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A Formal Specification of Support Verb Constructions

Introduction

The main purpose of this article is to give a minimal formal definition of the notion of a prototypical support verb construction and to relate it to lexical acquisition via the discussion of linguistic tests for this construction type. Minimal in this context means on the one hand that I will give a definition that uses only a small set of theoretical assumptions, and on the other that only the prototypical cases will be covered. Building on the definition, a set of tests – most of them collected from the many articles on the subject - will be presented. These tests are designed to provide a basis for defining the prototypical cases and to relate the basic definition to the more marginal instances. I will then give an estimate which test could be automated to enable a better corpus data collection for support verb constructions for lexicographers.

In the first section I will try to clarify the notions that are commonly used to describe semi-compositional verbonominal constructions in a very brief and selective research overview. The following definition of support verb construction will be complemented by the discussion of some types of borderline cases. I will also show that the basic concept underlying support verb constructions is not language-specific, but can be applied to such constructions in a wide range of language

In the second part of this article I investigate a number of linguistic tests that have been proposed to delineate different types of verb-nouns-constructions that are situated between fully compositional and completely frozen constructions. Most of the tests that are described in this section of this article, apart from those that involve language specific test parameters, can be applied to a wide range of different languages.

In the third and last part I will relate the definition and the tests to efforts that have been made to extract support verb constructions automatically from large text corpora.

A short research review

On the first glimpse it might seem superfluous to add yet another article to the many publications that have been written about the notion of support verb constructions, about the similar – though not identical - German notion of "Funktionsverbgefüge" (literally "function verb constructions"), and the various other notions that have been coined to denominate semi-compositional verb-noun constructions – other terms that are in use to name such constructions, parts of them, or a superset of semi-compositional expressions are light verbs, operator verbs, complex predicates.

All in all the publications on the subject are almost innumerable, and so are the terms used to name them. However, recently, a certain consolidation seems to have taken place, and the notion of support verb construction is gaining ground also in anglo-saxon publications. Still there is a strong discrepancy between the German research, focussing on the notion of Funktionsverbgefüge and the general discussion on support verb construction. Maybe the following discussion can contribute to mend this gap.

In a short review of the research tradition, we start with the German linguistics the notion of "Funktionsverb" and "Funktionsverbgefüge" (FVG) (function verb construction), which has been around since the 1960ies (Polenz 1963) and has received a lot of attention in pure linguistics as well as in natural language processing. Looking at the research literature it becomes obvious that the notion has different competing definitions. Among the most cited researchers on the subject are Polenz (e.g. Polenz 1997), a researcher who was involved in creating the notion on the one hand, and Helbig, especially with the German grammar Helbig/Buscha (1991), which – in addition to defining the criteria for being a FVG - gives a long list of constructions. Unfortunately, these two have a completely different concept – a fact that is sometime overlooked in articles citing these publications. The only common point to all concepts seems to be that a FVG consists of a semantically reduced verb and a non-concrete noun denoting actions or states. Polenz has a very narrow definition of function verbs as carrying certain types of semantic information, and explicitly excludes referential predicative nouns from the definition. However he gives some examples of constructions that violate these criteria. Helbig/Buscha, on the other hand, have a very wide concept, a superset of Polenz' definition that includes – but is not restricted to - semantically empty verbs and referential nouns. The nebulous research situation

