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Introduction: Deconstructing Vocabulary Knowledge

James Milton and Tess Fitzpatrick

Introduction

The study of words and word knowledge has a very long history. For hundreds of years the ancient Greeks and Romans struggled to understand the functions of words and their relationship with meaning. It proved difficult for ancient scholars even to divide words meaningfully into different functional classes. Two thousand years later we are still wrestling with words and most recently we have been puzzling over the nature of word knowledge, and how and where this knowledge is stored. Knowing a word is an elusive concept and we are still unable to capture, in a simple description, everything that knowing a word might involve. Word knowledge, it seems, is complicated and it is hard to capture all of its many facets in a simple yet comprehensive definition.

Because word knowledge is complex and difficult, the descriptions we use often take different approaches in attempts to characterize the idea. One approach, a component approach, attempts to list the different aspects of knowing a word or, often, describes contrasts between different aspects of knowing a word. A second approach, a developmental approach, tries to characterize the parts of word knowledge that learners acquire at different stages of learning. A third approach might be described as a metaphorical approach. Word knowledge cannot be seen or touched or even measured very readily and sometimes it can be more usefully characterized by metaphors, such as describing word knowledge as a ‘web’ of words (Aitchison, 1987, p. 84). Just like the ancient Greeks’ classifications of word types, these attempts at description have grown over time to reflect the multi-faceted nature of word knowledge and in many ways these descriptions are still far from perfect.

Component approaches to word knowledge

Spoken form, written form and meaning

One of the earliest attempts to characterize word knowledge is the distinction made by Aristotle in the fourth century BC. Like other Greek philosophers
he was concerned with clarifying the relationship between thought, usually articulated in words, and the reality the thought and words represent. In his *De Interpretatione*, Aristotle described four fundamental components:

- real world things,
- impressions (perhaps the idea or concept of those things),
- spoken signs, and
- written signs.

Knowing a word, then, can involve knowing both its spoken form and its written form. While the teaching of modern languages routinely distinguishes between the skills of reading and writing, and those of listening and speaking, in the study of vocabulary knowledge this distinction is often overlooked. Studies presume that if learners know one form of a word they will also know the other form. But even in modern and more literate times than those of ancient Greece, it can be hard to know both word forms equally. When a foreign language involves a different orthography, it can be very hard to learn to recognize words in writing. Western European travellers to China, for example, may be unnerved by the experience when the signs they are surrounded by in airports or elsewhere are completely incomprehensible. Across Europe, on the other hand, where the Roman alphabet is mostly used, such signs continue to convey some sort of information, and can be sounded out for example, even if the meaning is not always completely clear.

Aristotle’s four fundamental components also introduce a distinction that has a very modern sound. He recognizes that there is a distinction to be made between the form of a word and the meaning or concept it represents. It is the kind of distinction made by Saussure (1916) who draws a distinction between *signifiant* and *signifié*, where *signifiant* is the thing that signifies or the sound image, and *signifié* is the thing being signified. The idea that language is a representation of reality, and not part of that reality, is an idea that has been at the root of linguistic debate for centuries.

**Receptive and productive word knowledge**

While there is a wealth of linguistic thought and description in Western Europe between the ancient times and the twentieth century, Aristotle’s idea of a written form, a spoken form and a meaning underlying them, was not systematically advanced on. For much of this period Aristotle’s opinions were taken, like the Bible, as reflecting an absolute truth. However, with the growth of modern linguistics fresh ideas emerged. In 1921 Palmer makes the distinction between being able to recognize a word when it is encountered with the support of other words for context, and being able to use it in speech or writing, which involves being able to call the word to mind spontaneously for production. This distinguishes, therefore, between *receptive* and *productive*
knowledge, also sometimes called passive and active vocabulary knowledge. The significance of this for Palmer was that it pointed to the need to administer different vocabulary tests to learners to try to characterize their vocabulary knowledge fully and accurately. This has proved to be a useful and enduring distinction which we still commonly make today, and the call for multiple tests to adequately understand a learner’s vocabulary competence is still being repeated (for example, Nation, 2007; Richards and Malvern, 2007).

It will be appreciated that this idea overlays Aristotle’s distinctions and that both the spoken and written forms of a word may be known receptively or productively.

