Context and Contextual Word Meaning
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In linguistics, context carries tremendous importance in disambiguation of meanings as well as in understanding the actual meaning of words. Therefore, understanding the context becomes an important task in the area of applied linguistics, computational linguistics, lexical semantics, cognitive linguistics, as well as in other areas of linguistics as context triggers variation of meaning and supplies valuable information to understand why and how a particular word varies in meaning when used in a piece of text. Keeping this question in mind, I have made an attempt here to understand the nature, type, and role of context in the act of meaning disambiguation of words used in a language. In contrast to the observation of earlier scholars, I have identified four types of context that can help us to understand the actual meaning of a word. At certain situations, although reference to the local context appears to be the most suitable proposition, reference to other contexts also becomes equally important to decipher the actual meaning of a word in a natural language text.

1. Introduction

A word, when used in a piece of text, usually denotes only one meaning out of multiple meanings it inherently carries. Although it is still unknown to us how does it happen, the general observation is that it is the context that determines which meaning of the word should be considered. This observation, as a logical consequence, leads us to identify the context responsible for meaning variation of a word. The general conviction is that identification of context depends heavily on intuitive ability of a language user. I argue that natural language texts are the best resources for the task, since words are usually represented within these texts with all kinds of context-based information. Language corpora, made with different kinds of natural text, contain numerous examples of contextual use of words to provide useful information for understanding meaning variation of words as well as for deciphering their actual context-based meanings.

In this paper I have tried to identify contexts in a systematic way, focusing on the use of words in a piece of text. In Section 2, I have tried to define context and its types; in Section 3, I have focused on the local context and its role in meaning disambiguation; in Section 4, I have discussed the nature and role of sentential context; in Section 5, I have referred to the topical context that provides wider perspective for more accurate understanding of word meaning; in Section 6, I have focused on the global context as a source of the most valuable information required for meaning disambiguation of words; and in Section 7, I have looked into the nature of referential interface underlying among the contexts. Finally, in the concluding section, I have tried to justify the relevance of meaning disambiguation in various spheres of linguistics.

2. What is context ?

For my present discussion I have used the term *context* to refer to an immediate linguistic environment (rarely detached or isolated) in which a particular word occurs. Since it is not always explicit, it may be hidden within the neighboring members of a word used in a piece of text. If we cannot extract the information relevant to the meaning of a word from its immediate linguistic environment, we need to take into account the topic of discussion as a sphere of necessary information. Taking these factors into consideration, Miller and Leacock (2000) have classified context into two types: (a) local context, and (b) topical context. While the local context refers to one or two words immediately before and after the key word (KW) under investigation, the topical context refers to the topic of the text where the KW has been used. According to these scholars, reference to the two contexts is more of less sufficient in understanding the actual contextual meaning of the KW used in a text.

In my view, the two contexts mentioned above are not enough for understanding the intended meaning of a word, as these contexts often fail to provide the necessary information required for the purpose. In certain readings, information acquired from the local context and the topical context may be sufficient, but these are not enough for understanding all possible meaning variations of a word. To acquire more information I, therefore, argue to classify context (taking these two types into my consideration) into four broad types (Dash 2005a):

(a)   Local Context,
(b)   Sentential Context,
(c)   Topical Context, and
(d)   Global Context

The local context refers to the immediate circle of the KW, the sentential context refers to the next circle immediately beyond the local context, the topical context refers to the wider circle beyond the sentence level, while the global context refers to the world at large. Although such a stratified layering of the contexts is not always explicit in a piece of text, it helps us to visualize tentatively how the contexts should be interpreted for understanding the actual contextual meaning of a word. Moreover, the conceptual layering of the contexts (Fig. 1) will lead us to deal with the problem in a systematic manner and thereby reduce the amount of errors in interpretation and understanding the contextual meaning of words in a text.
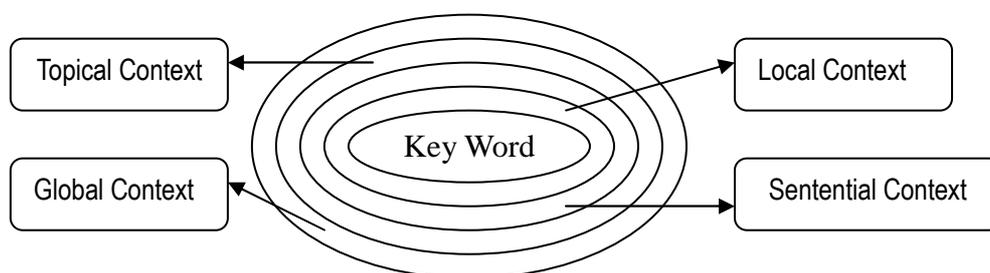

