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# How Many Valences?

C.L. Ebeling

1. This note is meant as a contribution to the solution of a descriptive problem which for some time has been an object of discussion in the Linguistics Division of the Amsterdam Slavic Department. I shall confine myself to two approaches: that of S&S, and that of Honselaar's VD.[1] The raison d'être of this paper is that I believe Honselaar's thorough scrutiny of a number of relevant data has cast new light on certain points, making it necessary to modify the procedure outlined in S&S. Yet I do not subscribe to all his conclusions.

The question to be treated in the following lines is: how many valences are there in the meaning of a finite verb? The final objective is to devise a procedure which will lead to an intuitively acceptable outcome for all verbs of all languages. In the present paper only Russian examples will be analyzed.

First of all I briefly summarize a few things from S&S. The meaning of

a) *Oleg pisal knigu* "Oleg wrote/was writing a/the book"

is analyzed as

b) 'Σ / *nonperf . past*

PN*Oleg* = [$x$; $x$ writes $y$]
[$y$; $x$ writes $y$] ; book / *sing*',

which notation can be paraphrased as "a nonperfective act ('Σ') in the past, namely, the fact that Oleg ('PN*Oleg*' stands for 'having the proper name *Oleg*') is writing in such a way that the thing written (represented as '[$y$; $x$ writes $y$]') is a book". Of course, the elements '*nonperf*', '*past*', 'writing', 'book' and '*sing*' require a further definition, but this is of no importance for the present purpose. Moreover, for all examples in this paper the analysis is incomplete in that the semantic correlates of the intonation, the sentence peak(s),

and the order of the words are omitted.

Each ultimate constituent of b) is a *semantic particle*. A semantic particle consists of one or more *valences*. If there are two or more valences, they are enclosed in square brackets and placed in one column: '[$x$; $x$ writes $y$]
[$y$; $x$ writes $y$]' is a bivalent semantic particle. The relations within a semantic particle (i.e. between the valences of a plurivalent semantic particle) are not of a syntactic nature, but implied in the semantic particle itself. The relations between the semantic particles are syntactic and indicated by *relational symbols* such as "=", "/", ".", ";" in b); for their values I refer to S&S.

2. The form a) is a string of morphs (with an intonation and one or more prominence peaks); a) is also a string of words, but that does not concern us here. The meaning b) is a constellation of semantic particles. The relation between a) and b) is called *correlation*. Each morph in a) correlates with something in b), e.g. *Oleg* (phonemically /aɨéK/) correlates with 'PN*Oleg*'. But there is not always for each morph exactly one semantic particle, e.g. '*nonperf*' in b) must be ascribed to /ṗlsá/, which possesses this meaning when it is not preceded by a prefix and then only if there is an object which makes the construction "telic" (cf. e) below); thus there is a correlation

c) /ṗlsá/ : '[$x$; $x$ writes $y$] , '*nonperf*',
[$y$; $x$ writes $y$]'

or, with a specification of the relation between the constituents,

c) /ṗlsá/ : 'Σ / *nonperf*
= [$x$; $x$ writes $y$]
[$y$; $x$ writes $y$]'

The two semantic particles of c) form together one *seme*, i.e. they correlate together with one morph.

A morph is a morpheme alternant. If a morpheme is indicated by ⧘ ⧙ and, in an enumeration of its alternants, the latter are separated by |, then the following equation can be made:

d) ⧘ṗisá⧙ = /ṗlsá | ṗlš | ṗíš | ṗísa | ṗlś | ṗíś/

Each morph of d) represents the shape assumed by the morpheme in a given number of contexts.