This is not the only new set of qualities which emerged at this time. In 1917 Palmer commented that the term ‘word’ is vague and might include very frequent collocations and phrases like in spite of and as a matter of fact (Palmer, 1917, p. 40). He also comments that a word might include functional units like affixes such as -ly and -ment at the end of words and multi- and poly- at the beginning. His terminology, polylogs for collocations for example, and miologs for morphological affixes, failed to catch on, however.

A simple three-part model of word knowledge has now expanded to include a variety of other potential factors. From this point onwards it becomes logical to attempt to systematically list all of these possible qualities which might be included in a definition of word knowledge.

Lists of word knowledge

The earliest modern list of word knowledge components is probably by Cronbach (1942). In this paper he distinguishes between:

- generalization
- application
- breadth of meaning
- precision of meaning
- availability.

Knowledge of the form of the word has disappeared in this analysis, and Palmer’s ideas of an appreciation of how words can combine is implied rather than clearly stated. Nonetheless, a consideration of polysemy has emerged, that a word form may carry several different meanings or uses. At the general level, therefore, generalization refers to the word’s definition, and application to using it appropriately. Breadth of meaning refers to an appreciation that the word may have several different meanings, and precision of meaning being able to use them correctly in different situations. The receptive and productive distinction is preserved, however, since availability refers to productive use.
Richards (1976) expanded this list further and suggested eight assumptions which could be made about vocabulary knowledge:

1. The native speaker of a language continues to expand his vocabulary in adulthood, whereas there is comparatively little development of syntax in adult life.
2. Knowing a word means knowing the degree of probability of encountering that word in speech or print. For many words, we also know the sort of words most likely to be found associated with the word.
3. Knowing a word implies knowing the limitations imposed on the use of the word according to variations of function and situation.
4. Knowing a word means knowing the syntactic behaviour associated with the word.
5. Knowing a word entails knowledge of the underlying form of a word and the derivatives that can be made from it.
6. Knowing a word entails knowledge of the network of associations between that word and the other words in the language [sic].
7. Knowing a word means knowing the semantic value of a word.
8. Knowing a word means knowing many of the different meanings associated with a word. (Richards, 1976, p. 83)

Many of these assumptions are repetitions of earlier ideas. Knowing a word involves knowing the meaning of a word (number 7 in the list), or several meanings (number 8), and its restrictions on use (numbers 2 and 3). Number 2 on the list implies recognition of both spoken and written forms. Other assumptions expand still further the idea of word knowledge to include knowledge of a word’s associations (number 6), its derived forms (number 5), its collocations (number 4) and the subtleties of connotation and meaning the word might carry (number 8). It also includes assumptions which might seem out of place in a component analysis, such as the idea that native speakers can continually expand their vocabulary while other aspects of language are relatively fixed and unchanging in adult life. As a list it continues the process of refining and adding detail to the idea of word knowledge, but it is a relatively unorganized list.

Nation (2001) produces the latest and, to date, most comprehensive version of this type of analysis. He adds further to the list of word knowledge components and codifies this knowledge under three broad headings: knowledge of form, knowledge of meaning and knowledge of use. This is tabulated and shown in Table 1.1.

This table includes knowledge of spoken and written forms and also, within the form category, knowledge of the inflected and derived forms of words which allow speakers to add to the meaning or function of a word. The meaning category now includes not merely the simple idea that a word has a meaning, but includes the connotations and associations which words can carry with them and which a learner will need to know if the word is to be used
appropriately. Finally, the use category defines the places in which words can be used and the company they are likely to keep. If a word is a noun, for example, then it will commonly be preceded by an article, if it is a pronoun then it is likely to be followed by a verb. Some words like to associate closely

| Form          | Spoken |  | R | What does the word sound like? |  | P | How is the word pronounced? |
|---------------|--------|  |   |                               |  |   |                             |
|               | Written|  | R | What does the word look like?  |  | P | How is the word written and spelled? |
|               | Word parts |  | R | What parts are recognizable in this word? |  | P | What words parts are needed to express the meaning? |
| Meaning       | Form and meaning |  | R | What meaning does this word form signal? |  | P | What word form can be used to express this meaning? |
|               | Concepts and Referents |  | R | What is included in the concept? |  | P | What items can the concept refer to? |
|               | Associations |  | R | What other words does this word make us think of? |  | P | What other words could we use instead of this one? |
| Use           | Grammatical functions |  | R | In what patterns does the word occur? |  | P | In what patterns must we use this word? |
|               | Collocations |  | R | What words or types of words occur with this one? |  | P | What words or types of words must we use with this one? |
|               | Constraints on use |  | R | Where, when and how often would we expect to meet this word? |  | P | Where, when and how often can we use this word? |

