Linguistic, Conceptual and Encyclopedic Knowledge: Some Implications for Lexicography

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In contemporary linguistics, theoretical linguistics and lexicography seem each to go their own ways, they do not seem to show much interest in each other's preoccupations and their relationship is far from being intimate. The lexicographers' attitude towards language is often atheoretical and they reproach linguists for producing theories which are not very useful in practical work; theoretical linguists, on the other hand, blame lexicographers for keeping aloof from theoretical questions, for being satisfied with a kind of fiddling job. Theoretical linguists construct theories in order to account for various aspects of language. They also construct theories concerning the representation of lexical items which constitute the lexicon of a given language. The lexicon is viewed as a module (or component) within an overall description of language. An adequate theory of the lexicon has to take into consideration the requirements of other modules as well. Therefore, a lexical item need not be a word of the language, it can be a stem morpheme, a phonologically not fully specified sequence of segments or even an abstract entity with no direct relationship with the actually occurring elements of the language. In most cases the lexicon is not considered to be a simple agglomerate of lexical items, it is at least in part rulegoverned. The main concern of lexicography, on the other hand, is the compilation of dictionaries. A dictionary is not a theoretical construct, it is a list of words, each word being provided with a description serving primarily practical purposes (Lang 1983). (In what follows I am going to refer by the term lexicon to the module of an overall theory of language that contains the lexical items with their specifications and by the term dictionary to any product of lexicographic nature). What, then, can a theoretical construct, the lexicon, and a (partial) record of the word stock of a language, the dictionary, have in common? It would seem as if the gap between the two were unbridgeable and that the two disciplines, the theory of the lexicon and lexicography, cannot be reconciled. This is, however, not the case: on the one hand, no theoretical work on the lexicon is possible without appropriate data which can, at least to some extent, be supplied by lexicography, and dictionaries could certainly be made more adequate by making use of some of the insights gained by theoretical research. Furthermore, there are also quite a few problems which both the theory of the lexicon and lexicography have to tackle. The distinction between linguistic and everyday knowledge is one of them. Is there a dividing line between linguistic and everyday knowledge? If so, where should this line be drawn? And to what extent does everyday knowledge determine the meaning of lexical items? The answers to these questions have far-reaching consequences for both theoretical and applied research.

Following some recent work in theoretical linguistics it seems expedient to distinguish between three types of knowledge: linguistic knowledge, which, roughly speaking, concerns the core meaning of lexical items, conceptual knowledge, which has to do with the predictable modifications of the core meaning in various contexts, and encyclopedic knowledge, which comprises the rest, i.e. knowledge

associated with a word but which is not immediately relevant to linguistic structure. For example, the lexical item *book* may be said to have as its core meaning something like 'a written or printed work of some length', i.e. *book* is a written or printed physical object. The fact that the lexical entry *book* can also be used as a nonphysical entity as in

(1) I enjoyed your recent book.

belongs to our conceptual knowledge. And our knowledge concerning the shape of books (e.g. hardcover, paperback), or concerning their contents (fiction, scientific, crime, etc.) belongs to encyclopedic knowledge. Or to take another example, the basic linguistic meaning of the verb *eat* is 'to take into the mouth, masticate and swallow food'. Conceptually, however, *eat* means more than that. For example, we know that there is a proper way of eating which can be acquired as in

(2) She can already eat alone.

We also know that eating can be affected by illness; question (3) refers indirectly to this fact:

(3) Can you eat?

Then there are quite a few things which we know about eating which however do not play any role in semantic interpretation. We know, for example, that one normally eats breakfast, lunch and dinner. We also know that we normally eat from a plate and normally use various instruments while eating (a knife, a fork or a spoon, for example). Furthermore, we also know what a usual breakfast consists of (often depending on culture or country, of course). But all this information belongs to what we call encyclopedic knowledge. Both linguistic knowledge and conceptual knowledge are evoked for semantic interpretation, encyclopedic knowledge, on the other hand, plays a role in certain inferencing processes only. Thus, for example, from

(4) The book weighs 7 pounds.

we may infer that the book is a rather thick one. But this has nothing to do with semantic interpretation. Similarly, in the case of

(5) Bill has not yet finished dinner, he is eating the soup now.

the hearer may infer on the basis of what he knows about eating dinner that Bill now is eating the first or second course which will be followed by the main course. But, once again, this is not part of the semantic interpretation of the respective sentences in question.

