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Paradigms of Semantic Derivation for Russian Verbs of Sound

Abstract

Modern methods of semantic analysis require that a polysemous word be divided into several separate lexemes - each with its own independently defined meaning. This division has an undesired consequence - the unity of a word, clearly felt by the speakers of language, is destroyed, which fact makes this model of lexicon obviously defective. In our paper an effective way of reestablishing the semantic unity of a word is proposed. We present an inventory of semantic derivation rules that transform one meaning of a polysemous word into another. Hence the notion of a paradigm of semantic derivation (and of systematic polysemy). The treatment of systematic polysemy in the Semantic Database for Russian verbs is outlined.

polysemy, lexeme, semantic derivation, diathesis

1. General

As is known (see, e.g., Weinreich 1964, Apresjan 1974, Pustejovsky 1995), systematic polysemy is central to language, being a key aspect of linguistic creativity. The question is how to account for systematic polysemy in linguistic theory and to cope with it in practical lexicography.

Following I.A.Melchuk (1974), we use the term l e x e m e to denote a word taken in one of its meanings - even if these meanings stem from regular polysemy. I claim that the set of lexemes of a word can be represented as a p a r a d i g m o f s e m a n t i c d e r i v a t i o n, each lexeme in the paradigm being semantically derived from the one preceding it in the hierarchy (or they are both derived from a common third lexeme of the same paradigm) by means of some general rule applicable to sufficiently many different words (in Nunberg, Zeanan 1992 these rules are called transfer functions). The problem is then to find sufficiently general transfer functions working on the lexicon as a whole. There are good reasons to believe that words belonging to one and the same semantic field have the same or similar derivational paradigms. A paradigm of systematic polysemy (i.e. a semantic hierarchy of theoretically possible meanings of a word) is conceived as a notion parallel to the paradigm of grammatical word forms.

In this paper I describe the approach to systematic polysemy implemented in the Semantic Database for Russian verbs (which is being worked upon in the Russian Academy of Sciences, see Kustova, Paducheva 1994). One fragment of this Database is taken here as an example - namely, verbs of sound.

2. Parameters of meaning and meaning change

In the Semantic Database in question a lexeme is provided (among others) with the following types of semantic information.

1. THEMATIC CLASS (which is approximately the same as «semantic field»). Thematic classes unite verbs with a common semantic component occupying a prominent position in their semantic structure. We distinguish, for example, existential verbs, mental verbs, verbs of possession, movement, physical action, speech, perception, emotion, sound and others . Thematic classes often have their repercussions in syntax. For example, it is natural for a verb of information transmission, such as *tell*, to have an Addressee among its arguments (and participants of the situation referred to). Creation verbs, such as *cook*, usually have an argument specifying the Result. Existential meaning presupposes specification of the Domain of existence (cf. *it exists only in the world of his imagination*). In general, combinatory potential is often predictable from the meaning. Take, e.g., Swedish *att hota* 'threaten' and *att skrämma* 'frighten' (an example from Gellerstam 1988) that differ in their combinability with the direct object; hopefully, this difference in combinability has a semantic explanation.

2. TAXONOMIC (and, also, ONTOLOGICAL) CATEGORY. We distinguish, for example, verbs of action (*build*), process (*boil*), state (*starve*), activity (*walk, jump*), happening (*to drop*) and the like - (these are Vendler's aspectual classes extended and elaborated according to Paducheva 1992). What is new in our project as compared to Vendler's exposition is that each class is characterized not only by its combinability but also by its format of meaning definition (see Kustova, Paducheva 1994) or, to put it differently, by its semantic formula. For example, the formula of a happening, as well as action, usually implies causation, which is not true of a state.

