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## Basic Level Categories as Basic Cognitive and Linguistic Building Blocks

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### 1. Introduction

The starting-point of this paper is Rosch's research into the internal structure of categories and the conceptual hierarchies in which many cognitive categories, especially categories of objects and organisms, are arranged. As is well known, the central notions in this context are those of 'prototype' and of the 'basic level' of categorization. While the prototype notion has received considerable attention even from linguists who are not working in the field of what is today called Cognitive Linguistics, the idea of a basic level of categorization has for some time lived in the shadows. It is only in the last decade that linguists have again concerned themselves with aspects related to the basic level of categorization, arguing that it is cognitively more salient than the other levels. Some relevant publications are Lakoff (1987), Taylor (1989), Brown (1990), Kleiber (1990), Schmid (1993), Ungerer (1994) and Ungerer/Schmid (forthcoming).

In these publications it is argued that basic level categories such as **CHAIR**, **CAR** and **DOG** are cognitively 'basic' in the sense that they provide us with the most direct conceptual access to the organisms and objects in the world (e.g. Lakoff 1987, 267). This is for example borne out in the fact that I think of the object that I am sitting on at this moment as a **CHAIR** rather than as a piece of **FURNITURE**, i.e. as a member of a superordinate category, or as a **DESK CHAIR** (a subordinate category). The aim of this paper is to show that this cognitive prominence of basic level categories is strongly reflected in language, and this in a much more distinct way than has previously been assumed. What is to be shown, then, is that basic level categories are basic not only from a cognitive, but also from a linguistic point of view.

To show this, the role that basic level categories play in different types of additions to the lexical resources of English is investigated and contrasted with the role of superordinate categories. The creative processes that are examined are metaphorical and metonymic extensions of word meanings, the main word-formation patterns, i.e. composition and derivation, and the

formation of fixed expressions or idioms. These processes were selected because between them, metaphor, metonymy, word-formation and idiom-formation provide the main means of extending the lexicon of a language (Dirven 1985; Lipka 1990, forthcoming). Consequently it is in these areas that one would look for 'basic' linguistic items from which others are derived.

## 2. The cognitive prominence of basic level categories

To start with, it will be helpful to recapitulate the major findings on the cognitive prominence of basic level categories.

a) In one of a series of experiments Rosch et al. (1976, 387ff) asked American college students to write down lists of attributes for superordinate categories (e.g. FURNITURE, FRUIT), basic level categories (e.g. CHAIR, TABLE, APPLE, PEACH) and subordinate categories (e.g. KITCHEN CHAIR, JONATHAN APPLE). The lists were analysed with regard to the number of attributes that were shared by the members of a category; Rosch et al. were thus looking for what one may call "category-wide attributes" (cf. Ungerer/Schmid forthcoming, ch. 2). The result of their analysis was that on average, basic level categories could muster 8 category-wide attributes, while for superordinate categories the scores were between 0 (for FURNITURE) and 3 category-wide attributes (for FRUIT). The scores for subordinate categories were a little higher than those on the basic level, but many of these attributes were shared by neighbouring categories and this means that their distinctive power is considerably reduced. The usual, and indeed quite convincing, interpretation for this finding is that basic level categories represent the most useful and cognitively efficient way of subsuming the individuals in the world in categories (e.g. Kleiber 1990, 88ff). It is on this level that we find an ideal balance between, on the one hand, the similarity of the members within a category, and on the other hand the difference of these members to the members of a neighbouring category.<sup>2</sup>

A conclusion that may be drawn from this is that if one regards naming category-wide attributes as a form of conceptual analysis, basic level categories seem to be conceptually prominent, since it is for them that the largest numbers of distinctive category-wide attributes are named.

b) A second factor is the common overall shape of category members, which was tested by Rosch et al. by manipulating outline drawings of objects and organisms. The easiest way to understand what lies behind this is if one tries to imagine, or indeed draw, a pictorial representation of the superordinate category FURNITURE as opposed to CHAIR or TABLE. While I have no difficulty in conjuring up a mental image of a chair or table, for furniture all I can do is think of a whole collection of different pieces or fall back on one of the basic level categories. The reason is that the overall shapes of all the different objects that are subsumed in the superordinate category FURNITURE are fairly diverse (just think of beds, sofas, tables, chairs, cupboards and bookshelves). The contribution of the outer shape to the formation of a superordinate category is therefore very limited. For different kinds of chairs or tables, however, it is perfectly possible to identify a category member on the basis of its overall shape. In addition, the common overall shape of the objects collected in a basic level category allows for the storage of the category prototype as a perceptual *gestalt*<sup>3</sup>