Each lexical item of a lexicon must encapsulate at least a minimum amount of linguistic knowledge but it need not encode conceptual knowledge. Encyclopedic knowledge, on the other hand, is excluded from the description of lexical items. Much of conceptual knowledge is rule-governed, which means that particular lexical items need not always be specified for this knowledge. For example, a 'conceptual rule' tells us that certain human products (a book, a letter, a painting) may be judged with respect to their contents. Another 'conceptual rule' predicts that certain physiological abilities (like eating) may be affected by illness, or that there is a proper way of executing a certain ability and this has to be acquired (like

the proper way of eating). This way of looking at lexical items entails, among other things, that most lexical items are underspecified, much of the semantic information is provided by 'conceptual rules'.

Lexical items may differ as to how much linguistic knowledge they contain in their descriptions and how much conceptual information they need for being fully specified. Proper names, for example, are semantically fully specified by the information 'proper name'. Proper names are 'rigid designators', as a logician would put it, they are exclusively used for identification. We know, however, that proper names can be turned into common nouns by conceptualizing some of the encyclopedic knowledge associated with them. In the case of a sentence like

(6) He is the Napoleon of our century.

Napoleon is not used as a proper name but rather as a common noun. In that case the meaning of Napoleon consists of a set of properties. The same holds true for the interpretation of Budapest in the sentence

(7) I like Budapest.

To be sure, exactly which properties are attributed to a proper name depends mainly on the context and they need not always be made explicit. The 'conceptual rule' which is applied here runs as follows: 'Assign a set of characteristic properties of the referent to the proper name'. The application of this conceptual rule leads to a different lexical entry, *Budapest* as a proper name is not the same as *Budapest* as a common noun. Consequently, 'conceptual rules' can also be used to create new lexical items and not only for producing information for already existing ones.

Clearly, conjunctions must contain a linguistic description, however, they seem to lie outside of the domain of 'conceptual rules', though, of course, they may give rise to various inferencing processes. Thus, for example, the conjunction and must contain the information that it concerns two independent sentences which (= the corresponding propositions) are simultaneously true or false. The fact that and sometimes admits (or invites) other interpretations, for example, a temporal interpretation 'and then', is a consequence of inferencing processes and not a matter of semantics.

In the case of certain common nouns there seems to be a clear division of labour between the two types of information. The core meaning is altered or supplemented by means of 'conceptual rules'. The noun *school*, for example, may have at least the following literal meanings:

- (i) a regular course of meetings of a teacher or teachers and students for instruction, i.e. teaching and learning activities,
- (ii) a place or establishment where instruction is given,
- (iii) the institution itself,
- (iv) the body of students or pupils attending a school.

These meanings are derived by 'conceptual rules' from an underspecified core meaning which can be paraphrased as 'things whose goal is to provide for teaching and learning activities'. The noun 'university', too, has these meanings, the difference concerns the grade of learning, a university is an institution of learning of the highest grade (this means that one has to introduce a variable of grade into the description of the core meanings of the lexical items school and university). But

except for this difference it can denote either (i) the ensemble of teaching and learning activities, (ii) a place, (iii) an institution, or (iv) the body of students and teachers. This seems to hold true for a whole set of words (i.e. a 'semantic field', some further examples: museum, church, academy, radio, theatre, bank. etc.). Once again, 'conceptual rules' may be at work to derive the above-mentioned meanings from the core meaning. These rules 'shift' the core meaning in various directions (that is why M. Bierwisch calls this phenomenon 'conceptual shift', cf. Bierwisch 1983). These are nouns which differ from the school-type nouns in the core meaning only, the rules of 'conceptual shift' are by and large identical. We saw this already by comparing school and university. To take yet another example, consider the noun parliament where the core meaning is something like 'things whose goal is legislation', the fully-fledged literal meanings, however, include the building which houses the parliament, the institution itself, the body of the members of the parliament or the ensemble of activities aiming at legislation.