3. OBLIGATORY PARTICIPANTS of a typical situation denoted by the verb (such as Agent, Patient, Result, Place etc.) taken together with their communicative ranks. In fact, Subject and Object both belong to the highest communicative rank, i.e. they occupy the central position in the perspective imposed by the verb upon the situation referred to. The two other ranks are Periphery and Zero (the latter rank is ascribed to a participant that is outside the perspective altogether). The set of participants with the communicative rank assigned to each of them is called diathesis of a verb, see examples (1)–(3):

(1) a. brosal v nee *kamni* (lit. 'was throwing stones onto her');
    b. brosal v nee *kamnjami* (lit. 'was throwing with stones onto her');
(2) a. Postojannye vojny istoshchili *kaznu* 'perpetual wars exhausted the treasury';
    b. *Kazna* istoshchilas' ot postojannyx vojn 'the treasury was exhausted by perpetual wars'
(3) a. vybil pyl' *iz kovra* 'beated the dust out of the carpet';
    b. vybil *kover* 'beated out the carpet'.

In (1b) the participant *kamni* 'stones' moves from the central position (Object = Center) to the Periphery; in (2b) the participant *vojny* 'wars' moves from the central position (Subject = Center) to the Periphery, this change of diathesis being marked in Russian by a reflexive particle -*sja*/-*as'* attached to the verb; in (3b) *pyl'* 'dust' becomes an incorporated participant, of the Zero rank.

The meaning definition consists of several syntactically independent components, all of them of a propositional form. Each component contributes to specifying the role of this or that participant in the situation (cf. Jackendoff 1993: 61); this is why the components of a semantic formula may also be said to have communicative ranks.

4. TAXONOMIC CATEGORY OF A PARTICIPANT also contributes to the meaning of the verb. The following taxonomic categories of nouns are essential for the topic of this paper: mechanisms (such as *car, ship, alarm-clock*, in particular, mechanisms or tools intended for sound production – *piano, guitar* etc.); sounds and whatever can give rise to a sound (*music, verse*); events accompanied by sound emission (*shot*).

Thus, there are at least four parameters relevant for the meaning of a lexeme - thematic class, taxonomic category, diathesis of the verb; and taxonomic categories of the participants. Each of these parameters easily changes its value, thereby giving rise to a new lexeme. For example, the meaning difference between *remind* in (4a) and (4b) is accounted for by the fact that *remind* denotes an action in (4a) and a happening in (4b); among the two uses of *napolnjat'* 'fill' in (5) one is a process, namely, see (5a), and another a state, see (5b); two uses of *tresnut'* 'crack' in (6) differ in that in (6a) the lexeme belongs to the class of deformation verbs and in (6b) to the class of verbs of sound (so what undergoes the change here is the taxonomic category, or the semantic field, of the verb):

(4) a. He *reminded* me of my promise;
    b. His arrival *reminded* me of my promise.
(5) a. Voda *napolnjaet* bassejn 'Water is filling the pool [by and by]';
    b. Voda *napolnjaet* bassejn do kraev 'The pool is filled with water up to the edges'.
(6) a. Led *tresnul* v neskol'kix mestax 'The ice cracked at several places';
    b. Chto-to *tresnulo* v lesu - eto medved' 'Something cracked in the forest - it's a bear'.

3. Verbs of sound and their meaning paradigm

Verbs of sound constitute a compactly structured word class, the same semantic oppositions being regularly repeated in different combinations. We have chosen those verbs that have sound emission as their central and obligatory component: *gremet'* 'clatter', *groxotat'* 'thunder', *gudet'* 'buzz', *drebezzhat'* 'rattle', *zvenet'* 'ring', *zvonit'* 'cause ring', *zvuchat'* 'sound', *svistet'* 'whistle', *skripet'* 'squeak, creak', *stuchat'* 'knock', *taraxtet'* 'rattle', *treshchat'* 'crack', *xlopat'* 'flap', *xljupat'* 'squelch', *xrustet'* 'crunch', *shelestet'* 'rustle', *shipet'* 'hiss', *shumet'* 'to make noise', *shurshat'* 'rustle', *shchelkat'* 'click'. For example, in *xrapet'* 'snore' the sound component is not central; in *plakat'* 'cry' it is not obligatory. This is why these words are not included in the list.