induced by these competing definitions recently led to a thesis by Pottelberge (2001) who tries to prove that the phenomenon itself is not defined – and not definable - clearly enough to deserve a linguistic denomination. Although the book takes into account most of the important work on semicompositional verbonominal constructions and gives a very good analysis of the research situation, if suffers from the lacking willingness to distil a clear notion out of the contradicting definitions. All in all, rejecting the concept itself on the grounds of inconsistent terminology usage is certainly an unnecessary overreaction, which we can see clearly if we take into account the research on similar constructions in Romance linguistics. Here the related - though not identical - notion of support verb construction (SVC) has been studied intensely, so in French linguistics since the 80s under the label "constructions a verbe support", coined by Maurice Gross (Gross 1981, Giry-Schneider 1987). More recently, this notion has also found its way into anglo-saxon traditions of linguistics (e.g. Dras 1995, Fillmore et al- 2003) and has been applied to the analysis of verbnouns-constructions in many languages (e.g. Nøhr-Pedersen 1989). The notion support verb construction is quite well defined, denoting combinations of predicative nouns and semantically weak/reduced verbs, where the noun subcategorizes semantically, and the verb syntactically. It can be shown that it tags a subset of the German Funktionsverbgefüge in its wider definition as used by Helbig/Buscha 1991. It should be noted that many researchers in German linguistics now use the German notion Funktionsverbgefüge as a translation of the term support verb constructions (e.g. Detges 2002) and vice versa, which is certainly compliant with the core meaning of the underlying concepts, but can be slightly problematic for understanding if no account is given which definition of the notion is used.

Towards a formal definition of support verb constructions - Mel'cuk and Framenet

To get a clearer picture of possible definitions of support verb constructions it is useful to move away from the general linguistic discussion of the subject and to review the subset of articles that try to give an account of semicompositional verb-noun constructions in a formalized context. One of them are the treatment in the framework of Mel'cuk's lexicongrammar (e.g. Mel'cuk 1996), using his concept of lexical functions, the other is the more recent description in Frame Semantics (Fillmore/Johnson/Petruck 2003; also see Boas (this volume). The latter

analysis builds on the analysis of Mel'cuk, which will be presented more in detail.

Mel'cuk was among the first researchers to give a formal account of support verb constructions (e.g. Mel'cuk 1982), and has more recently adopted the term as the denominator for them. He describes (e.g. in Mel'cuk 1996) support verb constructions using the concept of lexical function. To understand his concept, we have to present shortly what he means by a lexical function: it is a function that takes a lexical unit as an argument and gives back one – or a set of – several other lexical units. Mel'cuk distinguishes between paradigmatic lexical function and syntagmatic lexical function – the latter are central to his description of support verb constructions. Syntagmatic lexical functions are designed to describe systematic dependencies within constructions, and are mainly used to encode collocations – i.e. non-symmetric dependencies between one semantically transparent and a semantically reduced unit. To encode support verb constructions, Mel'cuk uses the lexical functions OPER, FUNC and LABOR. All three lexical functions take a predicative noun as an argument and give back a support verb. The theoretical base necessary to understand the functions is that Mel'cuk uses a three level approach on syntax and semantics, i.e. he postulates an intermediate level between semantics and the surface representation of language, called deep syntax. For predicative nouns – nouns that have semantic arguments like verbs, he encodes the valency in this intermediate description layer using the notion of deep syntactic actants.

In SVCs encoded by the OPER function, the predicative noun occupies the direct object position of the verb. OPER carries a subscript, e.g. $OPER_1$. This subscript encodes which deep-syntactic actant of the noun is realised as the subject of the support verb. An example: $OPER_1$ (*assumption*) = *make*; this means that *make* is the support verb that takes the first argument of *assumption* as the subject to form a support verb construction like he *makes an assumption*.

FUNC and LABOR function in a similar manner; in FUNC, the predicative noun occupies the subject position of the verb, the subscript encodes which deep syntactic actant of the predicative nouns occupies the direct object position. In LABOR, the predicative noun occupies the indirect object position, and there are two subscripts encoding which actants are realised in the subject and direct object position of the support verb.