So far we have examined cases where the 'conceptual rules' are identical and the core meanings differ. In other cases not only the core meanings are different but also some of the 'conceptual rules' to be applied. The noun opera has at least one 'conceptual rule' common with the school-type nouns: it may also be used to denote the opera house. It is worthwhile noting that languages do not differ that much with respect to core meanings but they may exhibit essential differences as to the 'conceptual rules' to be applied. For example, school may denote in English 'the faculties of a university' but this meaning is not available in, say, German or Hungarian. On the other hand, the noun operaház 'opera house' can be interpreted in Hungarian to mean the body of people (singers, musicians, administrative staff etc.) working at the opera house. In English, however, opera house means just the place where operas are usually performed.

In general, the context makes it quite clear which one of the possible uses of the given noun is at stake. Consider the following sentences containing all the noun school:

- (8) (i) School annoys him.
 - (ii) Bill's school is making a trip to the sea-side.
 - (iii) Bill's school is just across the street.
 - (iv) School is one of the most important inventions of modern times.

In (8) (i) school is used in its activity-sense, in (ii) school means 'the body of students and teachers', in (iii) the place of the school and in (iv) the institution. One may say that the context activates one or the other 'conceptual rule' which then produces the desired result. The phenomenon which would traditionally be called polysemy is thus accountable in terms of 'conceptual shift'.

Another case where 'conceptual rules' play an essential role can be exemplified by Labov's famous experiment with the words *cup*, *vase* and *bowl* (Labov 1973). Labov showed students pictures of containers and asked them to label each as either a cup, a vase or a bowl. The students all agreed on certain shapes. For example, they all considered tall thin containers without handles to be vases and low flat ones to be bowls. But they were quite confused when faced with something that was in between the two. Was it a vase or a cup? And suppose vase and bowl shapes were given handles, what then? They had difficulty in decoding, and they came to different conclusions from one another. Moreover, they were often inconsistent in their own

responses. One conclusion which can be drawn from this experiment is that fuzzy edges seem to be an intrinsic property of word meaning. Another conclusion may be, however, that there are prototypical cups, vases and bowls and less prototypical ones. The prototypical properties cover three dimensions: shape, size and material. A prototypical cup, for example, is a small, open container with a handle whose height and breadth are not significantly distinct and which is made of porcelain. Any departure from these prototypical properties renders the cup less prototypical. For example, a cup without a handle is less prototypical than a cup with a handle, or a cup whose breadth is two times as much as its height is less prototypical than a cup whose measures are more balanced. Finally, a cup made of plastic or paper is less prototypical than a cup made of porcelain. (At least, in our culture this is still the case). The core meaning, then, of natural kind terms is the one that encapsulates the prototypical properties. But it should be kept in mind that these are not absolute properties, they formulate sufficient but not necessary conditions for membership. Conceptual semantics accounts for the fact that each property at hand can be relaxed in various ways and that categories (properties) may overlap.

Next, let us consider the case of verbs. In the sentence

(9) Faulkner is difficult to understand.

the verb to understand means at least three different things depending on the interpretation of Faulkner. If Faulkner refers to Faulkner's writings to understand means 'to understand intellectually'; if, however, Faulkner means Faulkner's speech to understand means 'to perceive', i.e. 'to understand acoustically'. Finally, if Faulkner is interpreted as Faulkner's behaviour, to understand involves moral understanding. Depending on the context, then, to understand is interpreted in slightly different ways. (Bierwisch speaks of 'conceptual differentiation' in this case.) 'Conceptual rules' take care of this differentiation in the same way as they do of 'conceptual shift'. The core meaning of to understand is something like 'comprehend with respect to some aspect' where the variable 'some aspect' has to be specified contextually. In the example cited above the variable may mean content, sounds, or behaviour. In other cases other aspects may enter into play.

The verb to cut represents a somewhat more complicated case (Searle 1980). For a considerable number of senses of this verb one may postulate the following core meaning 'to detach with a sharp-edged instrument'. Now, it is easy to see that this verb involves different activities and different instruments in each of the following cases.

- (10) (i) Bill is cutting bread.
 - (ii) Eve is cutting Bill's hair.
 - (iii) Eve is cutting her nails.
 - (iv) Bill likes cutting grass.