So not just from a conceptual, but also from a perceptual point of view, basic level categories seem to be more easily digestible, because one can discern the basic level category a certain object belongs to from its most direct property, namely from its visual gestalt. More complex properties like function or origin, which are crucial for the membership in superordinate categories are not so important.

c) A third finding by Rosch and her colleagues (1976, 393ff) is that only when they are categorized on the basic level can objects be related to characteristic actions. Taking the example CHAIR, it is easy to see that no matter what kinds of chairs we are dealing with, frequent ways of interacting with them are the actions of sitting down and getting up. These complex actions can be broken down into a number of more simple motor movements like bending one's knees and waist and reaching down to the armrests or the seat. By contrast, it is impossible to find such simple motor movements which are valid for all members of the superordinate category FURNITURE. YOU lie down on a bed, you put things on a bookshelf, you open a cupboard, and you eat and write on a table.

Thus the feeling that there are certain motor movements which 'belong' to a whole class of objects only applies to the basic level of categorization. (As in the case of category-wide attributes, the motor movements related to neighbouring subordinate categories like KITCHEN CHAIR or DESK-CHAIR are too similar to contribute to a distinction between them.) Strictly speaking, common motor movements are not a cognitive criterion in a narrow sense of the word; but, they are nevertheless very important for our understanding and conceptualization of objects and the categories to which they belong, because it is only when we interact with them, when we handle and employ them, that we really come to know the objects around us.

d) A final point which indicates the cognitive prominence of basic level categories is that only basic level categories have a full-fledged prototype structure consisting of a prototype, or more precisely a prototypical subcategory, good members, bad members, a periphery and fuzzy boundaries. Obviously this claim is less straightforward than those made in the last three sections and therefore it requires further elaboration.

In his book on prototype semantics Kleiber (1990) shows that what he calls *La Version standard de la sémantique du prototype* erroneously took 'superficial' prototype effects to be psychologically real phenomena. He goes on to argue that an extended version of prototype theory should be espoused. According to this version the idea that prototypes have a share in the actual processing of categories is rejected. Instead, prototypicality itself is seen as a prototypical notion (Geeraerts 1988), and the principle of family resemblances (Wittgenstein 1958, 66f; Rosch/Mervis 1975) is invoked to explain category coherence. Although Kleiber's criticism of earlier prototype theory is certainly warranted, there is yet another way to overcome its shortcomings, which is based on a systematic differentiation of types of categories and levels of categorization (cf. Brown 1990, Ungerer 1994). Thus one may argue that the view of prototypes as cognitive reference-points which guide the processing of categories is valid but, and this is important, only on the basic level of object and organism categories (Ungerer/Schmid forthcoming). On the other two levels of conceptual hierarchies, however, and in other types of categories, for instance locative relations (i.e. 'prepositions' such as OVER, UP, OUT) or abstract concepts (e.g. IDEA, ARGUMENT, LOVE), other principles of cate-

gory formation such as family resemblances, image schemas and metaphorical and metonymic mappings are at work.

Summarizing the cognitive prominence of the basic level, the main point is certainly that basic level categories seem to be structured in such a way as to make the conceptual processing of the large variety of things in the world as effective as possible. Therefore, they may be regarded as providing the most natural cognitive access to the concrete entities in the world. Conceptual and perceptual aspects that have been mentioned here are:<sup>4</sup>

- the large number of distinctive category-wide attributes
- the common overall shape which contributes to the potential for gestalt perception
- the common motor movements.

All these factors contribute to the fact that on the basic level the effective prototype structure of categories is manifested in its best form. These aspects also indicate that it is on the basic level that the focus of the human interest in the world lies (Ungerer 1994, 149). Of course, the focus of interest may vary depending on people's experience and knowledge, or, speaking more generally, the basic level is context- and culture-dependent; but this is an issue that can only be mentioned here in passing (see Dougherty 1978, Lakoff 1987, 37f).

