a condition which is true for the *KWM* in general. The shorter the sentence that triggers the image, the better.

Evidence exists that bizarreness has a facilitative effect on long-term recall (e.g. Andreoff & Yarmey, 1976; Merry, 1980a, 1980b; Merry & Graham, 1978; Webber & Marshall, 1978) and is less susceptible to interference (Einstein et al., 1989). Andreoff & Yarmey (1976) and Merry et. al. (1978, 1980a, 1980b) found positive results at both immediate and delayed recall; Webber & Marshall (1978), on the other hand, found plausible images superior at immediate re-test, but bizarre images superior at 1-week re-test. Support comes from O’Brien & Wolford (1982) (see above).

Some researchers have addressed the issue of the long-term effect of bizarreness and concluded that there might be a beneficial effect (the results are not strong) (Andreoff & Yarmey, 1976; Merry, 1980a, 1980b; Merry & Graham, 1978; Webber & Marshall, 1978). This could be caused by the uniqueness of bizarre images, which leads to less interference (Einstein et al., 1989). There are some findings that bizarreness helps retention after at least a one-week interval (O'Brien & Wolford, 1982; Webber & Marshall, 1978). All these experiments have taken place in

the laboratory and are of limited interest to the educationalist. The psychologist in the laboratory and the teacher have different perceptions of ‘long-term’. Most experiments of the psychologists typically last days or weeks. In the latter case they often speak of ‘long-term’ effects. Teachers endeavour to make information last much longer – preferably for life.

As has been demonstrated, the results are inconsistent. One reason for this might be that the vast majority of research has taken place in the laboratory with, typically, college students who are not representative of the population in general (Richardson, 1987). Most experiments also have stringent time limits. My hypothesis is that this may be a major factor in the debate. Professional practitioners of mnemonics have no time limits when practising their art, neither have the students in class where vocabulary is taught *systematically*. They take home the list of vocabulary to be learnt and the mnemonics that go with it. In class, when they first encounter the mnemonics, they also have no strictly imposed time limits and can discuss them and share the experience with their fellow students, which in itself is beneficial (Hulstijn, 1997; Levin, Levin, Glasmann, & Nordwall, 1992). Bizarre images are enjoyable, but this enjoyment needs time to sink in. When this happens, motivation results. In a laboratory experiment there is simply not the time for this to happen.

The fact that bizarreness is appreciated by learners can be demonstrated by the following example: during a lesson a student pretended not to know an item of English vocabulary, of which I was certain that she indeed knew it. When asked, she replied that she was curious to find out what keyword I, the teacher, would ‘dream up’ for THAT word. In addition to motivation, emotion (enjoyment) comes into play, which facilitates remembering (the amygdala fires to support the hippocampus and the rhinal cortex (cf. Ch. 4.3)). The laboratory is not conducive to enjoyment. This might be an explanation as to why experiments contradict 2500 years of experience. The issue of bizarreness should probably be further examined in the classroom under the aspect of motivation, and not be restricted to retention only.

### 5.3.8. Teacher vs. learner-generated keywords

Another debate of lesser importance to the classroom is that of whether it is more beneficial to learners to be provided with the keyword and the imagery link by

the teacher, or whether it is better that the learners form these two themselves (see below). Again, practitioners through the ages agree that self-generated images are better, but research on the matter has produced inconclusive results. Reese (1977: 131-4) surveyed 10 experiments but found no superiority for either strategy. Hall et al. (1981) found provided keywords superior to self-generated ones (Tab. 1).

*Means and Standard Deviations for Recall of English Equivalents Given Spanish Words in Experiment 1*

| *Time of test* | *Keyword provided* | *Keyword generated* | *Control* |
|---|---|---|---|
| *Immediate* | | | |
| *M* | *24.41* | *17.94* | *24.12* |
| *SD* | *4.11* | *9.05* | *5.34* |
| *1-week* | | | |
| *M* | *10.29* | *8.06* | *10.71* |
| *SD* | *4.27* | *4.52* | *4.88* |

Tab. 1: Hall et al. (1981)

Research since then has been equally inconclusive (Carrier at al. 1983; Jamieson & Schimpf, 1980; Patton et al.1991; Schwartz & Walsh, 1974). The reason for this is probably that the necessary conditions have to be of the same quality (degree of interaction, concreteness, vividness, etc.). Even if this were possible, the question of subjectivity would still arise, i.e. how individual people react to the images (Sperber, 1989: 84-5). However, despite inconclusive research results there is the strong possibility that self-generated images are at least slightly superior, due to the effort and creativity the learner has to employ (elaboration) and which results in 'deep processing' (ibid.) (cf. Ch. 4.1.4).

The reason why this debate is not very important for the classroom is that strategies are notoriously difficult to teach and success is doubtful, although it is generally seen as important to teach appropriate learning strategies (e.g. Brown, 1994; Oxford, 1989). One of the main problems the teacher faces when trying to teach learning strategies is inertia. Other than in the laboratory, the teacher has to deal with a vast amount of vocabulary and cannot painstakingly assure that the learners do indeed form their own images or think of something completely different. In addition, there is the time factor as the critics of the *KWM* point out: ".....It takes

more time and effort to master than the preferred alternatives: external strategies, and rote repetition" (McPherson, 2000: 142). Atkinson (1975) suggests that a panel of people should generate the keywords to ensure quality. Singer (1977) goes one step further and suggest that it should be the students as groups that develop the relevant *keywords.* However, in the short time-span of her experiment (10 days) this is feasible, but not over a period of one semester. It would disrupt the classroom procedure for too long.

My experience suggests that keyword and images have to be provided by the teacher (or teaching material) to have an effect on ALL learners in class. I agree with Sternberg's scepticism (1987), and who "...cannot help but wonder how many people who have learned vocabulary by the keyword method, whether in an experiment or in actual language instruction, will continue diligently to use the method on their own".

**Survey 1**

To find out whether the learners are prepared to adopt the strategy of self-generated keywords and images, a survey was carried out with 48 learners:

"After the *KWM* had been explained to you, the teacher provided you with the keywords and the images. This will cease next semester. When you learn vocabulary then, are you going to create your own keywords and images?"

The answers:

| | *no.* | *%* |
|---|---|---|
| *yes, always* | *5* | *10* |
| *sometimes* | *31* | *65* |
| *I don't know yet* | *7* | *15* |
| *rarely* | *5* | *10* |
| *no, I don't think so* | *0* | *0* |

After 3 semesters of learning vocabulary with the *KWM*, the majority would only use it 'sometimes' in the future. Given that the learners had been exposed to the method for this lengthy time and that they knew its success rate (the questions were asked after the retention tests), it is also remarkable that only a minority of 10% embraced it wholeheartedly and that a sizeable minority was either not committed or thought they might use it 'rarely'.

When presenting the keywords and the images, the teacher invents and presents them according to his/her individual personality. They will certainly not suit every learner. The question was how they dealt with this.

**Survey 2**

I asked the learners “When you are presented with the vocabulary list, the keywords and the images, do you sometimes change these for ones you like better?”

The answers:

| | *no.* | *%* |
|---|---|---|
| *yes, always* | *0* | *0* |
| *frequently* | *9* | *19* |
| *I have never given it a thought* | *10* | *21* |
| *sometimes* | *23* | *48* |
| *never* | *6* | *12* |

The answers show that a sizeable majority do create their own keywords, but only if the process has been set in motion by the teacher with the presentation of the lists. Even then, 33% have either not bothered or taken the keywords and images as presented.

When analysing the two results, the conclusion seems to be that the vast majority of learners will not use the *KWM* (and other techniques) *systematically* if the keywords and images are not provided, i.e. if only the strategy itself is explained and practised. This confirms scepticism about teaching learning strategies (see above). However, these findings concur with often-quoted research results on learning that good learners use mnemonics in situations where it is profitable to use them (Pressley & Levin, 1977; Pressley, Levin, Didgon, Bryant, & Ray, 1983; Pressley, Levin, Kulper, Bryant, & Michener, 1982). It also seems clear that the use of mnemonics is causal in proficient learning (Pressley, 1982), which would explain why mature learners who do not use mnemonics spontaneously prefer mnemonic procedures once they try them (O'Sullivan & Pressley, 1984; Pressley & Dennis-Rounds, 1980; Pressley, Levin, & Ghatala, 1984). The *iKWM* might be the initial trigger that sparks off the idea to the learner that mnemonics work.

There is anecdotal evidence that learners abandon *systematic* use of the *KWM/iKWM* once the teacher ceases providing the keywords and images. After completion of the research project, all but one of my classes dissolved. The one that continued (experiment 5) into the next semester was told that they had to form their own keywords and images. I suggested the creation of a list:

| ***English*** | ***German*** | ***Keyword*** |
|---|---|---|
| *goat* | *Ziege* | *Gote* |
| *evanescent* | *vergänglich* | *Eva in Nesseln* |

**Survey 3**

Six weeks into this semester I distributed a questionnaire to the 12 members of this group to establish whether the learners who had embraced the method enthusiastically had also adopted the learning *strategy*. In the first survey I had asked the learners what they *thought* they *would* do. This survey examines what they *actually did*.

"You have been working on your vocabulary now with the help of the *integrated Keyword Method* for three semesters. You have also reported that you like the way it works. At the beginning of this semester I ceased providing you with the necessary material and advised you to invent your own keywords and images and include these in your note books when you encounter new vocabulary. I would be very grateful if you could let me know how you use the method now."

| | |
|---|---|
| *I use the method regularly and systematically* | *1* |
| *I use the method often but not regularly and systematically* | *0* |
| *I use the method sometimes when I encounter a difficult word* | *2* |
| *I don't use the method at all* | *9* |

"For those who have ticked answer No, 4, please give me a reason why you have abandoned it."

The result of this small sample suggests that learners do not use the *iKWM* after a course has ended . Nine learners (75%) had not continued with the method, two were still using it from time to time selectively and only one learner used it systematically as before. On the follow-up question of how she managed the method it transpired that she used the vocabulary card system as described in Nation (2001: 303 ff.) and added a keyword sentence on every card. This is excellent practice. Alas, only one learner made the effort.

All nine participants who reported that they no longer used the method, gave a reason why.

1. No time
2. No time
3. No time
4. Not enough time
5. Much effort
6. Too much effort
7. Strenuous
8. Too much work
9. It is better if you do this

The answers were refreshingly succinct and to the point. Eight learners found obvious excuses, while the last one provided at least an honest answer. For him/her it is clearly the job of the teacher to provide the necessary material. As soon as the burden shifts to the learner, he/she falls back on the strategy or strategies that were used before the introduction of the *iKWM*. For these learners the issue whether learner or teacher-generated keywords and images facilitate vocabulary retention better was irrelevant. If they had to do it, it was no longer used.

This sample was too small to arrive at a firm conclusion, but it is a further demonstration of how the teaching of learning strategies is fraught with difficulties.

## 5.4. Mnemonic techniques

Mnemonic techniques abound. Most of them still betray their descent from the original method from ancient times, the *loci* method, i.e. they are mainly list learning methods. Over the millennia several others have developed. A selection is given below.

**a) Acronyms**

An artificial word, the letters of which each stand for a word/ concept/ piece of information:

NATO – North Atlantic Treaty Organisation

**b) Acrostics** (first letter mnemonics)

The first letter of each word in a sentence stands for a different word/ concept/ piece of information:

**R**ichard of **Y**ork **G**ained **B**attle **I**n **V**ain – the visible spectrum in sequential order: **R**ed – **O**range – **Y**ellow – **G**reen – **B**lue – **I**ndigo – **V**iolet

**c) Finger/knuckle method**

Another form of the Loci method, the places being on the surface of the hand. I am not aware that this method has been used for vocabulary learning, although grammar has been tried in the past (Kelly, 1969: 45).

**d) Peg/hookword techniques**

*i. Based on number-letter combination*

Numbers are allocated to particular letters because of their similar appearance or concept:

1/ t, d one down stroke in the number and the letters)

2/n two down strokes)

7/k *k* looks like the number seven together with its mirror reflection [sic!], etc.)

9/p;b p looks like a mirror reflection of 9 [sic!])

'Hookwords' have to be created with the relevant first letter, images formed and then linked with the target word. This technique for vocabulary learning is literally unknown outside research literature.

*ii. Based on numbers/pictures*

1 - candle

2 – swan

3 – trident etc.

A list to be learnt is linked with these numbers and pictures. A shopping list would look like this:

a candle stands on a sack of potatoes.

a swan carries a loaf of bread

Neptune carries a bottle of whisky on his trident, etc.

**e) Number and rhyme**

one - run

two - shoe

three - tree etc.

The procedure is as above.

**f) Keyword technique**

(subject of this thesis)

**g) Loci method**

Probably the oldest and best known technique and adaptable to learning vocabulary lists. The learner chooses familiar places (loci) such as items in a room, trees and houses in a well known street and ‘deposits the words to be learnt there’. To retrieve and remember them, he/she walks along these places and ‘collects’ them again. If this is done often enough, the words become anchored in memory.

**h) Mind Map**

The technique of the Mind Map is extremely popular with learners (my own experience) and is described and advocated widely in learning journals and popular books about learning and memory (e.g. Hertlein, 1999; Meier, 1999; Morris & Smith, 1998; Mukerjea, 1997; Russel, 1979; Svantesson, 1990; 1998 and many more). It consists of drawing connected lines with the words to be learnt on them, including some known ones to make the link *known – unknown*, which is also a feature of the *keyword* method. This is not to be confused with word spiders/trees which link word *families*; the Mind Map represents words within a context. The result is often that a story with gaps unfolds. I am not aware of any research on the Mind Map and vocabulary retention, but it would be an interesting and potentially useful piece of work that could benefit teachers and learners.

**i) Paired Associates**

Two words of similar sounds AND meaning are linked together, German *black* (schwarz) with *swarthy*. It is difficult enough to find words with phonetic overlapping only, but a meaningful teaching with the above is difficult to envisage.

**j) Rhymes**

(see below)

**k) Spatial Grouping**

Words are rearranged to form patterns:

e.g. the body

head
shoulder shoulder
chest
ribs
waist
pelvis
thigh thigh
knee knee
calf calf
ankle ankle
foot foot
toe toe

(Holden, 1999: 46)

**l) Total Physical Response (TPR)**

It is claimed that learning is best achieved by doing. Listening alone can account for 20% of retention, plus seeing 30%, plus speaking 70% and doing 90% (Endres, 1989: 105). Asher (1966; 1969; 1977) made this knowledge the basis of a language learning course. The learner executes orders physically (wave your left arm!) after the teacher has demonstrated them. It is hoped that the 'physical response' causes an increased memory trace. Asher's experiments showed a clear advantage compared with comparison groups. Engelkamp & Krumnacker (1980) and Schaaf (1988) subsequently confirmed this. The classroom activity 'Simple Simon says' can be seen in this context. Although the principle idea is still around (Adams, 2003, uses it to teach phrasal verbs), during the last decade TPR has not attracted much attention.

As mentioned above, most of these techniques are of no more than passing interest to the teacher/researcher. This is particularly so since some of the

presentations of vocabulary and grammar in connection with these techniques are often not conducive to learning.

Since mnemonic techniques rely on the practitioners' imagination and ingenuity, this short and selective list can only show what mnemonics can do in principle. There exist many more techniques, and it would be impossible to compile a complete list of them. It is left to the individual to try combinations and variations according to his/her personal preferences. Mnemonics utilise natural creativity. The number of techniques used is only limited by the practitioners' imagination. This is not to say that all of these techniques are equally useful. Some mnemonic devices are only of interest to aficionados of the art and cannot be recommended to the wider public, let alone the classroom.

**m) Visual (pictorial) representation**

This method is used to represent words according to their meaning, and is therefore one of the few that convey meaning per se. Unfortunately, there are not many words that are amenable to this treatment.



Figs. 4 & 5: (Meier, 1999: 172-3)

Grammar can also be visualised with some excellent results in my experience, e.g. the use of *for* and *since:*

A major problem for German learners of English is the use of *for* and *since,* because both words translate as *seit.* The explanation is that *for* is used for a time span and *since* when a point in time is involved. The German word for time span is *Zeitraum,* the second syllable of which depicts the concept of *space/room. The mnemonic* help is that the word *for* has a letter in it with a lot of space/room:

f O r

The word *since* has a point/dot in its appearance and is therefore responsible for a point in time (*Zeitpunkt*):

s i nce

The teaching of tenses:

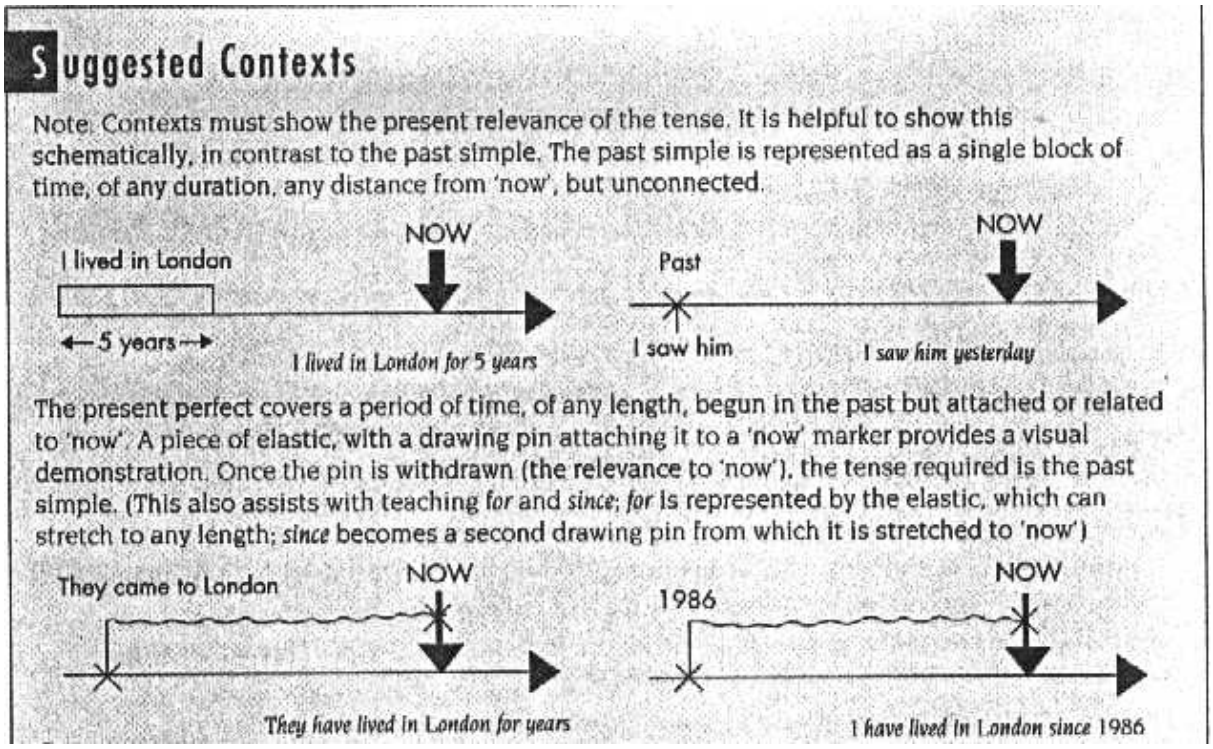


Fig. 6: (Aitken, 2002: 25)

This kind of grammar teaching is very popular with learners and can be adapted to other areas (Meier, 1999).

### 5.4.1. Limitations and unrealistic use of mnemonics

Importantly, it should be made clear that mnemonics do not improve memory in general (McPherson, 2000; Schacter, 2001), despite the (sometimes extravagant) claims of many popular books (Buzan, 2000; Herrmann, 1991; Lorayne, 1998, 2000) and even promises in the titles of books with a claim to science (e.g. Gruneberg & Herrmann, 1997; Halacy & MacClain, 1977; Herrmann, 1991). This is especially true for prospective memory, the ability to remember things in the future, such as birthdays, appointments, anniversaries, etc. Even the most ardent mnemonist still needs a diary. Mnemonics are of use for clearly defined memory *tasks,* such as remembering lists, keeping in mind the already played cards in a card game, the facts needed for a speech in the correct order, PIN nos., etc. Most are used for sequential learning. For this reason the loci method is the most widely advocated mnemonic method today, as it was in antiquity. It follows that if one wants to master more than one memory task, one has to get acquainted with several mnemonic devices, which can be a daunting task. Buzan (1994) suggests up to 9,999 'pegs' to be learnt, Birkenbihl (1997) suggests the learning of 100 items and their location in one's house, where one can mentally 'deposit' the things to be remembered. Not counting for the tendency of housewives to move furniture around, it can easily be imagined that the vast majority lose interest in these techniques immediately. If there is a desire to improve verbal memory generally, the playing of a musical instrument is probably more efficient. It seems that this activity is beneficial to this purpose (Ho, Cheung, & Chan, 2003). Students with musical training recalled significantly more words than untrained students, and verbal learning performance rose in proportion to the duration of musical training.

Newcomers to mnemonics are often told that they have to remember a lengthy rhyme to be able to remember how many days each month has:

*Thirty days have September,*

*April, June and November.*

*All the rest have thirty one,*

*Except February alone*

*Which has twenty-eight in fine*

*'Til leap year gives it twenty-nine.*

Apart from being a bad rhyme, the idea of having to learn it is ridiculous. The old-fashioned knuckle mnemonic is much more effective.

Even people who have been trained in these techniques (among them cognitive psychologists) rarely use them (e.g. Gruneberg, 2001; Herrmann, Rea, & Anmdrejewski, 1988; Park, Smith, & Cavenaugh, 1990; Yates, 1966).

This unfortunate tendency to carry things too far would only be of limited interest if it had not spilled over into the literature on language learning. Kaminska (2002) quotes uncritically a considerable number of mnemonic devices for learning prepositions which are of questionable value, e.g.:

*AT home, AT work, AT school*

*or AT the swimming pool.*

*AT noon, AT midnight, too,*

*AT twenty-five to two.*

*AT dinner or AT tea –*

*you'll always think of me...*

*I promise I will do it.*

*I'll do it now or soon.*

*I'll do it IN a minute*

*or IN the afternoon.*

*ON Monday, IN the evening,*

*IN May, ON June the 3rd.*

*AT Christmas or AT Easter*

*I'll do it, take my word!*

Apart from not being precise – one can be IN the swimming pool, too – to ask the learners to learn this boring and slightly confusing poem would defeat the object. There are more of these unfortunate rhymes on offer.

Kelly (1989) tried to learn Polish vocabulary but abandoned the exercise precisely because of the overload not on memory capacity but on effort caused by some mnemonics, here the hookword technique. He had to rehearse a considerable amount of numbers and started enthusiastically, but this enthusiasm waned during practice and he rarely made it to the end of the list. If this happens to a highly motivated researcher who uses himself as subject, the effect this 'learning' experience has on the average learner in the classroom can be imagined.

The overriding principle for the use of mnemonics in the classroom should be that of simplicity (cf. Ch. 6.5.6). Since this is violated in too many cases, it is not surprising that teachers and learners are very sceptical. Their first encounter with the method and an unfavourable or inferior execution leads to the tendency that teachers and learners equate this with the method in general. The *KWM method* has the advantage that it can be kept simple and that there is no additional learning involved.

# 6. The Keyword Method

When the *KWM* is used in the classroom, the teacher has to ensure its effectiveness. To do this, he/she has to adhere to certain characteristics. These are introduced and discussed in this chapter. It is an accepted fact for the advocate of the *KWM* that it attracts a multitude of objections. These are critically examined in this chapter and some arguments are brought forward to weaken these objections. I also suggest that the KWM can be sparingly used for areas other than vocabulary learning, albeit without consistency and that learning/teaching material could be adapted to include it in the curriculum.

### Origin

The origin of the *KWM* is uncertain. Desrochers and Begg (1987) place it between the 13th and 19th Century, a rather liberal estimate. The first explicit mention of it is from the middle of the 19th Century by J. Bacon for the learning of French vocabulary (ibid.).

In modern times the cognitive psychologists Atkinson and Raugh excited renewed interest in the method and claim to have coined the term Keyword Method (*KWM*) (1975). They demonstrated the method by testing the retention of Russian vocabulary. Atkinson describes the *KWM* as follows:

> *"By a keyword we mean an English word that sounds like some part of the foreign word. In general, the keyword has no relationship to the foreign word except for the fact that it is similar in sound. The keyword method divides vocabulary learning into two stages. The first stage requires the subject to associate the spoken foreign word with the keyword, an association that is formed quickly because of acoustic similarity. The second stage requires the subject to form a mental image of the keyword, 'interacting' with the English translation; this stage is comparable to a paired-associate procedure involving the learning of unrelated English words" (Atkinson, 1975: 821).*

As is possible with all mnemonic techniques, this procedure requires *reconstructing, relating* and *retrieving* (Mastropiery & Scruggs, 1991: 10-12), the 3 "Rs" of mnemonics. The following should be seen in the context of an *initial* encounter with the target word, the 'jump start' (Raya, 1998).

## 6.1. Reconstructing

The unfamiliar target word is reconstructed to a phonetically similar L1 word. This word should be concrete (cf. 2.3.6.) and, as widely suggested, familiar to the learner. My experience, however, is that this is a desirable but not absolutely necessary condition. When teaching the *iKWM*, a vast number of keywords are needed and it is sometimes inevitable that the teacher uses some words that are unfamiliar to the learners, e.g. on one occasion I used the keyword *campanile,* assuming that everyone was familiar with this Italian term for a church tower. This was not the case. After an explanation, this keyword was readily accepted – it *had* become familiar to the learners.

Example: goat = *Gote* (Goth)

## 6.2. Relating

Once the above has been done, the *keyword* has to be related (linked) to the to-be-learnt information in an interactive picture, image or sentence.