The usual instrument for cutting bread may still be a knife. The activity involved in the case of our first sentence is then tied to 'cutting bread with a knife'. Similar things hold true *mutatis mutandi* for the other examples. For cutting someone's hair one usually uses scissors or a hairclipper, for cutting nails nail-scissors or a nail-trimmer, for cutting grass grass-shears, a scythe, a sickle or a lawn-mower. But, once again, the instruments used are merely prototypical for the activity in question. One can depart from the prototypical situation quite easily; for example, one

can cut bread with a saw or with an ax, though such a situation is not very likely to occur. A more radical departure from what may be considered prototypical would be to use scissors for cutting bread, but it is questionable if such an enterprise would be successful. And it would be quite absurd to try to use a lawn-mower or mowing machine for cutting bread. Cutting involves various movements depending on the instrument used (e.g. up and down, back and forward, from left to right and from right to left etc.). The difference between the detaching, dividing and trimming senses of cutting are due to the properties of the object to be cut, these are thus not part of the core meaning of cutting. In other words the core meaning of to cut is further specified by 'conceptual rules' evoked by the context. In the present case context means the object to be cut, on the one hand, and the prototypical instrument associated with the verb phrase, on the other.

These examples may suffice to show what is meant by linguistic and conceptual knowledge in the description of lexical meaning. Since the distinction between linguistic knowledge and conceptual knowledge, on the one hand, and between conceptual knowledge and encyclopedic knowledge, on the other, is notoriously hazy, we need operational criteria in order to be able to draw these distinctions in a more or less systematic way. Unfortunately, however, we don't have any criteria at our disposal as yet which would work in all cases without exception. But there are some which can profitably be used in at least certain cases.

One set of criteria has been suggested by G. Gruber (1985). He considers the words *cub*, *glass* and *snake*. He points out that being young is a part of the meaning of *cub*, being of glass is a part of the meaning of *glass*, and having no legs is a part of the meaning of a *snake*. However, these aspects of meaning are distinguishable as lexical, conceptual and encyclopedic, respectively. That this distinction covers different things can be shown by considering the means by which violations of these aspects of meaning are understood. Consider the following three unacceptable phrases:

- (11) (i) an adult cub
 - (ii) an earthen glass
 - (iii) a snake with legs

These unacceptable phrases represent three different types of violation. Since non-adult is an inherent feature of a 'cub', (11) (i) represents a semantic anomaly. A prototypical glass is made of glass, (11) (ii) is thus a conceptual violation. Finally, our present knowledge about the world tells us that snakes have no legs, consequently (11) (iii) is an encyclopedic violation.

If the above phrases are to be construed in an acceptable way, the manner in which this is done serves to differentiate lexical, conceptual and encyclopedic meaning. "A violation of lexical meaning tends to be understood as metaphor, a conceptual violation is construed as acceptable by a reference to the boundaries between the features involved, and supposing an imaginary situation or fantasy suffices to render an encyclopedic violation acceptable." (Op.cit. 256)

The phrase adult cub may have two metaphorical interpretations. In one case one may be speaking of an actual cub which is like an adult in certain ways. In this case the word adult is used metaphorically. Alternatively, one may be speaking of an actual adult animal like a cub in certain ways, in which case the word cub is used metaphorically.

The phrase earthen glass can be interpreted by reference to the boundary area between the areas more typically referred to by contrasting conceptual feature values. An earthen glass is not a prototypical glass.

Finally, consider the phrase a snake with legs. In order to interpret the phrase in an acceptable way, it is necessary only to imagine a snake with legs. It is not necessary to construe the phrase either as metaphor or as an instance of boundary reference.

Gruber also points out that there are certain sentence forms which when completed by a phrase serve to distinguish among lexical, conceptual, and encyclopedic meaning. One of them is the *but*-test.

- (12) (i) It's a cub, but it's adult.
 - (ii) It's a glass, but it's earthen.
 - (iii) It's a snake, but it has legs.

There is a clear violation only in the case of the lexical meaning. (Op.cit. 265)

A test frame which distinguishes between encyclopedic and conceptual meaning involves generics.

- (13) (i) *(We discovered that) cubs are adults.
 - (ii) (We discovered that) glasses are earthen.
 - (iii) (We discovered that) snake have legs.

It is possible to accept the encyclopedic violation as some sort of discovery.