Partially building on Mel'cuks analysis, support verb constructions have also been studied in the FrameNet project. Their treatment is described in various articles, i.e. Fillmore/Johnson/Petruck (2003 : pp. 243f),

Atkins/Fillmore/Johnson (2003: p. 270) – both articles appeared in a special issue of the International Journal of Lexicography on FrameNet. In this theoretical framework, support verb constructions are accounted for by encoding the predicative nouns as one possibility to realise a frame (which is basically a semantic concept, denoting a predicate-argument structure). In the valency structure for a SVC, describing the concrete realisation of a frame through lexical items, the TARGET-slot – the position which encoded the relation to the semantic FRAME object for a sentence - which is normally occupied by a verb – is used for the predicative noun; the support verb receives a separate slot, called support verb. Thus the predicative noun determines the semantic actants (called Frame Elements) that are entered into the valency frame denoting the whole support verb construction. This analysis is fully compatible with the one Mel'cuk gives through his lexical functions.

A minimal formal definition

After this short presentation of two theoretical accounts we are now ready to produce our own definition of support verb constructions by distilling the basic assumptions from the discussed formal accounts.

Theoretical pre-requisites

The definition builds on the following theoretical pre-requisites:
We have a syntax theory that differentiates between at least two layers. One layer must be a representation that contains a notion of semantic predicate or at least of semantic actants of a given subcategorization frame. The other layer describes the subcategorization on the surface syntactic representation of a construction. Worded in another way, there must be a notion of semantic subcategorization and one of syntactic subcategorization. In the following I will call the semantically subcategorized units "semantic arguments", the semantic subcategorization frame the argument structure, the syntactically subcategorized units "syntactic actants" and the syntactic subcategorization information "syntactic subcategorization frame" These notions can be replaced by any other expression, if the definition fulfils the conditions above (e.g. semantic actants or theta-roles for the arguments).

Consitutents

A support verb construction consists of a predicative noun and a support verb.

The predicative noun

A predicative noun is a noun denoting an action or a state. The noun has an argument structure, i.e. it subcategorizes at least one semantic participant.

The basis for the description of a support verb construction is the formal specification of the (semantic) argument structure of the predicative noun. The noun realised in the support verb construction is not semantically reduced or shifted with respect to a usage in compositional constructions.

The support verb

The semantics of the support verb is either void or reduced to a small set of semantic features that are relevant for very large subclasses of verbs (lexicalized aspect, which is pertinent to event/action verbs or amplification/attenuation.

Realisation

The fundamental idea of a support verb construction is the realisation of some or all arguments of the predicative noun in syntactic slots provided by the support verb. In prototypical support verb constructions, the verb does not semantically subcategorize any of its syntactic complements. This means that the noun is the predicate of the construction, the verb has mainly syntactic relevancy. The verb is used to encode the diathesis, this means the verb determines which nominal arguments receive which syntactic slot.

The predicative noun is realised as head of a noun phrase in a syntactic slot provided by the support verb; in many cases but not always this is the direct object position.

This means that prototypical support verb constructions are semi-compositional structures consisting of a semantically transparently used noun and a verb that is semantically reduced and adapted to the construction. Examples are:

(1)   *He gives a lecture.*

(2) *Elle fait une présentation.*
(3) *Sie hält eine Vorlesung.*

Here a promised formal definition:

Given a predicative noun (a noun denoting an event or a state) N with the semantic arguments [A1…An], where n>0 and given a verb V with the syntactic slots [S1…Sm], where m>0. N and V form a support verb construction if:

–   The predicative noun N is realised in one Si (typically the direct object) or the verb.
–   At least one Sj (typically the subject position) is occupied by argument Ak of the predicative noun.
–   None of the syntactic slots Si is semantically subcategorized by the verb – i.e. the verb encodes the syntactic subcategorization only.
–   The semantic contribution of the verb exclusively non-predicative, and – if not empty - restricted to aspect, mode, attenuation/amplification,

This definition is not new; fundamentally similar definitions are the formal treatments discussed in the previous sections. The difference here is that it tries to be independent of a specific syntactic theory – or rather to make the definition applicable to different syntactic theories.

It is also evident, that the given definition is largely language independent. Using the specification it should be possible to identify support verb construction in arbitrary languages that fulfil the requirement of distinguishing nouns and verbs. This is compliant with the findings in research on specific languages where it could be shown that support verb constructions exist in many languages – apart from European languages a in Korean (Han 2000) , Hindi (Mohanan 1997) and many other languages.