Example: *Goten* reiten auf Ziegen (Goths ride on goats)

This interaction is of prime importance and should be as vivid as possible (cf. 2.3.4.). It is the degree of the interaction between the target word and the *keyword* that determines the memory trace.

## 6.3. Retrieving

The third step is to retrieve the definition of the target word from memory. This consists of repeating the two steps above. The learner is required to, firstly, think of the keyword (goat), then think back to the interactive picture/image (Goten/Goths riding on goats) and, secondly, think of the kind of interaction that happened in that

picture/image and, thirdly, express the desired response (*goat*). This process works in both directions, i.e. productive and receptive.

The danger for learners who are unfamiliar with the *KWM* is that some initially confuse the *keyword* with the target word and respond with goat = Gote/Goth. This normally disappears with experience, but in some rare cases, this persists (cf. interview). In this case the *KWM* is not the right strategy for this particular and, in my experience, rare learner.

It should be noted that this example is an ideal one, since it deals with two concrete nouns which are phonetically very similar. When presenting hundreds of keywords, this ideal state is the exception rather than the rule. Unfortunately, in some available learning material, mainly for beginners (e.g. Gruneberg & Coldwell, 1995), the authors present only concrete target words, thereby giving the tacit impression that for abstract words the *KWM* is less facilitative.

In most cases it is only possible to find keywords that display similarity with the target word in one or two syllables and/or do not belong to the same word category. Fortunately, several experiments have shown that this does not affect the effectiveness of the *KWM*, although it is desirable that the *first* syllables display the phonetic similarity with the target word (e.g. Pressley, Levin, Hall et al., 1980; Raugh & Atkinson, 1975). However, there are cases where the similarity of first syllables is not of great value, especially if it is a prefix. This has to do with pronunciation and especially with the location of the strongest stress. In Raugh and Atkinson's example (Raugh & Atkinson, 1975) of *caballo,* meaning horse, the stress and therefore its prominent feature, is on the second syllable. Rather than choosing a keyword that begins with *ca,* a word should be chosen that begins with *ball,* such as *ball, ballerina or ballyhoo*. It helps not only remembering but also pronouncing correctly. The fact that, for the learner, unusually pronounced words are often very memorable is not new. However, as far as I am aware, there is no research which has tried to examine how these phonetic cues (stress; vowel sounds etc.) are actually used.

## 6.4. Keyword Method research

The *KWM* is probably one of the most researched strategies for vocabulary learning in the laboratory and in the classroom (Bellezza, 1983; Desrochers & Begg,

1987: 64; Nation, 2001: 312). Most research has compared the *KWM* with other learning strategies such as learning in context, images without interaction and strategies that were left to the learners to choose and use. The most 'popular' control group is that which uses rote learning. The results should be viewed with caution. 'Mindless' rote learning is not always what it seems. There is "...increasing experimental evidence that simple rote learning is largely a fiction" (Paivio, 1971: 300). Apparently, subjects in experiments 'annoyingly' persist in finding ways to avoid pure rote learning by forming their own coding strategies (ibid.) There are several sources that give an overview of *KWM* research and regard it as a performance enhancing strategy that can be used as an alternative or supplement to currently practised strategies (e.g. Bellezza, 1983; Cohen, 1987; Desrochers & Begg, 1987; Gruneberg & Morris, 1992; Levin, 1981; Paivio & Desrochers, 1981; Pressley, Levin, & Delaney, 1982).

Although Butler at al. (1973) conducted an experiment with the *KWM* in 1973, well before Atkinson & Raugh (1975; 1975) and without using the term (see above), it was Atkinson & Raugh whose experiments heightened the awareness of mnemonics for vocabulary learning and, consequently, triggered a plethora of experiments to such an extent that one could see further laboratory research into the effects of the *KWM* as superfluous.

The results of these influential experiments are therefore reproduced here:

In an experiment (1975) the subjects (college students) had to learn 120 Russian words, divided into three comparable 40-word sub-vocabularies for presentation in separate days (three study-test trials). The control group, which used their own learning strategies, received the Russian word and its English equivalent on a computer screen, the *keyword* group was additionally presented with a keyword. In the test phase the subjects were presented with the Russian word and had to produce the English equivalent within 15 seconds. A test for all 120 words was conducted on the fifth day and, as a surprise to the subjects, again on the sixth.

As the graphs below show, the *keyword* group scored significantly better.

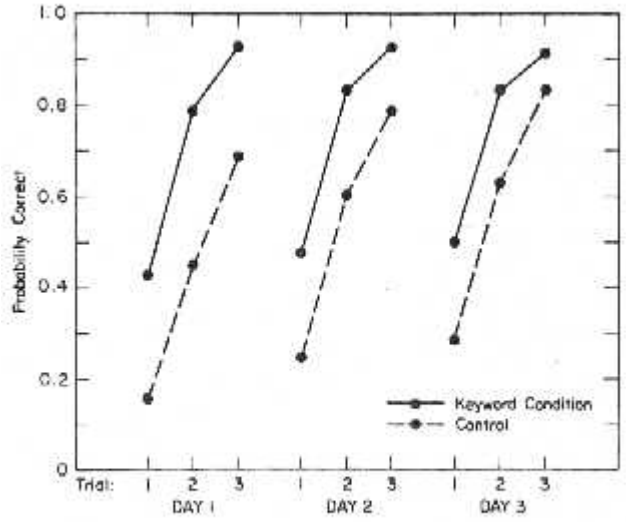


Figure 2. Probability of a correct response over test trials on Day 1, Day 2, and Day 3.

Fig. 7: Atkinson (1974: 823)

After the fifth day, retention was 72% compared with 46% of the control group and after the sixth day the result was 43% compared with 28%.

*Probability of a Correct Response on the Comprehensive and Delayed Comprehensive Tests as a Function of Experimental Treatment and Study Order*

| *Vocabulary* | *Comprehensive test* | | *Delayed comprehensive test* | |
|---|---|---|---|---|
| | *Keyword* | *Control* | *Keyword* | *Control* |
| *First subvocabulary* | *.64* | *.33* | *.48* | *.25* |
| *Second subvocabulary* | *.70* | *.43* | *.44* | *.30* |
| *Third subvocabulary* | *.81* | *.63* | *.36* | *.29* |
| *Total vocabulary* | *.72* | *.46* | *.43* | *.28* |

Tab. 2: Atkinson (1975: 823)

The third graph shows that only eight of the total 120 words were better retained by the control group than by the *keyword* group.

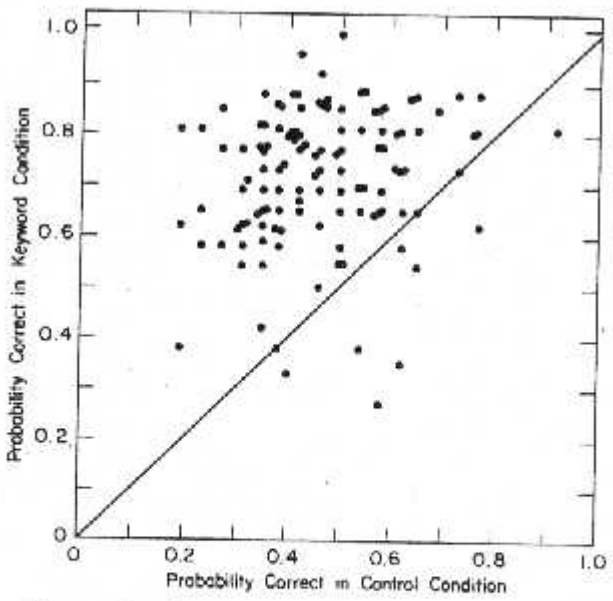


Figure 3. Scatterplot of performance levels on the comprehensive test. (Each point corresponds to an item; the ordinate gives the performance level when the item was studied in the keyword condition, and the abscissa its value when studied in the control condition.)

Fig. 8: Atkinson (1975: 824)

Since then there have been a multitude of experiments which confirm the beneficial influence the *KWM* has on learners, including children (e.g. Pressley, 1977; Pressley, Levin, & McCormick, 1980), college students (e.g. Kasper & Glass, 1988; Pressley, Levin, Hall et al., 1980; Pressley, Levin, Nakamura et al., 1980), the elderly (e.g. Gruneberg & Pascoe, 1996; Jackson, Bogers, & Kerstholt, 1988; Yesavage, Sheikh, & Lapp, 1990) and the disabled (e. g. Gruneberg, Sykes, & Gillet, 1994; Slife, Weiss, & Bell, 1985).

Brown and Perry (1991) compared three learning strategies, *keyword* only, *semantic* (meaning through context), *keyword-semantic* (keyword plus context) and found that the *keyword-semantic* strategy worked best. They also made the link between this performance and the *depth-of-processing theory*, i.e. a well-known theoretical framework with a learning strategy (cf. 4.1.4.). An interesting point from the view of the teacher/researcher is that they claim the experiment took place in authentic classroom situations.

*"This is important, because for a strategy to be useful, research must demonstrate that certain learning strategies are not only effective in the laboratory but in the classroom as well (ibid.)."*

The students involved in the experiments might be of a different opinion as far as classroom authenticity is concerned. Six 'intact' (ibid.) classes (a total of 60 subjects) were divided into three experimental groups and received a day of instruction on how to use their method, as well as a second day of instruction and practice testing. On each of the following four days the subjects were given 5 minutes to learn 10 new words, followed by a cued-recall test. "In order to maintain high student interest in instruction and testing, students were told that this was the first time that their method had been used .....and that their results would be carefully analyzed to see how helpful their method of instruction was" (ibid.). Authentic classroom situation indeed.

This example has been given some prominence here since it demonstrates the dilemma surrounding research on the *KWM* for educational purposes. To move laboratory conditions into the classroom is not sufficient. Claims that experiments took place with 'intact classes', 'in natural classroom settings', etc. should therefore be treated with caution.

The language teacher is interested in long-term retention of vocabulary, another reason why educators view laboratory results with scepticism. Beaton, Gruneberg & Ellis (1995) examined the performance of one individual who had learnt 312 Italian words from a *keyword* language course (Gruneberg, 1987) 10 years previously. Without revision, the subject remembered 35% of the words with spelling fully correct and more than 50% with minor errors of spelling. After 10 minutes looking again at the original list, recall increased to 65% and 76% respectively. After a further revision of 90 min., recall was virtually 100%.

The case of one individual is not enough to draw a firm conclusion, but over a very long period it is inevitable that one cannot assemble original groups again.

Griffith (1980, cited in Sperber 1989) conducted an experiment with soldiers of the US Army, taking (3) different levels of intelligence into account (GT-scores/General Technical Aptitude Test, a test of intelligence). The subjects had to

learn 15 Korean words. Level one and two did significantly better than the control group and level three still outperformed the control group, but to a lesser extent. This contradicts findings that the *KWM* is suitable mainly for weak and inexperienced learners (e.g. Hall et al., 1981). The *keyword* group also outperformed the control group in the time needed to learn these words. On average they needed 787 sec. compared with 933 sec. for the control group. Griffith draws the conclusion that the *KWM* is highly effective, regardless of the intellectual aptitude of the subjects. In fact, if the SER (study efficiency ratio = number of correctly translated words divided by overall learning time x 1000) is employed, the *keyword* group's performance is 79% better than that of the control group (ibid.)

Singer (1977) reports that the *KWM* proved very successful, although she did not use a control group. The experiment in 'Junior High' lasted 10 days and she presented five to eight words per day.

*Recall of the English Words: Delay Condition with No Review*

| *Class* | *Number of Students* | *Average Delayed Test Score (%)* |
|---|---|---|
| *7A1* | *16* | *62.4* |
| *7B2* | *17* | *75.0* |
| *8A* | *26* | *58.3* |
| *9A* | *15* | *96.4* |

Tab. 3: (Singer, 1977)

Singer's paper is interesting not only for her experiments, but also for her report on the effect the *KWM* has on the motivation of the learners – and teacher (cf. 9.2.)

Pressley et al. (1982) conducted an experiment with 108 native English speaking students who had to learn a list of 30 one and two-syllable low frequency English nouns each. One criterion was that '*university students should not be likely to know the meanings of the words*' (my italics). Among these was the word *poteen* (whiskey distilled in Ireland in small quantities, privately). This incidentally highlights the problem the researcher faces when choosing the words to be learnt. The chances are very high that students are familiar with this word and its connotations, such as brain damage and going blind (see below). The second criterion was that it was possible to create a concrete *keyword* for some part of each of the vocabulary

words. Their performance was then examined according to their strategy group, i.e. *Keyword imagery, Imagery, Synonym and No-strategy control* (experiment 4 and 5). Pressley et al. arrived at the conclusion that the *KWM* proved superior to every alternative considered, (rote-learning and context) when the provision of definitions in response to vocabulary words was the dependent variable. In one respect they make a baffling statement. 'In Experiment 5, *non-keyword* users were less likely than *keyword* subjects to confuse the *keyword* portions of the vocabulary words with the definitions'. In her experiments (1993), Kasper examined the effect of the *KWM* on sentence combinations (in Spanish) and reported that the keyword group remembered 86% of these sentences compared with 49% of the control group (rehearsal).

Rodriguez and Sadoski (2000) belong to the few who examine the *KWM* with an element of context (see also Brown and Perry (1991)). They compared this with rote learning, learning in context and the *KWM* without context. The material for the *keyword/context* group consisted of the target word, the *keyword* and three sentences in the target language that included the target word. This is similar to the material used in this thesis but without the wider context of reading material. The activity 'in the classroom' consisted of the learning of 15 words, all nouns. These nouns and the *keywords* were all concrete. Delayed recall was tested after one week. The graph below shows that the *context/keyword* method was superior to all other methods examined. The students in the *context/keyword* method were able to retain 1.5 to 4 times as many correct definitions after one week as the students in the other groups (context only and rote-learning).

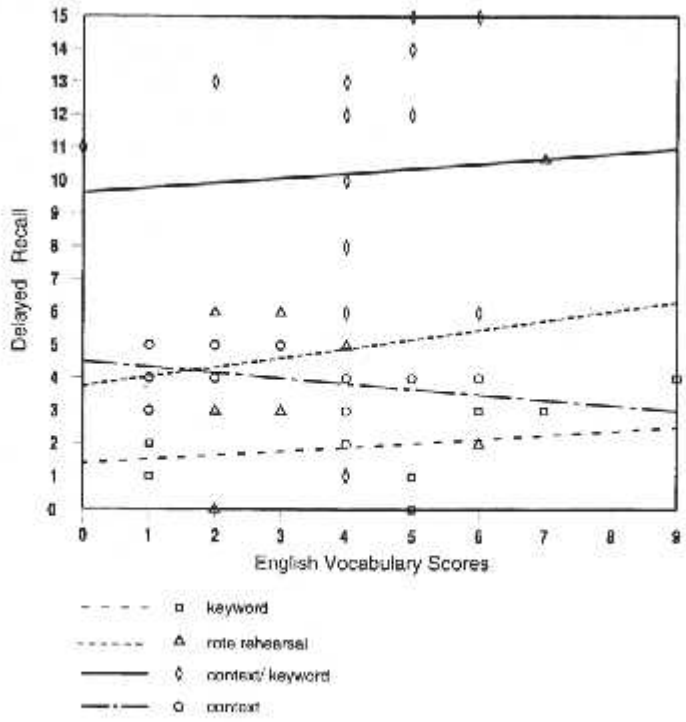


*Figure 2.* Plot of delayed recall with English vocabulary scores by groups.

Fig. 9: (Rodriguez & Sadoski, 2000)

Avila and Sadoski (1996) tested the retention rate of 93 low-achieving, disadvantaged, fifth grade LEP (Limited English Proficiency) Hispanic students by presenting them with 10 (sic!) items of vocabulary over three days and found that the *KWM* proved superior in recall and comprehension. As the title of their paper suggests, they see the use of the *KWM* in the classroom as a new application. Their conclusion as far as the suitability of the *KWM* for the classroom is concerned is that the study..... also demonstrated that using the keyword method is practical in a public school classroom context and that the students were..... successfully taught the keyword method. The two most relevant sentences in the paper are probably..... that they (the students) found the technique *not only effective but also enjoyable...* and that.... *researchers need more classroom assessment of the* keyword method before making any permanent conclusions.

Kaminska (2001; 2002) examined the effectiveness of the *KWM* when teaching phrasal verbs. Her study was conducted over three consecutive years, the experiments proper lasted three to four weeks only. In the process of this study she developed a variation of the *KWM,* which she calls *literal-keyword technique*. She

drew pictures to assist the learners to form an effective image, although she arrived at the conclusion that this was probably not necessary. The results of her study 'strongly' suggest that the *KWM* is also suitable to teach phrasal verbs and that these learnt with the *literal-keyword technique* seem to be better retained than those acquired by more traditional discovery exercises, especially when large amounts of vocabulary are to be learnt (ibid.). A side effect of her study is that it showed the flexibility of the *KWM.* It was used for an area which is normally not seen as suitable for the use of it.

There has been research which did not show that the *KWM* is superior to other learning strategies. Fuentes (1976) found no beneficial effect of the method, but it has to be said that the research method used is questionable. The subjects were presented 5 new words daily over 6 weeks, thus keeping well within Miller's 'magical number' 7+/-2 (1956). Students should be able to learn 5 words a day with any strategy. In addition, the subjects were given words the teachers *thought* were unknown to them, which may or may not be the case. As Fuentes writes: "The procedures followed were necessarily accomplished in subsets. Each separate procedure was performed simultaneously in all schools by 'trained research assistants' (inverted commas added). .....Only a select group of students was used eventually in the experimental sample.....(p. 27) and ...an effort was made to include words that eventually would have been introduced late in the academic year. By doing so, the keyword study became an *integral part of the curriculum* (my italics) and not merely a supplement." Gairns & Redman (1993: 92) call this a classroom trial.

Some others (Thomas & Wang, 1996; Wang & Thomas, 1992; Wang, Thomas, & Ouellette, 1992) reported that there is no long-term benefit of the *KWM* compared with rote learning, when immediate testing is prevented. It could be argued that, in laboratory conditions, immediate testing is an indispensable task and, indeed, it would be 'pedagogically perverse' (Gruneberg, 1998) to omit it deliberately.

Hall, Wilson & Patterson (1981) report that the *KWM* enhances learning when the words are presented in sequence (paced), but shows no additional benefit when the words are given together and the learners have to learn them in the same overall time (unpaced). They deduce that in the latter case the subjects have time to use some of their own learning strategies instead of adhering to the instructions.

Questionnaires for both groups revealed that some subjects of the *keyword* group did not follow the instructions to use the *KWM* only (three did not use it at all) and that some subjects of the control group used a variety of strategies, among them the *KWM*. This demonstrates that interpretive research has to accept the existence of a number of variables that cannot be controlled.

Pressley et al. (1982) repeated these experiments using a different vocabulary list and testing the subjects individually rather than in groups. Under these conditions they found a clear advantage of the *KWM* in paced and unpaced conditions.

*Mean Percentage of Meanings Recalled, by Condition and Experiment*

| | *Presentation method and strategy* | | | |
|---|---|---|---|---|
| | *Paced* | | *Unpaced* | |
| *Experiment* | *Keyword* | *Control* | *Keyword* | *Control* |
| *1a* | *57.9* | *43.6* | *75.0* | *48.8* |
| *1b* | *55.4* | *35.4* | *76.2* | *60.4* |

Tab. 4: (Pressley, Levin, Didgon et al., 1982)

Pressley et al. are of the opinion that the quality of the wordlist was one factor that prevented the *KWM* from showing its superiority. Hall et al. had included in their list numerous items that possess natural language mediators (as in loan words) that college students could have easily detected and used. ‘It certainly is possible that such mediators could be as powerful as, or even more powerful than, keyword mediators...’ (ibid.). In other words, students could have used other than mnemonic elaboration.

However, the majority of the research literature reports that the *KWM* is superior to any other vocabulary learning strategy, although some reservations persist. As mentioned above, the quality of the *keywords* as provided by the experimenters is a variable that cannot be kept constant – and this affects the outcome of the studies. There are methodological difficulties. A good image for one person might be a bad one for another. Gruneberg et al. (2000) had images rated by thirteen independent raters for their memorability. A significant difference was found between the ‘good’ and the ‘bad’ images, with the good *keywords* being rated as being of significant higher memorability. In subsequent retention tests it was found that the ‘good’

images condition provided significantly higher levels of both receptive and productive learning compared with the ‘bad’ images and ‘rote’ learning condition.

## 6.5. Characteristics of a successful keyword strategy

### 6.5.1. Phonetic similarity

As we have seen, the *keyword* should be phonetically similar (not necessarily identical) to the target word (e.g. **Gote-goat)** and the learner has to be able to form a link between them.

An example for a good *keyword* is that given above, i.e. ***Gote*** *reitet auf* ***Ziege.*** An ineffective example, as taken from a *keyword* language course (Gruneberg & Coldwell, 1995) is **goat – gut** (good) and the learner is expected to imagine a good goat. This happens when one concentrates solely on a keyword and disregards the criteria as listed below.

### 6.5.2. Uniqueness

The association should be unique to avoid the possibility of interference with other associations. Goths having goats with them is not unique, but riding on them is.

### 6.5.3. Exaggeration

Despite research results that do not show an advantage of bizarreness, practitioners of mnemonics generally agree that the more bizarre an image is, the better (see interviews). The Goths in full armour riding on giant goats is greatly bizarre and unusual.

### 6.5.4. Sensory nature

For most people the image will be predominantly visual, since visual memory is seen as the strongest by most practitioners from antiquity (e.g. Auctor ad Herennium, 1st Century BC) to today (e.g. Buzan, 1982), but smells, sounds, movements etc. should be included wherever possible. The Goths holding their noses because of the

repellent smell of the goats (and the learner actually smelling it in his/her imagination) improves the process of imagination and therefore memory.

### 6.5.5. Interactivity

The connection between the objects should be the prime feature of the image – disconnected images do not work well. Goths looking at goats is not effective, but riding them and urging them on with shouts and their heels is.

### 6.5.6. Simplicity

The simpler the connection, the better. The image of the Goths having a wedding feast and roasting goats on their spits is neither simple nor unique. (Lack of simplicity is a frequent criticism I have encountered from my students [see interviews]).

### 6.5.7. Creativity

Being creative involves the learner much more in the association and increases depth of processing. Students bring their natural creativity to the classroom and this should be utilised by involving them in the search for a *keyword* if possible (see below).

### 6.5.8. The sexual, vulgar and naughty

Learners forming their own *keywords* and associations should not be afraid of making them sexual or vulgar. They might occur to them anyway when the possibility arises and most people find that they remember these associations much better. (Russel, 1979: 124) This is a technique not to be recommended for the classroom, but if the learners form their own associations, nobody needs to know. It is the effectiveness that counts.

### 6.5.9. Involvement

Memory is intimately linked with conscious experience. The more strongly the learner experiences something, the better he/she will remember it (ibid.)

From the above it can be seen that the example ***good goat*** violates almost all of these criteria. For people who see a goat as a good animal there is nothing unique, a smelly goat is not unique, and seeing a goat is not unique either. There is no sensory element involved, no interaction, no creativity and no involvement. It was therefore unlikely to enhance memory and was consequently rejected by my students.

### 6.5.10. Use of one keyword for different target words.

Circumstantial evidence suggests that it is not the isolated *keyword* but the image (elaboration) that causes vocabulary retention. The *keyword* is only used to facilitate this elaboration. It therefore seems logical to assume that one *keyword* can be used for different target words **(e.g. Gote = goat, coat, cot etc.)**, provided there is a sufficient interval between the various uses to eliminate interference. The length of this interval is determined by the time it takes for the target word to be firmly rooted in the learner's long-term memory bank, i.e. the learner no longer needs the *keyword* to retrieve the target word. This interval will certainly be influenced by individual factors. Although there is no research material available on this subject, my own experience seems to confirm this. If the isolated *keyword* were responsible for vocabulary retention, this multiple use would not be possible. Besides, when one provides keyw*ords* for hundreds, if not thousands of words for use in the classroom, there is often a limited choice of *keywords* available and one has to use one *keyword* for several target words. The enormity of the task can be imagined when one imagines one has to find *different keywords* for all the English words that begin with cons... Research is urgently needed on this matter.

### 6.5.11. Simplified keywords

A *keyword* can be embedded in a phrase, a film/book title, a name etc. in the target language the learner can identify. This is another example which suggests that it is not the *keyword* itself that aids memory but the imagination it triggers. When presenting the target word **easy**, the phrase **take it easy** or the film title **Easy Riders** was suggested.

**Duck** and **pig** are words that are often used in experiments as reported in the literature and there is always a *keyword* with interactive images provided. This

violates the criterion of simplicity**. Donald Duck** in the cartoon Mickey Mouse and **Miss Piggy** of Sesame Street fame are names and characters everybody is familiar with.

Some of the *keywords* and images given in published material are of poor quality. This gives, unfortunately, the impression that careful choice of these is not of paramount importance. Perhaps this is one factor why the *KWM* is often rejected by classroom practitioners. They equate the poor quality of the *keywords* and images with the method.

## 6.6. Objections to the Keyword Method

It is only relatively recently (within the last 40 years) that imagery has attracted renewed interest. Before that behaviourism prevented a thorough inquiry into the subject.

Bower (1972: 51) is of the opinion that "..many experimental psychologists cannot entertain thoughts about imagery without some deep sense of guilt associated with forbidden taboos. Our fraternal indoctrination that imagery is the forbidden fruit has been handed down to us, of course, from the heydays of radical behaviourism, which consigned it to the flames along with other cognitive concepts".

