

A cognitive view of incidental vocabulary acquisition: From text meaning to word meaning?

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1. Introduction

It is generally accepted that a considerable percentage of the L2 vocabulary of learners is acquired incidentally, i.e. as a 'by-product' of reading (Nagy, Anderson & Hermann 1985, Nation & Coady 1988, Nation 2001). The author's personal interest in this subject, however, was rather triggered by the observation that many words that learners encounter in a text are in fact *not* acquired – for instance because they are not attended to during the reading process, because the meaning cannot be inferred or because the word simply does not remain in the learners' memory after reading. This observation gave rise to the following basic questions: What principles and guidelines characterize the process of (re)constructing the meaning of unknown words within the text comprehension process? What factors determine the effort a learner makes to determine the meaning of an unknown word in a text, and what factors are responsible for the degree to which the contextual meaning can be determined? Furthermore, how does this meaning construction process influence the subsequent acquisition of these new lexemes?

Although research on vocabulary acquisition in general, and on incidental vocabulary acquisition in particular, has increased considerably over the past years, researchers appear to be concentrating on specific aspects of this phenomenon rather than adopting a comprehensive view of the processes involved. Aspects which form the focus for research activities include e.g. the resources and procedures applied in meaning inference (Haastrup 1991, van Parreren & Shouten-van Parreren 1981), the influence of reading task and learner factors (Hulstijn 1993, Grace 1999), or the effect of dictionary or glossing support (Hulstijn et al. 1996, Knight 1994, Krantz 1990, Roby 1999). Consequently, hardly any answers to the above questions can be found in these studies.

The shortcomings of the current research situation appear to be situated on three levels. Firstly, the selective and quantitative attitude of most studies tends to lead to results which do not grasp the qualitative nature of the acquisition process. Due to the varying conditions and research questions, these studies can rarely be compared or integrated into a comprehensive perspective. Secondly, the dimension of the text comprehension process appears to be totally neglected in most current studies, so that no distinction is made between the text meaning level and the word meaning level within the comprehension process. Thirdly, the process of inferring the meaning of an unknown word in a text is frequently equated with the actual acquisition of these words.

This paper is written from a complementary perspective and discusses the main dimensions of incidental vocabulary acquisition from a global, cognitive viewpoint. One goal will involve sketching a combined model which integrates the process of inferring word meaning into the overall text comprehension process. Another focus will be on the non-trivial step from text meaning to word meaning which the learner has to take in order to build up new vocabulary knowledge. The theoretical observations presented here formed the basis for a range of empirical case studies carried out with German learners of English, who were given text passages with the target words occurring in specific contextual constellations, and asked to think aloud during their reading tasks. Unfortunately it is not possible to provide a detailed description of these studies in this paper; however, selected results will be integrated where appropriate.¹

2. The text comprehension process: Mental modelling

In earlier research approaches to text comprehension the interest tended to be on the *product* of the reading process; the interest of modern research, in turn, has shifted to the *process* of reading. Moreover, in modern research approaches, text comprehension is not seen as a passive process of decoding, but rather as an active construction process on the part of the reader (Meutsch 1987). The reader is seen as building a mental representation of the textual meaning based on information contained in the text and on the activation of complementary knowledge resources (van Dijk & Kintsch 1983, Johnson-Laird 1983).

The process of actively constructing textual meaning can be outlined in the following way: the reader processes the text, uses her language knowledge

¹ For a detailed discussion cf. Rieder 2002.

for retrieving the propositions mediated by the words and sentences and thus builds a propositional basis of the text meaning. This basis in itself will be incomplete, however, as much of the information required for text comprehension will not be contained in the text explicitly. The reader thus has to activate complementary knowledge resources such as world knowledge in order to supplement this propositional basis by means of explicatures and implicatures (Blakemore 1992) in order to build a coherent representation of the situation described by the text. This process of retrieval and supplementation can be illustrated by the following example:

- (1) The animal ran towards him with lowered horns. Peter quickly climbed over the fence.

The reader of sentence (1) will typically interpret the lexeme animal as bull and will probably conclude that Peter leaves a pasture over a fence because he is afraid of the approaching bull, and not that he climbs into the pasture. The information for this specific interpretation, however, is not contained in the text and is solely based on the activation of relevant world knowledge (Schwarz 2000).

Parallel to this interaction of two levels of knowledge resources, text comprehension seems so be characterized by two complementary processes: on the one hand, the reader retrieves and updates the propositional basis by means of *bottom-up processes* based on her language knowledge. On the other hand, she complements this bottom-up analysis through *top-down processes*, i.e. associations and predictions based on additional knowledge resources and on the information already processed (Brown & Yule 1983: 234).

Thus, the reader constructs and updates her mental model of the textual meaning by means of these interacting bottom-up and top-down processes throughout the reading process. In this process, the existing model at a certain stage of reading forms the basis for the interpretation of newly read information and is in turn continually tested and updated by this new information (Rickheit & Habel 1995). Furthermore, the interpretation on the part of the reader is always characterized by a search for coherence. The reader will always try to interpret new information in a way that is consistent with her current mental model. Discontinuities in the textual basis are thus bridged in order to maintain textual coherence, and the resources activated for bridging these discontinuities are always applied with a focus on textual coherence (Beaugrande & Dressler 1981: 108).