Special cases and borderline cases

Any account of linguistic phenomena that tries to seize natural language in a formal framework also has to consider the less central and borderline cases, otherwise it will only be fit to describe a very small section of the phenomena to cover. In the previous paragraph I have outlined the basic concept of a prototypical SVC; in this section we will review some often discussed types of borderline phenomena.

Verb-PP-Constructions

A related kind of construction are the ones that have been in the main focus of German research on semi-compositional verb-noun constructions, labelled "Funktionsverbgefüge". They consist of a predicative noun embedded in a prepositional phrase, again combined with a support verb. The difference between those constructions and prototypical support verb constructions lies in the fact that there are three constituting elements - the preposition, the noun and the support verb. The prepositional phrase containing the noun is more or less lexicalised and the predicative noun is not referential. Examples for this are:

(4)   *to come into bloom*
(5)   *etre en fleur*
(6)   *in Blüte stehen*

Neither here are the syntactic actants of the verb semantically subcategorized by the verb, but in this case they can only be indirectly related to the semantics of the predicative noun and can be viewed as arguments of the prepositional phrase. This type of construction is more difficult to describe semantically and allows much less generalizations and especially does not easily allow the construction of semantic equivalence classes between verbal and nominal predicates as in the case of prototypical support verb constructions.

To make the situation more complicated, there are some true support verb constructions that formally resemble the tripartite type described in the previous paragraph, but where the preposition is selected by the verb and serves rather as a kind of case marker than an autonomous semantic constituent.

(7)   *to suffer from a disease*
(8)   *souffrir d'une maladie*
(9)   *an einer Krankheit leiden*

(Note that to *suffer from a disease* does not necessarily involve suffering; it is possible to suffer from a disease without ever taking notice). These constructions fulfil all conditions for support verb constructions.

Causative construction

In addition to the named borderline cases there is specific type of very similar constructions that differ from prototypical support verb construc-

tions by introducing an extra causative actant through the verb frame. An example is the following:

(10) *Einen Aufstand anzetteln*
    (to raise a rebellion)

Here the subject of the SVC is not necessarily an actant of the predicative noun, but induced by the verb, which is thus not a prototypical support verb, because support verb are not semantic predicates according to our definition.

It must be taken care, however not to exclude all VN constructions containing a causative component from the set of prototypical SVCs, because the component can also be induced by the predicative noun. This is the case in the following constructions:

(11) *Le lion fait peur à Sophie*
    (the lion induces fear in Sophie)

Note the synonym relation to:

(12) *Sophie a peur du lion*
    (Sophie is afraid of the tiger)

Also note that the causative actant can be encoded with the noun alone and that is hardly possible to use the subject of the support verb and causative complement of the predicative noun in the same construction, because they encode the same argument:

(13) *la peur du tigre*
(14) *?Le lion fait peur du tigre*

In such cases the causative construction can be viewed as a support verb construction. It cannot be negated that the support verb has a causative meaning component in most of these cases, but the causative subcategorization of the support verb and the predicative noun coincide and the causative semantic role of the verb subject can be explained without referring to any verbal semantic subcategorization.

Lack of syntactically subcategorized arguments

A further borderline case are constructions consisting of a semantically weak verb, that do not fulfil the criterion of encoding an argument of the predicative noun in the verbal subcategorization frame, because the verb only has one syntactic slot that is occupied by the predicative noun.

(15) *Es herrscht Verzweifung*
      (dispair reigns)

These constructions bear some resemblance to prototypical SVC in many respects – the semantics of the verb is weak/reduced and the nouns bears the main predicative meaning, but one of the key criteria, the subcategorization of nominal arguments by the verb, is violated.

And, of course there exist all degrees of lexicalisation in support verb constructions, which means that there is a continuous transition between truly semi-compositional constructions and idioms. For many of the borderline cases it is difficult to decide on their status. The main purpose of the test battery presented in the following chapter is to have linguistic criteria to single out prototypical support verb constructions and distinguish them from other types of not fully compositional verb-noun combinations.