Even today, mnemonics are far from accepted as a valid learning tool. It is seen as suggestive, manipulative, mechanical, unsophisticated and non-intellectual. Mnemonics has been – and sometimes still is – rejected to the point of irrationality and open hostility (Gruneberg, 2001; Gruneberg & Herrmann, 1997). More serious than these vague objections are reservations that are based on current teaching methodology. The concept of CLT sees the use of mnemonics for language learning purposes as superfluous. The use of keywords and imagery is seen as uncomfortably close to the old concept of rote learning and 'overlearning' by the audio-lingual method. The CLT approach with its reliance on relevancy, understanding, meaningfulness and creativity (Gray, 2001) frowns on explicit teaching of vocabulary, although the explicit teaching of grammar has already weakened its pure form. The *KWM* as practised so far certainly does not fit in with the schema theory (situational-communicative learning of language) in language teaching which asserts that a target language item to be learned has to become part

of the learners' schema (Brown & Yule, 1983; Pincas, 1996). The above would be a valid objection to the *KWM* if it is meant to *replace* current teaching methodology rather than be an *integral part* of it. In this context, it is the reliance of the *KWM* on the mother tongue of the learners which arouses suspicion. It is widely accepted that the target language has to be used in the classroom as soon as possible and as often as possible. This view remains unchallenged. The *iKWM* only provides the initial encounter with the target word. It gives a jump start to the learner (Raya, 1998). From then on, the methodology the textbook or general teaching is based on takes over.

One of the main characteristics of mnemonics is that abstract concepts are learnt by linking them with concrete ones, i.e. concretising the abstract. This is often seen in the scientific community as inferior thinking (Pressley, 1985), but it is known that, for instance, A. Einstein used strong visual stimuli: "... the very best thinkers often do not think abstractly but rely instead on concrete experiences and representations" (Baddeley, 1979: 222-3). Rohwer (1980) voices a similar sentiment. This touches on the question of whether there are people with no imagination and imagery skills. Baddely (cited in Oxford, 1995) is of the opinion that imagery seems to be helpful even with people who insist on being poor visualisers. There is evidence that poor visualisers and good visualisers show the same improvement in memory when instructed to use imagery. The major difference seems to be that good memorisers display more confidence than others.

Bower dismisses the possibility that there are people with no imagination:

> *"Another issue concerns individual differences. The classic questionnaire study of Sir Francis Galton (1883) turned up some people who reported having no imagery. A more recent and adequate survey by McKellar (1965) of 500 British adults from a variety of occupations turned up none who reported no imagery; 97% reported availability of visual imagery, 92% had auditory imagery, and over half had a variety of sensory imagery available, including movement, touch, taste, smell, pain and temperature. We may still wonder what to make of those occasional respondents who report no imagery whatsoever.*

> *Smith (1966) lists three alternatives: they are liars, they have only propositional memory (involving motor skills – my addition), or they have misunderstood the reference of the question. The first may be discounted; of the last two, I prefer the "misunderstanding" account. Psychologists are familiar with respondents' misunderstandings of self-descriptive terms. Respectable society matrons will deny giving vent to erotic impulses although their behaviour and their husbands speak otherwise." Bower (1972).*

Oxford (1995) reports that she found in 'hundreds' of informal-style surveys with language learners and teachers that 50-80% said they were visual learners or that the visual sense is a major part of their sensory preference.

Opponents of the *KWM* in the classroom cannot, of course, deny the encouraging results of the research in psychology, but this is part of the problem. Although some research has been carried out with schoolchildren and some with adults in the classroom, this basically constituted the transfer of laboratory conditions to a different environment, without taking all the aspects of classroom learning into account. I am not aware of any longitudinal research in the classroom using the *KWM*.

Since it has mainly been the laboratory that has provided research results, these can easily be dismissed by educationalists. The vast majority of researchers have used university students as subjects, mostly students of psychology. In fact, when I did some literature research at the University of Swansea, it was the case that most research there was carried out by students on students. Research was carried out on a 'tit for tat' basis – 'you take part in my experiment, I'll take part in yours'. These psychology students have, by definition, a special interest in the subject and have experienced some training, whether they are consciously aware of it or not.

University students are not representative of the population in general. Richardson (1987), among others, observes that social class influences work with imagery and that university students are not representative of the class structure in general. It is also known that age has an effect on learning with imagery (Cunningham & Weaver, 1989; McDaniel & Kearney, 1984). For those

educationalists who have children in mind, it is clear that more mature learners such as students have a wider range of metacognitive skills at their disposal (Kurtz & Weinert, 1989), while those who are in adult education would argue that able and 'seasoned' learners such as university students with their varied learning strategies cannot be seen as role models for the average adult language learner (Banaji & Crowder, 1989). This is also true for children, since the classroom is a collection of learners with different abilities and strategies.

There is concern "...that the experimental laboratory approach is limiting in terms of our understanding of memory phenomena *per se* (Neisser, 1976), (and that) there is the need for an ecologically valid approach to memory in order to have a better understanding of memory *per se"* (Banaji & Crowder, 1989) *,* e.g. 'experiments' and observation in the classroom. Others (Nattinger, 1989) see such research as problematic on grounds of uncontrollable variables, i.e. validity. The answer is probably that findings in the 'real world' should be examined in the laboratory and that laboratory findings should be examined in 'real life', in the case of this thesis the classroom.

The artificial environment of the science laboratory with its lack of variables peculiar to the classroom can only provide a first stepping stone for educational research, and before this has not been carried out in more depth, objections to the *KWM* will probably still remain and teachers will maintain their resistance to the method .

### 6.6.1. Interference

Sceptics of mnemonic techniques often point to the interference system inherent in mnemonic techniques. It could well be that the use of the same mnemonic devices for different kinds of information over time blurs the memory. For instance, if one uses the loci method and uses the same places to 'deposit' different images, there could be danger of confusion. The ancient practitioners of the art of memory were aware of this argument but maintained that it is not valid because the images could be removed before new images were placed. They used the metaphor of cleaning a tablet to prepare it for new information. In a famous case study of an outstanding mnemonist (Luria, 1969), the subject of this study reported precisely this technique to 'forget' outdated information. Lowry (1974) stated, after an experiment

with 144 college students trying to remember 12 high-imagery noun pairs that "...if the effect of mnemonics is in some way centred on modifying stimulus encoding (increasing distinctiveness), then the use of mnemonics would result in less interference than when mnemonics are not used". In other words, good mnemonics are less susceptible to interference. Bugelski (1968) found no interference problems. Paivio (1971) agrees. "As training progresses, mediators drop out". As far as the *KWM* is concerned, there is no research I could find which dealt with the problem whether the same keyword could be used for different target words without causing interference, i.e. confusing the two – or more. My experience suggests that this can be done once the process of automatisation has been completed for the old target word, i.e. the speed of processing within procedural memory. There has to be a reasonable time interval (cf. 6.5.10).

### 6.6.2. Time

A frequent objection to mnemonics is that the technique is time consuming. Although it is undoubtedly true that the *KWM* takes some time away from learning in context, this time should be seen as investment that yields interest (Sperber, 1989: 95). It has been shown that the *KWM* is up to three times more effective than other strategies, which means that the *KWM* becomes only ineffective compared with other strategies if learners spend three times longer with the *KWM.* From my experience this is not the case, although it would be interesting to investigate how much time the learners actually spend with the *KWM*. This, however, is outside the scope of this thesis.

For the teacher, the question is how the *KWM* affects classroom management. As we have seen, the most effective way of implementing the *iKWM* in the classroom is not by asking learners to provide their own keywords and images but to have these provided for them. This shifts the burden of time expenditure to the teacher. The learners spend no more time learning (imaging) with the keyword method than with other strategies. Indeed, the effectiveness of the *iKWM* could well cause the learners to spend *less* time concentrating purely on vocabulary. For the teacher, the provision of hundreds of items of vocabulary with keywords and imagery instruction is extremely time consuming, i.e. when one considers the time effect, one automatically considers the practicality of the *KWM* (cf. Ch. 6.6.3). Mastropiery and Scruggs (1991)

acknowledge this but are of the opinion that this problem occurs only initially and that it, in the long run, saves time. Mnemonic materials, once developed, could be used repeatedly and mnemonic instruction can therefore substantially reduce the time for vocabulary teaching, potentially freeing the teacher for other activities. This is partly true.

I have taught English vocabulary systematically for 4 years and have come to the conclusion that it is best to split vocabulary teaching into two forms. The first is teaching vocabulary from a written context (authentic material) as described in Ch. 12. This is the time consuming part since it requires lengthy (and boring) preparation, but this is also the part where Mastropiery's and Scrugg's comment is valid. Over time the teacher collects a large bank of text with accompanying keywords and imagery instruction. This material can be used again in different courses of the same type, but there is, of course, a limit to useful recycling. Authentic material can become outdated and irrelevant to the learners (e.g. news paper articles). As long as there is no pre-produced material provided for the teachers, the *KWM* will not be accepted by them, purely for economic reasons. This problem can only be solved if the TEFL publishing industry produces material that incorporates the *KWM*. This can be done in the form of a supplement to text books, which introduces vocabulary unit by unit and provides keywords and accompanying images. I have produced these supplements for two classroom textbooks (Jones, 1996; O'Connell, 1987) as a side effect of the research project and can confirm Mastropiery and Scruggs' suggestion that the *KWM* actually saves time when integrated into the lesson with the appropriate teaching material.

The second part is, of course, speaking. Classroom language is unpredictable. During this stage it is also vital that the flow of English is as continuous as possible without too many interruptions. An explanation of a word with writing on the blackboard can be accommodated within this flow, but if the students are asked to pause, think of a keyword and an image and then spend 10 seconds imagining it, the flow would vanish and the *KWM* would become counterproductive. There are two ways to deal with this problem. The learners can be asked to write down the vocabulary in their notebook and then find keywords and images at home – and hope for the best. Another solution is the 'mind map', another mnemonic device that is received by the learners with enthusiasm – without exception (cf. Ch. 5.4.). Thus, if

the *KWM* is applied systematically and in context, the time problem for the *learner* does not exist. If the time problem for the teacher prevents the *KWM* from being implemented, this cannot be blamed on the method.

### 6.6.3. Practicality

It is sometimes claimed that mnemonics are not practical since they are mainly used in memory research in the laboratory and – far worse – in public by professional practitioners of the art who demonstrate astonishing feats of memory of little use to the 'man in the street' (Paivio, 1971). Apart from the fact that the remembering of names and an increasing quantity of PIN numbers is highly practical, this thesis tries to demonstrate that at least one aspect of mnemonics, the *KWM*, is eminently practical in language learning.

### 6.6.4. The mediator as a crutch

Another limitation is supposedly that mnemonics provide a crutch which makes the learner dependent on it, but it has been shown by Pavio (1978) that this is not the case and that over time the mediator (crutch) disappears. Another (early) study (Higbee, 1978) showed that mediators seem to disappear when learning progresses. This is in line with my own observation that the keyword recedes into the background and is only brought back when needed, e.g. in case the target word is forgotten and has to be consciously retrieved again. In the field of language learning it should not be forgotten that the learning of vocabulary with the *iKWM* provides the *initial* encounter with the target word and that there is a re-noticing process (Batstone, 1996) at work; practice will eventually make the mediator superfluous. My own experience suggests that the mediator might lose its usefulness, but it is still there and can be retrieved if a rarely-used target word is forgotten and needs to be brought to the fore. It is also the case that a mediator can become attached to the target word, especially if it was originally perceived to be difficult to learn. For instance, 'evanescent' was such a word for me, and I devised the two keywords 'Eva' and 'Nesseln' ('Eve' and 'nettles' respectively) plus the image of Eve sitting in nettles and ageing rapidly from a youthful 18 year old to a wrinkly 80 year old. This target word is now a natural part of my lexicon but whenever I use it the image as described 'pops

up' as well. This does not infringe on the speed of recall or influence the fluency of my speech; it is just there for a fleeting moment.

### 6.6.5. Understanding/meaning

One of the objections frequently put forward is that mnemonics might help the memory but not understanding of the subject. Since this is central to language learning, the observation that mnemonics do not generally foster understanding and meaning seems to limit their use in the classroom severely. In the special case of the *KWM*, understanding *is* conveyed. One of its elements is translation. To arrive at a keyword, the target word has to be translated into L1, e.g. in order to form the keyword **'Goth'** for **'goat',** one has to imagine Goths riding on goats and this can only be done if one understands what it is, i.e. **'Ziege'.** Translating *is* understanding, and the name of the animal in the mother tounge conveys meaning, i.e. the learner is immediately familiar with the concept.

While acknowledging that the question of meaning is an important one, part and parcel of the *iKWM* in the monolingual classroom *is* meaning (translation and imaging). Other mnemonics do not have this 'ingredient'. It should not be forgotten, that the use of mnemonics is primarily for facilitating *remembering*, not for understanding a concept. Mnemonics in general should therefore not be blamed for not achieving what they are not meant to achieve.

### 6.6.6. 'Tricks'

Mnemonics are very often seen as 'tricks' and 'gimmicks' (e.g. Pincas, 1996). This notion is constantly being reinforced by the display of the power of memory by magicians and clowns. Even such an eminent advocate of the *KWM* as Gruneberg co-operated with the magician Paul Daniels to produce a television show. Hrees (1985) took the inspiration for his collection of texts on mnemonics from a circus clown. Even scholars in education who are prepared to entertain the idea that the *KWM* could work, talk of 'tricks of the trade' (Higbee, 1978). As is shown in this thesis, the *KWM* is not based on tricks but on sound psychological theory and neurological evidence.

Higbee (1978) describes these perceived shortcomings of mnemonics in general as ‘pseudo-limitations’. When surveying the literature and reading about these objections, the distinct feeling occurs that they are based on misunderstandings and lack of understanding. To date there is no scientific evidence that substantiates these misgivings.

## 6.7. The Keyword Method for areas other than vocabulary learning

### 6.7.1. Grammar

The *KWM* is not suitable for the systematic teaching of grammar, although Gruneberg (1995) claims that he teaches some basic grammar using keywords in his *Linkword* courses (English). For *very* basic grammar this is feasible in a few cases, where grammar can be taught by translation, e.g. he translates the third person singular German *hat* into *has* and uses a keyword for memorisation purposes. This is helpful for absolute beginners, but this practice reaches its limits very quickly when the teacher runs out of grammar items that can simply be lexicalised. As soon as grammar becomes more complex (e.g. the use of the perfect tenses), it breaks down for the simple reason that there is no meaning involved. Even if a learner could memorise a complex rule, such as that for the 3rd conditional passive:

> *if had(n’t) or had(n’t) been + past participle in one clause and would(n’t) have or would(n’t) have been + past participle in the other (O'Connell, 1987: 169)*

...the teacher who asked what this means would be met with a blank stare. No matter what the memorising method, the result would be the same. There is a vast gulf between memorising grammar rules and implementing them in fluent speech, i.e. committing them to procedural memory. However, especially learners in the adult classroom demand explicit grammar teaching since they are used to (and fond of) committing knowledge to declarative memory. It gives them more security. This meets with the current teaching practice and should be accommodated. Although the *KWM* is not suitable for this purpose, some other mnemonic devices can be of help.

The rhyme has been introduced in Ch. 5.4.:

*Never, ever, yet, so far,*

*present perfect, ist doch klar.*

This is a good example of a short mnemonic rhyme, which is readily accepted by learners. The author has obviously sacrificed completeness for simplicity and therefore memorability. Two rhymes as suggested by Zaranska (1997: 183-43), cited in Kaminska (2002: 44-5), were rejected by my students for being too long and complicated (cf. Ch. 6.5.6.). Besides, the learners still want explanations of *why* this particular form is used, which then results in explicit grammar teaching.

Visual mnemonics can also be of help since they can convey meaning which mnemonics normally do not (see Ch. 5.4.).

Gruneberg (1987) suggests a device for learning the gender of a noun where necessary (e.g. German). The idea is to use a (very) masculine image for masculine gender, such as a boxer (***der*** Boxer), a (very) feminine image for feminine gender, such as a beautiful woman (***die*** Frau), and an image that is neuter in German (***das*** Feuer). These are than imaged together and linked with the target word, e.g. a boxer is imagined to fight a table (***der*** Tisch). I suggested this to a French teaching colleague and she reported that this has become a resounding success with her learners. Desrochers et al (1989; 1991) also address this issue.

These two examples, chosen because of their simplicity, should suffice to show that some mnemonics can be used for teaching grammar although this has to be used selectively and judiciously. Some authors provide a bewildering array of mnemonics for grammar learning to the extent that confusion sets in. Sperber (1989) suggests mnemonic solutions for almost every conceivable grammar rule (in German as a foreign language). Most are difficult to follow and certainly not ‘brain-friendly’.

### 6.7.2. Orthography

The keyword method has not been used for teaching spelling and it is difficult to envisage that this can be done in an organised way. This is not to say that there are not occasions when the keyword method can be applied to this area.

One of my learners had difficulty with the spelling of the word *sausage* and spontaneously devised a *keyword* to help her:

*sausage* - die ***Sau sag***t (the sow says)

This example shows that it can be done but I am not aware of any attempt to teach spelling with the help of the *keyword* method.

Other mnemonic techniques, however, have been suggested to facilitate spelling, such as:

**Acrostics:**

necessary - Never Eat Chips, Eat Slimming Salad And Remain Young.

**Rhymes:**

I before E, except after C. This rhyme is very popular, despite its oversimplifying nature. There are exceptions to this rule.

Gruneberg and Sykes (1996) suggest several different mnemonic techniques for the learning of non-Roman alphabets. Others have examined the effectiveness of mnemonics on learning Chinese/Japanese ideographs and found beneficial effects (Ho, 1984; Wang & Thomas, 1992)

### 6.7.3. Pronunciation

Because one of the characteristics of the *keyword* method is phonetic overlapping (cf. 5.5.1), the facility to help pronunciation is inherent in the technique, although it frequently gives the learner only a 'jump start' by providing an approximation as in the example *evanescent – Eva in Nesseln.* It is for the learner and the teacher to build on this. It is true that the *KWM* has no in-built 'mnemonic tricks' to help pronunciation (Nordkämper-Schleicher, 1998) But then, the keyword itself is of help to the learner in this respect.

## 6.8. Keyword learning material

### 6.8.1. Text books

As mentioned before, mnemonics in general and the *keyword* method in particular are conspicuous in school text books by their absence. Only very few examples can be found .

Although most current textbooks do not provide vocabulary lists unit by unit, some do. If the *iKWM* were adopted, publishers could provide their textbooks with vocabulary lists with keywords and images or even the occasional drawing (this, of course, touches on the *teacher-generated* vs. *learner-generated* issue [cf. Ch. 2.3.8.]). This would neatly combine the *KWM* with the method/methodology the textbook is based on. When I did the research for this thesis, one of the side-effects was that I produced, to all intents and purposes, *iKWM* vocabulary lists for two textbooks (Jones, 1996; O'Connell, 1999). A vocabulary list in the form of a supplement could be offered to the teachers and learners as an ‘optional extra’. In my classrooms the learners were very keen on them and prepared to pay for them. For further discussion of how the *KWM* can be integrated into lessons, see Ch. 9.

### 6.8.2. Dictionaries

The KWM can be integrated into bilingual or monolingual dictionaries by providing *keyword* information in addition to the normal explanatory sentence. In monolingual dictionaries, this has to be done with keywords in the target language, with the learners drawing on words they have already learnt. The producers have to make sure that the *keyword* is not more difficult than the target word.

**donate** – imagine you **donate** a **doughnut**

I could find only one source (Scholfield, 1997) that suggested this kind of treatment in the learning literature .

### 6.8.3. The L1 in the classroom

Although the *iKWM* can be used in the multilingual classroom (see the example above), the majority of EFL classes around the world are monolingual, with the teacher speaking the learners' language. English is the *lingua franca* of today, but only a minority of learners of English have the opportunity to visit an English-speaking country and therefore learn the language in their native environment. Most educators frown upon the idea of using the L1 in the foreign language classroom. As mentioned in Ch. 1, translating, i.e. the L1, inevitably plays a role. It is also inevitable that the *iKWM* increases this role. This is not a disadvantage. While it is possible to provide advanced learners with target language *keyword*s (see above), low level learners can only draw on what they know – their mother tongue. The *iKWM* acquaints them *initially* with the target word (the jump start) – and from then on it is context which provides the re-noticing effect.

The fact that there is no teaching/learning material available limits use of the *iKWM* severely. It means that the teacher has to spend considerable time providing keywords and images for the learners. Apart from the natural inertia of teachers, it would also mean that it is not cost-effective. When all these hours are taken into account (and it is very time-consuming and tedious), the teachers' pay falls to an unacceptable level. For these reasons alone, the *iKWM* will not make any impact on current teaching practice unless teachers (and learners) receive support from education authorities, e.g. by including it in the curriculum, and from the language teaching/learning industry.

## Interim conclusions

Far from being childish, non-scientific and unsophisticated, the success of mnemonics in general and the *KWM* in particular can be explained by the examination of theories of memory, philosophy and neurological evidence. Of the theories of memory, two have particular relevance.

The *depth (levels) of processing theory* explains the success of mnemonics by their ability to engage the learner in *deep* (mnemonic) elaboration. When the *iKWM* is used, another *deep* elaboration, semantic processing is included, thereby enhancing learning further.

The concept of learning with mnemonics is also in harmony with the *dual coding theory,* providing verbal information processes (keyword/target word) and visual information (imagery).

Neurology has provided evidence that mnemonics enhance memory through causing synchronic firing of brain cells with the involvement of the amygdala, thereby increasing brain activity. There is also evidence that concreteness, a vital element of the *KWM*, enhances brain activity and hence learning. It is therefore possible to answer the first research question positively. Whatever the specific objections to the *KWM* are, the argument that it is not based on sound scientific enquiry and principles cannot be maintained.

*Concreteness* and *interaction* are probably the most important elements of mnemonics since they form the basis of imagery. Elements such as *bizarreness* or the question whether keywords and images should be self-generated or provided, have not been decisively answered by research and will probably continue to cause controversy mainly for researchers who are interested in memory research. For teachers, these issues tend to be ‘academic’ since they have limited relevance for the classroom.

The literature provides a plethora of mnemonic techniques, most of which are equally only of passing interest to the teacher, because mnemonics are often seen as *art pour l’art,* and therefore tend to be complicated and too elaborate for the average learner.

When using the *KWM* in the classroom, the teacher has to observe certain guidelines, without which the method could not function effectively. Prominent among these is *simplicity*.

Without the provision of pre-produced teaching/learning material, it is unlikely that the *iKWM* will make a noticeable impact on education or the classroom. Learners will most likely prefer to rely on the teacher, rather than going through the process of devising keywords and images systematically themselves.

Although there is plenty of empirical evidence that the *KWM* is very effective for vocabulary learning, research to date has mainly taken place in the laboratory and quasi-classroom situations. No longitudinal research (one semester or more) in a genuine classroom environment has been undertaken. The following chapters of this

thesis address the issue of whether the results of the laboratory have relevance for the classroom, i.e. whether the effectiveness of the *KWM* can also be demonstrated in the classroom with its multitude of uncontrollable variables.

# The study

## 7. Research methodology

Readers of a research project like this immediately turn their attention to the issue of validity. For this reason, this chapter is concerned with research methodology and research tools. It was my intention to show why I had chosen a certain paradigm (interpretive) and which tools within it.

The quantitative research paradigm is normally not conducive to classroom research. The classroom environment with its collection of individuals and the resulting numbers of uncontrollable variables cannot be captured by 'number crunching'. An advocate of the positivist paradigm will always be tempted to question the reliability and validity of such research because of the inevitable number of uncontrollable variables (see below). Therefore, researchers, and especially the teacher/researcher generally adopt the qualitative research paradigm. Rather than to predict, the aim is to explain and interpret. The quantitative approach is not only mostly not feasible, but also not desirable. Research should be conducted to find out and help. Interpretive classroom research is probably the one branch that 'speaks' directly to the teacher (van Lier, 1988: 31).

### 7.1. Interpretive research

A major criterion of the interpretive paradigm is that theories and concepts tend to arise from the enquiry and do not precede it. It is 'hypothesis generating' rather than 'hypothesis testing' research (Robson, 1993:19). Data collection and analysis are not rigidly separated (ibid.).

Qualitative research, as a set of interpretive activities, privileges no single methodological practice over another. It is difficult to define because it has no theory or paradigm that is distinctly its own (Denzin & Lincoln, 2000: 6). Others discuss "intellectual undercurrents which tend to be viewed as providing qualitative research with its distinct epistemology, i.e. *phenomology* (the phenomologist views human behaviour.... as a product of how people interpret their world. It is the *process* that is of interest), *symbolic interactionism* (views social life as an unfolding process in

which the individual interprets his or her environment and acts on the basis of that interpretation), *verstehen* ("understanding" in Weber's sense: ....to attempt the interpretive understanding of social action in order to arrive at a causal explanation of its course and effects), *naturalism* (the researcher should treat the phenomena being studied as naturally as possible), and *ethogenics* (the grasping of the belief systems which underlie social episodes, i.e. sequences of interlocking acts by individuals)" (Denzin & Lincoln, 2000). Multiple theoretical paradigms claim use of qualitative research methods and strategies. They are used in many separate disciplines.

Qualitative researchers use semiotics, narrative, content, discourse, archival and phonemic analysis, even statistics, tables, graphs, and numbers. No specific method or practice can be privileged over any other (adapted from Denzin & Lincoln (2000: 6). As Olesen points out (in the context of feminist research), there is the question of the overarching issues of credibility and believability.....without falling back into positivist standards that measure acceptability of knowledge in terms of some ideal, unchanging body of knowledge (Olesen, 2000). The qualitative researcher will always be confronted by the positivists with the question of validity. Not that validity is neglected by the qualitative researcher. His/her science is as rigorous but validity has to be established within his/her research paradigm. ...."Qualitative" implies an emphasis on the qualities of entities and processes and meanings that are not experimentally examined or measured (if measured at all) in terms of quantity, amount, intensity, or frequency. Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied (and sometimes who is studied – my addition), and the situational constraints that shape inquiry. They seek answers to questions that stress *how* social experience is created and given meaning (Denzin & Lincoln, 2000: 8). The interpretivist researcher claims that the difference between human (social) action and physical phenomena lies in the fact that the former is inherently meaningful. The meaning that is behind human action is of interest to the interpretivist researcher (Schwandt, 2000: 191). Interviewing as done in this thesis is one technique in interpretative research to discover meaning.