Figure 1 *Conceptual layering of contexts of a word in a piece of text*

In Figure 1 the KW is surrounded by four circles. The first circle is the local context, which is the centre of our attention as it can provide the most vital information regarding the contextual meaning of a word. Therefore, we refer to the local context first to obtain

information from the neighboring words of the KW. But, in most cases, it is observed that the information acquired from the local context is not enough to capture the actual contextual meaning of the KW. In that case, we need to refer to the sentential context for retrieving the information from the sentence where the KW has taken place. In a similar fashion, we need to explore the topical context to extract information from the topic of discussion if the local context and the sentential context fail to provide it. Finally, we consider the global context to acquire information from the extralinguistic world for deciphering the contextual meaning of the KW when we find that other contexts are not able to provide us necessary inputs for our purpose. The process of systematic extraction of information from different contexts is presented in Figure 2, which shows contributions of the contexts in understanding the meaning of words.
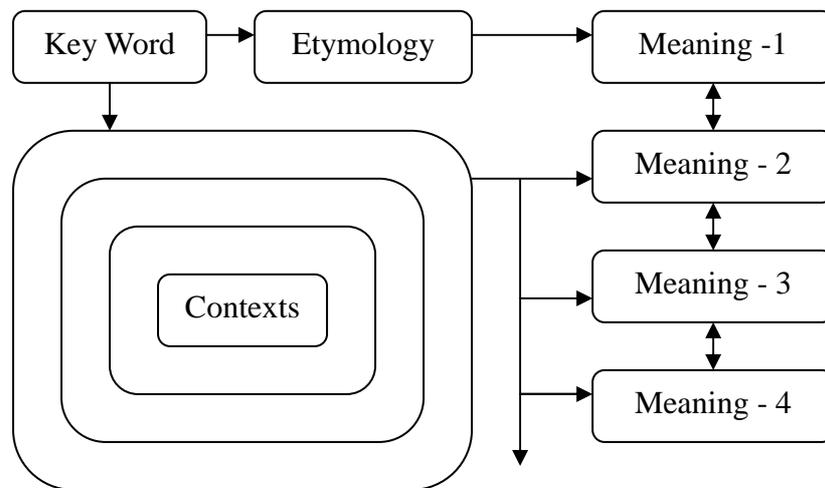
Figure 2 *Generation of new senses due to the variation of context*

In the following sections I have discussed each context with examples obtained from the Bengali corpus of prose texts (Dash 2001) to show where does context belong; how does it act to create variations in meaning; and how information obtained from different contexts helps us to understand the actual contextual meaning of a word in a piece of text.

3. Local Context

The local context refers to the immediate environment of the KW in a sentence where it has occurred, encompassing its immediately preceding and succeeding words. Conceptually, the immediately preceding (i.e., left) word (LW_1), the key word (KW), and the immediately succeeding (i.e., right) word (RW_1) ($= LW_1 + KW + RW_1$) constitute a lexical block, where the KW is the main member while the LW_1 and the RW_1 are supporting members. Systematic interpretation of the lexical block will supply necessary information to retrieve the contextual meaning of the KW. The members of the lexical block generate a network of semantic relationship from which the intended meaning of the KW is derived by integrating meanings provided by the LW_1 and the RW_1. Thus, in majority of cases, proper importance to the local context will help us to obtain the actual meaning of the KW. Within the sphere of structural

semantics, it is a unique network of syntactically related members within which each member derives its meaning from the interface of its semantico-syntactic relation with other members (Verschueren 1981: 326).

To examine how the local context supplies information to understand the contextual meaning of the KW, on experimental basis, I have used 4 sets of lexical blocks where I have put the KW in the middle and one word in each side ($\pm$1) in the following manner (Figure 3). I have distributed the sample data set to a few native Bengali speakers to examine if they can understand the contextual meaning of the KW by associating meanings of the neighboring words without referring to the sentences. Each informant is provided with only one set of data at a time in sequential order: [Set 1] > [Set 2] > [Set 3] > [Set 4].