Linguistic tests

In the previous paragraphs it became evident that we need a battery of linguistic tests to delineate support verb constructions from other, superficially similar expressions. Such tests should allow us to identify prototypical support verb constructions and distinguish them from marginal cases and from other construction types - mainly compositional verbo-nominal constructions on the one hand and from non-compositional idioms on the other.

When we define such tests, this will also help to find manifest properties of support verb constructions that are based on the theoretical definition of the construction given earlier in this article. At a later stage of research, this can eventually lead to a revision of the theoretical concept.

On the micro level we can, on the basis of linguistic test frames, describe the concrete behaviour of a given support verb construction by defining a matrix of properties that hold for that construction.

Finally, assuming a more computational linguistic perspective, we want find such manifest properties that can be automatically or semi-automatically be derived from corpus data as an aid for lexicographers of electronic and traditional dictionaries.

The tests listed in the following subsections are not new. Many of them have been mentioned in a long row of articles on the phenomenon, others are occasionally mentioned in publications.

The tests are divided into three sections, according to the properties of support verb constructions described earlier. In the first section I list tests that are suitable to test the referentiality of the predicative noun phrase. The second section is dedicated to tests about the verb semantics, checking the property of semantic reducedness and compositionality of the construction. The concluding third section lists tests for the status of the complements within the support verb construction.

Referentiality of the predicative noun phrase

The first set of tests deals with properties related to the referentiality of the predicative noun phrase. There are several concrete features that allow to check this property. The features discussed in the following are pronominalisation and variability of the noun phrase.

Pronominalisation

Predicative nouns in support verb constructions can be pronominalised in two ways: the noun in the construction can be referenced by a pronoun outside, and the predicative noun can be replaced by a pronoun within the construction. Here an example for the first type of pronominalisation:

(16) *He gives a lecture that no one understands.*
(17) *Er hält eine Vorlesung, die niemand versteht.*
(18) *Il fait une présentation que personne ne comprend.*

This property does not hold for the adverbial type of support verb constructions, where the predicative noun non-transparently embedded in a prepositional phrase:

(19) **The tree comes into bloom that is white.*

In constructions where the predicative noun can be referenced by a pronoun outside the construction, it can also be represented by a pronoun within the following three examples:

(20) *He regretted the decision that he had taken.*
(21) *Er bedauerte die Entscheidung, die er getroffen hatte.*
(22) *Il regrettait la décision qu'il avait prise.*

Again, this is not possible for adverbial support verb constructions.

None of the pronominalisation tests should hold for idioms, of course, because the parts are not referential. However, remotivation of parts of idioms makes it possible to pronominalise the noun in certain cases (17):

(23) *He let the cat out of the bag that the theatre company was about to ask me to be a member.*

Our finding on pronominalisation seem to contradict a statement of Van Durme (1995, 38f), who notes that pronominalisation is restricted in support verb constructions. She gives the Danish equivalent to the construction in (25). Such constructions are possible in a none support verb context:

(24) *She makes an assumption about the reason.*
(25) **She makes one about the reasons.*
(26) *She makes a cake for the wedding.*
(27) *She makes one for the wedding.*

To me it seems evident that the reason for this is the lack of the predicative meaning component in the sentence with the pronoun. In contrastive contexts, where the pronoun meaning – und thus the sentence predicate - can be easily identified, even this kind of pronominalisation is possible:

(28) *She makes an assumption about the reasons for this event, he makes one about the consequences.*

Pronominalisation of the predicative noun is one of the few linguistic tests that hold for all support verb constructions; the only restriction seems to be that the noun meaning must be accessible in cases where the general meaning ENTITY of non-predicative nouns does not allow an interpretation of the sentence.