Although not dismissing the place of quantitative research in the classroom altogether (both concepts can be complementary, depending on the objective), it was felt that the above definitions of qualitative research in this research project made the

qualitative research option the most promising and it was therefore decided to adopt it.

## 7.2. Reliability

When a research project is replicated and yields the same results, then the assumption is allowed that the research was reliable. Research in the classroom, such as language tests, cannot be replicated, only repeated, mainly because a lot of data are not, in any meaningful sense, measurements (McDonough & McDonough, 2001: 63). In qualitative research much has to be taken on trust and we have to rely on the researcher having done what was claimed to have been done, which means the researcher has to provide a more detailed account of his actions (Hitchcock & Hughes, 1989: 7). Since reliability reflects the (elusive) generalisability (see below) of the researcher's finding, most classroom researchers are more concerned with validity, which reflects the internal consistency of research (Elton, 1995: 8; Grabe & Stoller, 1997; Hopkins, 1993: 155).

## 7.3. Validity

A scale, test or other research tool is said to be "valid" if we are certain that it has measured those features it was designed to measure. As with reliability, it is an open question whether in qualitative research validity can be achieved to a level that satisfies the critics of such a research approach. However, there are ways to increase the degree of validity. The researcher has a variety of validity checks at his disposal to increase validity (Hitchcock & Hughes 1995; Cohen et al 2000; Robson 1993). The most common form employed to strengthen validity is triangulation (Hitchcock & Hughes 1995). For this reason, I have used triangulation (multiple experiments, questionnaire and interviews) to minimise the threats to validity in the research project.

## 7.4. Transferability/generalisability

There is *always* (my italics) the danger in interpretive research of succumbing to the temptation to generalize (adapted from Coady & Huckin, 1997: 118). As a

*general* statement, this cannot go unchallenged. This might be true of *some* research, such as single case studies, single experiments in the classroom etc., but if the aim of research is to find out and help, generalisation/transferability should be on the mind of the researcher. Luria's (1969) case study of a 'mnemonist' for instance, a man with unusual eidetic talent, is interesting, but not of help to others. The teacher/researcher, on the other hand, conducts research to see if the results can be used to improve/change his/her teaching. For this reason, the possible transfer of findings from one setting to another on the basis of 'fit', I prefer the term 'transferability' for the research project.

In studies such as those in this thesis, generalisation is not meant to be statistical, but logical, theoretical or analytical (Stake, 2000: 165-86), in other words, naturalistic (Yin, 1994: 19-26).

To address this problem of transferability, the research project in this thesis consists of multiple studies (5 experiments. 1 questionnaire and 3 interviews). Yin (Bassey, 1999) and Bassey (Becker, 2000: 223-33) agree that generalisation is possible by conducting multiple studies, examining the same phenomenon with different populations and/or different locations. This has been done in this thesis. Bassey, however, also introduced the concept of 'fuzzy' generalisation, by which he means that an element of uncertainty has to be accepted. "....it is possible, or likely, or unlikely that what was found in the singularity will be found in similar situations elsewhere". Fuzzy generalisation is the result of a multitude of uncontrollable independent variables in the classroom (see below). This concept of 'fuzzy' generalisation is one that I consider appropriate for this research project.

## 7.5. Uncontrollable variables

As in all classroom studies, in this research project there are a number of uncontrollable independent variables, which means that the experiments in this thesis are quasi-experiments, which are more usual in real-world situations outside a psycholinguistic laboratory. Some controls have to be sacrificed because of real-world constraints (McDonough & McDonough, 2001: 160). Although there is a *certain* degree of control in the classroom, a longitudinal study means that the learners, who spent 135 min. per week in the classroom are outside the control of the

teacher/researcher for the rest of the week. Some learners learn during this period industriously, some less than that and some not at all (e.g. I sling my bag into the corner when I come home and have a cup of cappuccino [Interview 3]). During the research period there was a holiday break. Some might have gone on holiday to countries were they had to/ could speak English, some stayed in Germany. Some followed the instructions closely, some others did not, etc..

These variables render the task of the positivist researcher impossible. For the qualitative researcher these uncontrollable variables are an accepted fact. In the settings of classroom research, variables do not operate simultaneously and independently. Nor do they operate in concert. Classroom research examines processes and sees variables as working at different points in time "....as events unfold" (adapted from Becker, 1990: 240.). Existing variables might even be unknown to the researcher (see above). One could expand on Bassey and suggest that fuzzy variables make generalisations fuzzy or that ."......generalisations are about a process, the same no matter where it occurs, in which variations in conditions create variations in results. That's actually a classier form of generalisation anyway" (Becker, 2000) The issue of uncontrolled variables and the time factor has implications for the form the analysis of the findings of classroom research takes. Since there are changes over time within the classroom research project (the process), Becker advocates the use of (detailed) narrative analysis as an appropriate means to capture this process. This approach has been adopted for this research project. For teachers interested in progress, research findings without relevance to *their* classroom can make interesting reading but are of limited value to their practice.

## 7.6. Testing

When designing the experiments, the question had to be addressed which form of vocabulary test would be appropriate for the task. Depending on the particular part of L2 acquisition the researcher concentrates on, the objective can be to find out:

1. How broad and deep learners' vocabulary knowledge is.
2. How effective different methods of systematic vocabulary learning are.
3. How incidental learning occurs through reading and listening activities.

4. Whether and how learners can infer the meaning of unknown words encountered in context.
5. How learners deal with gaps in their vocabulary knowledge.

(Read, 2000: 151)

This thesis addresses question 2.

### 7.6.1. Multiple choice test

One option would have been to test the vocabulary items in context, as, for instance, in a multiple choice test, probably the most popular test in L2 today. However, this kind of test has some limitations. From the teacher/researcher's point of view, they are difficult to construct and hard work. In this case it would have meant that a large number of test items had to be designed (the highest number of unknown words to one student). The learner may know another meaning of the word but not the one requires or he/she might arrive at the right word by process of elimination and since there are normally four words to choose from, there is an in-built chance of 25% of choosing the correct word. The items may test the students' knowledge of distractors rather than their ability to identify an exact meaning of the target word, another form of elimination. The learner may also miss an item either for lack of knowledge or words for lack of understanding of syntax in the distractors. This kind of test permits only a very limited sampling of the learner's total vocabulary (e.g. a 25-item multiple choice test samples one word in 400 from a 10,000-word vocabulary (Wesche & Paribakht, 1996). It sometimes approaches the form of an IQ-test. For these reasons, the idea of a multiple choice test was discarded. Also, since a part of this thesis is concerned with memory, a simple cue-recall test fits in with this theme. There was also the opinion of the learners. When this issue was debated they opted for the simple translation test on the grounds that a multiple choice test would be too easy. This is, incidentally, also an indicator of the confidence of the learners after having learnt the vocabulary with the *iKWM*. Learners normally tend to take the easiest way when it comes to testing. A straightforward translation test was therefore adopted.

### 7.6.2. Translation test

#### Objective

The test as carried out in this thesis is discrete, i.e. it tests vocabulary items on their own merit and separated from other components of language competence, a measure of vocabulary knowledge or use as an independent construct (Read, 2000: 9). It is selective, i.e. normally selected by the teacher/researcher, but in this case selected by the learners as individual words from reading texts. It is a measure in which specific vocabulary items are the focus of the assessment (ibid.). It is also objective in the sense that the material is divided into small units, each of which can be assessed by means of a test item with a single correct answer that can be specified in advance. They do not normally require any judgement by the scorer as to whether an answer is correct or not.

Finally, it is context-independent, i.e. it is a vocabulary measure in which the learners can produce the expected response without referring to any context (ibid.). The simplicity of the test means that it tests breadth of vocabulary knowledge, i.e. the number of words for which the learner knows at least some of the significant aspects of meaning, and not depth, i.e. a sufficiently deep understanding of a word if it conveys all of the distinctions that would be understood by an ordinary adult NS under normal circumstances (adapted from Anderson & Freebody, 1983). It was therefore not designed to test communicative competence of any kind.

## 7.7. Experiment, questionnaires and interviews

### 7.7.1. The experiment as a research tool

An experiment is a procedure for testing a hypothesis by setting up a situation in which the strength of the relationship between variables (here the application of the *iKWM* and the resulting degree of vocabulary retention) can be tested. Other than a ‘true’ experiment, a quasi experiment has no random assignment of subjects (Nunan, 1992: 230). In educational research such as this, experiments take often the form of quasi-experiments. “....while we are able to introduce certain elements of experimental design into many of our studies – we often lack full control over various

aspects of the procedures" (Porte, 2002: 74). In other words, there are a number of uncontrollable variables. For these reasons, genuine classroom research such as this uses the quasi-experimental form, since the teacher/researcher deals with intact classes – and these classes have to be kept intact throughout the teaching/researching period. A random distribution of the learners would defeat the object. Uncontrollable variables, as recognised by the application of quasi-experiments, are an integral part of teaching and research in real classroom situations.

### 7.7.2. The questionnaire as a research tool

All data obtained from questionnaires and interviews is subjective and the result of a snapshot. Questionnaires have the advantage that the data is more amenable to quantification than discourse data such as from interviews (Nunan, 1992: 143). As with the following interviews, there is a possibility that the so-called 'Hawthorn effect' is at work, i.e. the learners are aware that they are subjects of a research project (Cohen, Manion, & Morrison, 2000: 127) and their performance is improved because of the attention directed towards them. To increase validity, researchers try to minimise this effect. All participants in this research project were subject to teaching with the *iKWM* for at least three semesters and the experiment proper was conducted during the full length of one semester. In other words, the novelty had worn off. Time diminishes the Hawthorn effect.

### 7.7.3. The interview as a research tool

Interviews allow the participants (interviewees and interviewers) to discuss and voice their interpretation of the relevant topics and events and to be able to give their own points of view (Cohen et al., 2000: 267). They can do so without the straitjacket of pre-produced means for collecting data. The interviews conducted for the purpose of this thesis took the form of the informal and conversational ones. There was no predetermination of question topics or wording. The questions emerged from the immediate context and were asked in the natural course of the interview (ibid.). In this case, I, the teacher/researcher also experienced a learning process. New questions arose from the preceding interviews.

# 8. The pilot study

To examine whether the *iKWM* has a beneficial effect on vocabulary learning and whether the existing research results from the laboratory and quasi-classroom situations can be transferred to the genuine classroom with intact classes, I conducted in this study a pilot study and five (quasi) experiments, including two comparison groups to obtain empirical data. This data is then analysed to give meaning to these figures. The question of motivation is also addressed because of the potential enjoyable nature of the *iKWM*. For this purpose I used the tools of the questionnaire and the interview. The findings as obtained from these research activities are presented in this chapter.

It was my hypothesis, based on some experience, that the KWM would have a beneficial effect on vocabulary retention, compared with conventional teachings. The pilot study was conducted before I had carried out the literature research. I was therefore not fully aware of the extensive experiments carried out in the laboratory and quasi-classroom situations. The research questions was therefore more determined by curiosity than rigorous scientific thinking: which of the two groups returned superior results in vocabulary retention and which one enjoyed the learning experience more? Only if at least the possibility of a trend appeared, the task of a full research project could be undertaken.

## 8.1. Experiments

### Subjects

There were two separate courses: one was taught using the keyword method; the other acted as comparison group. In both courses the learners had joined the courses for a variety of reasons which mainly (for the older learners) consisted of a desire to learn and not a need to do so. A minority had joined the course to further their job prospects..

The institutions (VHS Bad Oeynhausen and Minden, Germany) in which the experiment took place, provided two beginners courses in adult education (one in the morning and one in the evening). It was therefore not in the hands of the teacher who of the learners belonged to the *KWM* group and who belonged to the control group.

The two groups were opportunity samples which, apart from the number of uncontrollable variables (cf. Ch. 7.1.4.), shows that the experiments in this thesis are not 'true' but quasi-experiments (Nunan, 1992: 41). The *KWM* group started with 10 learners, the comparison group with 16. In both classes age ranged from early twenties to fifties.

Subjects were native German speakers with the exception of two non-native speakers with a limited command of German, a Hungarian and a Vietnamese. All learners were beginners, although in today's world in Germany, many English words are incorporated into the German language, which makes it literally impossible to find absolute beginners. However, a placement test as demanded by the education authorities was carried out.

None of the learners had heard of the *KWM* or mnemonics in general. None of the learners had any exposure to English outside the classroom. Teaching took place once a week for 13 weeks at 90 min. per lesson, a total of 19 hours, 30 min. (see: Analysis)

### Materials

Due to the requirements of the education authority, the groups had different text books. The *KWM* group used 'English Network Starter' (Charlton, Karasek, Boczkowski, & Kranz, 1991) and the control group 'The New Cambridge English Course' (Swan & Walter, 1994). The teacher provided some additional written material in both courses. In the case of the *KWM* it was mainly Linkword (Gruneberg & Coldwell, 1995)

### Procedure

The comparison group was subject to conventional teaching, which meant that items of vocabulary were not presented in isolation but in the context in which they appeared in the textbook or during classroom conversation. The learners were asked either to deduce the meaning of the words from context or were given translations in addition to the written version on the blackboard (chalk and talk). The learners took notes of these items of vocabulary. Whenever possible, I engaged the learners in

communicative activities to practice (re-notice) these items of vocabulary. The learners were asked to look at their vocabulary list at home again.

A full and extensive explanation of the *KWM* was given to the *KWM* group. After this I divided the lesson into two parts. In the first (shorter) part I presented those items of vocabulary that would appear in the text in that particular lesson before the text was read. I also provided the keywords. For example, when the word "trousers" was to be learnt, I provided the German verb "trauen" (dare) and asked the learners to imagine vividly for about 10 seconds that they dared going to the opera with their trousers in their hands.

In the second part the learners moved to the text to encounter (re-notice) the vocabulary again in context. As with the comparison group, I engaged the learners in communicative activities as often as possible. In other words, part two was almost identical in both classes, with the exception that the *KWM* group was already familiar with the vocabulary in their text when they read it the first time, whereas the control group was not.

Both groups were told from the beginning that they were taking part in an experiment and that they would be tested on vocabulary before the end of the course (intentional learning). It was also made clear, and repeated immediately before the test that there was strict anonymity. The test papers did not reveal the names of the participants. However, when it became apparent that two non-native speakers with limited knowledge of German were taking part, they were asked for permission to mark their papers to identify them later. This permission was freely given. It was not possible to test the learners on identical lists of vocabulary since the textbooks were different. The option to prepare identical lists and teach one using the KWM and the other asking the learners simply to memorise it, as done in experimental conditions, is not a viable one since the rote-learning of vocabulary lists is simply not practised in the conventional classroom, although learners tend to do this outside the classroom at home (Sommer, 1978).

Vocabulary items with minor spelling mistakes were deemed correct. As in all applications of the *iKWM*, only the meaning of the word which was attached to it in the text was taught. Other meanings (synonymy) were left to later stages when they occurred. “Once the base word or even a derived word is known, the recognition of other members of the family requires little or no effort (Bauer & Nation, 1993: 253)

After 9 weeks of instruction I asked at random one member of each group to hand over his/her notes on vocabulary and chose from those lists 93 words to be translated into and from English for the *KWM* group, 76 words for the control group. The odd numbers were due to the different numbers recorded by the learners. (see: Analysis). The word lists consisted of concrete and abstract nouns, adverbs and adjectives.

### Results

Throughout the research on vocabulary retention, SigmaStat software was used (paired, one-tailed t-test and point plot graphs to show the groups' performances and that of the individual learners within them).

### Productive: German to English

The *iKWM* was found to have returned significantly better results than the comparison group:

| | |
|---|---|
| ***iKWM group*** | |
| *individual results in %* | *93%, 92%, 98%, 90%, 98%, 94%* |
| | |
| ***Comparison group*** | |
| *individual results in %* | *65%, 30%, 74%, 63%, 42%, 56%* |

| | |
|---|---|
| ***iWM group:*** | *mean = 94.5* |
| | *SD = 3.209* |
| | *t = 5.842* |
| | *df = 10* |
| | *p = 0.001* |
| | |
| ***Comp. group:*** | *mean = 55.0* |
| | *SD = 16.248* |

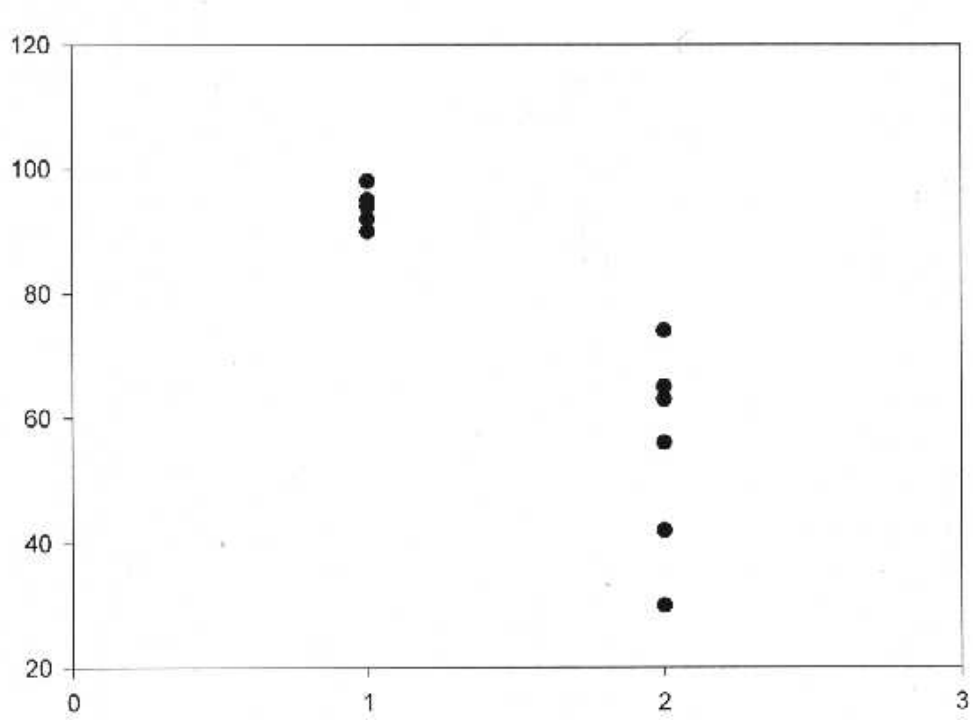


Fig. 10: (Pilot point plot productive)

**Receptive: English to German**

| | |
|---|---|
| ***iKWM group*** | |
| *individual results in %* | *73%, 65%, 98%, 87%, 92%, 95%* |
| | |
| ***Comparison group*** | |
| *individual results in %* | *63%, 73%, 34%, 44%, 59%, 20%* |

| | |
|---|---|
| ***iWM group:*** | *mean = 85.0* |
| | *SD = 13.161* |
| | *t = 3.724* |
| | *df = 10* |
| | *p = 0.004* |
| | |
| ***Comp. group:*** | *mean = 48.833* |
| | *SD = 19.813* |

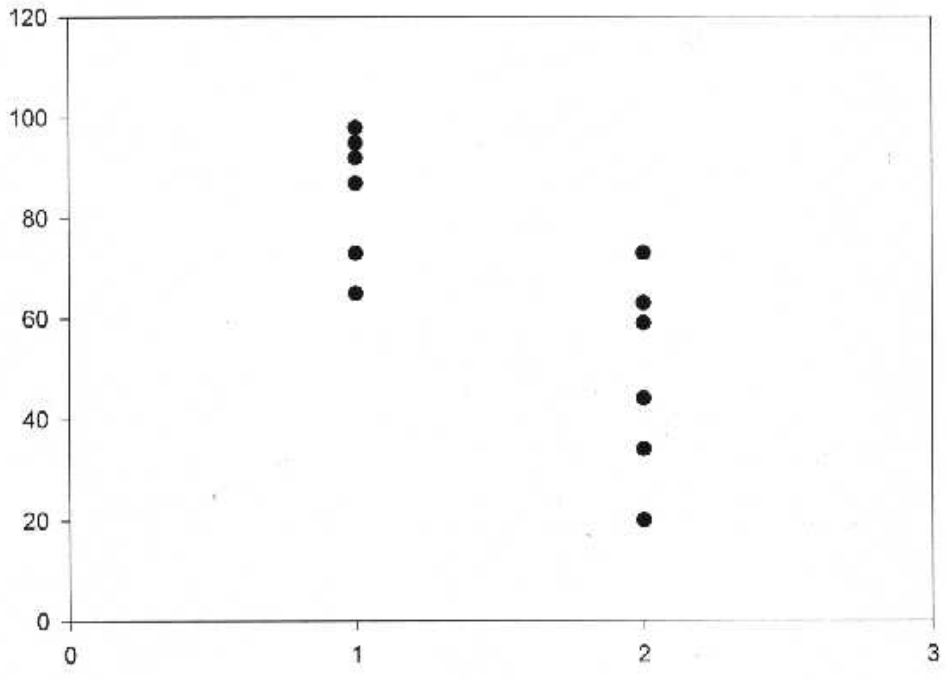


Fig. 11: (Pilot point plot receptive)

**2 non-native speakers**

| | |
|---|---|
| ***Productive:*** | |
| *student 7* | *79%* |
| *student 8* | *77%* |
| *mean* | *78* |
| ***Receptive:*** | |
| *student 7* | *61%* |
| *student 8* | *71%* |
| *mean* | *66* |

**Analysis of the experiment**

The difference between the two groups is statistically significant. All figures for the retention of vocabulary, productive or receptive, are higher for the *iKWM* group than for the control group. One (incidental) result is that, contrary to my opinion, the productive side of the vocabulary retention was more successful then the receptive one. It is also interesting to note that the participants had predicted this outcome. The reasons are unclear. As the graphs show, the 'knowledge band' is much narrower for the i*KWM* group than that for the comparison group which means that the 'level of learning' was more uniform than that of the other group. A similar picture occurs when receptive knowledge is concerned, although here the picture is not as decisive. When the learners display their productive skill, the least performing member of the *iKWM* group still returns better results than the best member of the comparison group. In receptive skill the groups overlap, but only marginally. It remains to be seen if this pattern is repeated in the ensuing experiments.

In the *iKWM* group a distinction had to be made between native speakers and non-native speakers. The knowledge of German of the (2) non-native speakers was limited to the extent that the keywords the teacher provided frequently had to be explained to them. Since the method is based on the link of imagery with similar pronunciation of the two words (English and German) I assumed at the beginning of the course that these learners would experience considerable difficulties with the

method. If, for instance, the keyword for trousers (trauen) was not known to them, then no learning could occur. However, when they were made familiar with the German keyword (translation), learning could take place. With beginners' classes, the alternative to give English keywords does not exist.

As expected, the performance of the non-native speakers confirmed the initial assumption. Their mean figure was clearly lower than that of their German speaking peers, productive and receptive (the means being 78/94.5 and 66/89.5 respectively). However, when examining the figures, it is also noticeable that their relatively 'poor' performance is still better then that of the comparison group (the means being 78/55 and 66/49 respectively. This seems to confirm that when a familiar German keyword was used, learning did indeed occur. These figures have to be viewed with caution because the sample was very small. There is also the question of the vocabulary to be tested. As happened with some other experiments (cf. Ch. 6.4), I tested vocabulary I *thought* the learners had been unfamiliar with. No pre-test was carried out. The only indicator that the vocabulary might have been unknown was the note book of the learners, but they could have copied some words to remind them *again.* This is a clear threat to validity. Nevertheless, this pilot study showed a trend which merited further investigation.

## 8.2. Questionnaires (*see Appendix 2*)

In adult learning, courses of this type (no exam course), there is normally mainly intrinsic motivation. If the expectations of the learners are not met, the drop-out rate is high. In contrast to extrinsic motivation, intrinsic motivation can be the subject of 'manipulation', i.e. it is in the hands of the teacher to try to maintain or even increase it.

Therefore, at the beginning of the course, the participants were given a questionnaire to find out the type of motivation they brought into the classroom and what they expected from the course. At the end of the course there were follow-up questionnaires to establish whether these expectations were met. These questionnaires took place on different days. Often, more than one answer was possible. The questionnaires were issued in German.

All but a majority came to the course with intrinsic motivation and their expectations were fairly low. The majority did not see vocabulary learning as a problem. At the beginning of the course almost all learners intended to practice vocabulary at home. The question about motivation was answered decisively. The vast majority of learners were highly motivated, with the others moderately so. It was also noticeable that there was no variation in the figures of the two groups. All learners saw themselves as beginners.

These answers had to be compared with the opinions the learners had after the course had ended.

From one questionnaire to the next, the number of participants changed. Of the KWM group, 2 (20%) left during the course, in the comparison group 10 (62.5%). As Schmitt (1998) points out, “longitudinal studies are prone to participant attrition”. Of all the participants, expectations of their progress on the course were not very high to begin with, but of the *KWM* group a great majority found that their expectations were greatly exceeded or exceeded, while of the comparison group only a small minority found that the course had exceeded their expectations.

When asked to judge the course, it is noticeable that all the responses of the *KWM* were positive, but the comparison group responded much less positively. The two questions directly concerned with vocabulary learning were answered especially decisively. Two thirds of the *KWM* group found that the difficulties they foresaw were not confirmed; only one third of the comparison group was of the same opinion. Equally decisive was the answer about revision at home. Two thirds of the KWM reported that they revised vocabulary regularly and with pleasure. Only a small majority (16.5%) of the comparison group agreed. The third conclusive answer referred to their opinion about their progress. Again, two thirds of the KWM group viewed their command of English now as much better than expected, while only 1 learner in the comparison group agreed with this.