### 3. The linguistic prominence of basic level categories

#### 3.1 The evidence so far

Moving now to the linguistic prominence of basic level categories, the evidence that has been collected so far (cf. Brown 1958, 1965, Cruse 1977) suggests that

- names for basic level categories are learnt first by children
- names for basic level categories tend to be monomorphemic
- basic level categories are used when the referent is first introduced into a discourse or text
- names for basic level categories are used most frequently.

However, this evidence can be viewed with some scepticism because, on the whole, it is not based on systematic observations; these findings represent a motley collection of data from the fields of language acquisition, morphology, discourse analysis and vocabulary frequency studies. The dependence of the basic level on personal experience and the cultural background may also lead to some confusion, as the work of Rosch herself, where the biological hierarchies yielded quite unexpected results, has shown (Rosch et al. 1976, 431f). It thus seems clear that in order to corroborate the linguistic basicness of basic level terms, more systematic evidence, particularly from the field of lexicology, is needed.

### 3.2 The new evidence

#### 3.2.1 Material and method of investigation

For this study of the potential of words for extending the lexicon, basic level terms are contrasted with superordinate terms. The material is a selection of 75 lexemes whose central sense denotes basic level categories of concrete objects and organisms, and 25 immediately related superordinate lexemes. The choice of examples of basic level terms was guided by the cognitive criteria of basic level categories which were recapitulated above. In addition, care was taken that a direct superordinate lexeme (e.g. *vehicle* for **CAR** rather than *object* or *thing*) exists in the common core of English and that both the basic level and the superordinate terms were morphologically simple, i.e. monomorphemic. Below, a list of the one hundred items that were selected is given. (In the list, a query indicates doubts about the status of a superordinate as regards either colloquiality or fit with the basic level categories and an asterisk that a monomorphemic lexeme could not be found.)

1. beverage:	tea	milk	juice
2. building*:	house	church	tower
3. clothes:	shirt	jacket	coat
4. crockery:	cup	plate	bowl
5. cutlery*:	knife	fork	spoon
6. fabric:	cotton	silk	wool
7. fitting *?:	carpet	curtain	lamp
8. food:	bread	meat	cheese
9. footwear*:	shoe	boot	sandal
10. fruit:	banana	apple	peach
11. furniture:	chair	table	bed
12. headgear*:	hat	cap	helmet
13. insect:	fly	wasp	bug
14. (musical) instrument:	piano	trumpet	flute
15. jewellery*:	ring	brooch	necklace*
16. locality *?:	city	town	village
17. mammal:	dog	cat	horse
18. plant:	tree	flower	bush
19. planet:	earth	sun	moon
20. stationery*:	paper	pen	envelope
21. tool:	saw	hammer	drill
22. toy:	doll	ball	seesaw*
23. vegetable:	pea	carrot	bean
24. vehicle:	car	bus	boat
25. weapon:	sword	pistol	cannon

Table 1: List of categories chosen for the analysis

The quantitative analysis carried out for these lexemes was based on two dictionaries, namely the *Oxford Advanced Learner's Dictionary*, 4th ed., and Lehnert's *Rückläufiges Wörterbuch*. It must be emphasized that the two dictionaries only provided the operational criterion which served as an objective measure of the frequency of the processes. Theoretical implications concerning notions like "lexicalization" or "institutionalization" are not intended (cf. Bauer 1983, 42ff; Lipka 1992).

On the basis of the entries in the two reference works the following parameters were analysed:

- a) Metaphors: The number of senses of a lexeme that represent clear cases of metaphorical extensions (e.g. *bed* 'layer of clay, rock etc below the surface soil'). Metaphor is defined as a transfer of a structural relation from one cognitive model to another; this relation is based on conceptual similarity between the structures of the models (cf. Ungerer/Schmid forthcoming, ch. 3.1).
- b) Metonymies: The number of senses of a lexeme that are clear cases of metonymic extensions (e.g. *chair* 'person in charge of a meeting'). Metonymy is defined as the mapping of one category within a cognitive model on another category within the same model; this mapping is based on conceptual contiguity within one model (Ungerer/Schmid forthcoming, ch. 3.1).
- c) Derivations: The number of derivations from the morphological base, especially suffixations and zero-derivations (e.g. *bed* v 'place or fix something firmly'). Multiple meanings of one derivative form were also counted.
- d) Modifiers in compounds: The number of compounds in which the lexeme acts as modifier (e.g. *bedfellow*, *bedroom*).
- e) Heads in compounds: The number of compounds in which the lexeme acts as head (e.g. *marriage bed*, *double bed*). This is the parameter where Lehnert's *Rückläufiges Wörterbuch* was used because this type of compound cannot be located systematically in a 'normal' dictionary.
- f) Figurative derivations and compounds: The number of items in c) and d) with a figurative meaning (e.g. *bed* v 'have sexual intercourse with (sb)', *bedrock* 'basic facts or principles').
- g) Fixed expressions: The number of fixed expressions based on the lexeme (e.g. *have got out of bed on the wrong side* 'be bad-tempered for the whole day').