Likewise, a seme is a sememe alternant. Different alternants of the sememe ⧘'writing'⧙ are found in b), e), g), k):

e) *Oleg pisal* "Oleg wrote/was writing" :

$$PN\textit{Oleg} = [x;\ x \text{ writes } y]'^{\Sigma\ /\ \underline{past}}$$

with the correlation

f) /ṗlsá/ : '[$x$; $x$ writes $y$]'

This univalent alternant is distinguished only by the fact that the second valence is not realized; its referent is not absent, because there is in each act of writing something that is written. In practice, there is a simple test to prove that the second valence is not eliminated from the meaning, but not realized either: e) can refer inter alia to the states of affairs expressed by *Oleg čto-to pisal* "Oleg wrote something", where "something" stands for "a definite entity which is not individually identified and does not belong to a set which is identified in any other way than by the fact that each of its elements can serve as the second relatum in the [$x$ writes $y$]-relation". Therefore, if a second valence were recorded in the notation, it would not add any information.

An equivalent notation for '[$x$; $x$ writes $y$]' in e) is 'writing': square brackets are indispensable only if the semantic particle is plurivalent and/or the notation contains ";", which is read as a relational symbol unless it is enclosed in square brackets. An equivalent notation for the bivalent semantic particle is '[writing]
[written]'.

g) *Oleg napisal knigu* "Oleg wrote/has written a/the book":

$$PN\textit{Oleg} = [\text{writing}]\ [\text{written}]; \text{ book } /\ \underline{sing}\,'^{\Sigma\ /\ \underline{perf}\ .\ \underline{past}}$$

with the correlations h) and j):

h) /ṗlsá/ : '[writing]
[written]',

j) /na/ : '*perf*'.

k) *Oleg napisal* "Oleg wrote/has written it/them":

$$PN\textit{Oleg} = [x;\ x \text{ writes } \underline{the}\ y]'^{\Sigma\ /\ \underline{perf}\ .\ \underline{past}},$$

where "*the*" stands for "most plausible in view of the frame of reference of the speech situation"; it must be added because the interpretation "Oleg wrote something" (in the sense defined under e), f)) is not admissible. There is no overtly expressed object, but yet the thing written is specified as

something for which the speaker assumes that the hearer is able to identify it. In the case of ⟨'writing'⟩ the presence of "*the*" is conditioned by the perfective aspect, but in other cases the element "*the*" is engendered by a verb without the support of the aspect. This holds, e.g. for

l) *ja vižu* "I see" (never: "I see something")

For the stem of this verb there are three semantic alternants:

m) '[seeing] | seeing *the* | having the power of sight'
[seen]

The correlation in k) is

n) /ṗlsá/ : '[writing *the*]'

Together, c), f), h) and n) lead to the equation

o) ⟨'writing'⟩ = 'Σ / *nonperf* | writing | [writing] |
= [writing] [written]
[written]
→| writing *the*'

The different semes represent the shapes in which the sememe occurs in concrete contexts. Of course, for the sake of brevity the second and third alternants can be combined into '[writing] [written]$_{fac}$' (with $_{fac}$ for *facultative*).

3. The question to be answered is: why is ⟨'writing'⟩ bivalent in b) and g)? In other words, why should we not write g*) instead of g)?

g*) 'Σ / *perf* . *past*
PN*Oleg* = <writing> [*x*; *y* is *goal* of *x*]
[*y*; *y* is *goal* of *x*] ; book / *sing*'

(of course, "*goal*" should be defined).

Notation g*) - which will be rejected - contains an instance of an element enclosed in angled brackets followed immediately (i.e. without a relational symbol) by another element. This arrangement indicates that 'writing' is coreferential with 'PN*Oleg*', while "x" is not coreferential with 'writing', but with the abstraction '<writing>', i.e. "x" specifies the way in which Oleg writes. In g*) the accusative singular ending /u/ correlates with '[*x*; *y* is *goal* of *x*]
[*y*; *y* is *goal* of *x*] ; Δ / *sing* ',

where "Δ" is a dummy, introduced for the specification of the relation between the constituent semantic particles.

In g), on the contrary, /u/ correlates only with '*sing*'.