The problem with Gruber's criteria is, of course, that they seem to work for natural kind terms only. How should conceptual knowledge be interpreted in cases where prototypes do not play any role? Gruber doesn't offer any answer to this question. He seems to assume that prototypes belong to the characterization of any lexical item, which is evidently not the case. But there is a more serious shortcoming inherent in Gruber's criteria: it is not always clear whether one can make a clear distinction between conceptual and encyclopedic knowledge as suggested by Gruber's criteria. For example, couldn't one say that a prototypical snake has no legs, consequently a snake with legs is a non-prototypical snake? In spite of these shortcomings, however, Gruber's criteria seem to work pretty well in the domain where they are applicable.

In other cases (in the case of certain types of verbs) one can apply the ability-test which I proposed elsewhere (Kiefer 1988). This test has already been mentioned in connection with the verb to eat. The basic idea is this. The construction 'able to y' may mean several things in addition to mere ability. The various senses are due to the application of 'conceptual rules'. Consequently, if we know what the core meaning of y is and if we know the range of senses of the construction 'able to y' we can pin down the conceptual knowledge associated with y. Conceptual knowledge is, however, restricted in this case to a small number of general properties such as: quality, quantity, manner of y-ing acquired, y-ing affected by illness, disposition for y-ing and a few others. Moreover, we can only find out something about conceptual knowledge associated with the context able to. That is, in general, it helps us to determine a certain portion of conceptual knowledge only. The rest has to be determined by other means.

Theoretically, it is conceivable that the distinction between conceptual and encyclopedic knowledge be based on a set of 'conceptual rules'. These rules have to

be determined by means of a detailed linguistic analysis both of individual lexical items and of lexical fields (e.g. Talmy 1987). The results obtained thus far are certainly promising but in no way definitive.

The large number of open questions does not mean, however, that we cannot already start thinking of the practical applications of the three-way distinction discussed above. This leads us to the last part of my paper which is going to address some of the practical consequences of the theory.

Dictionaries, in contrast to a lexicon, include encyclopedic knowledge in the description of certain lexical items. This is most apparent in cases where the linguistic meaning is minimal, as with proper names. A dictionary replaces here the meaning description by a description which may help the reader to identify the referent. The proper name *Budapest*, for example, is described by one well-known dictionary as "the capital of Hungary, on the Danube, formed by the union of the cities of Buda and Pest in 1872". Nothing in this description is linguistic. But encyclopedic knowledge is often made part of the description of common nouns as well. For example, it is quite normal to indicate the existing genera and the places where they live in the description of animals. This information belongs to encyclopedic knowledge, however. A dictionary occupies thus in many respects an intermediate position between a lexicon and an encyclopedia. To be sure, it contains much less encyclopedic information than an encyclopedia does since its main aim is to describe the word and not to convey information about the referent. The decisive question, however, is whether it contains all the relevant linguistic information.

Linguistic knowledge, as we argued above, consists of the core meaning of a lexical item which is essentially of three kinds. First, it may indicate the operation to be performed. This is the case, for example, with conjunctions. Here most dictionaries fare rather badly (Lang 1982). They rarely provide functional information, the information given is most often confined to the enumeration of quasi-synonyms. In The American College Dictionary, for example, the lexical entry and is characterized as meaning (i) along with, together with, (ii) as well as. Functional information is missing. The lexical entry or, on the other hand, is described only functionally: 'a particle used to connect words, phrases or clauses representing alternatives'. This is clearly inconsistent. It should also be noted that in the case of conjunctions it is particularly dangerous to refer to quasi-synonyms since typically each conjunction is the linguistic sign for a very specific operation: since is not the same as because, but is not the same as vet.

Second, the core meaning may consist of the set of prototypical properties. One should expect that a dictionary does not differ much from the lexicon in this respect. A closer inspection of some of the major dictionaries shows, however, that this is far from being the case. In the majority of cases we find an arbitrary selection of prototypical properties, often intermingled with non-prototypical ones. We saw in connection with the noun *cup* that the description must contain information about shape, size and material. Now either *one* of the specifications is missing or the description is kept too general and would thus not be sufficient in order to keep apart related items from each other. The following definitions, all taken from The American College Dictionary (1966), may be symptomatic. A cup is 'a small, open container, esp. of porcelain or metal', a bowl is 'a rather deep, round dish or basin' and a vase is 'a hollow vessel, generally higher than wide'. Notice that the description of 'cup' is equally applicable to *bowl* and *vase*. Moreover not only bowls are

typically round but also cups and vases, a hollow vessel is the same as an open container, depth is a more characteristic feature of vases than of bowls, etc. A higher degree of adequacy and more consistency could certainly be achieved by concentrating on prototypical properties.