3.2.2 Results

Below, the results of the analysis are presented in two ways. First, in order to give a glimpse of the kind of lexical material that is involved in this study, the results for the examples *furniture* vs. *chair*, *table* and *bed* are listed in table 2 on the next page. Looking at the table one can see that the superordinate category *furniture* can only muster a small number of compounds, in which it functions as head. None of the other creative processes are represented. By contrast, the three basic level categories are extremely productive as far as lexicalized figurative uses, word-formation patterns and the formation of fixed expressions is concerned. The most productive item of the three is *bed*, with no less than 5 metaphorical and 1 metonymic senses, 9 derivations, 18 compounds as modifier, 38 compounds as head, 7 figurative derivations or compounds and 10 fixed expressions.

Second, it is interesting to obtain a quantitative overview of the results. This will allow us to abstract from single categories and to make some conjectures as to the general potential of superordinates and basic level categories for triggering creative processes in the lexicon. Such an overview is provided in table 3 where scores for the first three groups of basic level terms

furniture	chair	table	bed
a) 0 b) 0 c) 0 d) 0 e) module furniture sectional furniture built-in furniture add-on furniture knock-down furniture tubular furniture unit furniture f) 0 g) 0	a) 0 b) 'person in charge of a meeting' 'position of a university professor' c) 'chair v, 'act as a chairman' (= figurative meaning) 'chair v, 'carry (sb who has won sth) in a sitting position on the shoulders of group' 'chair-lift' 'chairman' 'chairwoman' 'chairperson' electric chair vice-chair cane chair posture chair rocking-chair nesting chair wing chair Bath chair hammock-chair wheel chair swivel chair ice-cream chair sedan-chair kinderchair sleeper-chair Windsor chair Morris chair boatswain's chair night chair easy chair f) all marked by <sup>f</sup> in c) and d) g) 0	a) 'large area of high levelland' 'list of facts or figures systematically arranged' b) 'people seated at a table for a meal' c) 'food provided at table' table v, 'submit for discussion' table v, 'leave (a proposal etc.) for discussion at some future date' d) table-knife table manners tablespoon table tennis tableware periodic table end table experience table life-table conscription-table plane-table manning table dressing table writing-table high table corbel-table steam table turn-table multiplication-table pier table Lord's table frequency table butterfly table gypsy table f) those marked by <sup>f</sup> in c) g) at table 'white having a meal' drink sb under the table put one's cards on the table the negotiating table on the table 'offered for discussion' turn the tables 'reverse a situation' under the table '(of money) paid secretly' wait at table	a) 'bottom of the sea, a river, lake etc.' 'layer of clay, rock etc. below the surface soil' 'flat base on which something rests' 'layer of rock, stone, etc as a foundation for a road or railway' 'garden plot; piece of ground for growing flowers' b) 'being in bed' c) 'bed v, 'place or fix sth firmly' 'bed v, 'accommodate; provide with a bed' 'bed v, 'have casual sexual intercourse with' 'bed down v, 'settle for the night' 'bed sth down v, 'provide an animal with straw' bedded 'having the specified type or number of beds' bedding 'bedclothes and mattresses' bedding plant 'one suitable for planting in a garden bed' d) bedbug bedclothes bedpan bedpost bedroll bedside bedside manner bedspread bed-wetting sofa bed childbed marriage-bed double bed truckle bed spring bed sick-bed chalk-bed coal-bed camp-bed water-bed oyster-bed flatbed box bed maternity bed e) abed bedstead road bed sand-bed lathe bed single bed rapid-rocking bed track bed death bed flock-bed bark-bed twin bed osier bed feather bed filterbed river-bed tent-bed hotbed nursery bed day bed lazy-bed those marked by <sup>f</sup> in c) and d) f) as one makes one's bed, so one must lie on it bed and board a bed of roses die in one's bed early to bed and early to rise have got out of bed on the wrong side make the bed take to one's bed wet the/one's bed

and their superordinates are given. The 7 parameters are ordered as listed above. The bottom row of the table indicates the arithmetic means for all 75 basic level and 25 superordinate categories.