In this class of «ideal» sound verbs the whole paradigm of a word can be predicted from the basic, or primary lexeme (i.e. the lexeme constituting the root of the paradigm).

The paradigm of the verb *zvenet'* 'to ring' looks as follows (the category of the thematic class of a lexeme that has undergone the change is given in bold letters):

ZVENET'-1, **causation-as a process**: *Idut, kandalami zvenja* 'they [convicts] go clinking with chains'
ZVENET'-2, **functioning**: *Zvonok zvenit* 'The bell rings'
ZVENET'-3, **process: active**: *Zvenjat cikady* 'Cicadas ring'

ZVENET'-4, **process: passive**: *Vetki zvenjat na moroze* 'The branches are jangling because of the frost'

ZVENET'-5, **existence** (of sound): *Vdaleke zvenela pesnja* 'There was a song ringing in the distance'

ZVENET'-6, **property** (of the source of sound): *Eti bokaly xorosho zvenjat* 'These glasses cling nicely'

ZVENET'-7, **quasi-existence**: *Sokolovskaja gitara do six por v ushax zvenit* 'There is still twangling of Sokolov guitar in my ears'

ZVENET'-8, **movement**:*Tramvai zveneli po ulicam*'Trams were ringing along the streets'

Almost all «ideal» verbs of sound dispose of the same paradigm of systematic polysemy. If the paradigm of a verb is defective it usually has a semantic (or, perhaps some other) explanation. For example, the paradigm of *shumet'* 'to make noise' is in many ways specific - we may call it defective - because it is a word with an evaluative meaning; *zvonit'* 'to cause to ring' cannot denote a process of non-controlled causation because this word is, historically, a causative of *zvenet'*.

4. Transfer functions

While constructing the derivation paradigm we should begin with establishing the semantic hierarchy of the lexemes of a word. The hierarchy of lexemes belonging to the paradigm of the verb *zvenet'* is demonstrated by Diagram 1.

Diagram 1

1. **causation-as a process**

2. **functioning**   3. **process: active**   4. **process: passive**   8. **movement**

5. **existence** (of sound)   6. **property** (of sound source)
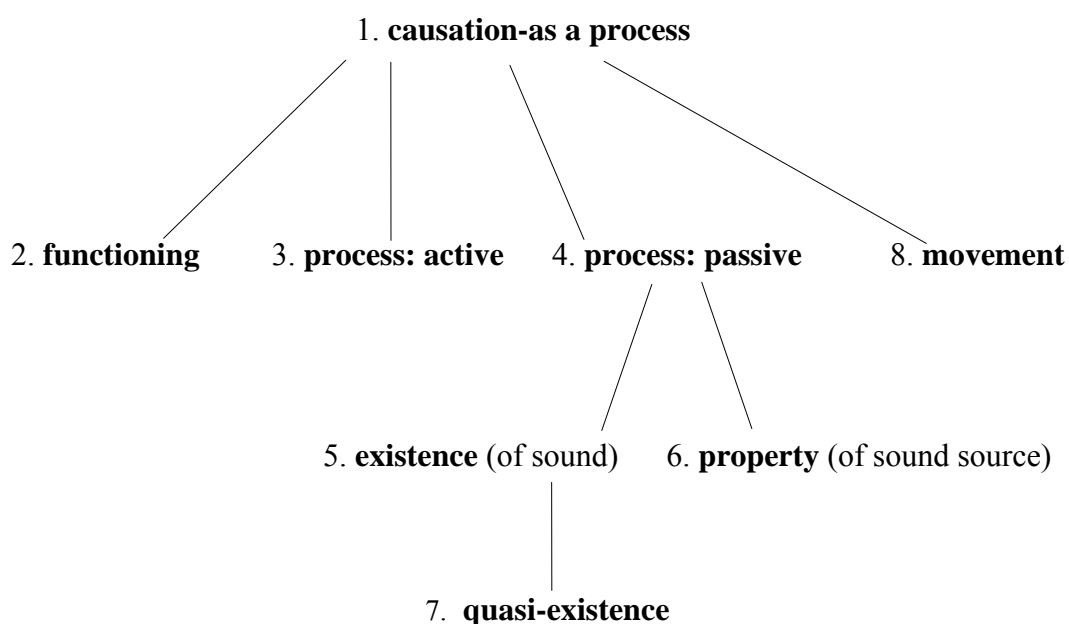
7. **quasi-existence**