Third, 'conceptual rules' may bring about 'conceptual shift', as we saw above. Here one should expect that related nouns (roughly, nouns belonging to the same semantic field) have approximately the same range of meaning. This expectation is borne out by the facts. But to what extent is this reflected in the dictionaries? Unfortunately, dictionaries don't seem to pay attention to this regularity, the meanings (or uses) encoded represent a more or less random selection from among the possible meanings. Let's compare, for example, the lexical entry school with that of university. Evidently, the latter undergoes the same 'conceptual shift' as the former as testified by the following sentences.

- (14) (i) The university annoys him.
 - (ii) The university is making a trip to the seaside.
 - (iii) The university is just across the street.
 - (iv) The university is one of the most important inventions of modern times.

In the first sentence *university* means 'teaching and learning processes', in the second 'the body of teachers and students', in the third 'the place of the university', and in the fourth 'university as an institution'. Now let us have a look at the dictionaries. We will draw our examples from The American College Dictionary again. For the lexical entry *school* the following meanings are mentioned (we will restrict ourselves to the meanings which can be determined by means of general 'conceptual rules'):

- (15) (i) a place where instruction is given,
 - (ii) the body of students or pupils attending a school,
 - (iii) a regular course for instruction.

That is, from among the meanings deducible by means of 'conceptual rules' the 'institution' meaning is left unmentioned. In the case of the lexical entry for *university*, on the other hand, only the 'institution' meaning is represented: a university is 'an institution of learning of the highest grade'. The meanings represented by (14) (i)-(iii) are missing.

Or to take another example, the word book and painting have the property in common that they can both be used either as denoting a physical object or a piece of art with information content. In The American College Dictionary both meanings are listed for painting: (i) a picture or design executed in paints, (ii) act, art, or work of one who paints, for book, however, only the physical object meaning is mentioned ('a written or printed work of some length'). The conclusion that can be drawn from these observations is that one could make the dictionary entries more coherent and more systematic by paying due attention to the rules of 'conceptual shift'. Since 'conceptual shift', as already noted, relates polysemous lexical entries with each other, and since polysemy belongs traditionally to the well-established research areas in both lexicology and lexicography, we are by no means transgressing the confines of lexicography by requiring more consistency in this respect.

What about 'conceptual differentiation'? That meanings that are the result of 'conceptual differentiation', even if incompletely, are sometimes listed in diction-

aries can be shown on the example of he lexical entry to have, taken from The American College Dictionary. A cursory inspection already shows that the meanings enumerated are in fact relatable to the core meaning by means of 'conceptual rules'. To mention just a few of them: (i) to possess; (ii) to get, receive; (iii) to hold or possess in some other relation, as of kindred; (iv) to engage in, to perform. They can all be derived from a general core meaning (something like 'there is a relation between two entities') by conceptual rules. It should be noted that the modal readings of have are not traceable back to this reading and should therefore constitute a separate set of readings (they are homonyms; two meanings of a lexical entry are polysemous if and only if they can be deduced from the same core meaning). The problems which arise in connection with 'conceptual differentiation' are thus not exactly the same as the ones which are raised by 'conceptual shift'. The main problem lies here in the distinction between homonymous and polysemous meanings. Theoretical linguistics may bring us closer to the understanding of this difference.

In conclusion let me recapitulate the main claims presented in this paper. Quite a few insights gained in theoretical linguistics can fruitfully be exploited in lexicography. One of the methodological novelties concerns the distinction recently made between linguistic, conceptual and encyclopedic knowledge. Another has to do with the derivation of fully-fledged meanings by means of 'conceptual differentiation', and meaning changes brought about by 'conceptual shift'. Yet another important proposal is the identification of lexical meaning (for some lexical entries) with the set of prototypical properties. Also, the distinction made between conceptual and encyclopedic knowledge should have some consequences for lexicography.

For a successful application of theoretical methods in lexicography, however, a radical change in the attitudes of both theoretical linguists and lexicographers is called for. My paper is meant to be but a modest contribution to this end.

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