## 8.3. Motivation

So far, the figures of vocabulary retention show a beneficial effect for the *KWM*. Progress was seen by the *KWM* group as much better than by the comparison group. It was necessary to examine whether these results were due to the ‘mechanic’

application of the method or whether this different teaching/learning strategy also influenced motivation in a more direct way, resulting in less stress and therefore more willingness to revise. Q2 seems to provide some evidence, since the majority of the *KWM* stated that they had revised at home regularly and with pleasure. Therefore, I decided to provide the *KWM* group with a questionnaire which concentrated on the motivational effect of the *KWM*.

The result of this questionnaire is conclusive and confirms one I had conducted one year previously (unpublished). It is striking that the participants did not answer one question about the *KWM* negatively. When comparing the *iKWM* with conventional learning as they had experienced before, all learners saw it as more efficient, better for vocabulary retention, easier, and preferred it in a decisive vote to other means of instruction. They enjoyed it and attributed it to the increased motivation to learn (only one learner saw no difference). Even the control question showed that they had absolute confidence in the method – otherwise they would have not answered decisively that they would pass on their experience to their children.

Most questions were concerned with comparison of the *KWM* and conventional teaching and all the participants preferred the *KWM* method, given the choice. Efficiency, the ease of learning and with it the effect on motivation were seen as beneficial elements of the *KWM*. The open answers confirm the picture. One surprise answer concerns a facility of the *KWM* which receives little treatment in the literature, i.e. pronunciation. One learner recognised the help keywords give to pronunciation (cf. Ch. 6.7.3).

## 8.4. Anecdotal evidence

When the new method was introduced to the learners, some of them were sceptical. Most said it needed ‘getting used to’. They had to get used to the occasional bizarreness of the keywords, but even during the first lesson there was agreement among all the participants to try out this new method.

The group took to the method quickly. It appeared immediately that the participants were convinced of the method but that most of them had no intention of forming their own keywords. This raised the question of whether the debate about

provided or self-generated images is really relevant. They relied on the teacher or the written material. Scepticism about the bizarreness of the keyword method slowly disappeared. In fact, anticipation to hear about new keywords and their interaction with L1 words set in. On day 4 of the course one learner suggested speeding up the learning of vocabulary, i.e. she wanted more words together with the keywords to increase her vocabulary bank. Some, not all, participants agreed. I could hear some comments among the learners such as “I will *never* forget *this* word” or “this is *so silly,* it *must* stick”.

Later, two things happened which I thought very encouraging. One learner asked if she could bring her child to demonstrate to him the method in the classroom (this gave me the idea for q. 9 in Q3), another who knew that I was preparing a report on this subject for the School of Education, University of London, asked if she could have a copy because she had told two of her friends who were German primary school teachers about her experience and they wanted to know more about it. In the next lesson, the child in question thought it funny and was much more than the adults prepared to form his own keywords. Slowly, routine set in. Since they had lately learnt vocabulary concerned with farms, I asked them to write a short piece about farms as homework. Out of nine present, 7 did this, albeit sometimes with no more that 3 or 4 sentences (the control group was asked to do the same task, but the majority refused to do it because they did not feel they were ready yet). During the course I repeatedly asked the learners whether they practised vocabulary at home. All said they did and that this was at least partly due to the absence of mindless rote-learning. Generally, the opinion was that this kind of learning was quite enjoyable. Incidentally, none of them made the connection between the method and the world outside the classroom, i.e. using memory techniques to enhance any other kind of memory, i.e. memorising telephone numbers, names etc. This is not unusual.

## 8.5. Analysis of the pilot study

The anecdotal evidence seems to confirm the questionnaires and, ultimately, the vocabulary test. Since the subject of this project is a complete course, the impression prevails that the *iKWM* indeed has a beneficial effect on the retention of vocabulary and the motivation of the learners in the classroom (what effect it has on

the motivation of the teacher is not the subject of this paper but worth examining). The observation confirms the questionnaires and adds weight to them.

When judging the response of the learners to the *KWM*, it should not be overlooked that I, the teacher, gave (explicitly and implicitly) the impression that I was convinced that the method was better than conventional teaching/learning. A teacher who introduces a new method to the classroom cannot act in any other way. This might have influenced the learners further (the Hawthorn effect). To influence learners is the teacher's job.

The procedure and results of this pilot project influenced the conduct of the research project proper, in as much as the questionnaire was altered slightly, but most importantly it gave rise to the realisation that there was a clear threat to validity in the experiment, i.e. there was no pre-test of the learners' vocabulary knowledge. This had to be addressed to add to the validity of the following research.

# 9. The main research project

## 9.1. Vocabulary retention

### Experiments

Five experiments were carried out to obtain empirical data to examine the effect of the *iKWM* on vocabulary retention. The vocabulary to be tested was taken from reading material either from textbooks or from material provided by the teacher/researcher (news paper clips, extracts from literature, etc.). Previous research had confirmed what can only be described as common sense, i.e. that people who want to read (in a second language) rely heavily on their ability to understand vocabulary (e.g. Alderson, 1984; Ulijn, 1981). Research on learning in context relies almost exclusively on reading activities, since the other receptive skill, listening, is not conducive to scientific enquiry, i.e. it is difficult to envisage pre-tests.

### Research question

The *KWM* has been extensively examined in the laboratory and in quasi-classroom situations but, as far as I am aware, there is no research available yet that has examined its effect in a genuine classroom environment over a period of one semester (or longer). In this case the researcher is not somebody who can 'barge into' a classroom, conduct the experiments and disappear again to analyse the obtained data, removed from the environment where it was obtained. Teachers/researchers have to become one in order to obtain data that reflects the classroom situation.

The research question was whether the results of laboratory research can be transferred to the classroom, i.e. is the *KWM* as beneficial to the average language learner as it is to participants in the laboratory? Therefore, the 'null hypothesis' was that there would be no difference in performance between the treatment groups and the comparison groups. Since the environment had changed dramatically, the *KWM* had to be adapted and became in the process the *integrated KWM* (*iKWM*), i.e. an integral part of the teaching/learning procedure as described below. During the

preparation for this research project, a second question not directly related to it evolved. What is the effectiveness of current teaching practice? Only if this question could (at least tentatively) be answered, could the *iKWM* be examined in competition with other learning strategies. It was originally envisaged to use empirical evidence from past and current experiments, taken from the literature, as a comparison tool. However, it emerged that no research meaningful for the teacher exists, i.e. as far as I am aware, there exists no longitudinal (one semester or more) research on vocabulary retention from learning in context (with or without additional strategies) in genuine classroom situations. Consequently, the comparison groups as introduced in this thesis provide this information tentatively. Although the small samples (a total of 23 participants) can be seen as sufficient for this research project, additional research with much larger samples is needed.

**General procedure (*iKWM* group)**

The research project took place over a period of three years, although the experiments proper were conducted during one semester of the relevant language courses. At the beginning of the course the learners were familiarised with the *iKWM*. This normally resulted in a discussion, lasting approx. 45 min. Most learners were familiar with the concept of mnemonics (the institutes offer courses on memory enhancement techniques). In colloquial German, mnemonics are called *Eselsbrücken*, a translation of the Latin *pons asinorum*. However, none had had any previous encounter with the *KWM* in any form. Plenty of examples were given and the learners were also handed a written instruction of how the use the *iKWM* (see Appendix). Initially some learners were sceptical, but all were willing ‘to give it a try’ and frequent comments were that the technique ‘needs getting used to’ or ‘was interesting’.

After this initial introduction the learners were handed texts (see above) and asked to underline/highlight the words that were unfamiliar to them, i.e. to perform a pre-test. This resulted in individually differing numbers of unknown vocabulary. After having handed them back they received no further treatment with the *iKWM*. I, the teacher/researcher, took the texts back and provided *iKWM* lists for the *next* lesson. These included the English word, L1 word, a keyword with interactive image and a

sample sentence in English, e.g.

**goat - Ziege**

Goten reiten auf Ziegen in Italien ein. (Goths invade Italy on goats)

Goats are smelly animals.

(For a larger example see Appendix 1)

At the beginning of the next lesson the learners were handed the lists and asked to learn the vocabulary in the sense that they had to **imagine** the *iKWM* sentences. They were explicitly discouraged from trying to memorise by rote-learning. After this, the class had to read the texts again to encounter the words again in context, i.e. re-noticing in context. This re-noticing can be seen as the equivalent of testing in the laboratory, viewed as indispensable in such situations. It also acted as a check on pronunciation. Then the learners were asked whether there were still any problems with the vocabulary, but there rarely were.

From then on, classroom procedure proceeded as purported in the text book (e.g. Jones, 1996). This could consist of scanning, skimming, finding alternatives according to the article in multiple choice tasks, highlighting similar meanings in the text of given words and/or discussion and group work. Thereafter the learners were asked to take the *iKWM* lists home and further revision was left to their discretion, with the advice that, if they revised, they should first read the text again. This procedure was repeated with different texts and lists as the occasion arose. The *iKWM* was not used for verbal or any other learning tasks, such as grammar, word order etc. This description of the research procedure is also meant by all means to be seen as a vademecum for conducting lessons outside research with the *iKWM*. Incidentally, this procedure also shows that rehearsal is as necessary with the *iKWM* as it is with other learning strategies (e.g. Hogben & Lawson, 1994; Hulstijn, 1997; Moore & Surber, 1992; Wang & Thomas, 1992).

At the end of the semester, the learners were tested on the vocabulary of all the lists given to them. Because of the way the information about the vocabulary to be learnt was obtained, it was possible to give every learner a test list according to his/her individual needs. This was done either by filtering out those words that were

unfamiliar to all of the learners (Experiments 1, 2 & 3) or the lists were highly individual with a wide fluctuation of the number of words tested (Experiments 4 & 5).

Since in this thesis emphasis is given to learning vocabulary as a memory task, the tests were straightforward. The learners were given a list with German words (productive) and one with English ones (receptive) and were asked to provide the appropriate translation. There was a one-week interval between the two tests to minimise the learning effect of the first one. The learners were also asked whether they preferred anonymity, but they were divided on this issue: some did, but others insisted on knowing the results. Either preference could be accommodated.

### 9.1.1. Experiment 1

#### Subjects and procedure

The *iKWM* consisted of 6 (4 female, 2 male) members of the middle management of a mobile phone manufacturer. Their ages ranged from early 30s to 40s. The lessons took place on the premises of this manufacturer, who paid for the course. Attendance was voluntary, but it may be assumed that the learners had strong extrinsic motivation. Not only did they know that there was a test at the end of each semester, but they were also aware that their employer received a general (not individual) report about the progress made. They had one lesson of 2h 15min duration once a week for 15 weeks, a total of 33 h 75 min. The procedure was carried out as described before. From the unknown words handed in, 180 were filtered out that were unfamiliar to all of them.

The comparison group consisted of 7 (5 female, 2 male) members of an adult education class learning English (intermediate level), using the same text book (Jones, 1996) and spending the same amount of time on learning. Their ages ranged from early 20s to early 40s. At the beginning of a lesson that included a text, the learners were asked to hand in a copy of this with unfamiliar words underlined/highlighted. The learners either deduced the meaning of the words from the context or were given a translation, by the teacher, by fellow learners or from the dictionary. Any other learning strategy was left to the learners. On frequent inspection all learners produced more or less organised lists in their notebooks, writing down the L1 word with the equivalent target word. No further action was taken as this is normal

classroom procedure. From the unknown words they handed in, the same 180 words that were unfamiliar to all of them were filtered out and given back to them at the end of the semester as on the test list. Since they used the same texts as the *iKWM* group, the same words could be tested, the word lists handed in by both groups being large enough to do so. I taught both classes.

### Statistical results

### productive

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *180* |
| *individual results in %* | *96%, 95 %, 83 %, 96%, 99%, 99%* |
| *abstract words* | *65 = 36%* |
| | |
| ***Comparison group*** | |
| *no. of words tested* | *180* |
| *individual results in %* | *56%, 16 %, 35%, 32%, 29%, 30%, 17%* |

| ***iKWM group*** | |
|---|---|
| *mean* | *94.667* |
| *SD* | *5.955* |
| *t* | *10.806* |
| *df* | *11* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *30.714* |
| *SD* | *13.338* |

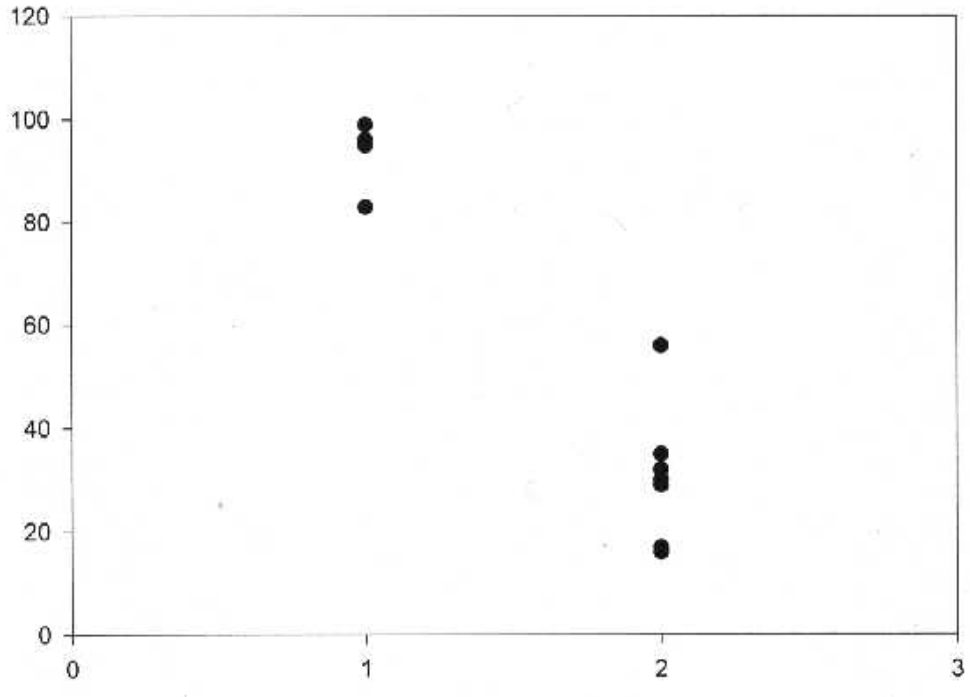


Fig. 12: (Experiment one - point plot productive)

**receptive**

| | |
|---|---|
| ***iKWM group*** | |
| *no. of words tested* | *180* |
| *individual results in %* | *94%, 89%, 79%, 97%, 98%, 95%* |
| *abstract words* | *65 = 36%* |
| | |
| ***Comparison group*** | |
| *no. of words tested* | *180* |
| *individual results in %* | *19%, 42%, 20%, 43%, 51%, 28%, 31%* |

| | |
|---|---|
| ***iKWM group*** | |
| *mean* | *92.0* |
| *SD* | *7.009* |
| *t* | *10.298* |
| *df* | *11* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *33.429* |
| *SD* | *12.2328* |

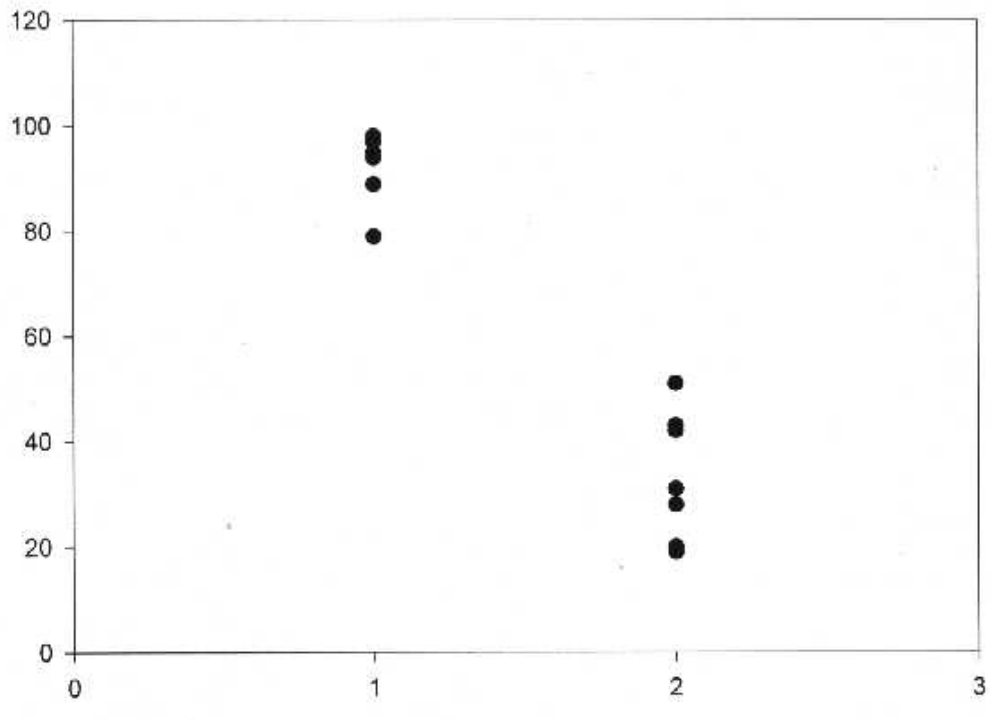


Fig. 13: (Experiment one - point plot receptive)

#### Analysis

The results are clearly in favour of the *iKWM* group. Not only do the members of this group remember approx. three times more vocabulary than the members of the comparison group, which is in line with some of the experiments in the laboratory of the psychologists, it is also noteworthy that the *iKWM* group returns a higher figure productively than receptively, although the difference is not high (2.667 points/ 2.8%). This is still surprising. The comparison group confirms the conventional wisdom that vocabulary is better remembered receptively (difference = 2.715 points/ 8.83%). The two graphs also demonstrate that the band of knowledge is much narrower for the *iKWM* group than it is for the comparison group, i.e. learning took place much more uniformly. In both productive and receptive learning the least successful learner of the *iKWM* group is still decisively better then the best performer of the comparison group.

### 9.1.2. Experiment 2

#### Subjects and procedure

There were two groups studying for the Cambridge First Certificate (FCE) exam (intermediate level). Both courses took place at an adult education college. Permission to conduct the experiment was obtained from the head of the language department and the learners, as was the case with the other experiments. The *iKWM* group consisted of 15 members (9 female, 6 male) and ranged in age from late teens to early 40s. One learner did not attend the receptive test. The procedure for this group was as described before. The text book for both groups was the same (Jones, 1996).

The comparison group consisted of 16 members (11 female, 5 male) and had a similar age structure as the *iKWM* group. The procedure for this group was identical to that of the comparison group in experiment 1. 186 identical words were filtered out for each group from the lists they had handed in. The difference to Experiment 1 was that the second group was taught by a different teacher, who agreed to permit me to use her class as a comparison. As far as her teaching procedure was concerned, she reported that she followed the textbook closely, i.e. vocabulary was supposed to be acquired from context. As happens in monolingual classes, she also provided and

allowed translation. All other possible learning strategies were left to the individual learner, in other words, she did not teach or advocate any particular strategy.

### Statistical results

### productive

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *186* |
| *individual results in %* | *82%, 100%, 92%, 100%, 100%, 58%, 60%, 57%, 71%, 96%, 97%, 99%, 99%, 99%, 100%,* |
| *abstract words* | *72 = 39%* |
| | |
| ***Comparison group*** | |
| *no. of words tested* | *188* |
| *individual results in %* | *47%, 41%, 10%, 46%, 38%, 24%, 23%, 13%, 28%, 35%, 22%, 28%, 22%, 17%, 30%, 35%* |

| ***iKWM group*** | |
|---|---|
| *mean* | *87.333* |
| *SD* | *17.036* |
| *t* | *11.445* |
| *df* | *29* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *28.688* |
| *SD* | *11.050* |

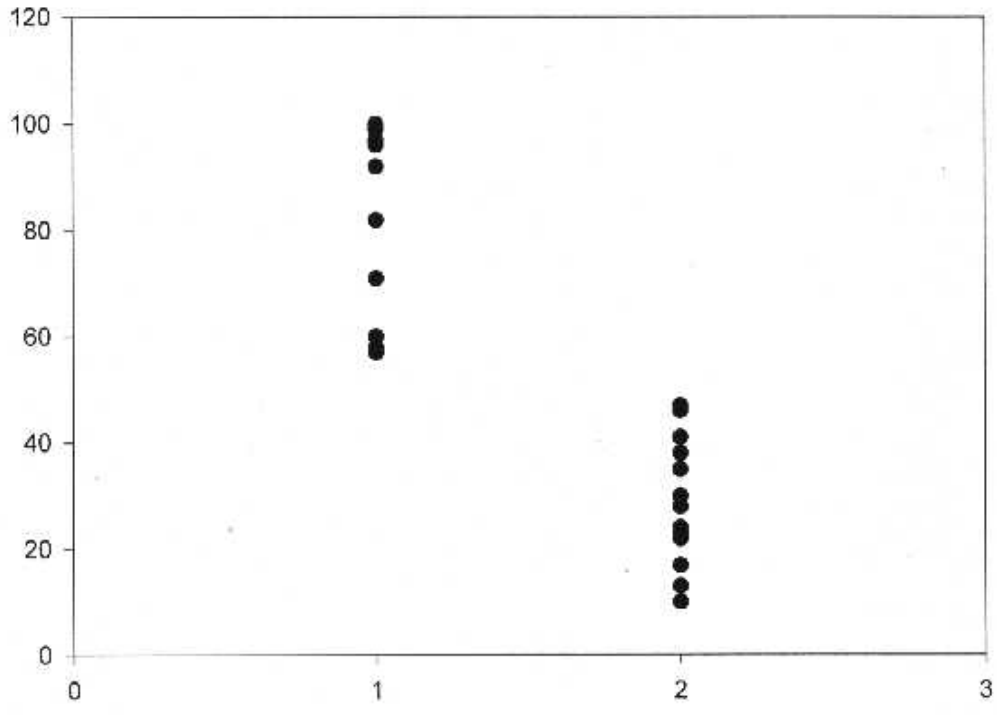


Fig. 14: (Experiment two - point plot productive)

**receptive**

| | |
|---|---|
| ***iKWM group*** | |
| *no. of words tested* | *186* |
| *individual results in %* | *79%, 96%, 100%, 100%, 100%, 96%, 99%, 72%, 66%, 85%, 75%, 97%, 85%, 98%* |
| *abstract words* | *72 = 39%* |
| | |
| ***Comparison group*** | |
| *no. of words tested* | *188* |
| *individual results in %* | *13%, 17%, 23%, 29%, 21%, 25%, 39%, 46%, 30%, 36%, 23%, 10%, 23%, 26%, 37%, 35%* |

| | |
|---|---|
| ***iKWM group*** | |
| *mean* | *89.143* |
| *SD* | *11.935* |
| *t* | *13.503* |
| *df* | *28* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *25.438* |
| *SD* | *13.667* |

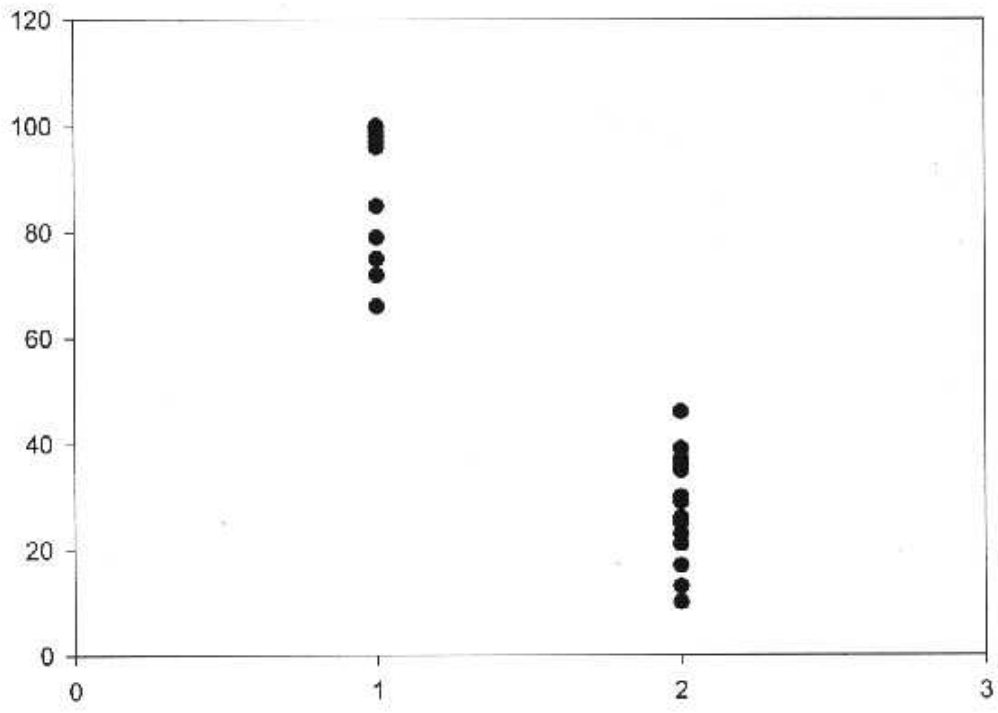


Fig. 15: (Experiment two - point plot receptive)

### Analysis

Again, the results are clearly in favour of the *iKWM* group. The members of this group remember in excess of three times more vocabulary than the members of the comparison group, but this time they return a higher receptive figure than a productive one, albeit a very small one (1.81 point/ 2.07%). This time the comparison group returns a higher productive figure (3.25points/ 12.77%). The two graphs show that the knowledge band for the *iKWM* for production is wider than that of the comparison group. This is caused by three participants (out of 15), returning figures of around 60%, conspicuously below the others. Still, the lowest return of the *iKWM* is clearly higher than the highest one of the comparison group both productively and receptively.

