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Bilingual Lexical Representation and Its Access

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Abstract

The purpose of this paper is to explore the terminology, concepts and access to bilingual lexical representation. The core problem of linguistic cognitive structure is linguistic representation which is the reflection of individual psychology on linguistic knowledge. In terms of linguistic representation, the research and experiments on the evidence of lexical representation in modern psycholinguistic period are reviewed. Psycholinguistic studies attempt to apply elucidate language theories and model systems to operate and interpret representational data. We recognize that the use of the concept of lexical representation may contribute to the search for "psychological grammar" .Moreover, we present the original intention of studying bilingual representation and three approaches of the bilingual lexical representation: lexical meaning, direct representation of reality, functional representations. Our focuses are models of lexical access, variables that influence lexical access and appraising models of lexical access. Then we represent models of lexical access, which are influenced by variety of factors, including the frequency of a word, its phonological structure, its syntactic category, its morphological structure, the presence of semantically related words, and the existence of alternative meaning of the word. It is concluded that bilingual lexical representation access is influenced by a variety of factors.

Keywords: Bilingual; Lexicon, Representation, Access, Variables, Models

1. Introduction

1.1. Preview

Studies have shown that linguistic cognitive structure actually exists in the process of bilingual transformation. Linguistic representation is the core question of linguistic cognitive structure, which not only reflects linguistic knowledge in individual psychology, but displays one's linguistic and semantic style. Finding an appropriate way to represent the structure is the priority in bilingual cognitive research. (Rongbao, 2002) There is so much argumentation about the representation, which surrounds how the structure is connected between two languages.

Shattuck Hufnagel (2015), on the basis of speech-error evidence, proposes a scan-copy device which deals with the input to working memory, Lapointe (1985), on the evidence of certain processing disorders, has suggested a read-copy mechanism, from a structural-pattern store. Moreover, Perkell (1982) has provided a convenient framework of a processing model which works from sensory goals to motor commands. It deliberately reflects a fairly traditional approach to the issue of how a segmentally structured input, in the form of target articulations for individual segments within a sequence, may be transposed into motor commands for the implementation of an essentially continuous speech signal. Gathering evidence on the linguistic representation, especially the entity such as the lexical representation is not an easy undertaking. In terms of the nature of the system, Certain clues has been investigated to come from linguistic sources: most influential among these has been the Chomskyan approach, which, since the early 1960s, has helped to define what may be called the modern period of psycholinguistics. In the early part of this period, experimental investigations were carried out intensively on specific of language behavior that was suggested by current theories of the language system. Within this framework, it was thought possible that psycholinguistic research might permit performance data to be interpreted in such a way as to shed light on the operations of the competence system which linguistic theory attempted to model (Chomsky, 1965).

1.2 Research Trends of the Representation

Using the concept of lexical representation might profitably disengage from particular versions of current linguistic theory, in order to pursue its own objectives (e.g. Sutherland 1996): essentially, these were taken to be bound up in the search for the "mental grammar". As a cognitive entity, is to be thought of not as fixed, unitary system, but rather as a complex of elements, which might reorganize, in the face of particular task demands, in order to optimize performance in specific situations; then a natural further consideration was that, if the experimental tasks required subjects to perform in ways that were markedly different from everyday functions of language outside the psycholinguistics laboratory, their might have little bearing on ordinary sorts of language behavior.

2. Lexical Representation and Its Access

2.1. Lexical Representation

2.1.1. The Reason of Researching Bilingual Representation

A very important part of learning a new language is mastering the vocabulary of that language. While it is believed by some that the learning of sounds and structures should take precedence in second language instruction, it is none the less true that a store of content words intimately related to the environment and experiences of the learners can make practice of these sounds and structures much more interesting (Finocchiaro, 1974). In the teaching of vocabulary, words and concepts are inseparable. As Dale and O'Rourke (1971) state, "…. vocabulary development is conceptual development". The success of the student in becoming proficient in any language will depend, in part, on the extent and richness of his or her experiences and previously acquired concepts. We all know the sentences are composed of words and phrases, and that the meaning of a sentence is the product of the words (and phrases) of which it is composed. But what is a word? And do all natural languages, in fact, have words? These questions are not as easy to answer, as they might appear to be at first sight. One reason is that the term "word" is ambiguous, both in everyday usage and also as it is employed technically by linguists. Words may be considered purely as forms, whether spoken or written, or, alternatively, as composite expressions, which combine form and meaning. When we look at words (and phrases) as meaningful units we also have to deal with the fact that, on the hand, a single form may be combined with several word forms. The utterances that we produce and understand may be either single-word or multi-word in their structure. In my discussion will consider the sorts of processes that may be involved in accessing our mental lexicon, which will be shown by the bilingual representation. So here my aim is to research the bilingual lexical representation.