[Set 1] | LW_1 | KW | RW_1 |
[Set 2] | LW_1 | KW | RW_1 | RW_2 |
[Set 3] | LW_2 | LW_1 | KW | RW_1 |
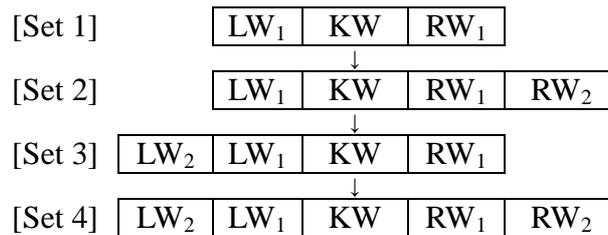[Set 4] | LW_2 | LW_1 | KW | RW_1 | RW_2 |

Figure 3 *Position of KW in the local context (LW = Left Word, RW = Right Word)*

From analysis of the results I have observed that a native Bengali speaker, in most cases, can understand the contextual meaning of the KW if (s)he is provided with a lexical block of five words (i.e., Set 4) where the KW has occurred in the middle of the construction. In this case at least, the informants do not need to know the meaning of the whole sentence. From this experiment I noted that in most cases information obtained from the local context is enough for understanding the actual contextual meaning of the KW. I have also realized that in machine translation (MT), if the meaning of a word is possible to extract from the local context, some problems of translation can be dissolved (Dash 2007, Chapter 4).

However, further analysis of examples obtained from the Bengali corpus shows that information obtained from the local context is not sufficient and we require information of various other types from other contexts to understand the actual contextual meaning of the KW. Even then, I find that the local context, with reference to all the words included in the lexical block, helps us to deal with some of the problems of lexical semantics mentioned below (Dash 2005b).

First, the local context provides us necessary information to know if the KW holds idiomatic relation with its neighboring members. For example,

(1) tār$_{[LW1]}$ khāoyā$_{[KW]}$-parār$_{[RW1]}$ kharac   beśi   nay.
     His   eating-wearing   expense   much (is) not
    "The cost of his sustenance is not very high."

In the above sentence (1), the occurrence of the KW (i.e., *khāoyā*) and RW_1 (i.e., *parār*) as a lexical block within the local context helps us to consider them together as an idiomatic expression with a special meaning, which is not possible to derive if the words are treated separately in the sentence. Without further reference to any other context, we can understand that *khāoyā* is not used in general meaning, since its latent lexical relation with its succeeding

word denotes an idiomatic meaning (i.e., living) hardly possible to retrieve from the isolated meanings of the words. However, to draw distinctions among the idiomatic meanings, we need to refer to the metalinguistic information of words (Goddard 2000). For this we need a machine-readable dictionary (MRD), which is developed with preprocessed texts, dictionarial definition of words, lexicological data, contextual information, and knowledge of pragmatics and discourse within the scheme of its structured representation of semantic information of words (Fillmore and Atkins 2000).

Second, information obtained from the local context is also useful for understanding lexical collocation of words used in a lexical block. From here, we can know if co-occurrence of any two words is caused by choice (to evoke an intended sense) or by chance (having no special significance). I have found that association of two different words (W_1 and W_2) can denote a special meaning (idiomatic and/or metaphoric), which is not obtainable from the summation of individual literal meanings of the words. That means the co-occurrence of the W_1 and the W_2 in a particular lexical block can generate a special meaning, which is different from the literal meaning of each word. Moreover, collocation of the KW with the new words generates new special meanings, which are different from the literal meaning of the words. Consider the examples (Table 1) taken from the Bengali corpus (Dash 2005c).

Neighboring Words	Literal Meaning	Special Meaning
ādā nuṇ khāoyā	to eat ginger and salt	work determinedly
kalā khāoyā	to eat banana	fail in a mission
kacupoṛā khāoyā	to eat roasted arum	eating rubbish
ghaṇṭā khāoyā	to eat bells	eating nothing
māthā khāoyā	to eat head	spoil one's character
cākri khāoyā	to eat one's job	rusticate one from job
tel khāoyā	to eat oil	pleased with flattery
hāoyā khāoyā	to eat air	strolling aimlessly
Digbāji khāoyā	to eat a vault	to act conversely
ghol khāoyā	to eat skimmed milk	to be harassed

Table 1 *Variation of meaning due to lexical collocation of words*

Third, even when there is no idiomatic relation between the words, the local context informs if the KW shows meaning variation due to its relation with the neighboring words. In each of the following examples taken from the Bengali corpus information extracted from the words occurring immediately before the KW becomes handy to find out the contextual meaning of the KW. In reality, the extralinguistic knowledge obtained from the preceding words helps us to retrieve the contextual meaning of the KW, as the following examples show:

(2) se   bhāt[LW1] khāy[KW]
     He rice   eats
     'He eats rice'.