## 9.1.3. Experiment 3

### Subjects and procedure

The *iKWM* group consisted of 19 learners of intermediate level. Their ages ranged from early 20s to early 40s. There were 12 female learners and 7 male ones. The textbook was the same as for the experimental groups 1 & 2 (Jones, 1996). The procedure was as described before. This group was less homogenous than the others. The number of words reported as unknown varied considerably. The highest count was 135 words, the lowest 25. It was therefore decided to treat every learner individually. For comparison, the group in Experiment 2 was used.

### Statistical results

### productive

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *27, 127, 119, 76, 76, 113, 35, 61, 121* |
| *individual results in %* | *100%, 48%, 93%, 64%, 92%, 100%, 66%, 97%, 98%* |
| | |
| *no. of words tested* | *119, 44, 34, 33, 55, 124, 33, 66,56, 28,* |
| *individual results in %* | *35%, 77%, 100%, 88%, 100%, 88%, 94%, 100%, 84%, 100%* |

| | |
|---|---|
| ***iKWM group*** | |
| *mean* | *83.842* |
| *SD* | *18.127* |
| *t* | *10.610* |
| *df* | *33* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *28.688* |
| *SD* | *11.050* |

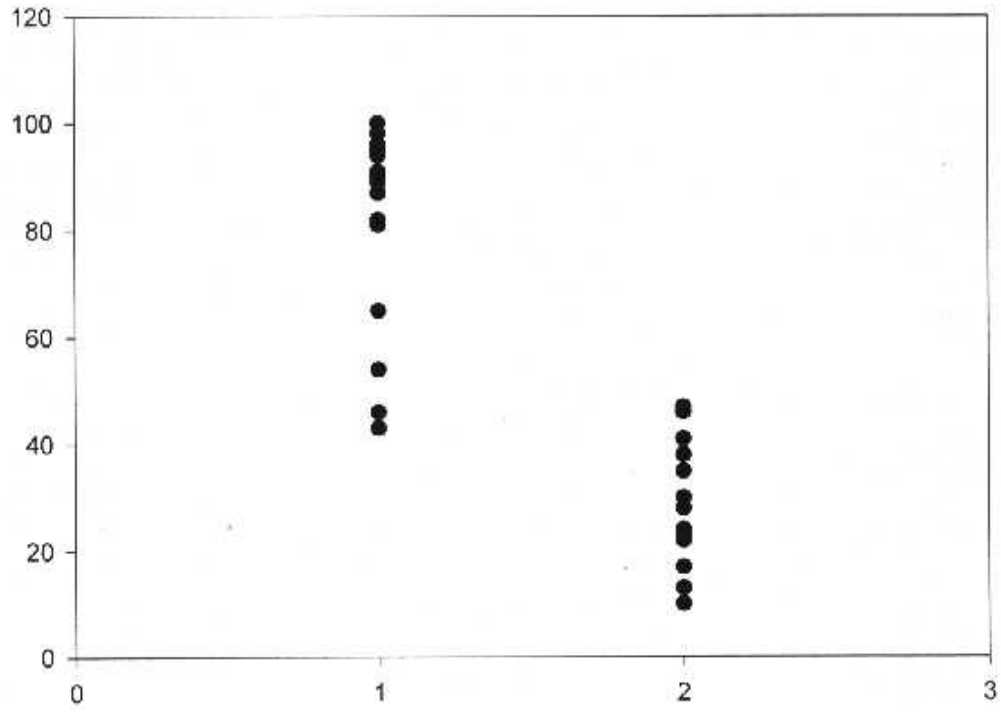


Fig. 16: (Experiment three - point plot productive)

## receptive

| | |
|---|---|
| ***iKWM group*** | |
| *no. of words tested* | *42, 35, 33, 56, 112, 134, 75, 76, 37, 60,* |
| *individual results in %* | *81%, 94%, 82%, 96%, 90%, 54%, 87%, 96%, 65%, 95%* |
| | |
| *no. of words tested* | *116, 120, 32, 120, 68, 56, 29, 25, 115* |
| *individual results in %* | *90%, 46%, 91%, 89%, 96%, 43%, 100%, 100%, 98%* |

| | |
|---|---|
| ***iKWM group*** | |
| *mean* | *85.474* |
| *SD* | *19.158* |
| *t* | *11.026* |
| *df* | *33* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *25.438* |
| *SD* | *13.667* |

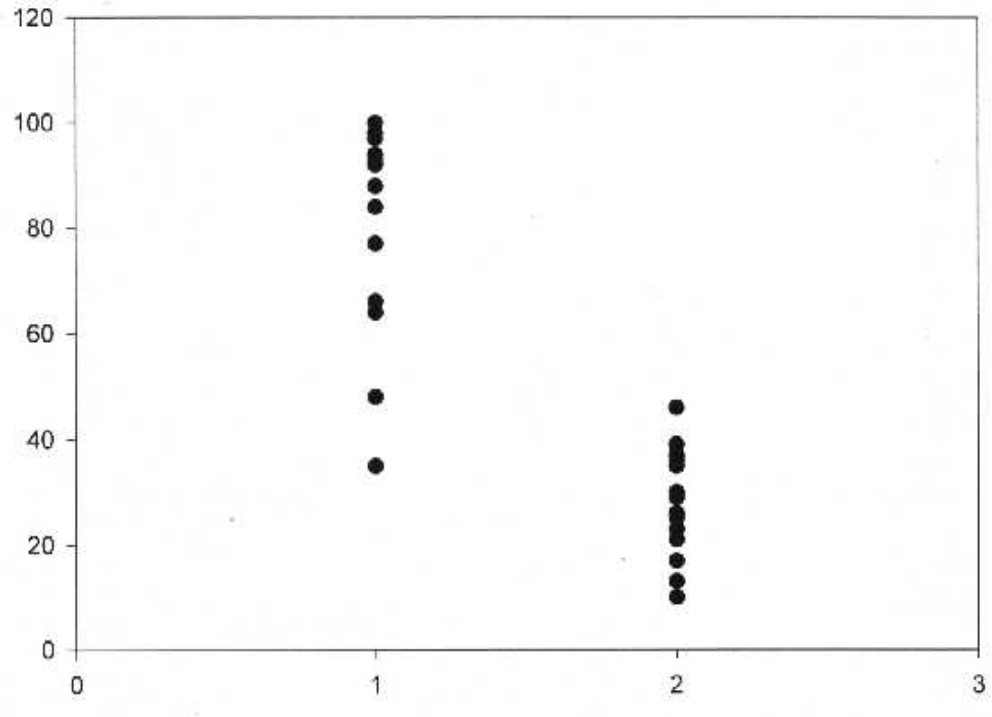


Fig. 17: (Experiment three - point plot receptive)

**Analysis**

The now familiar picture emerges again. The *iKWM* group outperforms the comparison group by more than three times. The figure for productive knowledge is again lower (1.63 points/ 1.94%) than that of receptive knowledge. In this experiment the graphs show a clearly wider knowledge band for the *iKWM* group. An explanation can be found in the individual figures. Of the 19 participants, a minority of 4 returned figures below 70% productively and receptively which meant that the groups overlap slightly.

### 9.1.4. Experiment 4

**Subjects and procedure**

The *iKWM* group consisted of 10 learners at advanced level (9 female and 1 male) and used an appropriate textbook (O'Connell, 1999). Their age ranged from 20s to 40s. As with the experimental group 3, the number of words on the returned

lists varied considerably. The procedure was as described before. For comparison, the group in Experiment 2 was used.

**productive**

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *27, 86, 49, 58, 113, 26, 46, 52, 57, 103* |
| *individual results in %* | *70%, 45%, 88%, 52%, 96%, 85%, 37%, 75%, 77%, 83%* |

| ***iKWM group*** | |
|---|---|
| *mean* | *70.8* |
| *SD* | *19.719* |
| *t* | *7.009* |
| *df* | *24* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *28.688* |
| *SD* | *11.050* |

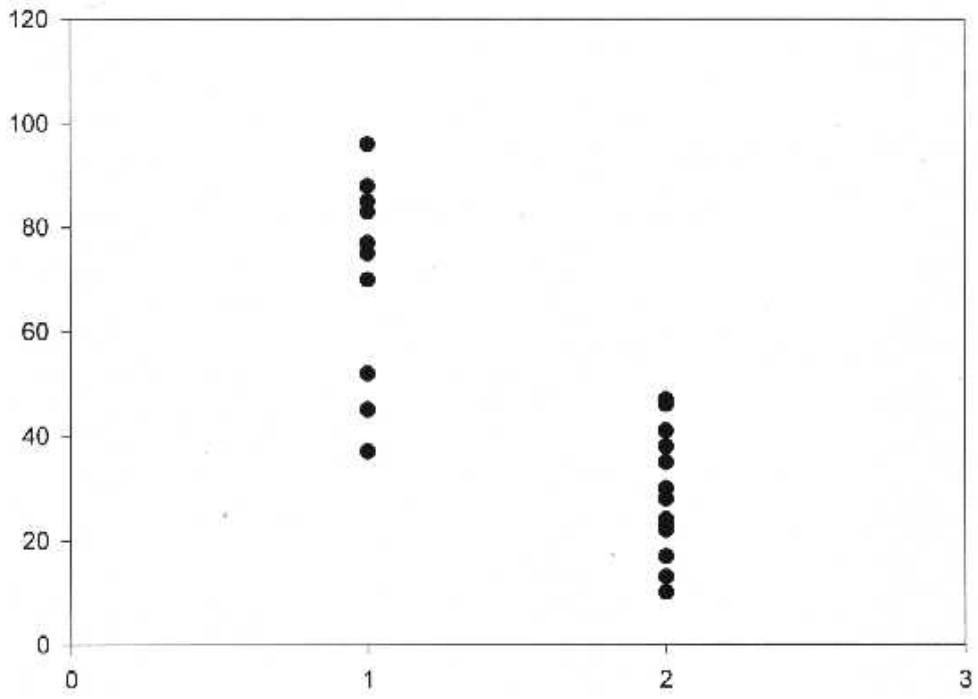


Fig. 18: (Experiment four - point plot productive)

**receptive**

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *83, 28, 107, 56, 48, 26, 44, 51, 107, 98* |
| *individual results in %* | *86%, 57%, 96%, 73%, 92%, 88%, 45%, 92%, 82%, 81%* |

| ***iKWM group*** | |
|---|---|
| *mean* | *79.60* |
| *SD* | *16.978* |
| *t* | *10.056* |
| *df* | *24* |
| *p* | *0.001* |

| ***Comparison group*** | |
|---|---|
| *mean* | *25.438* |
| *SD* | *13.667* |

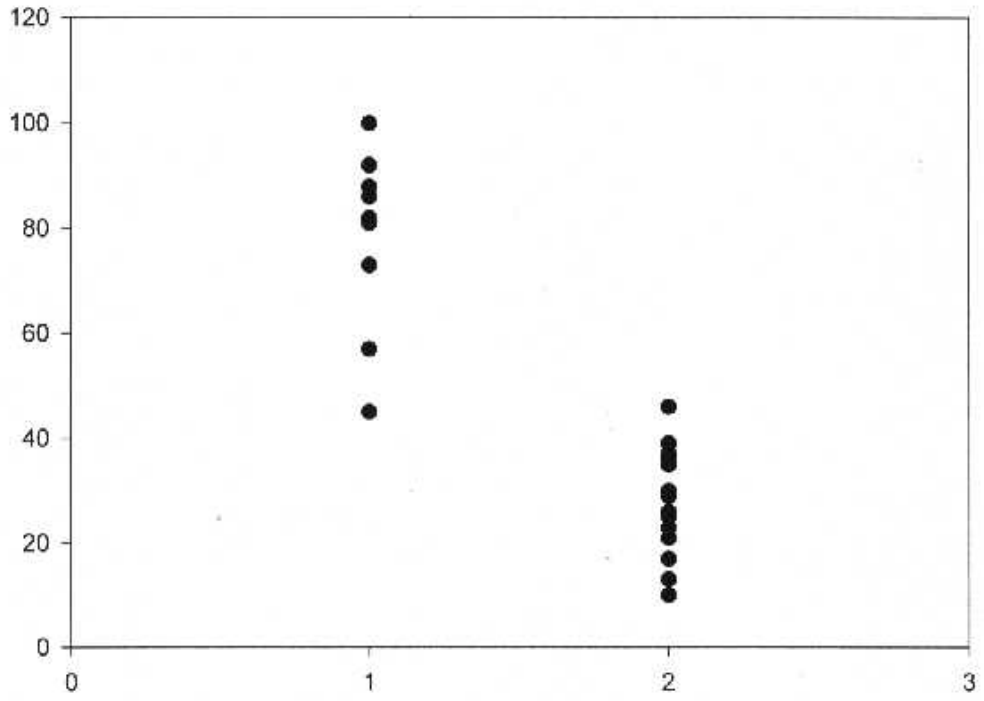


Fig. 19: (Experiment four - point plot receptive)

**Analysis**

Although lower than in the all the other experiments, the *iKWM group* still outperformed the comparison group by around three times. Again, the productive figure is lower than that of receptive knowledge (8.8 points/ 12.42%). The knowledge band as shown in the graphs is wider than that of the comparison group, which is again due to three participants (out of ten) who returned much lower figures than the rest. In this experiment one performer had a marginally lower result than the best performer of the comparison group, although not significantly so.

### 9.1.5. Experiment 5

#### Subjects and procedure

The *iKWM* consisted of 12 learners, 6 female and 6 male. The course took place in the morning and had the unfortunate title ‘English for the elderly’. The age of the learners ranged from early 50s to late 60s/ early 70s. As can be imagined, the motivation these learners brought to the classroom was exclusively intrinsic. No pressure from outside (job etc.) existed. The teaching material took the form of photocopies of authentic material, mainly newspaper clippings and sections of literature. The research procedure was as described as before. In this group also, the number of unknown words returned varied considerably.

#### productive

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *129, 70, 67, 72, 95, 74, 67, 73, 130, 129, 129, 129,* |
| *individual results in %* | *90%, 94%, 69%, 42%, 88%, 19%, 84%, 100%, 98%, 93%, 100%, 98%* |

| ***iKWM group*** | |
|---|---|
| *mean* | *81.583* |
| *SD* | *24.821* |
| *t* | *7.612* |
| *df* | *26* |
| *p* | *0.001* |
| | |
| ***Comparison group*** | |
| *mean* | *28.688* |
| *SD* | *11.050* |

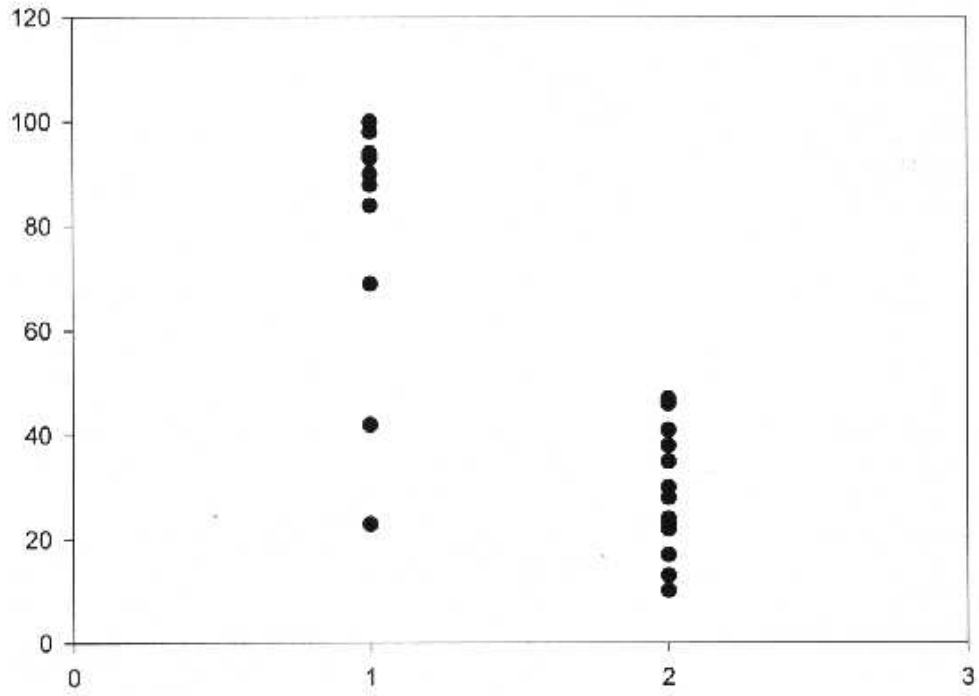


Fig. 20: (Experiment five - point plot productive)

**receptive**

| ***iKWM group*** | |
|---|---|
| *no. of words tested* | *128, 84, 68, 88, 122, 95, 75, 87, 128, 122, 128, 128* |
| *individual results in %* | *90%, 93%, 55%, 44%, 80%, 33%, 76%, 97%,99%, 91%, 91%, 98%* |

| ***iKWM group*** | |
|---|---|
| *mean* | *78.917* |
| *SD* | *22.597* |
| *t* | *8.244* |
| *df* | *26* |
| *p* | *0.001* |

| ***Comparison group*** | |
|---|---|
| *mean* | *25.438* |
| *SD* | *13.667* |

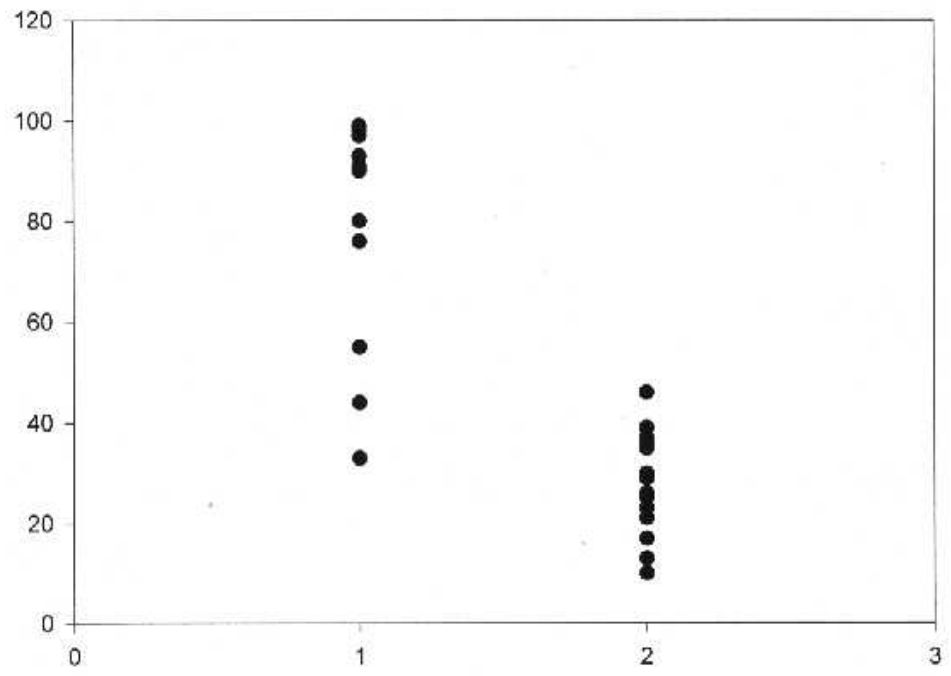


Fig. 21: (Experiment five - point plot receptive)

**Analysis**

This group was particularly interesting for the language teacher in adult education since it consisted of ‘mature’ learners. Nevertheless, even this group outperformed the (much younger) comparison group by more than three times. It is yet another case where the productive skills turned out to be better than the receptive ones (2.66 points/ 3.26%). The knowledge bands were again much wider than those of the comparison group. Two participants returned much lower figures than the rest (one as low as 19% productively), which is reflected in the graphs.

### 9.1.6. Analysis of the five experiments (summary)

If the five experiments are seen as one research project, a total of 62 learners were tested on a grand total of 7154 words, an average of 115 each. The numbers for the comparison groups were much smaller, i.e. 23 learners and a grand total of 4236 words, an average of 184 words each.

The five experiments show a clear superiority of the *iKWM* over context learning with translation. In all experiments the worst performing *iKWM* group outperforms the best performing control group. With one exception (Experiment 4), the means do not fall below 79 (productive and receptive). The comparison groups do not return means above 31. One noticeable result which the graphs display clearly is that the results for the comparison groups are fairly evenly distributed, i.e. the individual results deviate not too far from the group's mean, whereas the results of the *iKWM* groups are mainly clustered at the higher end, indicating that it is sometimes the influence of a few outliers which is preventing the group's mean from moving even higher.

When taking the means of all *iKWM* groups into account (the mean of the means), the difference in performance productively and receptively is 1.2 percentage points in favour of the latter. This is a surprising result because the outcome clearly contradicts the widely-held belief in the literature that the *KWM* is inferior for productive vocabulary learning, e.g. "it is much less effective in productive vocabulary learning than in learning to comprehend the L2 form" (Ellis, 1997: 137; Ellis & Beaton, 1993). The difference between the two is too small to be of statistical relevance, but it provides an indication and, it is hoped, encouragement for further research. The number of words learnt in the experiments also suggests that there is no evidence that the *iKWM* is unsuitable for the learning of a large amount of vocabulary. "... I wouldn't advocate using the keyword mnemonic on 1000 words, or even most of them. I would keep it for the hard words." (McPherson, 2003). Cohen (1987), Nation (1982) and Hulstijn (1997) are of the same opinion. Further research is needed to shed more light on this issue.

This research is not concerned with the concrete/abstract issue, but the results of the experiments do indicate that the *iKWM* seems to be as effective with abstract words as it is with concrete ones. Unlike the words learnt at beginners' level (see the

pilot study), learners at intermediate and advanced level have increased need for abstract words. Consequently, approx. one third of the words on the test lists of the experimental groups 1&2 were abstract words. Since the members of the other groups were treated individually, no meaningful data could be obtained from them. Nevertheless, the experiments provide an indication that statements such as “the *KWM* ...is of little use with abstract vocabulary” Ellis (1997: 137) are somewhat rash, to say the least.

One inexplicable result is that the most advanced experimental group (4) showed the lowest performance. One can only speculate on the reasons. Received wisdom has it that advanced learners learn languages better than others. This might be true for learning in general, but the result of this group could indicate that this is not necessarily always true for the specific task of vocabulary acquisition. In the secure knowledge that their existing vocabulary bank has served them well in the past, without too many serious problems, learners might instead concentrate on their communicative competence. Besides, almost by definition, the unfamiliar words the advanced learners encounter are more likely than not to be of low frequency (one of the words was *painter* = the rope or chain with which the shank and flukes of the anchor, when carried at the cathead, are confined to the ship’s side [OED]). Learners might decide that these words are unlikely to be needed and therefore not worth the effort of learning and remembering. Whatever the reasons, the results were still conspicuously above those of the comparison groups.

As the bar charts below show, all *iKWM* groups return broadly similar results, notwithstanding the performance of the lowest group (4). This adds to the validity of the experiments. The outliers in some groups (esp. Experiment 5) are not significant enough to invalidate the picture displayed by the mean figure. I could have opted to eliminate these outliers and adopt another measure of central tendency, such as the median. However, I decided against that, since these figures also show that the *iKWM* is not equally affective for *all* learners. In addition, these outliers are reflected in the t-scores.

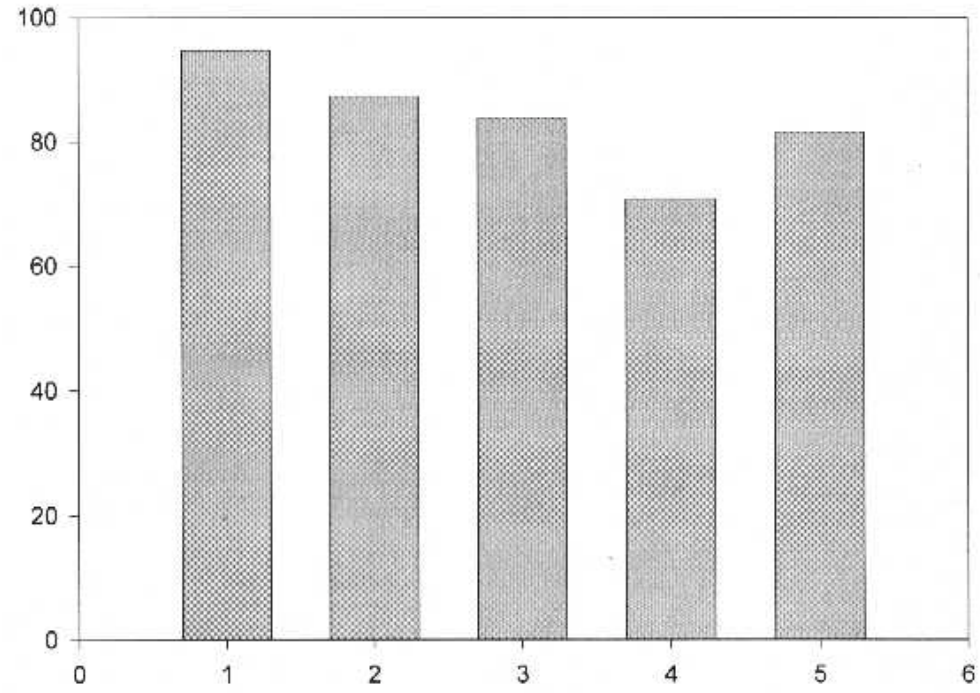


Fig. 22: (Bar chart *iKWM* groups productive)

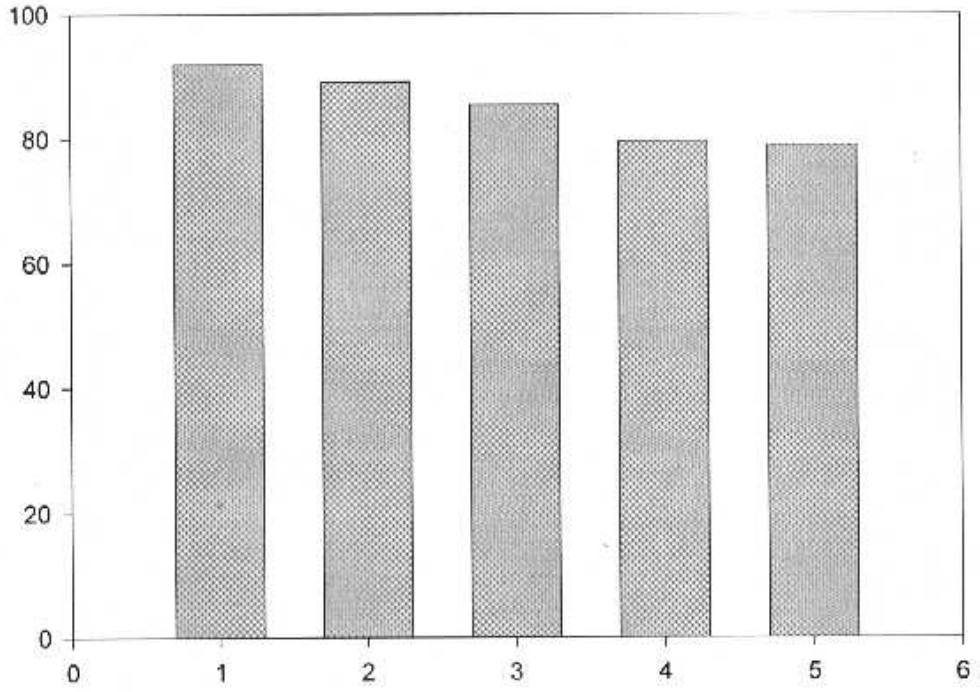


Fig. 23: (Bar chart *iKWM* groups receptive)

Although the comparison groups returned lower results than the *iKWM* groups, there seems to be a confirmation of my hypothesis in Ch. 5 that research conducted in genuine classroom situations could show a better return than that conducted in the laboratory or in quasi-classroom situations. Classroom atmosphere (e.g. interaction, competition, social attention) is generally seen as conducive to learning. For this atmosphere to develop, time is needed – and the development is gradual. In addition, if research is conducted over a longer period of time, the learners might push the knowledge that they are taking part in an experiment into the background (see below). Research as described in Ch. 4.4 cannot take account of these phenomena.