2.1.2 Terms and Concepts of Bilingual Lexical Representation

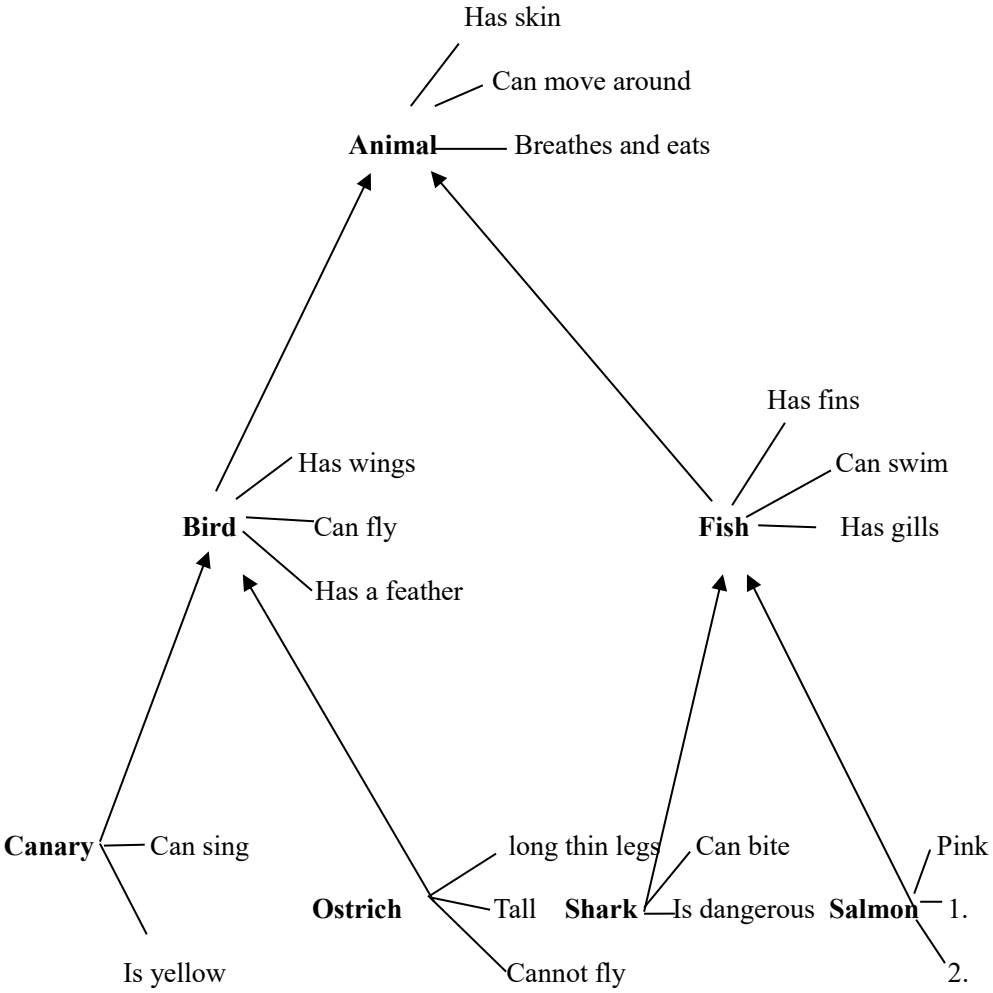
In fact, the research about bilingual representation has been working on for at least half of century. The semantic of lexicon is unstable, so there is much difficulty in defining the meaning and forms of lexicon. The general nature of the lexicon can be represented as comprising two components, stored word meanings and stored word forms, together with access paths that allow these components to communicate with each other, and with other elements in the processing hierarchy. We shall go into greater detail below, but for now we shall confine ourselves to two observations. The first concerns word forms: the issue here is whether they are stored so abstractly in the lexicon as to obliterate the differences between written, spoken, read and heard forms of words. The advantage of having unitary, modality-neutral form entries for words in a lexicon is obvious: each lexical item may be specified more simply. The cost is found in the need to provide rules deriving, say, written forms from phonologically specified entries, Whether the mental lexicon works on this principle is another matter, which depends, in a partly language-specific, on the feasibility of formulating cross-modality derivation rules of sufficient generality and simplicity.(Michael, 2002) The mind always has another option: to provide modality-specific word forms for each entry, whose advantage is that they are highly compatible with the systems that perceive and produce them. The cost is extra storage space in the lexicon, both for the more complex form-specifications and for the links between them. The second observation concerns word meanings: the issue here is whether these are represented in the mental lexicon in strictly linguistic-semantic terms, or in a way that also takes account of their more general cognitive attributes, such as associative and image-based properties. This is an issue that goes to the heart of what we consider the lexicon to be: does it consist of a well-defined word-meaning component in systematic relationship with linguistic word-forms; or does it consist

essentially of just those stored forms, which are directly mapped onto a general knowledge base that is not specifically part of the lexicon itself? We shall adopt a compromise approach here, allowing for the representation of word meanings as well as word forms within the mental lexicon, but at the same time allowing for an open-ended relationship between word meanings and general cognition. This provides us with a framework within which we may start to address the major issue in lexical access.

