Polysemy and Homonymy: A Conceptual Labyrinth

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Abstract

Multifunctionality of a language generates multi-semanticity of words. If different senses of word are systematically related, then how these senses are derived from each other and how they should be organised to reflect their regularity in sense denotation? Before this question is addressed, in this paper an attempt is made to identify salient traits of distinctions between the polysemous and the homonymous words in a language, which, if addressed properly, will lead towards formation of methods to overcome the problems of word sense disambiguation.

1 Introduction

The study of polysemy of a language has often been associated with the study of homonymy because distinction between the two has often not been very clear. In a piece of text, one can come across a set of words, which may appear either homonymous or polysemous. Since both types of word are often similar in surface representation (i.e., spelling and orthography) with no special mark for their distinction, one is easily misled to assume homonyms as polysemes or vice versa. However, there is a need to draw a clear line of distinction between the two, because these forms differ from each other not only in their nature, but also in function and implication.

In this paper an attempt is made to identify the clues and strategies that can be adopted for tracing the differences between the two types of words. Since there is no well defined process for doing this, one has to use traditional knowledge from linguistics, semantics and cognitive science. Making perceptible distinction between the two types of words is a prerequisite for developing tools, systems and resources for natural language processing, language engineering, word sense disambiguation, machine translation, information retrieval, machine learning, cognitive linguistics, and applied linguistics.

After identifying the theoretical and practical relevance of the phenomenon in various domains of human knowledge (Section 2), effort is made to understand polysemy (Section 3), identify the factors behind sense variations (Section 4), to explore the nature of homonymy (Section 5), and their conceptual relational interface (Section 6), the lack of which may cripple an investigator in the task of word sense disambiguation.

2 Relevance of the Phenomenon

In recent years, the multi-semanticity of words in a natural language has been discussed at length in semantics, applied linguistics, psychology, philosophy, literature, and artificial intelligence. Following this trend, the study of polysemy and homonymy has arrested considerable attention in lexical semantics (Ullmann, 1962; Cruse, 1986; Palmer, 1995; Nida, 1997), cognitive linguistics (Cuyckens and Zawada, 2001; Deane, 1988), computational linguistics (Schütze, 1998; Ravin and Leacock 2000), discourse analysis (Leech, 1974; Kreidler, 1998), language teaching (Todd, 1987), psycholinguistics (Pinker, 1995; Gibbs *et al.*, 1994), stylistics (Lyons, 1963; Allan, 2001), language and literature (Firth, 1957; Yule, 1985; Cruse, 2000) and many other fields.

Information obtained from analysis of various multi-semantic lexical units has made remarkable contribution in understanding nature, and process of language cognition and acquisition, designing tools and systems for language processing, and developing strategies for language teaching. In this light, an urgency arises for investigating the interface between polysemy and homonymy with an expectation that information obtained from this study will help in gaining insight about the phenomenon to overcome the hurdles of sense disambiguation of words.

3 What is Polysemy

In polysemy a particular word exhibits variations of its sense depending on the context of its use (Fellbaum, 2000:52). While studying polysemy in a language it is observed that multiplicity of sense of words is a general characteristic feature of a language (Palmer, 1995:108). Almost all the natural languages have a set of words that are capable in conveying multiple objects, ideas, and senses—both in their context-bound and context-free situations. This particular feature of words allows a user to derive more than one sense that may differ in terms of lexical feature, morpho-syntactic feature, sub-categorization feature, semantic feature, lexical selectional feature, idiomatic usage, proverbial usage, and figurative usage (Sinclair, 1991:105). For elucidation, let us consider the following examples obtained from the Bengali text corpus:

1) chabiṭā ṭebiler **māthāy** rākho
   "Keep the picture on the table"
2) tomār kathāṭā āmār **māthāy** āche
   "Your word is in my mind"
3) tin diner **māthāy** tini phire elen
   "He returned by the beginning of the 3rd day"

The examples given above show that the word *māthā*, in Bengali, is multi-semantic in function because it is used in three different senses: in (1), it means 'top of a table', in (2), it implies 'mind of a person', and in (3), it indicates 'beginning of a day'. In each case, the actual implied sense of the word is not difficult to retrieve because its immediately preceding and succeeding words help to understand its actual contextual sense. However, since the word *māthā* is not limited to only three different senses, it has many more senses in the language depending on its contexts of use (Dash, 2002). The most notable thing is that such multi-semantic words hardly posit any difficulty in day-to-day communication as well as sense disambiguation for the native language users but pose hurdles in the works of automatic sense decipherment, sense retrieval, and machine learning.

While investigating the nature of polysemy it is noted that the following observations may be true to most of the languages (Dash, 2005a).

(a) The number of multi-semantic (polysemous) words in a natural language is really large. Most of the multi-semantic words belong to noun, verb, and adjective, which constitute a major part of the vocabulary of a language.