However, there are also other morphs that can express the meaning '*sing*' in a combination 'book / *sing*', such as the nominative ending /a/ in *kniga*. The selection between these endings is determined by the wider context. The description has to account for this grammatical mechanism.

Let us suppose that g) is the correct analysis and that there is a speaker who wishes to transmit something which is approximately the content of g), i.e. there is in the mind of the speaker a *communicandum* which eventually leads to the pronunciation of the form of g), see S&S, 504. The speaker processes this communicandum until he arrives at the semantic constellation g), because in this shape it can be encoded. The rules which he observes in working towards this result constitute the *semantic formalizer*, a component of the grammar. In g) the relation between 'book' and ⟨'writing'⟩ is unambiguously given, but this relation must be reflected in the encoding by the selection of /u/ rather than /a/ or any other ending capable of expressing '*sing*'. Therefore the *encoder*, the second component of the grammar, adds a *fictitious semantic particle* 'Gacc' to the *pure semantic notation* g), but the addition of this element does not change the total meaning of the constellation. This is shown in the notation by the "G" (for *grammatical element*) of 'Gacc', as well as by the fact that no relational symbol connects 'Gacc' with the element to the left. Another fictitious semantic particle, namely 'Gmasc', takes care of the necessary agreement of the verb with the subject, so that the result is the *amplified semantic notation* p), see S&S, 500, 505:

p) /aìéK$_1$ na$_2$-pìsá$_3$-l$_4$ knígu$_5$-u$_6$/ :

$$\text{PN}Oleg_1 = \begin{matrix} {}'\Sigma\ / \\ [x;\ x \text{ writes } y]_3 \\ [y;\ x \text{ writes } y] \end{matrix} \begin{matrix} perf_2 \cdot past_4\ \text{Gmasc}_4 \\ \\ \end{matrix} ;\ \text{book}_5\ \text{Gacc}_6\ /\ sing_6',$$

where the subscript integers point to the correlations of the constituent morphs and semantic particles. (Note that this notation is incomplete in the way indicated under b) above.)

The lexicon ought to supply not only all the information necessary for the semantic formalizer, but also for this first step of the encoding component. For verbs this has been worked out by Honselaar (VD, 96 and passim) in his "valence models". In the framework of S&S it can be formulated as a rewriting rule to the effect that '[writing] [written] ; Δ' becomes '[writing] [written] ; Δ Gacc'. This rule can of course be generalized so as to capture a whole set of verbs (or rather: alternants of verb meanings), for which a mark such as "trans" indicates

that they are subject to the rule in question.

4. Returning now to the question posed in the initial lines of section 3, I shall discuss it on the basis of the following scheme; the notations q) and q') are equivalent in the sense that they cover the same constellations in the real or imaginary world.

q) '[$x$; $x$ $R_1$ $y$]
[$y$; $x$ $R_1$ $y$] ; $\Delta$ $GR_2$'

q') '<[$x$; $x$ $R_1$ $y$]> [$z$; $z$ $R_2$ $w$]
[$w$; $z$ $R_2$ $w$] ; $\Delta$'

In both q) and q') there may be other valences besides "$x$" and "$y$", but "$x$" is always the dominating valence (top valence); '[$x$; $x$ $R_1$ $y$]
[$y$; $x$ $R_1$ $y$]' in q), and '[$x$; $x$ $R_1$ $y$]' in q') correlate with an alternant of a morpheme {$v$} belonging to a finite verb form $fV_1$ of a verb V; '$GR_2$' in q), which is a fictitious semantic particle, and '[$z$; $z$ $R_2$ $w$]
[$w$; $z$ $R_2$ $w$]' correlate with a morpheme {$R_2$} (e.g. a preposition, a case ending, or, but never in Russian, a morpheme belonging to the verb form).