Note: R = receptive, P = productive.
together while others do not; Red Sea and Yellow Sea are geographical entities and commonly co-occur, we often speak of a blue sea or a turquoise sea (in places sunnier than Swansea), but purple sea or pink sea occur much less frequently together. Still other words are restricted in the places and occasions they are likely to be used. Swear words and taboo words are good examples of this. Swear words are much more likely to be heard on the football terraces than found in the pages of a textbook like this one. At each division, knowledge continues to be sub-divided into productive and receptive knowledge producing a list of 18 different aspects of word knowledge.

It will be appreciated that this has now become quite a considerable taxonomy. It becomes difficult at this level of complexity to operationalize the list and to devise ways to adequately capture a learner’s knowledge across the whole range of qualities. The prospect of a learner taking 18 separate tests to try to achieve this is quite unthinkable. It is not clear from this list either to what degree these separate elements interlink with each other. Do they function entirely separately or does a growth in one element, say an increasing number of spoken word forms, give rise to similar growth in other elements – for example, how often these words can be used? Alongside this growing list of the many and varied qualities that make up word knowledge, therefore, is a process to simplify the model and to reduce it to a smaller number of dimensions which can usefully characterize a learner’s word knowledge.

**Dimensions of knowledge**

Anderson and Freebody (1981) appear to have initiated the idea that there may be a smaller number of broad categories of word knowledge when they introduced a further dimension by contrasting breadth of word knowledge and depth of word knowledge. The distinction appears simple. Breadth of knowledge is the number of words a learner knows and depth of knowledge is what the learner knows about these words. This is potentially useful in that it allows a distinction to be made between learners who may have learned lots of words, perhaps through the rote learning of translation lists, but cannot use them idiomatically or appropriately, and learners who have also learned how the words they know associate with other words or the nuances of meaning they carry. It is not entirely clear how these terms map onto Nation’s (or anyone else’s) list of the many aspects of word knowledge. It appears that word breadth includes a knowledge of word form, whether spoken or written. But does it also include a knowledge of word parts, the inflections and derivations which allow new words to be created and words to change to reflect their grammatical function? Nation categorizes these as part of knowledge of form, but this aspect of knowledge could equally well be placed in the depth dimension. Questions might also be raised about the link between form and meaning in Nation’s table. Does breadth require the purely receptive ability to recognize that a word exists in a foreign language or does it also require some knowledge of the meaning that is attached
to the form once it is known? Or, yet again, does depth of knowledge include having a translation or appreciation of the semantic qualities of the word as part of this overall idea of things a learner knows about a word? This quality of word knowledge might equally well be included in either the breadth or depth dimensions and there is no hard and fast rule to say which of these alternatives is best.

In practice, it seems that researchers choose the definition which suits them best and this is often dictated by the availability of the testing instruments they have to hand. Checklist tests such as X-Lex (Meara and Milton, 2003) attempt to test passive word recognition, while Nation’s Vocabulary Levels Test (VLT) (to be found in Nation, 2001) requires the learner to link a word with a possible meaning. Both tests are considered tests of lexical breadth but it seems likely that they will produce quantitatively different estimates of vocabulary size given the different constructs which underlie the tests.

The idea of dimensions of lexical competence, such as depth, also implies that there is some link between the elements that make up this competence, although it is often not clear how this should happen. How should a learner’s knowledge of fixed idioms, for example, develop in relation to their knowledge of, say, collocations? Are they separate entities which can develop in isolation from each other or are they connected in some way so that a change in the knowledge state of one will influence the knowledge state of the other? Most researchers treat each element of the aspects that make up depth separately and test only one or two of the qualities. Meara (1997) has argued, however, that all of these elements in the depth dimension are meaningfully connected by the notion that they relate to the links between words. The links may be descriptively separable, there are collocational links, grammatical links and associational links, for example, but they are all still links. The development of a learner’s lexical depth involves increasing the number of links between the words in the lexicon. There is an implied connection with lexical breadth here, since any increase in the number of words a learner knows will also increase the possible number of links between words. A few words can generate only a handful of connections, but thousands of lexical items can, potentially, be linked in millions of different combinations.