2.1.3 The Approaches of the Bilingual Lexical Representation

The first approach of the bilingual lexical representation is via lexical meaning. If we now consider the discussion back to psycholinguistic issues, we can consider the implications of relying, as Garrett's model does, on message-level elements that are basically lexical, or "word-sized". Their corresponding entries in the mental lexicon are unanalyzed, stored elements of lexical meaning; their meaningfulness derives from their being set in many-to-many relationships with each other. As such, the individual items in this lexicon have nothing corresponding to an internal meaning-specification. It is difficult to see, then, what information could possibly be contained about such items in the "semantic-access" file of Forster's indirect model of lexical access. It is as if we were to walk into a library with no catalogue system, but with a set of guidelines to the effect that books on topic A are shelved alongside books on topic B, and so on. In other words, we are led directly to the main stacks, and the preliminary stage of consulting the catalogue is eliminated. If this seems a rather unlikely, and inefficient, way of organizing access to books in a library, we should not conclude that it is equally unsuitable as a model of human lexical access. After all, the analogy between a library and a mental lexicon is not perfect. If a message-level element having the properties of being human and female "calls up" or "activates" all such entries in the lexicon-"woman", "actress", etc. –this may naturally allow for such activated entries to interact with further properties of the message level, such as that the mental model involves a kitchen or restaurant event, in which case "actress'' is not further activated, but "waitress" is. In this way, the model is not only direct; it is also interactive and parallel in processing mode, since it allows for different elements and properties of the message level to enter into and guide, or constrain, the search process, along a number of different pathways through the lexicon, and activating a number of lexical items as it proceeds.

The second approach of the bilingual lexical representation is direct representation of reality. What is emphasized here is that, for example, an engineer's mental representation of a particular bridge, or a sculptor's idea of a statue, is couched in terms of the materials and proportions of the actual object. Model stresses will run through the model bridge (guided by the engineer's knowledge) like real stresses through the real bridge; and the spatial relations between different parts of the idea of the statue appear in the next part. This kind of lexical representation often is represented by network, such as figure-1. Currently the main idea regarding the organization of the lexicon is that it is set up as a network of interconnected elements. The elements are concepts or nodes, which are connected to one another by virtue of having various relations with one another. Given what we have had to say about sense relations in word association tasks, the idea of a network of concepts based on relations makes a good deal of sense. We obviously know a large number of words that are related to one another in a large number of ways, and it appears that a network might be an appealing way to capture this fact. In addition, we know that the brain is composed of neurons that are connected at synapses to other neurons and that these connections can be either facilitative or inhibitory. The idea that a network resembles, to some degree, what we know about the central nervous system makes the network idea again seem attractive.



(1. is edible; 2. swims upstream to lay eggs)

Figure1 (adapted from Rongbao, 2002)

The third approach of the bilingual lexical representation is functional representations. Nevertheless, the model is essentially a relational structure rather than a physical entity. We must assume that the mental model, as a complex neuropsychological entity, or statue of affairs, exists in the brain, but it is not this brain construct, in terms of the cells and pathways involved, that models the real world in a direct way. So, just as some other researchers, they were able to discuss the architecture of the brain from the point of view of language, without making contact with language itself, so here we assume that thought processes are not simply reducible to brain states. In this sense, the mental model is abstract: Johnson-Laird likens this abstractness to that involved when we say that a particular computer program (in the abstract sense) is available in different versions (the physical sense), to run on different pieces of hardware.

2.2. Lexical Access

2.2.1. Models of Lexical Access

One of the earliest and most influential models is the autonomous search model of Forster (1976, 1979). In this model, the word recognition system is divided into several diff3erent components. One is the devoted to the orthographic (spelling) properties of a word and another to the phonetic properties. Each of these is organized in descending order of frequency. Thus, more frequent words are searched before lower-frequency words. When the input is matched to one of the items in one of the two bins, a pointer to an entry in the master lexicon is retrieved. When this entry is retrieved, other properties of the word such as its syntactic function are retrieved. Forster's model assumes that the lexicon is autonomous or independent of other systems involved in language processing. Thus, according to this model, activation of words from the lexicon is not directly influenced by syntactic or semantic factors. Such factors affect the general cognitive system. Information from the lexicon is fed into this more general, and in this way syntactic, semantic information may influence word activation. This

model has been revised in recent years (Forster, 1987, 1989). Originally, the model assumed a single comparator matched the incoming signal to the lexical representation in the phonetic or orthographic files. This led to a problem in terms of the number of files that needed to be searched versus the observed speed of word recognition (Lively, Pisoni, & Goldinger, 1994). Thus, the revised model has separate comparators for each file bin.