(b) Function words has a greater tendency to be polysemous than content words, because the function words, unlike content words, tend to modify their lexico-semantic and lexico-syntactic entities depending on the contexts of their usage.

(c) Corpora that contain texts of actual language are more authentic and reliable than intuitive assumptions or dictionary data for supplying exhaustive list of citations of sense variations of words (Dash, 2008).

(d) The number of sense variation is not uniform to all words, since some words exhibit more sense variations than others. In Bengali, for instance, *māthā* 'head' has so far recorded 50+ different senses which easily outnumber *mukh* 'mouth' which has nearly 20+ senses (Dash, 2003).

(e) Most of the polysemous words have a core sense, which is normally derived from their etymology and referred to in the dictionaries. Other senses are usually generated from their usages in various contexts. Thus, variation of sense is generated from varied use of words.

(f) The most frequently used lexical items are normally multi-semantic in nature. Probably, due to their flexibility to be used in various contexts, capacities, and senses makes them polysemous.

(g) A word can remain polysemous in spite of change of its part-of-speech. For instance, in Bengali, *ār* registers 13+ senses as adverb, 10+ senses as indeclinable, and 6+ senses as adjective; *jor* has 8+ senses as noun and 12+ senses as adjective; *phãka* has 15+ senses as noun, 12+ senses as adverb and 15+ senses as adjective; *bābu* shows 10+ senses as noun and 5+ senses as adjective; *śeṣ* records 13+ senses as noun, 19+ senses as adjective and 9+ senses as adverb; *sār* shows 12+ senses as noun and 5+ senses as adjective; *ṭhik* has 6+ senses as noun, 16+ senses as adjective and 3+ senses as adverb; *par* reveals 5+ senses as noun, 8+ senses as adjective and 3+ senses as adverb; *dāruṇ* shows 11+ senses as adjective and 3+ senses as adverb; *dūr* has 3+ senses as noun and 8+ senses as adjective; *bhāla* has shown 5+ senses as noun and 11+ senses as adjective. This feature appears to be true to majority of polysemous words of a language.

4 Factors behind Sense Variation

The phenomenon of sense variation of words can raise a vital question: why some words register

sense variation while others do not? Answer to this question may lead one to trace the factors that are responsible for sense variations. Since it is not easy to trace factors, which are responsible for variation of senses, one can grossly identify two types of factor behind multi-semanticity of words: Linguistic Factors and Extra-linguistic Factors. First, we identify some purely linguistic factors, which are described below, to be quite active in language.

(a) Change of part-of-speech is a vital factor for sense variation. It forces words to generate new senses. The new sense, however, is not entirely different from the core sense. It is an extension of the core sense with addition of extra shades and implications. In Bengali, for example, the word *chāṛā* is usually used to mean 'without'. This is an adverb, which is etymologically derived from the verb √chāṛā to mean 'to make one free'. This word is also used as a noun meaning 'a female calf at the stage of maturity and freed from its mother', and as adjective meaning 'freed'. If all these senses of the word are taken into analysis then one can easily note a kind of invisible semantic relational network existing behind variations of senses of words used in various parts-of-speech. In each part-of-speech, the word carries a fine 'sense of separation' (which is originally noted in the verb root) in spite of their apparent sense variation. Thus, a simple network of senses may be designed for the word, which will help to know how the change of lexical class can cause change in sense of a word (Dash, 2005a).

(b) Collocation with neighboring word generates new senses for a word. The new sense may not be the earlier one noted when the target word (TW) collocated with different words. In collocation, a kind of shift of sense takes place when TW acquires a new sense while it collocates with other word (W_2). In Bengali, for example, the TW *mukh* collocates with *bandha* to mean 'introduction', with *pātra* to refer to 'spokesperson', with *patra* to signify 'manifesto', with *jhāmṭā* to mean 'scolding', and with *rocak* to mean 'tasteful'. In each case, the original sense of the TW changes due to its collocation with new words (W_{2_n}). It is difficult to understand linguistically such variation of sense of the TW, if one does not analyze and associate meanings of W_{2_n} with that of the TW.

(c) Contextual occurrence of words is probably the biggest factor of sense variation. In fact,

majority of the events of sense variation are caused due to this factor. Context provides so many sense variations that without reference to context understanding the actual sense of a word is nearly impossible. It is also observed that senses of words are expanded depending on local, sentential, topical, focal, and global contexts (Dash, 2008).

(d) Identical forms of case markers and endings also cause sense variations for the inflected words. For instance, in Bengali, case marker *-e* denotes both nominative and accusative sense of words, while *-ke* and *-re* denote both accusative and dative roles, and *-te* denotes nominative, accusative, ablative and locative senses of words. In each case, the variation of senses is possible with these markers.