Diagram 1: The verb *zvenet'* 'ring': semantic derivation paradigm

Every non-basic lexeme in the paradigm has a rule associated with it and providing it with a semantic formula (the format of meaning definition), this formula being derived from the formula of the lexeme preceding it in the hierarchy. Below we present transfer functions describing semantic relationships between different lexemes (presumably, these rules adequately describe the hierarchies of lexemes in the class of sound verbs and are also useful outside this class). Transfer functions supply non-basic lexemes with the semantic formulae

derived from the formula of the lexeme preceding it in the hierarchy. The basic lexeme of the hierarchy may, in its turn, be a semantic derivate of a word outside the semantic field in question (as is the case, e.g., with *treshchat'*), and there is a transfer function on that occasion as well.

Below we present a list of transfer functions arranged according to the above mentioned parameters of meaning.

I. THEMATIC CLASS CHANGE. Let us take as an example the verb *treshchat'* 'crack, crackle, creak'. It can be treated as derived from *tresnut'*, which in its primary meaning denotes a kind of deformation / destruction: 'to crack [into pieces]' (as in *Led tresnul* 'The ice cracked'); usually - though not necessarily - the destruction denoted by *tresnut'* is accompanied by a specific dry sound. Thus, *tresnut'* has two meanings and in the secondary meaning of *tresnut'* the sound-component comes to the foreground while the destruction-component goes to the background or disappears altogether being reflected only in the characteristics of the resulting sound. The process denoted by *treshchat'*, Imperfective, may, then, be presented as an iteration of *tresnut'*, Perfective.

The contents of the transfer function here consists in the change of the theme - the word enters a thematic class different from where it belonged before. This meaning shift is kind of metonymy-based: both components of the primary lexeme remain in the semantic formula of the derived lexeme but they change their rank (one moving from the periphery to the foreground, another going in the opposite direction), which is characteristic of metonymy shifts in general.

On the other hand, there is a productive type of semantic derivation by means of which a verb of sound is converted into a verb of movement, cf. such verbs as *axnut', baxnut', babaxnut', brjaknut', buxnut'* (all formed from interjections - *ax!, bax!, babax!* etc.), *groxnut'* (and *groxnut'sja*), *zagremet'* 'to be involved in a movement accompanied by the sound of thunder'. All these verbs have a derived meaning and in this meaning they belong to the semantic field «movement» or «causation of movement». Examples (1), (2) with the verbs *taraxtet'* 'rattle', *xljupat'* 'to make a sucking sound (usually, with one's nose)' demonstrate a syntactically instigated and highly productive semantic derivation:

(1) Motocikl *taraxtel* po derevne 'The motor cycle rattled along the village';
(2) My dva chasa *xljupali* po bolotu 'We squelched through the swamp for two hours'.

Another thematic shift caracteristic of verbs of sound: it comes easy to them to be used in the meaning of information transmission, cf. *whistle* (as in *The wind whistles*) and *whistle to smb*; *knock* as in *The wheels knock* and *He knocked at the door*.

II. TAXONOMIC CATEGORY CHANGE.

Example 1. The meaning of the verb *stuchat'* 'knock', in the context of the wind knocking at the window by means of a tree branch, may be treated as resulting from a metaphoric "fading away" of a telic knocking performed by a person.

Example 2. Another case of category change - transition from process to property:

(3) a. *Zvenjat⌣ stekla * (lit.'Window-panes\ are ringing⌣');
   b. *Eti bokaly prijatno zvenjat* (lit.'These glasses nicely ring\').