To start with, there is a *potential valence* "$y$" if and only if, in each portion of the real or imaginary world that can be designated appropriately by $fV_1$, the entity represented by "$x$" has a *distinctive* feature consisting in a relation $R_1$ to the entity represented by "$y$" (see S&S, 148ff, VD, 10f, point 1).

The following considerations are relevant to the selection between q) and q') in the case of a potential valence "$y$". First, it is clear that q) is less ambiguous than q'), for q) straightforwardly describes the relationship between "$x$" and "$\Delta$" as "$R_1$" (which is an exact projection of the relationship between the referents of these elements), whereas, for q'), the accuracy with which this relationship is expressed depends on the content of "$R_2$". Second, it is part of the theoretical framework of both VD and S&S that the representation of a meaning should not be less ambiguous than the meaning itself (so in distinction to the practice of transformational, post-transformational and logic-oriented grammarians). In other words, if there are no weighty arguments in favor of q), then q') is the better solution. (Obviously, this conception entails the rejection of case roles - such as Agent, Patient, Recipient, Beneficiary - as semantic universals, see VD, 1, 54.)

Now let {$R_2$} be the ending of the Russian instrumental case as in

r) *Oleg režet xleb nožom* "Oleg cuts the bread with a knife"

s) *Oleg est ikru ložkoj* "Oleg eats caviar with a spoon"

In r), *nož* "knife" represents a potential valence (because *rezat'* "cutting" inevitably requires the use of something with a sharp edge), but this is not the case for *ložka* "spoon" in s) (for an act of *est'* "eating" is possible without any instrument). That is to say, s) is certainly of type q'). For r) an additional test is needed.

Honselaar's criteria are formulated in points 4 and 5 of VD, 10f, which run - partly rephrased in accordance with the terminology of the present paper:

> 4. establish [with respect to parts of the sentence that represent potential valences] whether their meaning cannot be described on the basis of their own form;
> 5. label as 'representants of valences' [...] those parts of the sentence whose meaning cannot be described on the basis of their own form.

Honselaar's conclusion with regard to r) and s) - which I derive from the way he applies the rules to Dutch examples, e.g. to *door* "by", VD, 83-86 - would be that the two potentially different meanings of the instrumental must be united to form one invariant, because it is possible to circumscribe the meaning in r) by the same definition as that in s), which definition then, also for r) - here Honselaar quotes García[2] - "provide[s] a plausible avenue to the message communicated" (VD, 5).

The procedure of S&S would lead to a different conclusion, but at this point I now prefer to modify it in view of Honselaar's investigation (see, e.g., the treatment of the examples in VD, 77). There was in my Rule ccxxxi (S&S 476f) - which is roughly equivalent to Honselaar's points 4 and 5 - a restriction to the effect that,

t) if (i) "$y$" of q), q') is a potential valence and (ii) there is in the language a construction $Q$ with a finite form of V, in which the vertical ordering of at least two of the (potential) valences including "$y$" is different from that in q), q'), and (iii) $Q$ selects for the relation between "$x$" and "$\Delta$" another formal expression than q), q'),
then either "$y$" is a valence in both $Q$ and q), q'), or "$y$" is a valence neither in $Q$ nor in q), q'); in the latter event there is a plurivalent semantic particle '$R_2$'.

Maintaining criterion t) would force to distinguish between *nožom* of r) with 'knife' representing a valence of 'cutting' and *ložkoj* of s) with a bivalent instrumental meaning, in view of the (limited) possibility to say, without disturbing the relationships:

r) *nož režet xleb* "the knife cuts the bread",

whereas in s') the relation between the spoon and the eating is completely changed as compared with s):

s') *ložka est ikru* "the spoon eats caviar".