These 'means to an end'-characteristics of reader strategies for bridging discontinuities in the textual meaning, however, have important implications

for incidental vocabulary acquisition. In the special case where an L2 learner comes across an unknown word in a text, her mental model of the textual meaning will exhibit a discontinuity with regard to this unknown word.² If, however, these strategies are only geared towards bridging discontinuities to such an extent that textual coherence is achieved, this means that the reader will only focus on unknown words if they lead to perceivable discontinuities in the mental model, i.e. if she considers them as sufficiently important for grasping the text meaning. And even if the learner invests effort in inferring the meaning of the new word, she will still be operating on the textual level, and only invest effort in filling the conceptual gap until her mental model is sufficiently coherent.

3. The meaning of words in a text: Text level and word level interacting

In the model sketched so far, the meaning of the words occurring in a text can be seen as an ‘atomic basis’ on which the reader builds her mental model of the textual meaning. But how can the nature of these elementary building blocks of meaning be characterized?

In the cognitive approach taken in this paper, lexical meaning is not seen as definable object but rather as a set of cognitive relations within a speaker of a language. In the context of incidental vocabulary acquisition, several types of word meaning appear to be relevant: One type of word meaning, i.e. *denotation*, is formed by the relation between a lexeme and the extralinguistic reality of the speaker (Lyons 1977:206). Lyons describes this relation as a connection between a lexeme and the things, persons etc. external to the language system. According to cognitive approaches, however, this type of meaning is situated wholly within the language knowledge of a speaker and is said to be stored in the form of concepts which pick out parts of the encyclopedic knowledge of a speaker (Jackendoff 1983: 27ff.). Apart from the connection between a lexeme and its denotational concept, the denotational knowledge of a speaker will also contain knowledge about the potential lexical environment of words, i.e. of the *collocational relations* between lexemes (Kohn 1992: 378).

² In this paper, it is assumed that L1 and L2 reading are basically characterized by the same processes (i.e. that L2 readers apply similar strategies as in an L1 reading task). L2-specific variations in the reading process are seen as a result of compensation strategies due to L2-specific lack of knowledge resources.

A complementary component of word meaning is constituted by the *sense relations* between words within the language, which comprise the hierarchical semantic relationships of super- and subordination (i.e. hyponymy: rose-flower), and of co-ordination (i.e. synonymy: truck-lorry; antonymy: big-small, cf. Lyons 1977). Next to these sense relations, *frame relations*³ also play a role at this level of word meaning. Frame relations are formed by assigning lexemes to so-called knowledge frames, in which common knowledge about stereotypical situations is stored. Frame knowledge is activated through the words in a text, and the activation of the relevant frame knowledge in the reader is in turn presupposed by the author of the text: if the author assumes that specific entities can be inferred by the reader due to the activated frames, these entities are not always explicitly mentioned in the text.

Although complementary types of word meaning can be characterized, an attempt to find clear semantic boundaries for the meaning of a word soon tends to meet with problems. As it seems, one of the basic characteristics of denotative concepts appears to be their variability. In the extreme case, a word will exhibit several different denotations in isolation (hyponymy, polysemy, cf. Lyons 1977). But even for lexemes which seem to have a unified denotation structure at first sight, the variation of the meaning from one context to another makes clear that the denotational meaning includes a range of different contextual specifications. The meaning of the word coffee in the following three example sentences will illustrate this point:

- (2) He poured **coffee** into his cup.
- (3) A pound of **coffee** costs £3.
- (4) **Coffee** is grown in Brazil.

While sentence (2) refers to coffee as a drink, sentence (3) is directed towards the meaning aspect beans or powder. In sentence (4), in turn, coffee is seen as a plant or crop. These examples illustrate to what extent the recipient has to limit the denotational meaning potential of a word when specifying the contextual meaning of this word within a text. Furthermore, these observations also illustrate the basic difference between the concrete contextual meaning of a word and its abstract denotative meaning range. In the case where the reader knows the denotational word meaning, the process of determining the con-

³ The term 'frame' is used as a superordinate term for 'schemata', 'scripts' etc., for a discussion of the various terms see e.g. Beaugrande & Dressler 1981: 94f.

textual meaning variant can thus be pictured as a process of *disambiguation*, *selection* and *stretching*: In a first step, the reader has to *disambiguate* the denotational meaning range through the surrounding context (sense, frame or collocational relations, syntax, etc.) and through her top-down expectations. This process is then followed by *selecting* the contextually relevant meaning aspects, or by *stretching* the word's meaning range if the contextual variant is not directly contained in the activated denotational spectrum (as e.g. in the case of metaphorical language).