The extralinguistic factors, on the other hand, are not visible within immediate contexts of use of words in the text. These come from different sources, which have little connection with words under consideration. These extralinguistic factors can arise from various social, cultural, historical, geographical, discoursal, pragmatic and similar other issues which are mostly language specific and intelligible to the native language users only. The best way to understand these factors is to capture these in focal and global contexts of use of words and analyze them accordingly to extract relevant sense information (Dash, 2005a).

5   What is Homonymy

In case of homonymy, different unrelated senses or meanings are shared under same surface form of words (Fellbaum, 2000:52). Such words often exhibit identical spelling or orthographic forms but are different in meaning. A quick reference to respective meanings and etymology of the forms helps to identify homonyms quite easily in a text. Homonymy, in general is expressed in two broad ways:

(a) Homography: identical spelling and different meaning (e.g., *māl, jin, kapi, kalam,* etc.) and
(b) Homophony: different spelling and similar pronunciation (e.g., *dīn* 'poor' and *din* 'day', *śab* 'dead body' and *sab* 'all', etc.).

Like polysemous words, homonymous words are also considered ambiguous because of the two reasons mentioned above. To understand the nature of homonymy, let us look at the examples given below where the words *māl* and *jin* are used as homonymy in Bengali.

4) **māl**bhūmir khub kāchei śahar
   "Town is very near to the plateau"
5) sāper oṣudh āche **māler** kāche
   "anti-venom lies with snake-charmer"
6) kustir hātekhaṛi **māler** ākhṛāy
   "lessons of wrestling at wrestlers' camp"
7) galāy muktār **māl**, komare bāgher chāl
   "pearl string on neck & tiger-skin on waist"
8) sandhāy tār du peg **māl** cāi
   "He needs two pegs of liquor at evening"
9) se eta **māl** ekā baite pārbe nā.
   "He cannot carry so much of goods alone"

It appears that *māl*, as found to be used in the above sentences, is polysemous, since it is used in six different senses in six different contexts. In actuality, however, these are six different words, which are homonymous although they display orthographic similarity (i.e., same surface forms). They differ in both meaning and etymology as the following data (Table 1) shows.

Word	Etymology	Meaning
māl	< Skt. ma + -la	highland
māl	< Skt. mal + -a	snake charmer
māl	< Skt. malla	wrestler
māl	< Skt. mālā	garland
māl	< Prs. māl	wine
māl	< Arb. māl	goods

Table 1: Homonyms with different etymology
and meaning

Another interesting example of homographic homonymy is presented below (Table 2), which categorically shows that, since neither the surface form nor the identical utterance carry perceptible clues for identification of homonymous words, one is left with the information retrievable from semantics and etymology to dispel the enigma of sense variations.

Word	Etymology	Meaning
jin	< Skt. √ji 'to win' + na	winner
jin	< Arb. genie	demon
jin	< Prs. zīn	stirrup
jin	< Eng. jean	jean
jin	< Eng. gin	gin
jin	< Eng. gene	gene

Table 2: Homonymy: at the mercy of semantics
and etymology

The other type of homonymy is noted among homographic words where root/stem and suffix (if any), in spite of belonging to different part-of-speech, may look identical in their orthographic forms. This phenomenon is not confined to root and stem only, but spread across compounds and reduplicated words also with identical inflections and suffixes. Some examples of such forms are given below from the Bengali corpus:

10) se sārā din ei kāj **kare**
    "He does this work whole day"
11) Hisebṭā ekhan **kare** phelte pāra
    "You can finish the accounts now"
12) bājār **kare** phirte deri halo
    "It was late to return after marketing"
13) marār āge tini sab dān **kare** gechen
    "Before his death he donated all"
14) sūrýer **kare** sab jvalche
    "All are burning with sun rays"
15) ýābār samay hāte **kare** niye ýeo
    "Take it with you when you leave"
16) sādhāraṇ mānuṣ **kare** jarjarita
    "Common people are burdened with tax"

In the above sentences, the word *kare* is used in different senses. In each case, it is added with a suffix or a case marker, which is different in sematico-syntactic function but identical in form. Morphological analysis (Table 3) can reveal the internal structures of these homographic forms as well as their distinct semantic senses.

Word	Morphology	POS	Meaning
kare	kar + -e	FV	s/he does
kare	kar + -e	NFV	doing
kare	kar + -e	PPL	having done
kare	kar + -e	NN	in hand
kare	kar + -e	NN	by rays
kare	kare + -ø	IND	by/with
kare	kar + -e	NN	tax

Table 3: Identical inflected words with different
suffix and meaning

In the list (Table 3) given above, the suffix *-e* is attested as finite verb tense marker, non-finite verb marker, participial form of a verb, locative case marker, instrumental case marker of noun, and indeclinable. In all examples the suffix is one in spite of difference in its respective lexico-grammatical function. As a result, the word *kare* belongs to several parts-of-speech as apparently it carries no visible mark to determine its lexical class or semantic sense. One needs to integrate all kinds of underspecified morpho-grammatical information embedded within its surface form as

well as its contextual information while trying to understand its homographic identity.