In view of the considerable variance of the scores and the fact that the 100 selected items hardly make up a representative random sample, one should certainly not assess the means with their statistical significance in mind. All the same, the pattern of the data is obvious. The results show that for all parameters that were taken into account, the superordinate categories yield much lower scores than the basic level categories. With the exception of parameters (a) (metaphors) and (c) (derivations), the scores of the basic level categories are at least four times as high as those of superordinates, and for the last two parameters (figurative word-formation items and fixed expressions) the difference is simply overwhelming. As far as numbers are concerned, then, the overall result of the study is that in all seven respects, the basic level categories that were investigated are much more productive than the related superordinate categories.

superordinate	a	b	c	d	e	f	g	basic level	a	b	c	d	e	f	g
beverage	0	0	0	0	0	0	0	tea	1	2	0	23	16	0	3
								milk	2	0	5	14	10	4	4
								juice	2	0	4	0	2	2	1
building	0	0	1	2	5	0	0	house	0	12	3	29	134	4	14
								church	0	5	0	3	8	0	0
								tower	0	0	5	1	11	3	2
clothes	0	0	1	7	11	0	0	shirt	0	0	2	4	14	1	4
								jacket	3	0	0	1	32	0	0
								coat	2	0	2	3	48	2	2
crocery	0	0	0	0	0	0	0	cup	2	2	3	3	23	3	3
								plate	6	3	3	3	54	0	2
								bowl	2	1	0	0	9	0	0
...							...								
arithm. mean	0,6	0,2	1,6	0,8	5,2	0,1	0,2		1,1	0,8	2,2	4,8	23	1,7	3,1

Table 3: Overview of the scores for the first three groups of lexemes, and arithmetic means of the whole corpus

#### 4. Discussion of the results

The results show that basic level terms make up the raw material for productive processes in the lexicon, while the potential of superordinate terms is rather limited. This difference in linguistic productivity can be explained when we recall the cognitive prominence of basic level categories.

As we have seen in section 2, basic level categories are privileged with regard to their perceptual (gestalt), conceptual (category-wide attributes) and interactive properties (motor movements). In other words, this means that we are very familiar with what the things subsumed in a basic level category look like; we have a thorough and extensive knowledge of what they are made of, of the parts they consist of and of the functions they are intended for; and we have handled them so often that we have gained a tremendous amount of experience related to what can be done with them and how they behave. This rich cognitive background

associated with basic level categories makes it possible to work with them conceptually, as it were, and this is reflected in the extensions to the lexicon. For example, our knowledge of beds enables us to transfer their familiar flat shape to other domains, thus creating a metaphor. Likewise, the very familiar function of beds allows for a metaphorical mapping onto the cognitive model of trains, where the rails are seen as lying in their bed. Obviously there are such strong associations between the person who had the privilege of sitting in what probably used to be the only chair in a meeting and the chair itself that this gave rise to a lexicalized metonymy.

In the field of word-formation, basic level terms occur frequently as heads in compounds, because they have so many facets that can be further specified. To name some of the most obvious attributes, the category **TABLE** can be specified with regard to its members' function (*tea table, coffee table, pool table*), their shape (*kidney table, butterfly table, round table*), their location (*toilet table, refectory table*), or special parts or properties (*gate-legged table, flap table, corbel table*). When they occupy the modifier position, basic level terms are often exploited for their privileged position in associative networks: most things that you need while you are at the dinner-table can be found in this paradigm, for example the items *table-cloth, table-linen, table-mat, table-knife, table-spoon, table ware*, not to forget the *table manners*. Needless to say there are a number of examples where the whole compounds have given rise to further figurative meanings (e.g. *bedfellow, bedrock*). As far as derivations are concerned, the most frequent case is a conversion or zero-derivation from the noun to verbs. The shift from object or organism categories to an action category is usually also based on frequent interactions and often carries an element of metonymic mapping, for example when the word *bed* is used to denote actions like 'placing sth firmly', 'planting sth.' or 'having sexual intercourse with'. Finally, fixed expressions based on basic level terms, which in many cases again involve figurative elements, reflect our intimate familiarity with the members of the underlying categories which we have acquired through constant contact and interaction.