To answer research questions 2 and 2a: The experiments have shown that the *KWM,* if adapted to the classroom, is highly effective compared with learning in context. The rate of success also indicates that, with the *iKWM* in the classroom, results can be achieved that are comparable with those obtained in the laboratory. This also answers research question 3. 'Conventional' teaching of vocabulary in genuine classroom situations achieves a retention rate of around 25%, at least in the two experiments in this thesis. This is more than suggested in the research literature, but inferior to the *iKWM*. Acknowledging problems with the *implementation* of the method, as discussed in this thesis, means casting doubt on its future prospects in education. It would therefore be of benefit if other methods of explicit vocabulary teaching were compared directly with current practice to obtain empirical results. One could, for instance, leave one group to its own devices to learn vocabulary, as is mainly done at the present, and compare the results with those of a group which has used vocabulary cards (Nation, 2001: 303 ff.) *systematically* over a longer period, i.e. under the supervision of a teacher/researcher. Data of this kind does not exist yet.

As interesting as the results of these experiments would be, concentration solely on retention of vocabulary items would be unsatisfactory. The interconnection of the various activities, 'atmospheric' patterns and other imponderables of the classroom have to be taken into consideration. Vocabulary retention is one thing, competence in the language another. This competence can best be achieved if the learners complement the acquisition of knowledge with a willingness to participate. This willingness often disappears when they realise that 'swotting' yields disappointing results. This leads to the formulation of research question no. four.

## 9.2. Motivation

From the beginning of my teaching practice with the KWM it fast became apparent that the learners enjoyed it – and enjoyment normally leads to increased motivation. It was then a question of how this observation could be substantiated through research. By then the *KWM* had been adapted to the classroom to become the *iKWM* and the research question could be formulated: How does the *iKWM* affect the motivation of learners and how do learners experience this subjectively?

The research tools questionnaire and interview were used. These two are complementary; the questionnaire could also be seen as a form of conversation since it involves question and answers (McDonough & McDonough, 2001: 172-3). The two acts are combined as a triangulation process. In both cases the learners freely offered their co-operation. At least in the case of the interview there was the distinct feeling that they liked to talk about their experience.

### 9.2.1. Analysis of the questionnaire (*see Appendix 3*)

Regardless of whether learners judge the *iKWM* more or less favourably, one result is decisive. A clear majority prefer a course that incorporates them in the learning process. This is probably due to the realisation of an even greater majority that the *iKWM* helps them to learn better and faster and to remember longer and better. Learning with the method is seen as easy. 99% think it is fun. When the questions address motivation and how learners react to it, the picture becomes imprecise. Approx. half reported that their motivation had increased, but the other half disagreed.

The answer I expected with considerable interest concerned the willingness of the learners to increase their workload. If the method is fun and enhances the motivation of at least half the class, this should be the case. It was not. Just over half spend ‘a little’ more time on vocabulary learning, the rest did not. Equally, only a small majority reported to have the desire to learn more, and even this gave a subdued impression. None wanted decisively longer vocabulary lists. It seems that the positive attitudes so far reported do not spill over into great enthusiasm for more work. Nevertheless, the results from the experiments are convincing, which could indicate the *iKWM* could unfold its potential at an early stage (in the classroom),

although this potential does not seem to be sufficient to lower the inertia threshold outside it. This can be seen as positive. The *iKWM* makes the best use of the time the teacher spends with his/her learners.

The method was new to the learners (and is unknown to most other learners AND teachers I talked to). Most learners talked about it outside the classroom, with or without recommending it. Recommendation in itself is not so important; the fact that they were chatting about it indicates that the learners were positively inclined towards it. At the beginning of the course many learners remark that the method needs 'getting used to'. After the research project had ended, again a decisive majority saw the method as 'very useful', which I assume means that they *had* got used to it. Five learners reported that 'they couldn't do without it now', an expression which originated from one of the learners during the course and was subsequently used in the questionnaire.

Although the majorities were decisive, the sentiment was not universal. One learner persistently returned indifferent or negative sentiments. He saw the method as less efficient, he didn't like it to begin with, and still didn't like it at the end. His most positive statements were of indifference. We will meet him again in one of the interviews.

Questionnaires are useful tools for enquiring about the moods and sentiments of learners, but they are by nature fairly rigid. Learners are given a certain set of answers and cannot easily deviate from them. Therefore, any analysis is left with an impression of incompleteness. Interviews are much more flexible and can be used to shed more light on the tentative questionnaire results. For this reason (triangulation), interviews were used to clarify already available information.

### 9.2.2. Analysis of the interviews (*see Appendix 4*)

The picture that emerges from the interviews is more varied than that from the questionnaire: It qualifies some of the latter's statements and shows that questionnaires as a sole research tool without triangulation by other means can be unsatisfactory. Nevertheless, there is an overwhelmingly positive response. The most noticeable aspect is that, regardless of possible reservations, almost all learners seem to enjoy their experience with the method (the word 'fun' occurs twelve times in

the interviews). Others are ‘interesting’ (3), ‘great (63; 111; 112) ‘really/very good’ (14; 77), ‘the best method for me so far’ (113). One learner saw the list as a means of enjoyment, looking for ‘real hits’ (70). Several specifically mention their opinion that vocabulary stays in their memory for longer (3; 28; 63; 90; 111). Another interesting point from the teacher’s point of view is that they are very reluctant to undertake any work to ‘concoct’ their own keywords and images without guidance, ‘because nobody would actually do it’ (40) and (12; 14; 20), even though they realise that it would be better for them (40; 78; 82; 84). Yet almost as a rule they frequently change those keywords and images presented to them. This would mean that the *iKWM* vocabulary lists are used as a stepping stone, a jump start, for more autonomous learning. One made the interesting suggestion that the creation of keywords and images should be given as homework, to be shared with the others later (41).

Throughout this thesis I have advocated that mnemonics of any kind should be simple and that one way of achieving this is to keep the keyword sentences short. The learners were divided on this issue. Some agreed (82; 133), others thought it of no consequence (32), others even saw long sentences as beneficial (28). Here is probably the (unconscious) desire to elaborate at work. If there is one issue they all agree on, it is that of bizarreness. ‘The stranger it is, the easier it is to remember’ (24; 25), I’ll never forget...(94), fifty/fifty (18).

There is also broad agreement throughout the interviews that the *iKWM* is only used when deemed beneficial. Learners still use rote learning, semantic learning, and associations with other things such as book and film titles. Some of them transferred the vocabulary to cards as described in Nation (2001: 231). The perceived easiness of the *iKWM* is no guarantee that the learners revise more than before or, indeed, at all (85; 77) A few learners spoke to others about the method or tried it with relatives (son; brother). The learner who also worked as a teacher recommended the method to her learners without going through the work of providing vocabulary lists. Instead, she explained the method to her learners, gave examples, but also told them explicitly that they should not use it if they thought it was not for them (141). This is excellent practice and more than I could have hoped for. One learner (the same as in the questionnaire) was thoroughly ‘put off’ by the method (66).

The interviews reveal many facets of the *iKWM* which can be taken into account to improve it in practice, but they also reveal its limitations. It is clearly not the best method for everyone, but then which learning strategy is? The most important finding seems to be that the method is eminently flexible and adaptable. Almost every learner can use all or parts of it, according to his/her needs or preferences. However, without trying to pre-empt the reaction of the readers of these interviews, they neatly convey, in my opinion, the atmosphere of groups that work together and are prepared to discuss the matter at hand willingly and cordially.

From the above it can be seen that the fourth research question cannot be answered decisively and conclusively. The general findings are that the *iKWM* does increase the learners' motivation *in* the classroom, but that individual learners react differently to it *outside* the classroom. Some take the increased enjoyment and motivation with them, others do not. Nevertheless, the teacher's responsibility is normally confined to the classroom and there the increased motivation is noticeable. This increased motivation, together with the effectiveness of the method, ensured that the comparison groups were outperformed.

## 9.3. Further research

This research project is a first step to investigating the utility of the *KWM* in genuine classroom situations. Clearly, more research is needed to verify the results (or not) and to strengthen the case for possible generalisation/transferability. The more research, the more reliable the statistic data. All of this research was conducted by the same teacher/researcher. It would be very useful if it could be repeated in appropriate circumstances by (a multitude of) different researchers. It would enhance its validity and would therefore also increase the acceptance of these results by the scientific community. Another possibility would be to teach a class with conventional methods one semester, and with the *iKWM* the next. Although I regard the issue of bizarreness as settled from the point of view of the teacher, the abstract/concrete issue is not. In the applied linguistics/ educational literature it is still mainly subject to opinions and conjecture. Some really longitudinal research in the classroom should investigate more thoroughly whether a skilful application of the *iKWM* frees it from the odium that it is not suitable for the learning of abstract words. The sample in the first two experiments is too small to merit a conclusion, but it provides an indication.

“One important issue needing further investigation is whether subjects will cease to use mnemonics when instruction to do so is no longer provided” (Hulstijn, 1997: 206). My experience suggests, and the learners in the experimental group 5 have confirmed, that learners rarely continue with the strategy in a principled way after instruction has ceased (cf. Ch. 5.3.8.). However, the sample was too small to arrive at a firm conclusion. More research is needed.

One issue that is only loosely related to this thesis is the effectiveness of current teaching methodology. Research that has tried to investigate this is woefully inadequate. As far as I am aware, there is no research in the vein of this *iKWM* research project (teacher/researcher indistinguishable; research over a period of at least one semester in genuine classroom settings). This has the unsatisfactory result that we teach according to ‘conventional wisdom’ (Pressley & Harris, 1993). Meaningful research is urgently needed here.

# 10. Conclusion

The intention behind this thesis was to give a coherent account of the workings of mnemonics and the *KWM/iKWM,* including the theoretical issues and scientific findings that underpin the rationale for their use. It was my concern to show that mnemonics in general, and the *KWM* in particular, are in harmony with scientific theories and findings, not least with those of the neurosciences, which, I am convinced, will provide major contributions in the future (in combination with more traditional sciences in this field such as psychology and applied linguistics) to our understanding of how language learning occurs and how it can be enhanced. Particular emphasis has been placed throughout this thesis on the belief that educational research is of limited interest to the teacher if conducted in the laboratory and/or quasi classroom situations only. This research project has shown that the *KWM/iKWM* can be made to exploit its full potential in the classroom if it is used skilfully and with attention to the criteria that have been shown to make it effective (its integration into the syllabus). It has also been shown that at least two more or less hotly debated issues by researchers (bizarreness and learner/presenter-generated keywords) have been answered decisively by the learners, regardless of what scientists say. These issues should be seen more under the aspect of motivation and practicality than that of memory research. Since the main concern of the teachers is their students, they are well advised to take heed of their opinions and sentiments.

The experiments have answered research question no. two in a manner confirming that the *iKWM* is as superior to the comparison groups as the *KWM* is in the laboratory. It has also been shown that there is no marked difference between age groups or language skill levels. The results concerning the productive/receptive issue are intriguing. The experiments do not confirm the widespread conviction that productive knowledge is inevitably better acquired. This might be true for the 'learning in context' paradigm but the results of these experiments suggest that there could be teaching/learning strategies which could lift the receptive level to the productive one. This question has to be left open since one research project is not sufficient to provide even tentative answers. As far as vocabulary retention in general is concerned, five experiments with broadly similar results could indicate that it is legitimate to suggest that there is a case for 'fuzzy' generalisation as advocated by

Bassey (1999). The likelihood exists that similar research with comparable classroom procedures will yield similar results.

The question about the effect of the *iKWM* on motivation has not been answered as decisively as the one on vocabulary retention. More precisely, most learners report increased motivation, but only a proportion of them report that this has led to increased personal efforts outside the classroom. Formal education relies on learning efforts after the learner has left the classroom. However, the question was whether the *iKWM* affects the learners positively *in* the classroom, and that has been confirmed by the learners themselves.

In addition, the section on motivation suggests that the *iKWM* is readily accepted by learners and is furthermore of great value in alleviating stress. Very rarely did learners reject the method, demonstrating that even a method as effective as this is not the solution for *all* the learners *all* the time. But, administered skilfully, it could well be the solution for *most* learners *most* of the time. The ball is now in the educators' court. Training for teachers is needed, accompanied by the provision of material similar to that used in these experiments. Teachers can then offer learners a learning strategy which is flexible and adaptable to their individual needs, without it being imposed on them. But then, they might be knocking at an open door.

# Acronyms

| | |
|---|---|
| ALM | Audio-Lingual Method |
| CLT | Communicative Language Teaching |
| DM | Direct Method |
| EEG | Electroencephalography |
| fMRI | functional Magnetic Resonance Imaging |
| G/T | Grammar/Translation method |
| iKWM | integrated Keyword Method |
| **KWM** | **Keyword Method** |
| L1 | native language |
| L2 | foreign/second language |
| LTM | Long Term Memory |
| OED | Oxford English Dictionary |
| PDLP | Parallel Distributed Lexical Processing |
| PET | Positron Emission Tomography |
| RM | Reading Method |
| SILL | Strategy Inventory for Language Learning |
| SLA | Second Language Acquisition |
| STL | Situational Language Teaching |
| STM | Short Term Memory |
| TEFL | Teaching of English as a Foreign Language |
| TESOL | Teaching of English to Speakers of Other Languages |
| TPR | Total Physical Response |
| VVIQ | Vividness of Visual Imagery Questionnaire |
| VLSM | Voxel-based Lesion-Symptom Mapping |
| WM | Working Memory |

# Appendices

## Appendix 1

**iKWM instruction**

### The integrated Keyword Method

If you want to learn this list of vocabulary, you have to make sure that these words and their translations are being stored in your **long term memory.** For this to happen you have to follow the procedure set out below. If you do that, you will remember these words not only for the next few weeks or months, but for a much longer period.

The list is divided into blocks of 10 words. Read the English word and the translation first. **Do NOT try to memorise at this stage.** Read the German sentence with the keyword (Eselsbrücke) and imagine it as vividly as possible. **Do not try to make sense of this sentence.** There is none. You probably think that the sentence is idiotic and far-fetched. This is done on purpose. The more ridiculous, the better. Remember, it is the imagination that counts. It is a mistake to believe that understanding enhances memory. You only have to go back to your schooldays and you will agree that you often understood a word or mathematical formula but forgot it again a short while later (more often than not the next day).

**The image of the keyword has be burnt into your brain- not the word itself.**

So far you have dealt with the word without a context. How the word works in context is demonstrated with the English sentence that includes the word to be learnt. This is just an example. Don't learn it. You will encounter this word in a different context (the text book) again.

After dealing with one block of words, repeat it. Do this until you have completed one unit. This should not take more than 30 minutes. To be more precise: **do not spend more than 30 minutes on this exercise.** Then give it a break of at least 5 minutes, but not more than 30 minutes (have a coffee). Then repeat the exercise.

It is now up to you how you proceed. You can – after the second break – read the text from the text book as specified in the list, or you can postpone this to the next day. This reading and rereading of the text should happen at least six times. The last reading session should occur after at least 3 days**. Do not read 3, 4, 5 or 6 times in quick succession.**

To repeat:

You “learn” for a maximum of 30 minutes, repeat this after a break of between 5 and 30 minutes. After a further break you can now read the text. Then you read the text again the next day. Repeat reading the text as often as you like, but at least six times. The last reading should not happen until three days have passed.

**The breaks in between the learning are important. They give your brain a rest and the opportunity to “digest” what it has seen, and also tell it that there is no stress involved. Stress is lethal for learning!**

If you prefer different keywords from the ones given here, use ones that you generate yourself. This works even better. Remember – it is imagination and creativity that count.

## Vocabulary list

**stout** **fest gebaut, hier: beleibt**

Deine **beleibte** Freundin steht im **Stau.**

People should go on a diet if they have too stout a figure.

**doubt** **Zweifel**

**doubtful** **zweifelnd, zweifelhaft**

Dein **Daumen** sieht Dich **zweifelhaft** an.

It is very doubtful that I will make it in time.

**depend (on)** **drauf ankommen, (sich) verlassen**

Es **kommt auf den Deppen an,** ob ‘Du heute in die Disco kannst**.**

My garden party depends on the weather

**judge** **beurteilen; Richter**

Die **Richter** im **Tschad** sind alle schwarz.

**One should not judge people immediately one has met them.**

**bun** **weiches Brötchen**

Bugs **Bunny** ißt ein **weiches Brötchen** bei McDonalds.

Buns are very often sweet.

**paw** **Tatze, Pfote**

Der Bär greift der Bärin mit der **Tatze** an den **Po.**

Bears do not have hands – they have paws.

**retreat** **(sich) zurückziehen**

Der **Rettich zieht sich** langsam vom Teller **zurück.**

You should retreat when your enemy is stronger

**grocer** **Lebensmittelhändler**

**greengrocer** **Gemüsehändler**

Der **große Lebensmittelhändler** verkauft Dir etwas.

Most housewives go to the grocer’s at least once a week.

**chat** **plaudern, schwätzen,**

Du **plauderst** mit Freunden im **Chatroom.**

One likes to chat with friends.

**chest** **hier: Truhe**

**chest of drawers** **Schubkastenschrank**

**Che** Guevara guckt aus der **Truhe.**

One puts bed linen in a chest of drawers.

**kneel, knelt, knelt** **knieen**

Die Bevölkerung von **Kiel kniet** auf den Straßen.

You hurt your knee if you kneel to much.

**fumble** **fummeln, herumfummeln**

Du kennst jemand, der kann ganz **famos fummeln.**

Drunks fumble with their keys when they come home.

**weed** **Unkraut**

**seaweed** **Seegras**

**Unkraut** kommt immer **wieder.**

Weeding is an unpleasant task.

**tattered** **abgenutzt**

Auf deinem Rücken ist ein **abgenutztes Tattoo.**

You should buy a new suitcase if the old one is tattered.

**retire** **sich zur Ruhe setzen, in Rente gehen**

In die Rente, **rette** sich wer kann.

Make sure you have enough money when you retire.

# Appendix 2

## Questionnaires: pilot study

At the beginning of the course (Q1)

| | *KWM* | *Comp.* |
|---|---|---|
| Why are you attending this course? | | |
| • For vocational reasons | 1 | 5 |
| • Personal interest in learning English | 6 | 15 |
| • To exercise my 'grey matter' | 3 | 3 |

*More than 1 answer was possible.

2.) What do you expect from this course?

My expectations to speak and understand English after 5 months are:

| | | |
|---|---|---|
| • Low | 2 (20%) | 4 (25%) |
| • Hopeful | 8 (80%) | 9 (56%) |
| • Don't know | 0 | 2 (12.5%) |
| • High | 0 | 1 (6.5%) |

3.) What particular difficulties do you envisage in the light of your past experience?

| | | |
|---|---|---|
| • Pronunciation | 5 | 10 |
| • Vocabulary | 2 | 8 |
| • Grammar | 7 | 11 |

4.) I see vocabulary as a problem:

| | | |
|---|---|---|
| • A little | 0 | 3 (19%) |
| • Moderate | 7 (70%) | 3 (19%) |
| • Don't know | 2 (20%) | 5 (31%) |
| • Rather difficult | 1 (10%) | 5 (31%) |
| • Very difficult | 0 | 0 |

5.) I am prepared to revise vocabulary at home:

| | | |
|---|---|---|
| • Very much so | 6 (60%) | 9 (56%) |
| • A little | 3 (30%) | 5 (31%) |

| | | |
|---|---|---|
| • Don’t know | 0 | 1 (6%) |
| • Rather less so | 1 (10%) | 1 (6%) |
| • Not at all | 0 | 0 |

6.) As far as my motivation is concerned, I see myself as:

| | | |
|---|---|---|
| • Very much motivated | 8 (80%) | 13 (81%) |
| • Moderately motivated | 2 (20%) | 3 (19%) |
| • Neutral | 0 | 0 |
| • Not particularly | 0 | 0 |
| • Not at all | 0 | 0 |

7.) As far as my English is concerned, I see myself as an:

| | | |
|---|---|---|
| • Absolute beginner | 5 (50%) | 9 (56.5%) |
| • Beginner, but have had some lessons in the past – and forgotten almost everything | 3 (30%) | 5 (31%) |
| • Beginner, but I know a little | 2 (20%) | 2 (12.5%) |

At the end of the course (Q2)

In the KWM group 8 learners participated, in the control group 6.

In the first questionnaire you described your expectations of the course.

1.) These expectations were:

| | | |
|---|---|---|
| • Greatly exceeded | 2 (25%) | 0 |
| • Exceeded | 3 (37.5%) | 1 (16.5%) |
| • Fulfilled | 3 (37.5%) | 4 (67%) |
| • Not quite fulfilled | 0 | 1(16.5%) |
| • Not at all fulfilled | 0 | 0 |

2.) The difficulties in learning vocabulary I foresaw:

| | | |
|---|---|---|
| • Were not confirmed | 5 (62.5%) | 2 (33%) |
| • Were confirmed to some extent | 2 (25%) | 2 (33%) |

| | | |
|---|---|---|
| • Were fully confirmed | 1 (12.5%) | 0 |
| • A bit greater than expected | 0 | 1 (16.5%) |
| • Very much greater than expected | 0 | 1 (16.5%) |

3.) Did you revise vocabulary at home?

| | | |
|---|---|---|
| • Yes, with pleasure and regularly | 5 (62.5%) | 1(16.5%) |
| • Moderately | 3 (37.5%) | 4(67%) |
| • No | 0 | 1 (16.5%) |

4.) The knowledge of English you have now is:

| | | |
|---|---|---|
| • Very much better than expected | 5 (62.5%) | 1 (17%) |
| • A bit better than expected | 2 (25%) | 3 (50%) |
| • According to expectations | 1 (12.5%) | 1(17%) |
| • Less than expected | 0 | 1 (17%) |

The questionnaire on motivation (Q3)

1.) Compared with the conventional method, do you think that the KWM

| | |
|---|---|
| • is very efficient | 6 (75%) |
| • is efficient | 2 (25%) |
| • makes no difference | 0 |
| • is less efficient | 0 |
| • is not efficient at all | 0 |

2.) Are you of the (subjective) opinion that words learnt with the KWM stay longer and better in your memory?

| | |
|---|---|
| • yes, definitely | 5 (62.5%) |
| • better | 3 (37.5%) |
| • no difference | 0 |
| • worse | 0 |
| • doesn't work at all | 0 |

3.) Compared with the conventional method, do you think the KWM is

- very easy 2 (25%)
- easy 6 (75%)
- no difference 0
- quite difficult 0
- very difficult 0

4.) If you continue with this course or learn another language, would you prefer the KWM method to the conventional method?

- yes, would definitely prefer 4 (50%)
- yes, would prefer 4 (50%)
- no difference 0
- rather not 0
- definitely not 0

5.) If you had the choice between 2 courses, one using the KWM and the other not, which one would you prefer?

The conventional course

- yes, definitely 0
- probably 0
- no difference 0
- unlikely 1 (12.5%)
- under no circumstances 7 (87.5%)

KWM course

- yes, definitely 7 (87.5%)
- probably 1 (12.5%)
- no difference 0
- unlikely 0
- under no circumstances 0

6.) Leaving aside the results, did you enjoy the KWM more than the conventional method?

- much more 6 (75%)
- more 2 (25%)
- no difference 0
- worse 0
- I liked the conventional method better 0

7.) Compared with the conventional method, how did the KWM influence your motivation to learn?