6   Polysemy vs. Homonymy

The examples discussed above show that many homonymous words may appear polysemous in a text. However, analysis of their origin, form, and meaning may help to isolate them from the group of polysemes to restore their approved lexico-semantic identity in the language. To draw a line of distinction between the two types of words, we propose to apply various parameters, which are summarised below:

a) Polysemy is the existence of more than one semantic specification for the same lexical item. Homonymy, on the contrary, is the existence of more than one morphological specification sharing the same phonological and/or orthographic representation (Leech, 1974: 230).

b) While polysemous words have one and only one etymological ancestry, homonyms are not etymologically related (Yule, 1985: 96).

c) The best solution to the puzzle of polysemy and homonymy is to seek a core of meaning, and the homonymous items sharing the same core meaning should be undoubtedly marked as polysemous (Todd, 1987: 80).

d) A word that is polysemic will have a variety of synonyms each corresponding to one of its meanings. Moreover, it will also have a set of antonyms. It is tempting to say that where the antonym is the same, there is polysemy, and the differences of antonyms will refer to hononymy (Palmer, 1995: 107).

e) The ambiguity in homonymous forms is not likely to be sustained in a longer discourse, which may not be true to polysemous words (Kreidler, 1998: 55).

f) In polysemy, words are semantically related and sense variations typically originate from metaphoric usage; in homonymy, words are different in meanings which are not generally related (Ravin and Leacock, 2000: 2).

g) The context of homonyms consists of quite different vocabularies, whereas the contexts of polysemes may be quite similar (Ravin and Leacock, 2000: 26)

h) In case of polysemy, words are registered in a dictionary as single entry and their multiple meanings are normally numbered serially with examples of usage in different contexts, while in homonymy, words have dictionarial entry as separate listemes. Homonyms have separate entries in regular dictionary (Allan, 2001: 42-43).

Despite the strategies stated above, distinction between the two types of word has not been so simple and straightforward, since words that are etymologically related can, over time, drift so far apart that their original semantic relations are no longer recognizable (Ravin and Leacock, 2000: 2). Moreover, etymologically related meanings are not always related in mental lexicon of users; oppositely, there are cases where etymologically unrelated forms are felt to be related in mental lexicon (Ullmann, 1962:164).

Furthermore, as language users, people often find a metaphorical connection between these forms and intend to adjust their understanding of the words accordingly. Thus, from a historical point of view what is a homonymy may result from an accidental convergence of the forms, and be reinterpreted as a case of plolysemy (Leech, 1974: 229). It therefore, appears that the path of differentiation between the two types of word is full of labyrinths and quicksands.

Taking all these arguments into consideration, some general criteria may be provided (Table 4) as vital functional cues for marking differences between the two types of word.

Criteria	Polysemy	Homonymy
Existence	Word level	Word level
Structure	Single form	Similar forms
Orthography	Do not vary in spelling	May vary in spelling
Utterance	Do not have variation	Pronounced variation
Sense variation	Mostly due to context	Due to meaning and etymology
Context	Plays a vital role	Has no role to play

Table 4: Polysemy vs. homonymy

7   Conclusion

For various reasons related to conceptual clarity and practical applications there is a real need for making differentiations between the principled system of multi-semanticity (i.e., polysemy) and the accidental convergence of orthography and/or utterance (i.e., homonymy). The present paper provides some ideas regarding the nature and form of polysemy and homonymy; examines and contrasts their formal and functional differences; and highlights some of the unresolved problems

within theoretical understanding of polysemy and homonymy in context of conceptualization and word sense disambiguation.

Although some scholars like Moravsick (2001: 261) acknowledge the importance of analyzing sense variation of words, they are not in support for defining all possible and potential levels of sense variation to be furnished in the lexicon, as it may damage severely the productivity and the flexibility of a language use. Flexibility is needed because, at any given stage, a language may not mark out each sense sharply and clearly. Multi-semanticity or polysemy will leave many things in an incomplete state out of which productive devices will generate literal or metaphoric new alternatives to cope with novel experiences.

Even then, understanding distinction between polysemes and homonyms becomes important in information retrieval, where several relevant documents are presented to a close set of form, which may be a more forgiving environment than that of automatic translation (Ravin and Leacock, 2000: 26),

It is now an open question if we would support the line of argument of Moravcsik (2001) or join the group of computational linguists who prefer to understand the distinction between polysemy and homonymy as well as want to furnish all the possible and potential sense variations of words in the lexicon to overcome various conceptual and practical problems of ambiguities and sense disambiguation.

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