(3) se dudh[LW2]   khāy[KW]
     He milk   drinks
     'He drinks milk'.

(4) se   sigāreṭ[LW3]   khāy[KW]
He cigarette   smokes
'He smokes cigarette'.

After using reasonable amount of extralinguistic information we know that the words *bhāt, dudh* and *sigāret* denote three different objects, each one of which differs by its inherent bundle of componential properties. While, the word *bhāt* is a solid food item meant to be eaten, *dudh* is a liquid item meant to be drunk, and *sigāreṭ* is meant to be smoked. Using this knowledge we can understand that the KW *khāy* in sentence (2) means 'eating', in sentence (3) means 'drinking', and in sentence (4) means 'smoking'. Thus, three different meanings of the KW are linked up with a core (or etymological) meaning represented in the following diagram (Figure 4). This has been possible due to **lexical gap**, in which the lack of a suitable word expressing a particular meaning is duly compensated by expansion of meaning of a conceptually similar word available in the language.
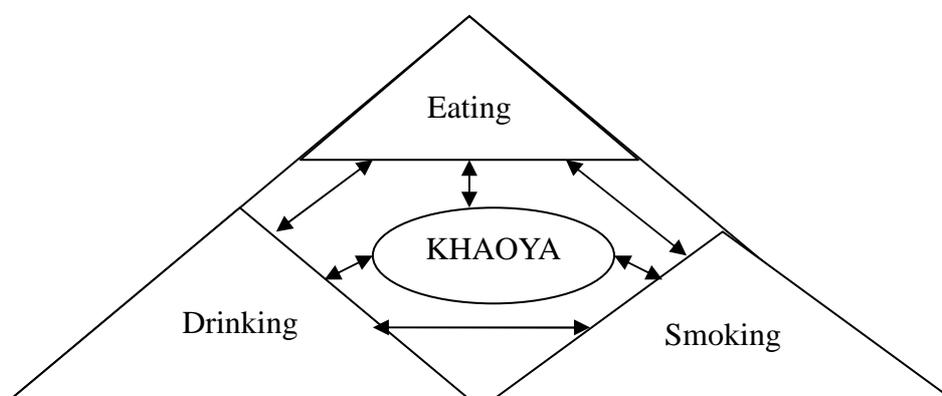

Figure 4 *Variation of meanings due to lexical gap*

4. Sentential Context

The sentential context refers to a sentence where the KW has occurred. It supplies syntactic information to know if the KW has any explicit or implicit syntactic relation with the other words used in the sentence. Evidences acquired from the Bengali corpus show that a set of two or three words maintains a special kind of relation although they are used at distant places within a sentence. It mostly happens in case of broken words, group verbs, idiomatic expressions, and set phrases where the two constituents, despite their idiomatic or phrasal relations, are separated from one another to be located at distant places in the sentence. In these cases, the sentential context allows us to explore if there is any variation of meaning of the KW due to its relation with the other members located far away. The most complex task, however, is to identify the members with whom the KW maintains a special kind of semantic relation in the sentence. Consider the following example taken from the Bengali corpus:

(5) ghol   tomāke āmi khāiye[KW] chāṛba
skimmed milk you-to I   drinking   (will) leave
'I shall harass you to the extreme'

The lexical meaning of the KW (i.e., *khāiye* = having eaten) in sentence (5) is entirely lost due to its idiomatic role in the sentence. The word that combines with it to generate idiomatic meaning is detached from it and located at the first position of the sentence. In Bengali, although the words *ghol* and *khāoyā* often occur side-by-side to evoke idiomatic meaning, in this sentence they are located at two distant places and this factor leads us to identify them in the sentence and associate their meanings together to retrieve the idiomatic meaning. Since it is not easy to identify which word is the most suitable candidate to be associated with the KW for idiomatic meaning, we need an MRD compiled with the lists of broken words, group verbs, appropriate prepositions, set phrases, and idiomatic expressions, etc. to help us to identify which two words, despite their distant location, have semantic relationship in the sentence to yield expected idiomatic meaning (Kilgarriff 2001). Moreover, since a computer system fails in this mission, to identify related words as well as to decipher their meanings we need extralinguistic knowledgebase and native language intuition to deal with the problem of meaning disambiguation of words within a piece of text.