- much increased 2 (25%)
- increased 5 (62.5%)
- no difference 1 (12.5%)
- lessened 0
- very much lessened 0

8.) If you have (or had) children, who learn a language at school, would you explain the KWM to them and recommend it to them?

- yes, definitely 6 (75%)
- probably 2 (25%)
- don't know 0
- unlikely 0
- no 0

There were two open questions, one asking for positive comments about the KWM and one for negative ones. Only 5 participants answered these questions.

The answers (positive):

"What I like about this method is that the words move quickly into long-term memory."

"The words can be better memorised."

"The words can be better memorised and learned. It helps one to pronounce them."

"The vocabulary bank can be enlarged quicker."

"It makes learning easier and things are retained longer."

The answers ( negative):

There was only one answer: “Nothing”.

(The answers were given in German – the translation is mine)

# Appendix 3

**The questionnaire: main research project**

The questionnaire was given to all members of the experimental groups (62) one week before the tests took place. They were given ten questions with multiple-choice answers in blocks of five, with the exception of question 10. Because the percentage figures are rounded up/down, the totals do not always add up to 100%. Because of the potential ambiguity of some questions (not every learner had the same conception of a 'conventional' course [question 4]), the content of the questionnaire was discussed with the learners before they completed it.

Question 1 was formulated to find out how the learners rated the efficiency of the *iKWM* in terms of the basic requirements of any learning strategy, i.e. speed and quantity.

How did you experience the KWM in terms of speed of learning and amount of vocabulary learnt?

- very efficient 23/37%
- efficient 36/58%
- no difference to before 2/3%
- less efficient 2%
- not efficient at all 0

Question 2 dealt with the issue of long-term retention. It has to be reiterated that the tests took place after the completion of one semester.

Are you of the (subjective) opinion that the vocabulary items learnt with the KWM stay better and longer in your memory?

- absolutely 30/48%
- better 29/47%
- no difference 3/5%
- worse 0
- not at all 0

Question 3 addressed the issue of practicality, since learners repeatedly report that the learning of vocabulary is a ‘chore’. The ‘method you used before’ relates to the individual experience of the learners, not a specific course that preceded this one.

Compared with the method you used before being introduced to the KWM, do you find it easy or difficult to use?

It is:

- very easy 28/45%
- easy 33/52%
- no difference 0
- rather difficult 0
- I don’t like it 1/2%

Question 4 is a twofold one. The intention was to find out whether the learners would draw conclusions from the answers above and consequently act on them, given the choice.

If you had the choice between 2 courses, one using the KWM and the other not, which one would you prefer?

Would you prefer the conventional course?

- yes, absolutely 0
- probably 0
- no difference 2/3%
- unlikely 3/5%
- absolutely not 55/89%

Would you prefer the KWM course?

- yes, absolutely 51/82%
- probably 10/16%
- unlikely 0
- absolutely not 0

Question 5 tried to establish whether the learners could confirm (or not) the sometimes voiced opinion of researchers that the KWM is enjoyable (e.g. Singer, 1977).

Not considering the results, would you regard the KWM as fun, compared with other methods you know?

- yes, very 14/23%
- more fun than the other methods I know 47/76%
- no difference 1 /2%
- less fun than the other methods I know 0
- no fun at all 0

Question 6 is direct.

Compared with other methods you know, has the KWM influenced your motivation for learning vocabulary?

- has increased considerably 2/3%
- has increased 30/48%
- no difference 30/48%
- has decreased 0
- has killed my motivation 0

Question 7 can be seen as a control question to q. 6.

After being presented with vocabulary items using the KWM, how did that effect your time you spend on vocabulary learning, compared with the past?

I spent:

- much more time to learn vocabulary 0
- a little more time 34/55%
- no difference 28/45%
- less time 0
- I have given up vocabulary learning 0

Question 8 tried to establish whether the answers of the learners on motivation spilled over into a changed attitude to their ambition.

The quantity of vocabulary items presented was

- far too small 0
- too small 10/16%
- just about right 51/82%
- too big 1/ 2%
- far too big 0

Question 9 was inspired by the learners themselves, since some of them reported during the course that they had talked to others about it and had also recommended it to and practised with their children.

Have you talked about this method to other people outside this classroom when mentionING your language learning experience?

- yes, I have – and recommended it 25/40%
- yes, I have – but without recommending 31/50%
- yes, I have – but expressed my negative view 1/ 2%
- no, I haven't 5/8%

Question 10 finally tried to find out whether the learners accepted the ‘strange’ method more readily after having had time to get used to it.

The method needs getting used to. Do you think it became more acceptable to you over time?

- yes, I couldn’t do without it now 5/8%
- yes, it is very useful 54/87%
- no difference 1 /2%
- I am still not convinced 0
- no, I still don’t like it 1 /2%

# Appendix 4

### The interviews: main research project

The interviews were conducted in German to alleviate the anxiety and inhibition that might have arisen from speaking in a foreign language. They were then translated, and the transcriptions are shown below.

### Interview 1

The first interview was conducted with 10 members of the experimental group 2. Interviewing the whole group would have resulted in a too lengthy and unwieldy interview. It was therefore conducted when coincidentally only 10 members were present.

J = interviewer; M = male; F = female; ?? = unclear

1. J: So, you've been coming here for three years, I mean three semesters now. When I first started confronting you with this method all that time ago – for you it was not quite as long ago – what did you think?
2. M: I thought it was really interesting because from school I only knew that you put German and English words next to each other and then covered up the German side. That's what I always used to do, also for the spelling, first trying to guess the German from the English and then the other way around. And it worked, it was possible to learn quite a lot in quite a short space of time, but I noticed that my long-term memory didn't work very well, that ..??? ... there were just so many words and after a while they were gone again. ??
3. F: That was the same for me, too. At first I thought this here was really interesting, and it was also fun, and over the months I noticed that I could still remember loads of things and pull them back up out of my memory. Really interesting!
4. J: ???
5. M: To be honest, for me it doesn't really work. I'm just too lazy, and if instead of two words I have to learn two whole sentences, then I end up knowing even less than before. I am sure you thought about the sentences a lot, but they still weren't conceived in a way that allowed me to remember them for any length of time. Some of them were OK, though.

6. J: I'll come back to that in a moment, to those particular sentences, I'll ask you about them in a second.
7. M: For me it was really good because I was already doing the same thing anyway, was thinking up a sentence or another word for myself to form a memory aid. For some things I hadn't had a good idea and then it was good to get a suggestion.
8. J: That brings me to my next question. If I hadn't done it like that, giving you a memory aid with a sentence, but had only explained to you how the method works, then I reckon you would have been able to do it, too, methodically I mean.
9. M: I think we could have with some of them, yes, because we would have found something, but not with others because no memory aid springs to mind. For example ?? there I wouldn't have had any problems thinking of a memory aid because it was immediately obvious, but with other words it wouldn't have worked because they weren't in any context.
10. J: Did it help you?
11. M: Methodically yes, but not necessarily with individual words. ??
12. F: For me.. I wouldn't have done it normally either, connecting things to other things, except for things that I already knew from songs or ads on TV. I would never have thought of saying "rude" means "unhöflich" so if I remember "mit jemandem rüde umgehen" ...
13. J: But I mean the method. Would you ever have written down yourself what I wrote down for you, in order to sit down and learn it?
14. F: No. But now I do. I connect things up to sentences. It was really good to be shown how to do that, it really is something we can use ourselves.
15. F: ???
16. J: Yes, that's the problem, isn't it? That the work ??
17. M: Don't you start to do it subconsciously at some stage? Not needing to write things down anymore and remembering them anyway?
18. F: Only for certain words which you automatically link to something else.
19. J: But not methodically?
20. F: No.
21. M: I use normal learning, but if I can't think of a word then I try to remember a link from somewhere, if it won't come to me any other way.

22. J: The next thing is that I use many silly sentences, with silly memory aids. Do you think that that helps?
23. M: My experience is that it helps, that with some words it is really easy to remember a sentence. They are more obvious when there is a clear link between the German and English words in one sentence. ??
24. F: I think so, too. And the stranger the link was, the easier it was to remember it because it was so funny, and if you're having fun you learn more. I feel very positive about the whole thing.
25. M: When something was funny I could remember it, but when a sentence was difficult then it just passed me by.
26. M: I try to link something to the word and also the sentence. For example "Kugelschreiber" ?? "Perser" ?? I remembered that like that. You have to make sentences and I don't think it matters if the sentences are short or long or somewhere in between.
27. J: Taking everything together, what did you like best, what not so much and what not at all? Somebody once said to me for example, it's all very well with these sentences, but they are too long.
28. M: But the good thing about them is that you are far more likely to remember. For example you said that "discontent" could be remembered by a link to a "disco" full of unhappy people. But if the sentence is too long then you first have to find the right word before you remember that it is "discontent" and that that means "unzufrieden". The one with the other sex, that was much easier to remember, for example.
29. F: That's what I think, too. I found that other sentence pretty shaky as well. But it's difficult if you don't know that it means – what was it again? – yeah, "unzufrieden".
30. F: I don't think it's really important if a sentence is short or long. If it contains something that I find difficult to remember, then it makes no difference.
31. J: It's a question of practice.
32. M: I reckon it's not so important whether it's short or long. The sentence has to go with the word ???, but apart from that the length doesn't matter.
33. J: Have you got any suggestions as to how I could improve upon what I have done with you?

34. M: I’ve got an idea, but it would mean far more work. What about thinking up two or three different memory aids for each new word. That would make it far more likely that each person could remember it.
35. J: You mean each person could choose the memory aid he or she feels happiest with?
36. F: Yes, because if in one sentence you are not really sure which word is meant, for example that “discontent” means “unzufrieden”, then the next sentence would make it clear.
37. J: Spoilt for choice?
38. F: Either spoilt for choice or simply confirmation of the right meaning, like a safety net.
39. J: Have you got any suggestions?
40. M: I don’t think the best thing would be for you to make up more sentences, but if we were to make up our own sentences, as they would be far easier to remember. The only problem is that nobody would actually do it...
41. F: But it would be a good idea if we did. Then you would really know 100% that you have understood it. Maybe you could give it as homework? Think up some memory aids for these words?
42. J: That is a good idea, I’ll have to think about that.
43. F: It doesn’t have to be all the words, maybe just 5 or so.
44. M: Everyone should do what they want to. Anyone who really has to learn something will do it by themselves. If you really need to learn something then you don’t need him to look at it for you. ?? If I have to learn something then I can always do it the conventional way.
45. M: And if you forget it again later?
46. M: How do you mean? If I learn it today for something tomorrow, then the difference won’t be all that great.
47. M: But if you learn it the other way then maybe you can still remember it in two years’ time!
48. M: Yeah, but by then my mind is on other things.
49. J: OK, I think we’ve all realised that.
50. F: I reckon that is the problem that you are then stuck with.
51. J: Something else. Have you spoken about this method with other people outside the classroom?

52. F: Yeah, loads, because I liked it so much. I am always hearing the people at work complaining that their lessons are so boring. And when I tell them what a laugh we have here, and how much we still manage to learn – I can see it in myself, how motivated I feel when I come here. And I tell them all that, and then they say that they must be doing something wrong. And then I tell them to come here too and have a look for themselves and see if they like it.
53. J: Have you spoken about it to anyone?
54. M: ?? They say it sounds interesting. But for me, I think that if you learn a language for a long time then at some stage you don't want to keep switching anymore, from German to English or vice versa, you just want to choose a language and go for it. That is a real goal to have when you are learning a language. Not to think about the grammar and how you construct this or that sentence. And that is one disadvantage of all these sentences here. They've got so many words in them that it takes much longer until you reach your goal.
55. J: Because you want to learn it all properly.
56. M: Yes.
57. J: Have you told anybody?
58. M: Yes, but I can't remember what they said.
59. F: I only told some friends in my class ??
60. J: Just one last question. Something that really interests me. I always say that everyone should do what comes naturally to them. So people who don't get on with this method should carry on cramming like before. Have you, as a result of our lessons, sat down to learn any vocabulary? Or don't you ever do that, sit down and learn purely from self-motivation?
61. M: It hasn't affected my motivation at all, but I have still learnt things. When we wrote that vocab test, for example, that helped, and I can still remember some of the things from it now. But I don't think I can still remember all the vocabulary.
62. M: I did it, writing down all the sentences, because we had just learnt how to in the lesson, but I couldn't use all of them, not when they were too long, for those ones I learned conventionally one to one. But I have to say that the things I didn't learn one to one, some idiomatic expressions for example, I can still remember them today. So it was a bit successful.
63. F: I always used to learn vocabulary one to one, and then a short while later I had forgotten the lot, it was no help at all. And now it is more a case of – oh look,

another one, and I know that one and that one – and that is far more important, I think that is really great.

64. F: For me there is no difference...???
65. J: So for you it makes no difference.
66. M: I don't feel motivated by it. If anything it puts me off even more.
67. J: Really?
68. M: Yeah, there is even more to learn, not just single words.
69. J: The very last question. Is it at least more fun coming into the classroom when you know what kind of things we have been doing?
70. M: Yes, like when we got the new lists. At least one sentence was always a real hit. You read it more than once because the grammar was incorrect or just because it was so funny.
71. M: ??
72. F: It's not a bad thing to learn such unusual things, even though classmates or work colleagues don't really understand or believe that we are learning anything useful, but it was great fun.
73. F: It is definitely more fun.
74. M: It is more fun because it is different and more laid-back than normal learning, even though I don't necessarily ...???
75. J: OK, so your experiences were largely a success. Thank you all very much.

**Interview 2**

This interview was conducted with 8 members of experimental group 5, which consisted of more mature learners who generally complain that their memory has deteriorated over time. There is also evidence that they blend out unpleasant experiences (e.g. stress) and remember more pleasant ones (Turk Charles, Mather, & Carstensen, 2003; Walker, Skowronski, & Thompson, 2003). The intention was to examine how they dealt with a method that is supposed to enhance memory.

76. J: What do you think of this method in general?
77. M: Personally, I think it is very good. We have spoken before about the alternative. I had a very different experience for two or three semesters. Learning

vocabulary from a book, like at school. Covering it up with one hand, we all know how it goes. I would never do it like that again, myself. This method is completely OK for me. I also think that we learn quite a lot here, and everyone can do as much as they want, whatever they think is right for them. When I get home, I sling my bag in the corner and drink a cappuccino. And yet I can still remember quite a lot. And whenever we go on holiday from now on, like to Crete this time, I am going to speak English, you can make yourself understood everywhere. Three years ago that was not the case. Once I needed “tuppence” change for parking, for example, but I didn’t have a book with me and nobody could understand me.

78. F: For me it is very effective, but it is even more effective when I make the memory aids myself or when I shorten them. If they are too long, my head is too full.
79. M: I use both. The memory aids, but on the other hand I have also realised that if I have to concentrate on learning vocabulary for something important, then I use both methods. I can remember quite a lot with the memory aids, but on the other hand I also have to hammer it all into my head using the old method. I use both, together they work well, so for me this method is an interesting plus.
80. F: I also think it is interesting to hear some things about the country and the way the people live. ?? What I used to think was artificial - I have now learnt that it isn’t really.
81. J: What do you think of memory aids?
82. M: Quite a lot. Because I tried them out on my son, just with a few words, he is in his second year of learning English. And the words that I taught him using memory aids, about a year or so ago now, I can guarantee that he still knows them. Memory aids can be a great advantage, certainly. But I must honestly say, for me myself – because I am very lazy, and also too lazy to think up my own memory aids – they are a bit difficult to grasp. But if you are prepared to do the work and think up your own ones, then I think it is very effective.
83. J: I’ll come back to that in a moment. What do you think of memory aids?
84. M: As I said before, I think they work better if you think up your own ones. Then they are easier to remember because you choose things that are immediately obvious to you. ??
85. M: I like the friendly atmosphere here, it’s good fun to come. Because I don’t do anything at home, I freely admit that, I’ve got too many other things to do. Coming

here is fun, that helps, ??, and then these memory aids, when the atmosphere is friendly and not tense, you remember more. And like you said, you go on holiday and then remember things. I will never forget what we had three weeks ago. ?? That was one thing which I just hadn't known before. ?? It's fun, and that's a great help.

86. M: How shall I put it? Understanding, as you said, the twittering. Just like you said, I used to only get the surface, had to put the rest together myself. And now I've got the background and see lots of things differently.
87. M: I use the method, too, and it is fun, and it's helpful. But I have to say ?? In the past I always had to force myself to learn anything, but that might just be me, but with these memory aids, they're really good.
88. J: If I understood you correctly, this method is OK. It doesn't have to be used all the time, but can be used. But a question about what was said just now. Some of you said it was better to think up the memory aids yourselves. But would you? What about if, next term, I said to you, OK from now on you're on your own, I'm not giving you any aids anymore?
89. F: I do use your things, but I shorten them. I often find them simply too long. M: They are hard to remember. ?? We just don't do enough. But if we didn't study these aids, or at least read them through, then we wouldn't remember a thing.
90. J: So both ??? No, I understand, using your imagination needs practice, doesn't it?
91. M: Another thing I noticed was that lots of vocabulary, and not just individual words, but also whole expressions in the context of particular events, sentences, words, song texts, things that certain people said – if you can see things as part of a sentence and not just the words themselves, then they are much easier to remember.
92. J: And what about the fact that many of my aids are quite silly? Do you reckon that helps?
93. M: Yes, I'll never forget the one with the silicon breast implants, for example!
94. J: So that helps, right? Have you got any suggestions? Anything to help make the aids better?
95. F: Maybe a few sentences to show how things are used in context.
96. J: OK, so memory aids in connection with their context. I asked another of my classes what they thought of the aids, and there was a Turkish man in the class.

When I asked whether he liked the aids, he said they were excellent. But he wasn't reading the German aids at all, he saw the whole English sentence as the aid! Have you tried explaining this method to anyone else? And if so, what was their reaction?

97. F: I have, because I've got quite a few friends who are teachers, also English teachers. And they told me that this method is not used in schools at all. But they liked it and wanted to try and use it themselves in the future. They found it a great help.
98. M: I haven't explained it to many people, but have had a positive reception when I have.
99. M: ?? I think we all really think the same thing. It's fun coming here. Firstly because of what we learn, and secondly because the lessons are well-balanced and interesting.
100. J: One last question. Has anyone got a negative comment? Would anyone say they didn't like it at all? In general, I mean? One thing you said, for example, was that sometimes the aids were maybe too long. Would anyone go so far as to say that they hated this method of learning?
101. M: These memory aids are not for everyone! Because you can only intensely imagine what comes into your own head. Otherwise your brain strikes. Not each aid is useful to each person.
102. M: You can take them as a guide and then think up your own sentences.
103. J: So even if the first aid is no good, you can still use another one?
104. M: Exactly. If you don't like it, you make up something else. I think that is a great help.
105. J: If I got that right, the method is important. And the things I give you can be used as a guide.
106. F: The funnier they are, the easier they are to remember.
107. J: Thanks a lot to all of you.

**Interview 3**

This interview was conducted with two members of the experimental group 4. It took place by chance, and the opportunity was seized because one of the two,

although a member of my course, taught English herself (beginners and lower intermediate level). The intention was to find out whether she had adopted the method in her classes, since I knew that she was rather pleased with the method and thought it to be effective.

108. J: First of all in general, what do you think of this method? It was quite new for you before you met me, wasn't it?
109. F: Not that new, I had already heard about it in several seminars, and it was good to hear about it, but I needed some material to see how it works in practice. The easiest way for me to remember things is with book titles, film titles, song titles – yes, that's best. But you have to think of them all first.
110. F: Since I am someone who imagines things as pictures, it is a good method for me. I can see a film running through my head and can remember it better and also for longer. Otherwise I had all the vocabulary in my short-term memory and after the test it was all gone. And now you can ask me three weeks later and it's still there. That's great.
111. F: Same here.
112. F: Of course it depends on the sentence. Sometimes I change a sentence if I don't think it's OK, don't think I can remember it, but generally speaking it has been the best method for me so far.
113. J: An important point for me as a teacher: If I had only taught you the method and not given you any sentences like I did, would you then have sat down and thought up your own memory aids?
114. F: I wouldn't have known how.
115. J; No, I mean after I had shown you how.
116. F: I completely redid it. Sometimes because the words were alien to me, and sometimes because there were five words and none of them would have occurred to me spontaneously. Then I invented a completely new sentence, just for me.
117. J: But you still had a sentence first, which you then changed. But if I had only given you the explanation, would you then have said OK, then I'll do it myself, systematically, just like he taught me?
118. F: I would have, yes.
119. F: I wouldn't have, no.
120. J: No? Why not?

121. F: Because I have often heard it in seminars, and it always sounds great, but then I have tried it at home, to make my own sentences, but then I couldn't be bothered because my exam was approaching and that's not a good time to start something new, and you shouldn't either, but if you get it given to you on a plate, then it is easier to get into it and start something new.
122. F: I would have been happy with an example, but I would have needed that example, too.
123. J: Yes, as a part of the explanation.
124. F: But apart from that, I redid it all myself anyway. I've got a whole box of cards at home.
125. J: Many of the examples I gave you were completely stupid. Is that helpful when you are learning, or doesn't it make any difference? Some people say that some of the things are too far-fetched, that they can't relate to them. What about you?
126. F: Sometimes I thought that, and then I just changed the sentence. I find it easier to use people as memory aids. For "conscious" I had "Conan the Barbarian", for example. That is also stupid, when it comes down to it, but then I chose a meaningful sentence.
127. F: For me it was 50-50. Sometimes I could remember the silly ones best. I said to myself, that's really ridiculous, but it stuck, and other times it was better to have something more logical ???
128. J: The course is finished now. If you take a different one in the future, where things are done differently, would you still carry on using this method?
129. F: I would, I would carry on.
130. F: Me too, not for everything, but for a lot of things.
131. J: Have you got any suggestions for improvement? After all, the things you had were all mine, I gave them to you. I can give you an example. Other people I have spoken to have often said that the sentences are too long and could have been shorter.
132. F: That's true, sometimes they were a bit long. Then you had to learn more sentence than just the bit related to the word.
133. F: As I said before, I used book titles. Then I knew, ah, you've seen that before as a book title. One example we had was "confidential" and somebody in the course kept calling out "Eddy Confidential"! (?)

134. F: That was me.

135. J: Have you ever explained or mentioned the method to anybody else?

136. F: I tested it on my brother because he always had extreme problems with learning things by heart. And by his standards he made some progress. I also explained it to a friend learning for an exam, but she did it with medical terms and didn't get on at all well, went back to learning it all doggedly off by heart.

137. J: Did you tell anyone?

138. F: No.

139. J: You know that I think this method is good, otherwise I wouldn't have taught it. Have you got any arguments against it? Where you would say, no, I don't like that.

140. F: I don't think it is the ultimate vocabulary learning method because I know some people who have got extremely mathematical brains and they need a left-right set up and then they can remember everything. But probably about 70% of people are more at home with pictures. That's why I did the course, too. I told them all about it, even wrote down a page of examples for them, but I also said that if they noticed it wasn't for them and that they didn't like it, then on no account should they force themselves to adopt this method. Instead they should keep to what they like best.

141. J: What were their reactions?

142. F: Some of them did change over. Because they said they could remember things better.

143. J: In other words, the method is good, but not for everybody?

144. F: Yes, that's right.

145. J: But quite apart from all that, what did you like best about the method? Did it - I'm just interested - did it get you to sit down and learn more? Did it alter your motivation levels?

146. F: That's just it, that's the important thing about it. I think it would be more important to bring across that people should use it themselves. I put together my box of cards, and just thinking up all the sentences and writing them down – I did it a bit differently, put the new word at the top, wrote the German sentence containing the part of the word underneath, highlighted the word in bright yellow and then turned the card around and wrote the German translation – and just by preparing the cards I was learning most of it already.

147. J: And what did you do? Did you just read what I gave you, or did you do something with it?

148. F: First I read the sentence that you gave me, and then when I was reading it the second time – I always read everything several times because it goes in better that way – if then I thought I would never be able to remember it, I made up my own sentence. But when I thought I could get along with yours, then I left it.

149. J: But when you say you made up your own sentence, was it the same kind of thing, with a memory aid?

150. F: Yes, or I took a sentence from a book I was reading at the time, or an article, and then translated it. Then it made sense to me. Like that word “peculiar”. I couldn’t get my head round that one at all, and then I read it in ‘Harry Potter’ and it suddenly made sense.

151. J: OK. Any more comments?

152. F: I think it should begin earlier, and not like now when we are well over 20. Maybe it could be taught to children starting primary school, no, that’s not so good, then children starting secondary school. The first time that I heard about it I was just finishing my apprenticeship exams, and then I thought I had survived 20 years without it and wasn’t about to change now, so close to my exams, what did people expect of me? Then it’s a bit difficult. ???

153. J: Last question. You have been in lots of courses in different schools. If you were to start all over again, would you say it would be a better way to learn? It would be possible to take it further, not only for languages but in subjects like Maths, Biology, Geography or whatever.

154. F: I think so, yes. Sometimes it would be good, but other times not because everyone has their own learning pattern. Some people get on better when they’ve got a text and say I am going to learn it word for word, off by heart, I don’t need to know what it means, it is more important to know it all by heart. Some learn like that, and others who want to understand what it means, for them this method is better.

155. J: Really last question: Would it be correct to say that it is a wonderful method but there are others too, and in some situations it is better to do things differently?

156. F: I think it’s good for languages, but I have often drawn diagrams, for example, and have worked with arrows and the like because there are often systems behind these things, in Biology for example. There you can draw the

system, and then you have arrows leading up to it. That is not really possible with this method, and that is why I would always say for languages it’s excellent, I would always recommend it and have already done so, but for those other things I would be a bit sceptical. Wherever I had to learn words off by heart, then yes, definitely, but where there is a system behind the concept, I would do it differently.

157. J. Thank you both very much.

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