The above examples have illustrated the case in which the denotational word meaning is available to the reader. In the case where the reader encounters an unknown word in a text, however, she does not have any denotational knowledge available as a starting point. Thus she cannot activate a suitable conceptual structure and her mental model will remain blurred with respect to this unknown word meaning. Assuming that the reader's primary goal is text comprehension, the degree to which she will try to determine the meaning of this word will primarily depend on how central the word is for building up her mental model of the textual meaning successfully.⁴ If the contribution of the word to the textual meaning is too peripheral, the reader is likely to skip the word without paying attention to it; if her text comprehension, however, is impeded by this information deficit, she will try to fill the conceptual gap by using the clues given by the surrounding context or her background knowledge.

From the perspective of incidental vocabulary acquisition, an important aspect to keep in mind here is that the reader will usually stay on the textual level when trying to figure out the meaning of the unknown word. She will only attempt to bridge the gap in her mental model until sufficient continuity is ensured. This focus on the textual level implies that she will not automatically form a connection between a concept of the contextual meaning she has reconstructed and the form of the unknown word, and will thus not automatically acquire new word knowledge.

In the current literature on incidental vocabulary acquisition, however, the process of meaning specification and the actual acquisition of a word are mostly treated as if they were a single phenomenon. This can be exemplified by Carton's original definition of the term 'inferencing':

⁴ Apart from textual factors, situational factors or individual learner factors are of course also determining factors for the degree to which a learner will concentrate on a word. For a brief investigation of these dimensions see section 4.

Inferencing refers to a process of identifying unfamiliar stimuli. In foreign language learning inferencing is concerned with the acquisition of new morphemes and vocables in 'natural contexts'. (Carton 1971: 45)

The above definition implies that the process in which the reader reconstructs the contribution of the word meaning to the text meaning during the reading process is equated with the actual acquisition of new word meanings. However, this equation, which is still carried through from the use of the term by Carton to many modern research approaches, is an oversimplification. On the one hand, it leaves out important characteristics of this phenomenon, and on the other hand it leads to a representation of the acquisition process which is inaccurate on several levels. Firstly, it gives the impression that the process of deducing contextual word meaning is automatically situated on the lexeme level. As the model of text comprehension sketched above has shown, however, the reader is normally focussed on the text level while reconstructing the unknown conceptual structure. Secondly, the different nature of the cognitive processes involved in inferring word meaning (i.e. building up conceptual knowledge) on the one hand and in acquiring vocabulary knowledge (i.e. storing conceptual knowledge, storing the word form, combining conceptual knowledge and word form) is neglected by this equation. The following sections will therefore focus on important features of word meaning construction within the text comprehension process and the difference between meaning inference and vocabulary acquisition.

4. The specification of contextual word meaning: Constructing conceptual knowledge

Due to the reasons mentioned in section 3, the conventional term inferencing seems to be ill-suited for describing the process of specifying the meaning of an unknown word during reading. As an alternative, the terms *focus* and *enrichment* will be used here for describing the two complementary factors directing this process. On the one hand, the word's saliency in the text (as regards form or content), the individual interest of a learner in that word and her particular reading goal will determine the amount of effort she will invest in figuring out the meaning of an unknown word (i.e. the degree of *focus* on a word). On the other hand, the learner's strategies and the knowledge resources available to her through the text and through her background knowledge will determine the extent to which she is able to specify the unknown conceptual structure (i.e. the degree of *enrichment* of the concept).

If the learner's primary goal is text comprehension, we can assume that the attention she pays to unknown words in the text will be guided by a *comprehension focus*. She will therefore only invest effort if the gap in her mental model is big enough to give her a direct reason to invest energy in determining the missing conceptual structure. With this type of focus, however, the learner's primary attention is still on the word's contribution to the textual meaning, and we can not automatically assume that she will take the step from the text meaning to the word meaning level. Furthermore, due to the *economic effort calculation* which is always subordinated to the overall text comprehension goal, the learner will stop the inferring process as soon as the continuity of her mental model is ensured to a satisfying degree, so that the concept may not be sufficiently determined at the end. If, however, the learner is interested in finding out the meaning of an unknown word independent of her text comprehension goal (e.g. due to a particular interest in this word, or because of a general interest in vocabulary extension), we can speak of explicit *learning focus* on her part. Here, the conditions for the step from meaning inference to vocabulary acquisition are much better, as the learner's focus is on the word level from the start, and she will thus make *exhaustive use of the resources* available for meaning inference. The degree of attention given to word meaning specification is thus directed by textual factors (e.g. centrality of the word for the text meaning, recurrence of the word in the text, etc.), learner factors (e.g. individual interest, learning motivation, etc.) and situational factors (e.g. reading goal, time available).

In terms of the semantic *enrichment* of the unknown conceptual structure, the learner will also take the text meaning as a starting point for forming a hypothesis about the contextual word meaning. On the basis of her current mental model and of her activated frame knowledge, she will be able to specify the new concept to a certain extent, so that the missing conceptual structure will not leave a complete gap in her mental model. We can illustrate the enrichment process with the following example sentence:

(5) He was kept in a **dungeon** for 25 years.