Meara (1996a) also extends the number of dimensions suggested by Anderson and Freebody and contrasts breadth and depth dimensions with the ease with which a word can be accessed. Daller et al. (2007) call this third dimension a fluency of knowledge dimension. This three-dimensional framework makes it possible to distinguish between learners who know lots of words and lots about them but struggle to use them (declarative knowledge), and learners who can quickly and naturally activate this knowledge for communication (procedural knowledge). Essentially, this is to reintroduce the receptive and productive distinction back into word knowledge analyses, but the idea of a theoretical three-dimensional lexical space, within which a learner’s knowledge can be categorized, appears an attractive one, though it has yet to be successfully operationalized.
Developmental approaches to word knowledge

It might be expected that developmental approaches to word knowledge would draw heavily on component or dimensions approaches. Some of the components of word knowledge appear, very obviously, to precede others. Knowledge of form ought to precede knowledge of collocation or association, for example. It is almost inconceivable that a learner could systematically link together words which are not even recognized as words. The relationship between vocabulary breadth and depth also appears to be one where breadth must develop before the dimension of depth can emerge, since, as has already been pointed out, the possibility of a dense matrix of links between words can only exist once many words have been acquired. It has also been suggested that receptive and productive knowledge are stages of development, or points at either end of a continuum of development, as well as qualitatively different aspects of word knowledge (Melka, 1997).

Although component and developmental approaches are clearly related, they are often described in very different terms. However, it is possible to infer how developmental stages relate to the componential aspects of knowledge in frameworks such as Nation’s. Dale (1965), for example, suggests a four-stage developmental model where learners place test words into one of four categories.

Stage 1: I never saw the word before
Stage 2: I’ve heard the word but I don’t know what it means
Stage 3: I recognize the word in context, it has something to do with _____
Stage 4: I know the word

This model implies recognition of form as a requirement of the development of other aspects of word knowledge, including the link to meaning. If it could be demonstrated empirically that learners really do move through these stages sequentially then this might help make sense of the breadth and depth dimensions and where to draw the line between them. Breadth might be viewed as the number of words that can be recognized, and depth as the degree to which the form can be linked to meaning in all its many aspects.

Paribakht and Wesche (1993) propose something similar in the Vocabulary Knowledge Scale (VKS). This hierarchical model of learning has five stages.

Stage 1: The word is not familiar at all
Stage 2: The word is familiar but the meaning is not known
Stage 3: A correct synonym or translation is given
Stage 4: The word is used with semantic appropriateness in a sentence
Stage 5: The word is used with semantic appropriateness and grammatical accuracy

Paribakht and Wesche (1993, p. 180)

This model appears to add stages beyond the recognition of form and the link to meaning, and suggests that knowledge of word use, and appreciation of the
semantic appropriateness of words and their grammatical functions, emerge late. It implies that Nation’s 2001 table is almost a developmental sequence as well as a component list: knowledge of form precedes knowledge of meaning, which precedes knowledge of use. The VKS has been quite widely used, for example in Horst and Meara (1999) and Milton (2008), but practical difficulties emerge. As Wolter points out (2005), its mechanism for testing knowledge beyond recognition of meaning is scarcely robust. The VKS is a self-reporting scale and is not intended to be too rigorous a testing instrument, but the effect is that reaching the highest points on the scale is undemanding. Producing a convincing sentence demonstrating the correct use of a word can often be done even in the absence of an understanding of its meaning. The five-point scale, in practice, often collapses down to two points; learners either feel they do not recognize the word, or they recognize it, think they know the meaning, and think they can use it.

In comparison to the detail included in the component approach to word knowledge, these developmental approaches appear unsophisticated and, as yet, are unable to specify with any level of certainty how or when the various elements of word knowledge are acquired. The testing mechanisms – self-reporting scales, for example – are also not as robust as many of the tests we have for assessing awareness of different aspects of vocabulary knowledge.

**Metaphorical approaches to word knowledge**

Several metaphors for word knowledge have already been used in this chapter; indeed, it is often difficult to describe the abstract nature of some aspects of word knowledge without the use of metaphor. One of these metaphors is that of the *lexical space* (Daller et al., 2007) comprising dimensions of breadth, depth and fluency. Daller *et al.* even draw this up (Figure 1.1) as a cubic space,
which implies that each dimension can function and develop independently of the others.

