1.0 Introduction

The acquisition of new vocabulary in an L2 is considered by many to be one of the cornerstones of learning a foreign language, and has long been a major focus of learner and teacher alike. Vocabulary knowledge is seen as so essential that it has been described as a prerequisite for successful communication (Nation, 2001), and that communicative success is achieved more effectively by learners with a more expansive general vocabulary than by those with a smaller, but more controlled, vocabulary (Meara & Fitzpatrick, 2000). One challenge faced by teachers of low-level learners then, is how to effectively equip their students with a broader vocabulary given the limitations imposed by classroom settings and time constraints. The present paper will consider this issue from the vantage point of certain insights into memory from cognitive psychology, including the phonological/articulatory loop (Baddeley, 1997; Cowan, 2000; Ellis & Beaton, 1993; Ericsson & Kintsch, 1994; Gupta & MacWhinney, 1997; Henriksen, 1999; Hulstijn, 2001; Segler, 2002), the pedagogical implications of the Lexical Approach (Lewis, 1993; Nattinger & DeCarrico, 1992; Schmitt, 2000), and the use of imagery to aid in the forming of associations and processing depth (Mohseni-Far, 2008; Nikolova, 2002; Papagno & Vallar, 1992; Schmitt, 2000). Finally, a suggestion is made for one practical method that teachers can take advantage of in applying the above research to their everyday practices.
2.0 Literature Review

2.1 Human memory formation

The acquisition and retention of a new language is largely a question of memory formation. As such, knowledge of the physical processes involved in memory formation, particularly those leading to the formation of long-term memories, can be beneficial to the language teacher. In this regard, recent findings from research done in experimental psychology are especially pertinent. When a piece of information is encountered and engaged, be it linguistic or otherwise, the brain first stores it in the working memory, which is thought to contain three primary components: “...a visuo-spatial short-term memory, a verbal short-term memory, and a central executive, which controls the flow of information to and from the other components” (Gupta & MacWhinney, 1997, p. 270). If the piece of information in question is completely new it will fail to activate the central executive (a neural mode, or mass of differentiated tissue, referred to as a ‘chunk node’); this in turn will lead to the brain creating a new ‘chunk node’ that releases an associated context signal. The connection between the context signal and new piece of information is initially very fragile, however, remaining activated for only two to thirty seconds, after which time it is subject to decay if not reactivated by an additional stimulus or thought process (Cowan, 2000). One of the simpler ways to achieve this reactivation is through repetition of the material, a method that has enjoyed widespread and longstanding support throughout the literature (Bahrick, Bahrick, Bahrick & Bahrick, 1993; Cowan, 2000; Ellis & Beaton, 1993; Ericsson & Kintsch, 1994; Gupta & MacWhinney, 1997; Henriksen, 1999; Knowles, 2008; Lewis, 1993; Mohensi-Far, 2008a, 2008b; Nakata, 2008; Nation, 2001, 2002; Papagno & Vallar, 1992; Schmitt, 2000; Segler, 2002; Wei, 2007; Weil, 2008). In addition to strengthening the specific relationship between the new piece of information and its context signal, such repetition also helps to secure the context signal into the wider neural network (Henriksen, 1999). Once complete, this process leads to information being stored in the long-term
memory. An intermediary state, termed the 'long–term working memory', has also been suggested by Ericsson and Kintsch, who state that, “Information in LT–WM [long–term working memory] is stored in stable form, but reliable access to it may be maintained only temporarily by means of retrieval cues in ST–WM [short–term working memory].” (Ericsson & Kintsch, 1994, p. 3) Much more research in this area is needed, but the broader lesson that can be drawn in relation to foreign language learning is the need for multiple exposures and repetitious interactions with the target material.