If a learner comes across the unknown word dungeon in sentence (5) in a text where the 'crime'-frame has already been activated, she will be able to specify the denotational concept 'dungeon' to a certain extent due to the surrounding clues (he, kept in, for 25 years) as 'place where a person is detained for a long time'. Due to her world knowledge, she will probably delimit the concept as a rough equivalent to 'prison'. The fact that the meaning of dungeon will probably be specified as the best possible meaning candidate and

not just as any meaning that moderately fits the context (e.g. a general place-term like 'room' or 'house') can be based on the *assumption of optimal relevance* (cf. Sperber & Wilson 1995), which seems to guide learners on the discourse level as well as on the word level: A learner will always assume that a certain word in a text is used deliberately by the author because it achieves an optimal meaning contribution. More specifically, if a learner already knows the English word prison, she will assume that dungeon is not a synonym of prison but rather a hyponym, representing a special type of prison. This tendency that learners will typically rule out absolute synonymy with known L2 terms can be explained by the *principle of contrast*, which is a general principle of language acquisition and implies that different words in a language are generally assigned to different meanings (cf. Clark 1993). Based on these principles, the learner will therefore assume that the word dungeon carries a similar meaning as prison but not exactly the same meaning. Accordingly, her denotation hypothesis will probably be a slightly modified concept [PRISON + ?] with an empty slot concerning the exact specification of the hyponym.

The above example sentence has offered ample clues to the meaning of the target word dungeon. Generally, however, cases where sufficient clues can be found in the text are rare, and the case where texts offer insufficient or even misleading clues to the meaning of a word are by far more common. We must always keep in mind that words are used in texts to convey the text meaning, and that it is not in turn the purpose of texts to define the meaning of the words which are used.⁵ Therefore, clues to the meaning of unknown words will primarily be found as "side-products" in texts. In most cases, the potential of the text for enriching an unknown concept will be implicit and leave aspects of the contextual word meaning unspecified. As regards the enrichment potential of a text, however, it is important to keep in mind the active role of the learner, who has to flesh out the text meaning and the relevance of the meaning clues by means of her language and world knowledge. This implies that the learner's knowledge resources and strategies form another determinant for the success of the enrichment process. In how far the meaning of a word can be specified by the reader will thus depend on the balance between the necessary and the available resources in the text (i.e. clues) and in the learner (i.e. language knowledge, world knowledge).

⁵ There are of course also cases where a word meaning is explicitly defined in a text – an extreme example where a text indeed has the sole purpose of defining the meaning of a word would be the meaning explanation provided in a monolingual dictionary.

While the degree to which a learner is capable of specifying the word meaning is determined by the *enrichment conditions* outlined above, the degree to which she is in fact willing to concentrate on an unknown word during the reading process depends on the *focus conditions* with regard to this word. Like the enrichment conditions, the focus conditions are also influenced by textual and learner-specific factors. On the textual level, the focus potential will for instance depend on a word's contribution to the text meaning or on the word's recurrence in the text. On the learner level, variables to be taken into account include the learner's text comprehension demands, her subjective interest in a certain word or her general language learning attitude. In addition to these two levels, however, the specific reading situation constitutes a third factor affecting word focus. Here, circumstances such as the reading goal, the time available, or the expected knowledge application after reading form influencing variables. On the whole, then, the degree to which a learner is able and willing to determine the meaning of an unknown word in a text is a result of the three influencing dimensions text, learner and situation. The particular constellation of these three dimensions will determine both the degree to which a learner can successfully specify the contextual word meaning, and the effort she invests in figuring out this meaning.

At the end of the specification process, the learner's hypothesis of the contextual word meaning will thus be more or less specific due to two types of limiting factors: Either she will have stopped the process at the point where a sufficient specification for her mental model is reached (economic effort calculation) or at the point where she has used all resources available to her (exhaustive use of resources). As a result, the concept of the contextual meaning will be specified to a certain degree, and the learner will be more or less certain that her meaning hypothesis is correct. The reader will specify the word meaning on the basis of its contribution to the text meaning and will not automatically assume that this contextual contribution is representative for its denotational meaning. In how far this meaning hypothesis does in fact mirror an aspect of the denotational meaning or not, will primarily depend on the meaning clues within the text and the learner's exploitation and complementation work. This constellation will in turn also determine how certain a learner is about the accuracy of her hypothesis.

In terms of describing the structuring processes involved in building up new conceptual knowledge, current research on incidental vocabulary acquisition has little to offer. However, useful ideas can be found in constructivist approaches, which view comprehension and learning as an active and subjective construction process on the part of the learner (Wolff 1994). Here, cogni-

tive structuring processes such as forming or assigning new knowledge schemata, or reorganizing, abstracting and generalizing knowledge structures, are viewed as strategies which a learner applies in order to (re)construct her knowledge (Norman 1982). Following this view, the act of building up conceptual knowledge during the text comprehension process can be imagined as an active construction process on the part of the learner.