2.2.2. Variables That Influence Lexical Access

The process of accessing or retrieving lexical information from memory is influenced by a number of factors. Such factors are the frequency of the word, its syntactic category, its morphological complexity, whether a semantically related word has just been encountered, and whether the word is ambiguous.

The role of word frequency has been demonstrated in a phoneme monitoring study by Foss (1969). In this task, participants listen to a continuous speech passage and do two things: comprehend the passage and listen for a target phoneme such as [b]. In some instances, the target phoneme followed a high-frequency word; in other instances, it followed a low-frequency word. The results were clear-cut: monitoring times increased slightly after a low-frequency word. Let's look at Foss's explanation of this result. Suppose we assume that both tasks, phoneme monitoring and comprehension, draw from the same limited pool of resources. Then if one of the tasks becomes more difficult, it might conceivably affect the other. Suppose further that comprehension is impeded by the presence of low-frequency words; that is, we are slower at accessing these words and thus must comprehension task becomes more demanding, w have fewer resources to devote to the phoneme-monitoring task. The end result is that monitoring times increase for low-frequency words. Studies of phoneme monitoring have been controversial, and some of the conclusions drawn from them have been called into question (see, for example, Ferreira & Anes, 1996).A good experimental strategy, in general, is to use several different methods to explore a given phenomenon and look to see whether the different approaches converge on a similar conclusion. Accordingly, it would be useful to find evidence that word frequency influences lexical access in a visual task.

In addition to word frequency, lexical access is influenced by the kinds of information---phonological, syntactic, morphological, and semantic information. Let us begin with phonological variables. The perception of continuous speech, clearly indicates that word recognition is influenced by prosodic factors such as stress and intonational patterns. In addition, we learned that there is a continuous interplay of bottom-up and top-down factors at work. We recognize words in part because we identify their constituent phonemes and in part because of the larger word, sentence, or discourse context.

As we have seen, there are robust differences in lexical access between high-and low-frequency words. The word frequency effect, however, only holds for open-class words. There is no difference in the speed of retrieval of high-versus low-frequency closed-class words (Rosenberg, 1985). The failure to find this difference with closed-class words suggests that we might have separate routes to retrieving words from different syntactic categories.

From a processing standpoint, it would make sense to distinguish between the affixes (prefixes and suffixes) of a word and the base or root word. This is because the set of morphemes or affixes is relatively small and is used over and over in ways that are semantically similar. As a matter of fact, new linguistic examples occur regularly (for example, *desensitize*) and are easily interpreted. These considerations have led several investigators to argue that morphological information and base word information are organized separately in the mental lexicon (Fraser & MacKay, 1975; Lorraine, Waksler, 1994; Taft & Forster, 1976). In this view, a word such as *decision* would be stored as the base word '*decide*' with a separate representation for –ion. In retrieving decision would not have to store as the base word and the morpheme are united. One argument for this kind of arrangement is that it achieves some storage economy since we would not have to store all of the various forms of word but only the base and the set of morphemes used throughout the language. However, this arrangement complicates the processing of these words: instead of accessing a single word, we would have to access both base and morpheme and then combine them. It is not obvious which of the two proposals, independent storage or combined storage, would be preferable.

2.2.3 Appraising Models of Lexical Access

How do the models discussed earlier fare in regard to what we have learned about lexical access? In some respects, they do quite well. For instance, all of the models provide an explanation for the word frequency effect. In one model, each time a word is encountered, the threshold for that it is temporarily lowered. That is, after the word *heart* is presented, less sensory information (for example, a less audible sound) would be needed to recognize the word again. With high-frequency words, the recovery from the lowering of the threshold is less complete than with low-frequency words, so less sensory information is needed for recognition. In a search model, frequency effects are explained in terms of how words are stored in the various files. High-frequency words are stored higher in the files than low-frequency words, and the search process begins at the to of the files. Accordingly, lexical access is more rapid for high-frequency words. In a cohort model, many word candidates are activated in the initial access phrase, but more frequent words would be chosen in the subsequent selection stage. In short, all of the models can be explain the word frequency effect. I n each case, the differential access of common versus less common meanings of ambiguous words is handled in an analogous way.

3. Conclusion

According to the above demonstration, we explored the main approaches of bilingual lexical representation are meaning representation, direct representation and functional representation. In addition, we introduced the variables that influence lexical closeness and the evaluation model of lexical closeness. On this basis, a lexical acquisition model is proposed, which

is influenced by many factors such as lexical usage frequency, phonological structure, syntactic category, morphological structure, existence of semantically related words and substitution of word meanings.

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