5. Topical Context

The topical context refers to the topic of discussion and focuses on the content of a piece of text. Quite often, it is found that the actual meaning of the KW depends heavily on the topic which has a strong role to alter etymological meaning of the KW. For example, in English, based on the variation of topic the word *shot* refers to 'firing', 'drinking', 'hitting a ball by bat', 'kicking a ball', 'putting a ball in the net', 'distance between a player and the hole', 'taking a snap', 'giving an injection', or 'making love', etc. (Dash 2004). The following Bengali examples can show that the event of meaning variation of the KW takes place due to variation of topic or content— a regular phenomenon noted in all natural languages. It also implies that we should extract relevant information from the topic to trail the change of meaning of the KW.

(6a) khāli peṭe   khāben[KW] nā
      empty belly-loc. (will)eat   not
      'Do not take in empty stomach'

(6b) khāoyār āge   kichu   kheye[KW] nin
      eating-gen before something eating   (do) take
      'Eat something before you take it'

(6c) khāoyār   age   er sa'nge kichuṭā jal   miśiye khān[KW]
      eating-gen. before this with   some   water mixing eat-imp.
      'Mix some water with it before you take it'

(6d) khub bhālo hay yadi baraph miśiye khān[KW]
      very good is if   ice   mixing eat-imp.
      'It is better if you drink mixing some ice with it'

If we analyze the above sentences (6a-6d) independently, we shall find that the KWs (*khāoyā*) do not have any notable variation in meaning. But if we combine all the sentences together

and analyze, we can easily extract a special meaning of the KW. Taken together, the sentences display a network of meanings, which is not obtainable from individual sentences. Here, special meaning is possible to extract only when we refer to the topic and interpret the sentences with close reference to the topic of the text.

The first reading of first three sentences (6a-6c) apparently refers to an instruction about taking some medicine, which is quite common in a doctor's prescription. However, as soon as we find *baraph* 'ice' in the last sentence (6d), we are forced to turn our attention from the medical prescription to the guidelines for drinking. Usually, the leaflets provided to the consumers contain such lines where methods of preparation and consumption of liquor is meticulously stated. Such diversion of meaning of the KW takes place because mixing ice with medicine is a comparatively rare event to mixing ice with liquor. Thus, reference to the topical context becomes instrumental for obtaining necessary information to decipher actual contextual meaning of the KW.

6. Global Context

Words are not isolated entities. They are actually interlinked with other words as well as with the extralinguistic reality (Verschueren 1981: 337). So does the meanings of words. The meaning of the KW is not only related to the meanings of other words occurring within local context, sentential context, and topical context, but also to extralinguistic reality surrounding the linguistic acts undertaken by language users. The verb forms of a language, for instance, usually evoke a scene of action constituting an agent, a patient, an item, a place, and a time— all coordinated in a particular discourse (Fillmore 1977: 82). This signifies that understanding the meaning of a verb form under investigation we need to consider of all the elements in a cognitive interface to realize its denotative, connotative and figurative meaning. For instance, consider the following sentence taken from the Bengali corpus.

(7) O to   ekṭā baipokā, sārādin   bai khāoyā   or kāj.
    He indeed (is) a   bookworm, whole-day book eating (is) his work.
    'He is indeed a bookworm, eating books whole day is his work'.

To understand the actual meaning of the KW (i.e., *khāoyā*) in sentence (7), we need information from the global context, since information available from other contexts is not sufficient for understanding the actual meaning of the KW. Since the KW is used in the sense of "always reading books", we can understand it only when we are able to know the literal and metaphoric meanings of *baipokā*. The literal meaning of *baipokā* is "a larva of a moth or beetle which feeds on the paper and glue used in books" (*Illustrated Oxford Dictionary* 1988) and metaphoric meaning is "a person devoted to reading". Once we are able to understand that a human being is metaphorically referred to as *baipoka*, we realize that the KW is used here not in literal meaning but in metaphoric meaning. Thus, understanding the contextual meaning of the KW depends on the general use of language, metaphoric use of words, and pragmatic knowledge of the users.