In line with a constructivist approach, learner behaviour indeed seems to be characterized by strategic actions and assumptions. Among these, the assumption of optimal relevance (see above) appears to be a general strategy when contextual word meaning is specified. Generally, a learner will not be content with a meaning which matches the context reasonably well, but will tend to look for concepts which are optimally relevant for achieving contextual coherence. As to the role of available lexicalized concepts, learners tend to search their existing L1 vocabulary for equivalent denotational concepts initially rather than creating a new conceptual structure for the unknown word. This strategy ties in with Nemser's (1998: 113) observation that the learner's first goal in lexical acquisition is not to discover the meanings of unfamiliar L2 words but to match new labels with familiar meanings, and that she only moves from this "assimilation stage" to the "approximation stage" (i.e. the adaptation and construction of new concepts) if no matching L1 equivalents can be found. In contrast to this search for L1 equivalents, lexicalized L2-concepts which are known to the learner will probably be ruled out as candidates for the new word meanings. The origin of this strategy is the assumption of contrast, i.e. the fact that learners do not expect two different words in their L2 to denote absolute synonyms.

In addition to the assumptions outlined above, several other strategies were observed in the empirical case studies.⁶ One interesting strategic assumption concerned the expected default quality of the new concept in terms of its ambiguity. While the learners in the studies readily accepted homonymous/polysemous word meanings in their mother tongue, they tended to experience serious difficulties when confronted with homonymous target words which recurred with different meanings in a text passage. As the case study results suggest, learners initially tend to rule out the possibility of conceptual ambiguity when approaching an unknown conceptual structure, and try to construct a concept which is unambiguous and homogenous, even if contradictory meaning clues are provided. This observation shows that *the principle*

⁶ For a comprehensive description and discussion of the empirical case studies see Rieder 2002.

of conventionality (i.e. that word meanings are consistent and conventionalized, cf. Clark 1993) obviously constitutes a major guideline for learners when constructing new meaning concepts.

So far, the observations have concentrated on the learner's first encounter with an unknown word. Encountering a word only once, however, can rarely be expected to result in the acquisition of this word. On the one hand, the learner is very likely to forget a word she has focussed on incidentally only once, and on the other hand, the contextual meaning in one context will only offer very limited information on the denotational meaning range. After discussing the enrichment process when a completely unknown word is encountered, we will now investigate how a learner reacts when she encounters a word again for which she has already constructed a (partial) meaning hypothesis.

Initially, we would expect her to start out from her previous meaning hypothesis and assume that the meaning of the word is largely consistent in the different contexts of its occurrence. This assumption is in line with the pragmatic principle of conventionality, which learners generally follow when acquiring new lexemes. Accordingly, the initial meaning hypothesis will probably function as a basis, and the learner will then test its validity in the light of the new meaning clues. Depending on how far the new clues can be integrated into the existing meaning hypothesis, the initial hypothesis will be refined, specified or revised accordingly.

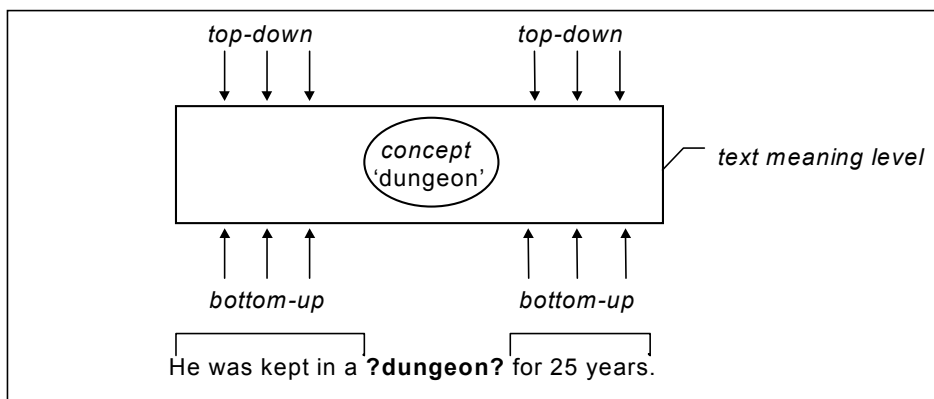
In the case where the new meaning aspects cannot be integrated into the original conceptual structure, the learner basically has three choices: she can either revise her old hypothesis on the basis of the new evidence, she can try to stick to the original meaning hypothesis as far as possible and try to extend it so that the new meaning aspects fit in, or she can choose to ignore the incompatible information. An interesting observation in the empirical studies concerned the fact that learners tended to stick to their meaning hypotheses about an unknown word once they had set them up, and tended to ignore contradictory clues as long as the new evidence was not completely incompatible. In some cases this strategy was so prominent that it even led to the construction of deviating mental models of the text meaning. These findings suggest that existing hypotheses form a powerful basis for further meaning specifications when a word is encountered again.