Since criterion t) yields several counter-intuitive descriptions of this kind, I now abandon it and I identify the meaning of the instrumental in r) and s), though my reasoning is slightly different from Honselaar's. From my point of view it is not sufficient that there is a plausible avenue to the message, because there are sentences for which - according to the description resulting from this approach - a correct understanding would depend to a larger degree on interpretation than I consider acceptable. (An example of such a sentence is u) below, which I believe to be less ambiguous than the criterion of a plausible avenue would imply.) I prefer to stick to a more stringent criterion (the main part of Rule ccxxxi, S&S, 476f), namely, the requirement that there be exact semantic identity. Applied to the problem at issue, this means that, since there can be given for r) a notation with the bivalent meaning which is necessary anyhow for the instrumental in s), and this notation *exactly* determines the states of affairs that can be designated appropriately by r), this notation prevails, i.e. r) is of type q').

Now compare r) with u):

u) *xleb režetsja Olegom* "the bread is (being) cut by Oleg"

The instrumental in u) can be paraphrased in a way which is also possible for that in r), namely,

v) "[the cutting] is brought about by [the knife (r), Oleg (u)]",

and it certainly would be a plausible guess that, as Oleg is a human being, he is the actor rather than the instrument. If this argument is taken to be convincing, and sufficient for our purpose, then the description of both r) and u) will be of type q'). In the following lines my conclusion will be that u) is of type q). According to this latter analysis, too, the hearer must make a choice between two possibilities and the search for a plausible avenue to the message is no doubt

an important prerequisite, but I think it is a choice between two alternative meanings (both given in the language), rather than between two interpretations of one meaning.

There are two independent arguments to demonstrate that definition v) is incorrect.

First, a sentence such as

r'') *nož režet xleb Olegom* "the knife cuts the bread with Oleg"

is incoherent because it presents the knife as the actor and Oleg as the sharp-edged instrument and thus describes a state of affairs which is never found in the world. However, if v) were correct, one would expect the hearer of r'') to make the plausible guess that Oleg, as a human being, must be the actor, so that the interpretation would be "the knife cuts the bread with Oleg manipulating it". Since this interpretation is not excluded by extralinguistic factors, the reason why the hearer rejects it must be looked for in the linguistic data. The only fact that can be held responsible is the (bivalent) meaning of the instrumental ending: its definition must explicitly exclude the possibility that the noun indicates the actor. This argument alone is sufficient to dismiss definition v).

Second, the identity established above for the instrumental meanings in r) *režet nožom* "cuts with a knife" and s) *est ložkoj* "eats with a spoon" - which was the ground for not recognizing the potential "instrument" valence in r) as a definite valence - ceases to be a complete identity as soon as the definition is widened to v), so as to include also the "actor" interpretation, because the latter interpretation is only realized in cases where the noun in the instrumental represents a potential valence. To be sure, one can try to remedy this defect of v) by altering v) in such a way that it comprises two variant meanings and specifies the environments in which the 'actor' variant is admissible. These environments can be specified in no other way than by referring to the voice (diathesis) of the verb: "actor" interpretation is possible only if the verb contains a potential "actor" valence. But if this potential valence is exploited to this end, it must be granted the status of valence in the definitive description, too, and then the noun in the instrumental inevitably becomes the filler of the slot created by this valence, which makes the "actor" interpretation univalent and separates it from the bivalent "instrument" interpretation.

Consequently, I record different semantic alternants for *-om* in u) and w):

u) *xleb režetsja Olegom*: 'Σ / nonperf . pres
bread = [y; x cuts y]
[x; x cuts y]; PN*Oleg*'

w) *xleb režetsja nožom* "the bread is (being) cut with a knife":
'Σ / nonperf . pres
bread = <[y; x cuts y]> [w; w instr z]
[z; w instr z]; knife / sing'

It follows that the definition of "*instr*" should explicitly exclude the possibility that "z" stands for the actor. Even with this specification the definition is not yet complete, for it occurs also in constructions such as x) and y), which I borrow from Kovaleva:[3]

x) *ego ubilo kirpičom* "he was killed by a brick"

y) *moego otca ubilo svin'ej* "my father was killed by a pig"