### 2.2 The Phonological/Articulatory Loop

Another area of primary concern to memory as it relates to language learning is known as the Phonological or Articulatory Loop. Research done in experimental psychology has shown that, “...overt repetition—i.e. re-cycling material through the phonological loop component of short–term memory lead[s] to...better long–term representations” (Ellis & Beaton, 1993, p. 553; see also Papagno & Vallar, 1992). In practical terms, the application of this loop would entail using rote repetition (whose best effects can be seen when students actually say the words aloud (Ellis & Beaton, 1993)) to promote the strengthening of the connection that is being developed between the newly created ‘chunk node’s' specific context signal and the vocabulary item’s form. The use of repetition in this way is further supported by the many studies that promote the benefits of multiple exposures to any given item (Bahrick, Bahrick, Bahrick & Bahrick, 1993; Cowan, 2000; Ellis & Beaton, 1993; Ericsson & Kintsch, 1994; Gupta & MacWhinney, 1997; Henriksen, 1999; Knowles, 2008; Lewis, 1993; Mohensi–Far, 2008a, 2008b; Nakata, 2008; Nation, 2001, 2002; Papagno & Vallar, 1992; Schmitt, 2000; Segler, 2002; Wei, 2007; Weil, 2008). Gupta and MacWhinney (1997) expanded on this to show that the same kind of rehearsal could be applied to multiple chunks of information with equal benefits. There therefore seems to be convincing reason to employ repetition in the classroom on at least some level when learning new vocabulary items. One potential flaw to this approach is that
of student boredom. A potential negative side effect of such boredom, if it occurred, could be that some students simply fail to repeat the items with their peers; but in this case the multiple exposures could nevertheless lead to some form of passive learning, an area of vocabulary which other research has shown could potentially be much more exploited than it has been (Laufer, 1998). Moreover, verbal repetition of an item has also been shown elsewhere to have positive results with both acquisition and retention (Baddeley, 1997; Cowan, 2000; Ellis, 1995; Ellis & Beaton, 1993; Gupta and MacWhinney, 1997; Hulstijn, 2001; Segler, 2002). In summary, the application of rote repetition to stimulate the phonological loop and thus strengthen the nascent ‘chunk nodes’, and later ‘cortical columns’, does indeed seem to be justified. A caution here, though, is given by Papagno and Vallar (1992), whose research suggests that phonologically similar words will tend to interfere with one another and therefore have detrimental effects on the learning of both. This has been echoed by Nation (2001) and Schmitt (2000) regarding vocabulary items of similar or directly opposite meaning.

2.3 The Keyword Method and other uses of imagery

Another practice often promoted in the study of vocabulary learning is termed the Keyword Method (or sometimes, Keyword Technique). This method is said to involve deep mental processing, and therefore to better facilitate learning (Schmitt, 2000). In this, the learner first finds a phonologically similar word in the learner’s L1 to the item desired to be remembered, for example the English word yam to help remember the Japanese yama (mountain). The learner then mentally combines the images, for instance, of a large mountain topped by a fresh yam. When the learner again hears the word yama, they are reminded of the image that they created for themselves and also its meaning of ‘mountain’ (Nation, 2001; Schmitt, 2000). This, and similar ways of providing oneself with a meaningful association (whether through imagery or semantic linking), offers learners a way to reach back to the word they are trying to learn, and are thus thought to aid in long-term retention
(Mohseni–Far, 2008). Some concerns about this technique, however, do remain. For one, research has not shown that it can be applied equally well to lexical chunks as it can to single words (and even in that case the Keyword Method has been criticized as only applicable to concrete nouns, and rarely to abstract ones (Segler, 2002)). Additionally, it may not always be possible for students to find a phonologically similar word in their L1 to match the L2 word that they want to learn. Moreover, some concerns of imageability and parts of speech also remain. Ellis and Beaton (1993), in a study of forty–seven psychology major undergraduates learning German, found that, “...the effectiveness of the keyword method depends upon the part of speech and/or the imageability of the keyword and, further that part of speech, and/or imageability, of the foreign word to be learned influences recall performance” (Ellis & Beaton, 1993, p. 554). Indeed, it is hard to imagine a student coming up with an appropriate keyword image for many purely grammatical items, and the issue regarding parts of speech also echoes earlier misgivings about using the technique with lexical chunks. Therefore, although the keyword method has been shown to be effective for learning individual words, it may not be able to be universally applied with full confidence.

While the keyword method has its limitations, the use of imagery as a means of providing meaningful association, and therefore deeper mental processing to strengthen learning (Mohseni–Far, 2008; Papagno & Vallar, 1992; Schmitt, 2000), is an important one and is borne out in much research. In a review of a study comparing two types of vocabulary item annotations, verbal only and verbal with visual information, the annotations with a visual element were found more helpful than those with only a verbal element (Son, 2001). Similarly, Yoshii and Flaitz (2002), in a study of 151 adult ESL learners, found that the group that studied vocabulary with a combination of text and picture annotations (as compared to text only and picture only) consistently outperformed the other two groups in both immediate and delayed testing. Other research has stated even more conclusively that, “...vocabulary acquisition is enhanced if the verbal information is accompanied by pictorial
information” (Nikolova, 2002, p. 103), which seems natural given the working model of memory described by Gupta and MacWhinney (1997, see above). Moreover, other data suggests that students move from a formal to a semantic knowledge of L2 words (McNeill, 1996), and as such classroom exercises and other activities might be more helpful if they focused on meaning, an element that image-based representations can assist in providing (Nation, 2002).