5. From meaning specification to vocabulary acquisition: Acquiring new words through reading

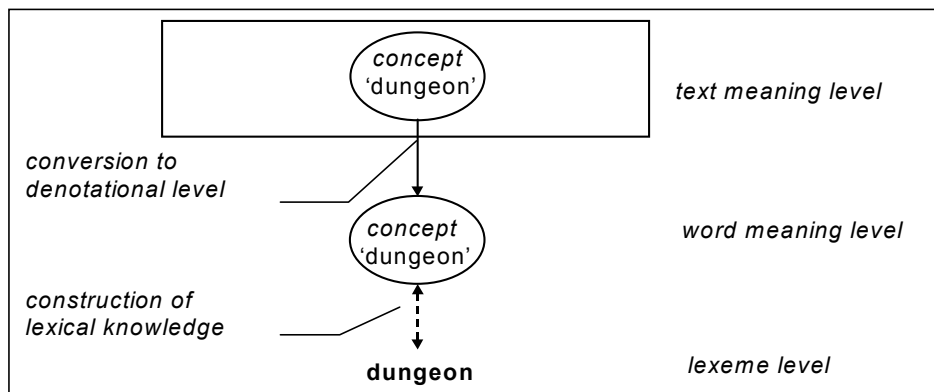
After having dealt with text comprehension and the specification of unknown word meaning within this process, we shall now turn our attention to the step from meaning specification to the actual acquisition of a new word. As already stressed, it is one important aspect of inferring contextual word meaning that the reader is usually on the text meaning level when specifying the unknown conceptual structure. Consequently, an active shift from the text to the word level is necessary on the reader's part in order to ensure that acquisition can take place, i.e. that she actively focuses on the word form, transfers the contextual meaning to the word meaning level and forms a mental connection between the word form and her meaning hypothesis. This shift will again be illustrated by means of example sentence (5) (see diagram 1):

Diagram 1. Steps in the construction of lexical knowledge during the *reading process*

Step 1: Specification of the concept on the text meaning level



Step 2: Shift from text meaning to word meaning



In a first step (step 1), the reader specifies the unknown concept of the word dungeon within her mental model of the text meaning. In order to construct lexical knowledge, however, she actively has to convert the contribution of the concept 'dungeon' to her mental model of the text meaning level onto the word meaning level and grasp the connection between this meaning hypothesis and the word form (step 2). From this cognitive perspective, it thus becomes clear that the path from word meaning inference to vocabulary acquisition is by no means as straightforward and automatic as many researchers suggest. As a precondition for the process of meaning inference to take place at all, a sufficient learner focus on the word has to be ensured; this degree of focus will also guide the degree to which the learner invests effort in the enrichment process, so that focus and enrichment are partly dependent on each other. And even if the learner focuses on a word and attempts to figure out its contextual meaning during the reading process, the conditions for incidental vocabulary acquisition are only positive if sufficient resources are provided by the text and by the learner, and if the learner focus is shifted from the text to the word level.

Putting the various strands together, three different processes appear to be relevant for ensuring that a new word in a text can be embedded in the learner's mental lexicon. Firstly, the specification of the contextual meaning on the text level through enrichment and focus; secondly, an abstraction from the contextual meaning contribution to the denotational level and the integration of this denotational knowledge into existing knowledge structures; and thirdly, the consolidation of the word form and of the connection between form and conceptual structure in the learner's mind:

❑ **Enrichment/Focus:**

text level: specification of contextual word meaning

❑ **Abstraction/Integration:**

shift from text level (contextual meaning) to word level (denotational meaning)

❑ **Consolidation/Association:**

word level: memorization of word form, link form-conceptual structure

Keeping a 'bird's-eye view' of incidental vocabulary acquisition, we always have to keep in mind that a single encounter of a word in a text can hardly be expected to lead to the acquisition of a new lexical item. In order to enhance the chances of acquiring a word, several instances of processing the same word in different contexts will be necessary, in which the learner can test her

first meaning hypothesis, elaborate the overall range of the denotative concept, and consolidate the word form and the link between form and conceptual structure.