The attraction of such a space metaphor is that it allows learners with different kinds of vocabulary knowledge to be systematically distinguished and positioned separately within the space. Learners who have learned lots of words through word lists but have little ability to call them to mind and use them correctly can be clearly distinguished from learners who may know fewer words but who can use these quickly and appropriately. These are not abstract differences; English as a foreign language (EFL) practitioners will be very familiar with non-native English-speaking students who exhibit these kinds of difference. Japanese students, for example, often appear to have large recognition vocabularies and typically communicate well in writing, but function poorly in oral communication where this vocabulary has to be processed and activated quickly. By contrast, Arabic-speaking students often possess much less English vocabulary but nonetheless present themselves fluently in speech. Of course, there is no real lexical space, but even at a metaphorical level it seems that the idea needs to be amended since the dimensions cannot operate entirely independently. It seems impossible to have great depth of vocabulary knowledge when only a few words are available to communicate with, but the relationship between breadth and depth, which will govern the shape of the lexical space, has yet to be convincingly characterized.

A further metaphor, that of a web of words, is often used to describe the depth axis and the way the words interact with each other. The idea of a web has emerged because when connections are plotted with lines between words, the result is meant to look a little like a spider’s web. This is not the only way to turn these relationships between words into a useful image and Aitchison (1987, p. 84), who introduces the web idea, also uses overlapping balloons and lines, as in Figure 1.2, to show especially strong links.

There are attempts to turn this metaphor into a model of lexical depth which can be empirically tested with real language users (for example, Wilks and Meara, 2007, and Schur, 2007). Meara and Wolter (2004) have developed
a test which allows learners to draw up these webs so that a score can be assigned to them. At first sight this looks like a promising innovation, but there are problems which emerge in deciding exactly what to include in the definition of a link. At what point, for example, do collocations, which clearly should be included in this kind of test, become sufficiently infrequent to be excluded? And should word associations be included in the test or not? Many word associations, like green and grass, are conceptual rather than linguistic links and it might be thought that such links exist in all languages. A test of associational knowledge potentially tells us very little of the nature of the developing foreign language lexicon except, perhaps, its breadth and whether the words forming the link are known or not. There are clearly many details to be worked out before this kind of metaphor becomes a really useful tool for linguistic description.

Reassessing the elements of word knowledge (and the structure of the book)

The development of our understanding over the last 100 years or so has entailed breaking down the idea of word knowledge into progressively smaller and smaller areas. This has made the analysis of the subject progressively more complex but not necessarily more clear. Some of the distinctions we like to work with may be artificial in the sense that they may lack psychological reality in the minds of learners who may work with a different set of divisions. The separation of associations and collocations may be one such distinction and it is noticeable that Meara treats them as equivalents in his tests of association networks. Simultaneously, and perhaps in response to this increasing complexification, there has been an attempt to try to capture the nature of word knowledge in a much smaller number of meaningfully distinct dimensions. However, it is not precisely clear how these dimensions should work or what should be included in them.

All of these things might become clearer if we understood better the processes of the acquisition of words and the ability to use them easily, accurately and appropriately. But the developmental approaches to word knowledge description are not well advanced. The place of vocabulary in the curriculum has been downplayed for many years and even now, with a resurgence of interest in vocabulary studies, we have only a hazy idea of how words are learned within the greater process of the mastery of a foreign language.

One of the effects of progressively dividing word knowledge into smaller and smaller units is that research becomes increasingly focused in smaller and more precisely defined areas and it becomes difficult to join the areas together to gain a good impression of the bigger picture of word knowledge and its development. Thus, we have research literature on the acquisition of collocation knowledge and associational knowledge separately, but little idea of how these two areas might interact if, indeed, they do. Inevitably too, some
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areas come in for far greater attention than others. We have for example, quite a large volume of research into the growth of word recognition when the word is in written form, but almost no work which parallels this investigating the acquisition of words in their spoken form.

The subsequent chapters are an attempt to pull together and summarize work which has focused on the various different aspects of word knowledge, and to give a more detailed account of some of the most recent research in these areas. For practical purposes we have used Nation’s 2001 taxonomy as the basis of this. This allows us to highlight the way learners’ knowledge in one area might link to knowledge and development in other areas. Each chapter is dedicated to one aspect of word knowledge from Nation’s framework and, in the light of research carried out by colleagues in the Swansea Vocabulary Acquisition Research Group, we have also added a chapter on confidence in word knowledge. This is not in Nation’s list but nonetheless seems to add a further dimension to our understanding of the way words are known and used. The final chapter will draw these strands together to see if a clearer picture of word knowledge and the way it is acquired can emerge.
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