In these sentences the brick or the pig cannot be interpreted as the actor, but there is more to it: in this type of impersonal constructions the instrumental explicitly indicates that no actor is involved at all. The first of these restrictions makes y) sound strange; it is a translation of a sentence from a novel by Graham Greene: "My father was killed by a pig". As Kovaleva rightly points out, the English sentence encompasses the meanings of both Russian y) and z):

z) *moj otec byl ubit svin'ej*

Only the context makes clear that y) renders the writer's intention correctly: "A balcony on the fifth floor gave way under one of those pigs [...]. My father was on the way to the Hydrographic Museum when the pig hit him coming from that height... It broke his neck."

On the basis of these considerations I now give a notation for x) which is different from the one proposed in S&S, 292:

x) *ego ubilo kirpičom*:
'Σ / perf . past
(<[y; x kills y]> [w; w instr z]) ; the 3dp - male sing
[z; w instr z] ; brick / sing'

Thus, the seme '[w; w instr z]
[z; w instr z] ; Δ / sing' (an invariant correlating with the morpheme /om|oj|ju|.../) has two variants, which are in complementary distribution: if the seme is connected to the left with an element not preceded by "=" (i.e. with an element directly dominated by "Σ"), then the depicted

state of affairs is not brought about by an actor.

5. The description I have arrived at in this way is not free of a counter-intuitive consequence. It concerns the meaning of *rezat'*. In the sentences discussed above the following semantic alternants are found for this verb:

(i) '[$x$; $x$ *cuts1* $y$]
[$y$; $x$ *cuts1* $y$]' in r) and r');
(ii) '[$y$; $x$ *cuts1* $y$]' in w);
(iii) '[$y$; $x$ *cuts2* $y$]
[$x$; $x$ *cuts2* $y$]' in u);

"$x$ *cuts1* $y$" stands for "$x$ penetrates $y$ and/or either separates $y$ form a larger whole or divides $y$ with a sharp edge which may or may not be a part of $x$"; "$x$ *cuts2* $y$" stands for "$x$ moves an object with a sharp edge in such a way that this sharp edge penetrates $y$ and/or either separates $y$ from a larger whole or divides $y$". Thus "*cuts2*" includes "*cuts1*" in the sense that for any "$x$" and "$y$" for which (iii) is true, (i) is eo ipso also true.

The necessity to work with two different definitions for 'cutting' is not very attractive. However, the same alternation is repeated in a great many other verbs (e.g. *vbivat'*, *gvozd' molotkom* "to drive in a nail with a hammer", *paxat' zemlju volami* "to plough the earth with oxen"); it can be taken care of in the lexicon by marking these verbs as belonging to a category for which the alternants can be derived regularly from each other. Further, the analysis has the advantage that it accounts for the fact that 1. in sentences of type r) the instrument can be mentioned, while the actor cannot be added to r') (because it would require an open slot created by a valence and the only available slot is filled by 'knife'), and that 2., in the case of alternant (iii), both the actor and the instrument can be expressed in the same sentence without entering into an asyndetic relation.

Summing up, I conclude that there are stronger intuitive arguments in favor of the proposed analysis than against it.

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NOTES

1. S&S = C.L. Ebeling, *Syntax and Semantics. A Taxonomic Approach*, (Leiden 1978).
   VD = W.J.J. Honselaar, *Valenties en Diathesen. Een bijdrage tot Russische valentie- en genustheorieën en een toepassing daarvan bij de semantisch-syntactische descriptie van enige verba, deictische woorden en prepositïes in het Nederlands*, (Amsterdam 1980).
2. E.C. García, *The Role of Theory in Linguistic Analysis: the Spanish Pronoun System*, (Amsterdam 1975).
3. L.M. Kovaleva, "O vozmožnosti svedenija nekotoryx semantičeskix aktantov v klass alloedinic", in: *Problemy teorii grammatičeskogo zaloga*, (Leningrad 1978), 108-113.