In contrast, superordinate categories do not treat entities in this comprehensive manner. Besides subsuming a number of basic level categories, superordinate categories primarily have the function of highlighting a small number of attributes that is shared by these basic level categories (Ungerer/Schmid forthcoming). For example, the superordinate category **FURNITURE** comprises the basic level categories **CHAIR, TABLE, BED, SOFA, SHELF** etc., and highlights the shared attributes 'is a large movable object' and 'makes a room suitable for living in'. Through this highlighting process the conceptual richness of the basic level categories is greatly diminished and, therefore, superordinate categories can be said to have a much 'leaner' category structure. Although the objects and organisms of course remain the same, we use only a small part of our knowledge about them when we collect them in superordinate categories. As a consequence the basis for further conceptual, and hence linguistic, development is too narrow, and this is why superordinate terms contribute so little to the enlargement of the lexicon. The only productive process in which remarkable numbers of extensions based on superordinates occur are compounds with superordinates as heads. Given the limited conceptual content entailed in the superordinates themselves it is no great surprise that this specifying type of word-formation process prevails.

## 5. Conclusion

In talking about the basic level of categorization it is important to bear in mind that the categorization of the objects and organisms around us is a cognitive process and not, at least not directly, a linguistic one. Certainly the linguistic, especially the morphological, characteristics of the words which denote cognitive categories may sometimes give us important clues as to their specificity. The actual place of a category in the conceptual hierarchy, however, can only be determined by means of cognitive criteria such as the potential of the members of a category for a shared gestalt, for many distinctive category-wide attributes and for common interactive motor movements.

Once the cognitive prominence of certain basic level categories has been established independent of language, it is possible to discuss the question whether the related words also have a privileged status in the lexicon, and this has been the issue addressed in this paper. The investigation has shown that basic level terms are much more productive with regard to word-formation processes and multiple meanings based on semantic transfer than their related superordinate terms. Thus the main findings of this paper reveal the existence of a pronounced correspondence between the cognitive and the linguistic prominence of basic level categories and terms respectively. In view of this correspondence it will become harder to uphold the well-known claims that our linguistic capacity should be investigated in separation from extralinguistic reality and from other cognitive abilities.

## Notes

- 1) As is obvious, a distinction is made in this paper between cognitive and linguistic phenomena. Since categories are seen as belonging to the cognitive level, whereas words of course make up a part of language, it will be helpful to distinguish between the two notions typographically: according to the usual conventions words will be typed in italics, while categories will be indicated by the use of small capitals.
- 2) Based on a few remarks by Rosch et al. (1976, 384) the role of distinctive attributes in the formation of the cognitively economic basic level categories has also been discussed in terms of the statistical notion of 'cue validity' by various authors (cf. Pulman 1983, 88; Lakoff 1987, 52f, Geeraerts 1988, 207f, Kleiber 1990, 88ff).
- 3) The *gestalt*, i.e. its potential for being perceived as a holistic *figure* (in the gestalt-psychological sense of the term) is more important than the outer shape of an object or organism. The importance of this factor for the formation of basic level categories, which for a long time was underestimated, is stressed by Lakoff (1987, 269f), Kleiber (1990, 84) and Ungerer/Schmid (forthcoming). In addition to the overall outer shape, the functionally relevant parts of an object or organism play a major role in the establishment of a visual gestalt (Tversky/Hemenway 1984, Tversky 1990, Ungerer/Schmid forthcoming).
- 4) Due to lack of space, the discussion of the cognitive prominence of basic level categories had to be limited to the main points. Other relevant factors such as the rapidity of object recognition, the storage of knowledge about objects and the relation of scientific and everyday 'folk' taxonomies of categories are discussed by Lakoff (1987, 46ff), Kleiber (1990, 84ff) and Ungerer/Schmid (forthcoming, ch.2). A more sceptical view of the importance of the basic level is held by Geeraerts et al. (1994).

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