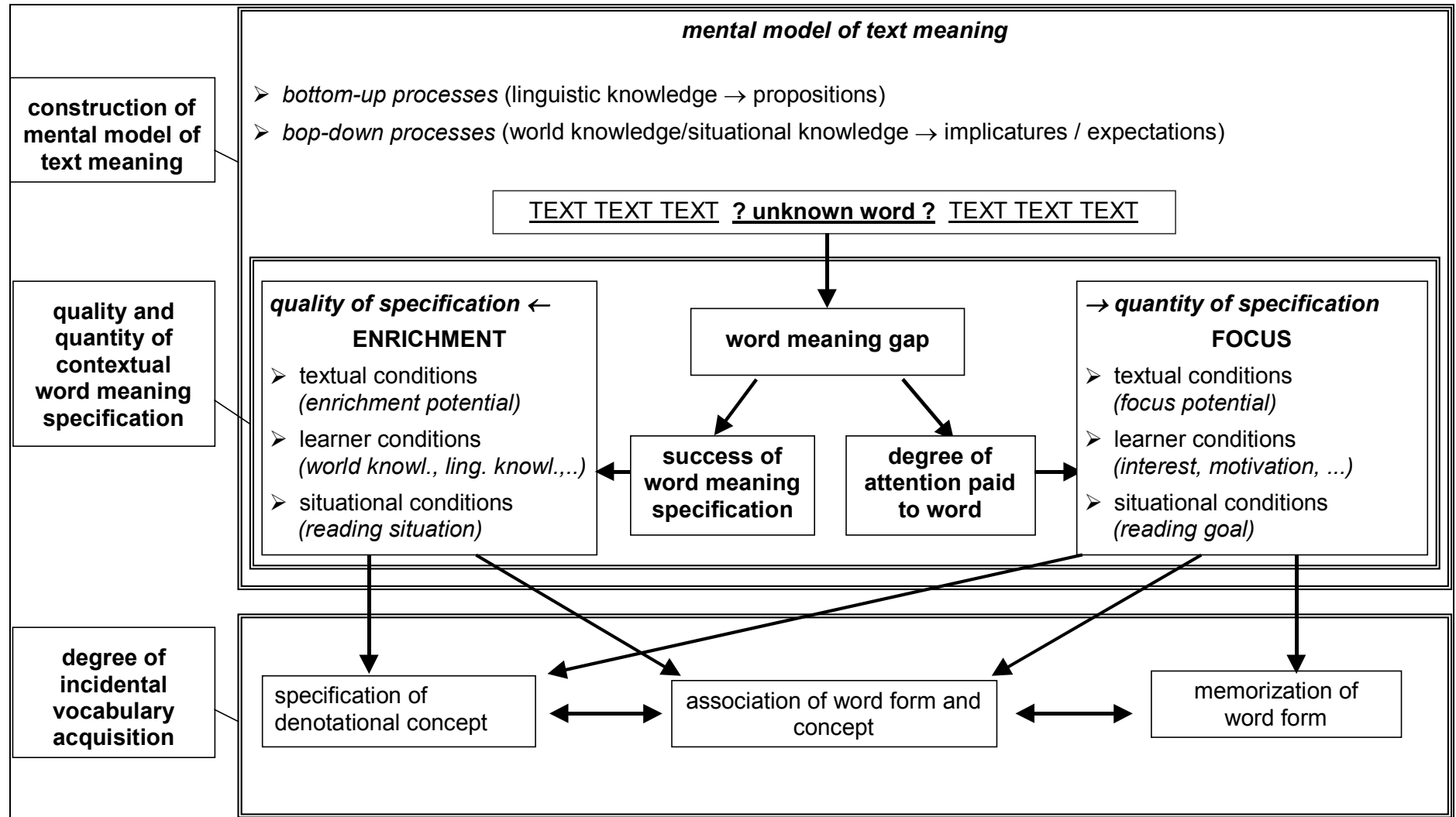
The process of abstracting the various contextual meanings to form the denotational meaning range of a word can be illustrated by comparing the denotational concept to a file-card box. Like in a file-card system, the different contextual word meaning contributions have to be abstracted into aspects of the denotational meaning (i.e. written on file-cards) and ordered into a common conceptual frame (i.e. the file-card box). Only within this framework do they result in the complex denotational concept. In order to lead to the acquisition of the new word, this new concept as well as the word form also have to be stored and linked in memory. All these processes require that the learner is repeatedly confronted with the word in order to ensure the elaboration and consolidation of lexical knowledge in the learner's mind.

As has been made clear by the theoretical and empirical observations above, incidental vocabulary acquisition involves a complex network of interacting processes and influencing factors. In an attempt to summarize the various dimensions, diagram 2 illustrates the interaction of the components involved in word meaning specification during the reading process, and of the implications for incidental vocabulary acquisition: Initially, the learner is confronted with an unknown word in the text, which will leave a conceptual gap in his mental model of the text meaning. The *quantity* of the meaning specification (i.e. the effort invested by the learner) will depend on the *focus* constellation, whereas the *quality* of the meaning specification (i.e. the degree of concept elaboration) will be limited by the *enrichment* constellation. Both the focus and enrichment conditions are influenced by specific textual, learner and situational factors. In terms of the effect on *vocabulary acquisition*, the degree of enrichment that has taken place will primarily affect the delimitation of the conceptual structure, while the degree and type of focus will influence the memorization of the word form as well as the abstraction from contextual to denotational meaning. Finally, both enrichment and focus will indirectly reflect on the association of word form and conceptual structure in the learner's mind; this association process, however, will only take place provided that the conceptual structure has been sufficiently specified and that the learner has taken the step from contextual to denotational meaning.

On the whole, then, the conditions for the incidental acquisition of an unknown word which a learner encounters in a text appear to be the result of two complementary determinants: the *availability* of the *resources* required for specifying the contextual meaning successfully, and the *necessity* for fo-

curring on this particular word. The resources are made up of the textual clues on the one hand and the learner's language and world knowledge on the other, whereas the necessity for a meaning specification is determined by textual conditions (e.g. the word's centrality for the text meaning), learner conditions (e.g. text comprehension demand) and situational factors (e.g. reading goal). The specific constellation of the resource and necessity components will then determine the degree of incidental vocabulary acquisition. The crucial precondition for an acquisition process to take place, however, will always be the learner's attention to the word form and her active step from the text to the word level.