2.4 The Lexical Approach

Despite having first been widely publicized as far back as 1992, the Lexical Approach is still only making inroads into many language classrooms. In essence, this approach involves learning vocabulary in groups of regularly co-occurring words, or lexical phrases. In the seminal work on the subject, Nattinger and DeCarrico (1992) define lexical phrases as being either strings of set lexical items, which cannot be altered, or as being general frames that allow some or much substitution/rearrangement of their parts. Within these two general categories are four further sub-divisions, those of: polywords, institutionalized expressions, phrasal constraints, and sentence builders. In a similarly influential work, Lewis (1993) defines lexical items as, ‘socially sanctioned independent units’, and goes on to state that, “Many are words, but many consist of multi-word units.” (Lewis, 1993, p. 90) He also further sub-categorizes lexical items as consisting of: words, multi-word items (sometimes referred to as multi-word units, or MWUs), polywords, collocations, and institutionalized expressions.

However the term is defined and categorized, the research shows a very strong basis for the notion that bits of language often come together, and that it is this togetherness that allows speakers to quickly organize their thoughts and express themselves with a remarkably high degree of automatization (Boers, 2000; Knowles, 2008; Lewis, 1993; Nation, 2001; Nattinger & DeCarrico, 1992; Schmitt, 2000; Wible, Kuo, Chen, Tsao & Hung, 2006). The main reason credited for this degree of automatization allowed by lexical items is
that in whatever form they occur they represent conventionalized and highly frequent forms of language, and since they are remembered wholesale by both speaker and hearer they spare both sides a great deal of processing burden (Nattinger & DeCarrico, 1992). Moreover, since many lexical items actually contain slots that are subject to change (such as: see you later/tomorrow/next Tuesday), they also have the advantage of fluency, an aspect that language learners especially can benefit from. Nattinger and DeCarrico (1992) point out that naturally occurring lexical phrase use is common among children learning both their L1 and/or L2; based on these advantages, both Lewis (1993) and Nattinger and DeCarrico (1992) stress the need for L2 learners to be equipped with prefabricated language that they can employ and/or substitute within the chunk’s allotted slots as a first stepping-stone towards fluency and communicative competence. Nattinger and DeCarrico even state that, “Many earlier researchers thought these prefabricated chunks were distinct and somewhat peripheral to the main body of language, but more recent research puts this formulaic speech at the very centre of language acquisition and sees it as basic to the creative rule–forming processes which follow.” (Nattinger & DeCarrico, 1992, Preface p. xv) Supporting this, Wible et al found that, “…users store and retrieve chunks as single multiword units rather than by rule–governed composition in real time” (Wible, Kuo, Chen, Tsao & Hung, 2006, p. 869). If these advantages of lowered processing burden and fluency hold out to be valid, and the current research strongly indicates that they will, then teaching methods and activities based on these ideas should be given greater consideration.

3.0 Making picture-based vocabulary cards

Based on the research discussed, one practical method for implementing these ideas in a way that can help students acquire and retain new vocabulary will be detailed below. In this method, students are asked to create picture-based vocabulary cards that demonstrate the meaning of the word or words to be studied. To begin with, a list of the items to be focused on is distributed to
the students. Whenever possible, the items chosen should come from the course textbook to juxtapose smoothly with the curriculum, and should also be in line with the principles of the Lexical Approach. See the attached Appendix A for sample vocabulary lists used by the author in the 2011–2012 academic year (taken from the course textbook: *Fifty–Fifty: A speaking and listening course, Book One*, W. Wilson and R. Barnard, 2007, Hong Kong: Pearson Longman). L1 equivalents of each item are explained by the instructor, and any issues of misunderstanding or confusion dealt with. Once all the students have understood the meaning of each vocabulary item (in terms of L1 equivalence; this is in keeping with Nation’s recommendations on teaching vocabulary (Nation, 2002)), an A4-sized blank sheet of paper is then distributed to each student. These blank sheets are to be folded into the necessary number of squares to match the items to be studied. For example, in the author’s classes the items to be studied were divided into sets of ten, the A4 paper was therefore folded in half four times to make sixteen squares of equal shape (with the extra six squares being used as reserves). Students are then instructed to create an image for each vocabulary item that they think best represents the meaning of that item; the level of complexity of each picture is left entirely up to the students themselves, what is important here are the meaningful associations they are creating that will aid in acquisition (Mohseni–Far, 2008; Papagno & Vallar, 1992; Schmitt, 2000). There are likely further benefits to processing to be gained by having the students write the L2 meaning (and even L1 equivalent) on the back of the cards, but this would hinder use of the cards during classtime (see below), and would also prohibit the use of the cards as memory aids during any vocabulary testing the teacher may wish to employ. (Since associations will have been formed between the images each student created and the target language some teachers may wish to let students make use of their own cards during testing periods.) It is therefore the author’s recommendation that the pictures created for each item, and the pictures alone, are put on the cards (see Appendix B for some student-produced examples of the cards described).
4.0 Using the picture-based vocabulary cards