This very general meaning shift affects many different types of verbs. Note that it is accompanied by a specific prosodic change: the verb denoting a property usually bears the main sentential stress, cf. (3a) and (3b). In (4), with the existential meaning, the verb is unambiguously unstressed:

(4) *Odnozvuchno zvenit kolokol'chik * (lit.'Monotonously ring jingle bells\').

Example 3. Existential meaning is also an obligatory member of a paradigm of a sound verb. Two specific conditions about the context should hold for the existential meaning to be realized:
(a) The subject should denote a sound - at least in one one of its meanings, perhaps, arisen at the price of a metonymic shift;
(b) The argument specifying the Place of the asserted existence should be present in the text - at least implicitly.

III. DIATHETIC CHANGE. The transfer function that accounts for the semantic derivation of ZVENET'-4 (process: passive) from ZVENET'-1 (causation as a process) can be identified as a diathetic change. Diathetic change belongs to the waste class of transfer functions called metonymy shifts. Metonymy is based on spatio-temporal contiguity of participants of the situation. Metonymic shift can be defined as a change of the focus of attention of the speaker. Indeed, take a classical example of metonymy:

(5) *veselym treskom treshchit zatoplennaja pech'* 'The stove rattles with a merry rattle' (Pushkin. «Winter morning»).

In the "real" situation it was the wood inside the stove that emitted the sound, not the stove itself. In the new metonymic concept that the situation acquires as a result of the shift the wood is ignored while the stove is brought to the foreground.

In the same way, in the transition from ZVENET'-1 to ZVENET'-4 the Causer fades away (it goes deeply into the background) and the Source of the sound is promoted to the foreground - this is a usual communicative effect of the diathetic shift.

It is worth noting that the kind of diathetic shift whereby the Patient is transferred to the position of the Subject, which is common in English (*He opened the door - The door opened*), is very rare in Russian. More than that, it is definitely excluded if the Patient occupies, in the primary non-shifted use of the verb, the position of the Direct Object. In the case of ZVENET' this is not the case - the Patient is in the Instrumental case.

The reason why the Patient (Sound source) of sound verbs never acquires the role of the syntactic Object deserves attention. A plausible hypothesis is that the Direct Object position of these verbs is, in the deep structure, occupied by the sound produced (i.e. "in the depth" these verbs are verbs of c r e a t i o n). In fact, verbal nouns derived from sound verbs, such as *shum* 'noise', *zvon* 'ringing', *stuk* 'knock', denote, in the first place, a sound, not an event as might be expected: the semantic relationship between *stuchat'* and *stuk* is the same as, e.g.,

between *nasledovat'* 'inherit' and *nasledstwo* 'inheritance', not as between *otpravit'* 'send' and *otpravka* 'sending'. The sound is, then, an incorporated Object of these verbs, while the Source is nothing else but an Instrument.

The figure of the Observer (this notion was introduced by Apresjan in 1986) plays an important role in the semantic structure of sound verbs. For example, the meaning of the verb *zvuchat'* 'to sound' may be represented as a converse of *slyshat'* 'to hear' - if the Observer is permitted to show himself on the surface:

(6) a. *Vdaleke zvuchit pesnja 'In the distance sounds the song' -*
    b. *Nabljudatel' slyshit pesnju '[The Observer] hears the song'.*

5. Concluding remarks

Thus, we propose to treat the set of meanings of a systematically polysemous word as a paradigm of semantic derivation. What are the advantages of this treatement?

1. Many of the meaning shifts are highly productive, and there is always a puzzle for a lexicographer whether such and such a use should be included in the dictionary or treated as an occasionalism. Now, if the occasionalisms are predicted by the structure of the paradigm the corresponding use should be mentioned in the dictionary if only the lexicographer has some specific information to add, apart from the mere fact of acceptability of the use of a word in this meaning, which is predictable from the structure of the paradigm.

2. Context dependent meaning changes are to be described anyway. Transfer functions give an account of these changes.

3. Derivational paradigms stimulate a more systematic description of the lexicon: semantic similarity tends to reflect itself in similarity of linguistic behavior. Paradigms of systematic polysemy force a linguist look upon one word in the mirror of another.

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