Diagram 2 Combined model of the factors influencing incidental vocabulary acquisition



References

- Beaugrande, Robert-Alain de & Dressler, Wolfgang Ulrich. 1981. *Einführung in die Textlinguistik*. Tübingen: Niemeyer.
- Blakemore, Diane. 1992. *Understanding utterances: An introduction to pragmatics*. Oxford: Blackwell.
- Brown, Gillian & Yule, George. 1983. *Discourse analysis*. Cambridge: C.U.P.
- Carton, Aaron. 1971. 'Inferencing: a Process in Using and Learning Language'. In: Pimsleur, Paul & Quinn, Terence, eds. *The Psychology of Second Language Learning*. Cambridge: C.U.P., 45-58.
- Clark, Eve. 1993. *The lexicon in acquisition*. (Cambridge Studies in Linguistics 65). Cambridge: C.U.P.
- Dijk, Teun A. van & Kintsch, Walter. 1983. *Strategies of discourse comprehension*. Orlando etc.: Academic Press.
- Grace, Caroline. 1999. 'Personality type, tolerance of ambiguity, and vocabulary retention in CALL'. *CALICO Journal* 15, 19-45.
- Haastrup, Kirsten. 1991. *Lexical inferencing procedures or talking about words*. Tübingen: Narr.
- Harras, Gisela. 1999. 'Variabilität von Wortbedeutungen: Wie verschiedene Semantiktheorien damit umgehen'. Vortrag bei der 30. GAL-Jahrestagung in Frankfurt/Main.
- Hulstijn, Jan H. 1993. 'When do foreign language readers look up the meaning of unfamiliar words? The influence of task and learner variables'. *Modern Language Journal* 77, 139-147.
- Hulstijn, Jan H., Hollander, Merel & Greidanus, Tine. 1996. 'Incidental vocabulary learning by advanced foreign language students: The influence of marginal glosses, dictionary use and reoccurrence of unknown words'. *Modern Language Journal* 80, 327-339.
- Jackendoff, Ray. 1983. *Semantics and cognition*. Cambridge, Mass.: MIT Press.
- Johnson-Laird, Philip Nicholas. 1983. *Mental models*. Cambridge, Mass.: Harvard University Press.
- Kohn, Kurt. 1992. 'Bemerkungen zur Kollokationsproblematik'. In: Anschütz, Susan. (Hrsg.). *Texte, Sätze, Wörter und Moneme*. Heidelberg: Orient Verlag, 369-387.
- Knight, Susan. 1994. 'Dictionary use while reading: The effect on comprehension and vocabulary acquisition for students of different verbal abilities'. *Modern Language Journal* 78, 285-299.
- Krantz, Gösta. 1990. *Learning vocabulary in a foreign language: A study of reading strategies*. Göteborg: Acta Universitatis Gothoborgensis.
- Lyons, John. 1977. *Semantics*. Cambridge: C.U.P.
- Meutsch, Dietrich. 1987. *Literatur verstehen: eine empirische Studie*. Braunschweig: Friedrich Vieweg & Sohn.
- Nagy, William E., Anderson, Richard J. & Herman, Patricia A. 1987. 'Learning word meanings from context during normal reading'. *American Educational Research Journal* 24(2), 237-270.
- Nation, I.S.P. 2001. *Learning vocabulary in another language*. Cambridge: C.U.P.

- Nation, I.S.P. & Coady, James. 1988. 'Vocabulary and reading'. In: Carter, Ronald & McCarthy, Michael, eds. *Vocabulary and language teaching*. London: Longman, 97-110.
- Nemser, William. 1998. 'Variations on a theme by Haastrup'. In: Albrechtsen, Dorte; Henriksen, Birgit; Mees, Inger M. & Poulsen, Erik, eds. *Perspectives on foreign and second language pedagogy*. Odense: Odense University Press, 107-117.
- Norman, Donald A. 1982. *Learning and Memory*. San Francisco: Freeman.
- Parreren, C.F. van & Schouten-van Parreren, M.C. 1981. 'Contextual guessing: a trainable reader strategy'. *System* 9(3), 235-241.
- Rickheit, Gert & Habel, Christopher, eds. 1995. *Focus and Coherence in Discourse Processing*. Berlin / New York: de Gruyter.
- Rieder, Angelika. 2002. *Beiläufiger Vokabelerwerb: Theoretische Modelle und empirische Untersuchungen*. PhD Thesis, Univ. of Tübingen.
- Roby, Warren B. 1999. 'What's in a gloss?'. *Language Learning & Technology* 2(2), 94-101.
- Schwarz, Monika. 2000. *Indirekte Anaphern in Texten*. Tübingen: Niemeyer.
- Sperber, Dan & Wilson, Deirdre. 1995. *Relevance: Communication and cognition*. 2nd ed. Oxford: Blackwell.
- Wolff, Dieter. 1994. 'Der Konstruktivismus: Ein neues Paradigma in der Fremdsprachendidaktik?' *Die Neueren Sprachen* 93(5), 407-429.