There are many different ways for students to make use of such a set of vocabulary cards once produced, and how each instructor chooses to structure an activity around them will naturally vary widely as well. In the author's own classes, both the “Memory” and “Go Fish” games have been employed extensively. In both cases students have been required to say aloud the vocabulary item represented on each card with each turn, and further required to produce an original sentence using the item when a pair was made (also stating it out loud), in accordance with the Phonological/Articulatory Loop and image association research (Baddeley, 1997; Cowan, 2000; Ellis, 1995; Ellis & Beaton, 1993; Gupta and MacWhinney, 1997; Hulstijn, 2001; Mohseni-Far, 2008; Nikolova, 2002; Papagno & Vallar, 1992; Schmitt, 2000; Segler, 2002). Students have also been allowed to consult their vocabulary lists while playing the games to further deepen their association-building/processing of the material and help cement the acquisition taking place (Mohseni-Far, 2008; Nation, 2001; Papagno & Vallar, 1992; Schmitt, 2000). In the case of the “Memory” game, students split into groups of three or four, shuffle all of their cards together, and place them face down onto a table or desk(s). The students then take turns turning over two cards and stating the represented vocabulary item or an original sentence if a pair is made. This continues until all of the cards have been matched (or until only a single set remains in the case of a group of three students). For the “Go Fish” game, students again make groups of three or four and shuffle all of their cards together. One student then deals out five cards to each group member and the remaining cards are placed in the middle of the table (or desk(s)). On his or her turn a student asks another of their group members, “[Person’s name], do you have [vocabulary item]?” If the student asked has that card then they reply in the affirmative and pass it to the first student, who then discards and makes a sentence using the item. If the student asked does not have that card then they reply in the negative and the first student takes the top card from the
stack of cards in the center of the table (or desk(s)). Once a single student has discarded all of their cards the game is finished. The repetitive nature of both games aids in memory formation while still maintaining an atmosphere of fun. Activities like those described here could be used as timed warm-ups, as review sessions prior to a vocabulary test, as a regular study method, etcetera.

5.0 Conclusion

Vocabulary acquisition and retention does not have to consist solely of study done outside the classroom, and teachers can take advantage of the time they have with students in this area by creating opportunities for network building (Henriksen, 1999). This can be encouraged by embedding words in meaningful context, such as the use of images to enhance verbal information (Chun & Payne, 2004; Nikolova, 2002), providing creative outlets such as student–authored materials (Nikolova, 2002), and testing based on productive vocabulary use (Meara & Fitzpatrick, 2000). An extensive vocabulary has long been seen as a sign of general intelligence (Anderson & Freebody, 1979) and an enabler of communicative ability (Meara & Fitzpatrick, 2000), and the achieving of one does not have to be a painful experience. The present paper suggests the use of picture–based vocabulary cards and some games using them as ways instructors can help their students improve their vocabularies by effective and enjoyable means.

References

Using vocabulary picture cards with low-level learners


Using vocabulary picture cards with low-level learners


**Appendix A: Sample vocabulary study lists**

1. go out of town
2. know how to ~
3. eat dinner in the evening
4. take the train to school
5. it's in the top drawer
6. live near ~ station
7. can't stand ~
8. go to the movies
9. take a trip overseas
10. get a haircut

1. play the piano
2. have lunch at a café
3. watch TV alone
4. listen to music on the way to ~
5. in the middle of the block
6. cost a fortune
7. go clothes shopping at the mall
8. read in bed at night
9. go out with friends
10. ride a skateboard
Appendix B: Student-produced vocabulary cards