Generally, a huge chunk of information of the global context is available from the external world, that supplies vital cues of place, time, situation, interpretation, pragmatics, discourse, demography, geography, society, culture, ethnology, and various other things (Allan 2001: 20). Since the global context builds up a cognitive interface between language

and reality, we often refer to it to understand: who says, what is said, to whom it is said, when it is said, where it is said, why it is said, and how it is said. Thus, the global context becomes a valuable source of information for meaning disambiguation of words, and it helps us to understand if the KW has any meaning variation, and if so, what it is.

7. Interface among the Contexts

Since each context is interlinked with the other in an invisible thread of interdependency, we can use information from all the contexts together to deal with the problems at hand. And, since there is no proposition for sequential use of contextual information, we can start with any one context and slide to the other as the situation demands. Thus, we can integrate information from the global context when we deal with the local context, the sentential context and the topical context. To understand how the entire interface works, let us consider the example given below.

(8) āpnār rabibārer   chāṭniṭā pāblik dārun   kheyeche[KW]
    your Sunday-gen chatni-the public very much has eaten.
    'Your Sunday scoop is well accepted by the public'.

To understand the meaning of the KW (i.e., *kheyeche*) in sentence (8), we need to use information from all the contexts, since the KW is used in a highly discrete manner with a figurative (metaphor) sense. To know the meaning of the KW, we need answers to the questions: who makes the statement? To whom it is made? When it is made? Where it is made? What does the word *chāṭni* mean? What does *rabibārer chāṭni* mean? How does it become palatable to the public? Furthermore, thoughtful reading of the word-pair *'chatni... kheyeche'* shows that it is used in a figurative sense with a disguised undertone of cynicism. Thus, information collected from all the spheres helps us to derive the meaning of the construction, to conceive the interface inherent in the network of time-place-agent-action, and to capture the actual contextual meaning of the KW.

Although the local context holds utmost importance in understanding the contextual meaning of the KW, we need access to the sentential context, the topical context, and the global context for additional information when the local context fails to provide it. Thus, reference to the other contexts becomes mandatory when information obtained from the local context becomes insufficient. While the sentential context refers to immediate environment of the KW focusing on its neighboring and distant members in a sentence, the topical context refers to the topic of the text where the KW has occurred, and the global context refers to the extralinguistic information of the external world.

From the point of view of cognitive linguistics, understanding the meaning of the KW depends heavily on the knowledgebase of the language users. People who are equipped with better linguistic and extralinguistic knowledge are more efficient to understand the contextual meaning of the KW than others. For example, a native Bengali speaker who has much wider exposure and experience of Bengali life, language and society, can easily understand the meaning of *kheyeche* in sentence (8), than a person who has limited exposure to the Bengali life, language, and society.

8. Conclusion

In linguistics a word is a bundle of information related to phonology, morphology, lexicology, semantics, syntax, morphosyntax, text, grammar, etymology, metaphor, discourse, pragmatics and the world knowledge (Pinker 1995: 344). It is not easy to capture all the information of a word just by looking at its surface form or to its orthography. We require a versatile system along with our native language intuition to decipher all the possible explicit and implicit meanings of a word used in a piece of text.

Theoretically, I have no problem to support Moravcsik (2001) when he argues that it is not necessary to define all possible and potential variations of meaning of a word. If we do that, we severely damage the productivity and flexibility of a language as well as burden the lexicon and the language learners excessively. Meaning variation of a word is a valuable feature in a natural language, which leaves things in a state of incompleteness out of which some productive devices generate literal and/or metaphoric new alternatives to cope up with the novel experiences.

But I observe that in lexical semantics, computational linguistics, natural language processing, word sense disambiguation, machine translation and various other areas of mainstream linguistics and language technology, we are really troubled with the problem of meaning variation of words. Therefore, we need to extract the actual contextual meaning of a word to be used in word sense discrimination, information retrieval, text analysis, WordNet, natural language understanding, text alignments, parsing, etc. We also need actual contextual meanings of words to compile dictionaries, develop grammars, formulate linguistic theories, and prepare resources for language teaching. Furthermore, systematic analysis of meaning of words can help us to establish firmly the notion of semantic indeterminacy and gradience (Leech, Francis and Xu 1994) in the area of language cognition.

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