Variability of the noun phrase

In support verb constructions the noun phrase is not fixed. The article and number is variable, and attributes can be added to the predicative noun.

a) Article and number are variable:

(29) *He committed a sensational murder.*
(30) *He committed the most sensational murders in the 20th century.*
(31) *Er beging einen aufsehenerregenden Mord.*
(32) *Er beging die aufsehenerregendsten Morde des 20 Jahrhunderts.*
(33) *Il a commis un assassinat spectaculaire.*
(34) *Il a commis les assassinats les plus spectaculaires du 20ième siècle.*

If number is restricted, this can be usually be explained by restrictions on the predicative noun semantics that are valid outside the support verb construction as well. In idioms the noun phrase is much less variable, and the same is true for the adverbial support verb constructions involving a preposition.

b) Variable Negation: This criterion is closely related to the use of the article. Different types of negations are possible with support verb constructions:

(35) *He has committed no crimes.*
(36) *He didn't commit a crime.*
(37) *(Il n'as pas commis un crime*
(38) *Il n'as commis aucun crime.*

In idioms, the use of the negation is much more restricted in general.

c) Possessive pronouns: The predicative noun phrase may also contain possessive pronouns. However, for those, there is an additional restriction coming from the theta-criterion - the semantic actant of the noun encoded as a complement of the support verb must not be realised again as a possessive pronoun, which accounts for the restrictions in the following construction (37). However there are many evident counterexamples that still need to be explained (38):

(39) *?The government gives its priority to infrastructure.e*
(40) *He committed his murder.*

Because of this complicated situation, this criterion is not well suited to test for referentiality of the noun phrase.

d) Attributes to the predicative noun: In support verb constructions, attributes can be joined to the predicative noun. A similar criterion is the possibility to build compound nouns with the predicative noun as head:

(41) *To make a difficult/tough decision*
(42) *Prendre une lourde décision / décision difficile*
(43) *ask a science question*
(44) *eine Wissenschaftsfrage stellen*

In idioms, attributes are not possible, apart from cases of evident remotivation.

e) Coordination of predicative nouns: In similar support verb constructions, two different predicative nouns can be co-ordinated:

(45) *He committed a murder and other crimes.*
(46) *Il a commis un assassinat et d'autres crimes.*

This is not possible in idiomatic verb-noun-constructions.

Passive

This criterion is only valid for the case where the predicative noun is formally the direct object of the support verb (Mel'cuk's OPER function). Here it is normally possible to passivise the construction (ex.(47) - (49)). In idioms this is less common (50).

(47) *A murder was committed.*
(48) *Un assasinat a été commis.*
(49) *Ein Mord wurde verübt.*
(50) *?The dead horse was flogged.*

Other tests for referentiality

In some cases the predicative noun in support verb constructions can also be substituted by a question word in some contexts (this criterion is given in Helbig/Buscha, 1991: 98f).

(51) *Was bekommt sie von ihm?*　(what does she get from him)
　　　Eine Anregung　　　　　　　(a suggestion)

However, this substitution is very limited, because the full verb reading of the support verb is dominant over the support verb reading, which makes the question difficult to interpret, in a similar way as the non-anaphoric pronoun in the previous section:

(52) *Was übte er?*　　　　(what does he exercise himself in)
(53) *Er übte Geige.*　　　(he exercised himself in playing the violin)
(54) *?Er übte Kritik.*　　(he criticised)

This substitution test is therefore less suited for checking the property of referentiality.

Verb is semantically reduced

Tests referring to verb semantics in support verb construction verify whether the verb has a reduced semantic deviating from the semantics of the corresponding full verb.

Nominalization of support verbs

The verb in support verb constructions cannot be nominalised. The reason for this is the lack of verb semantics.

(55) *to take decision*
(56) **the take of a decision*

Exceptions to this are the nominalized infinitive in German and the -ing nomininalisation in English, which is always possible. This kind of nominalisation does not exist in French:

(57) *das Stellen einer Frage*
(58) *the asking of a question*

Unfortunately, there are various other exceptions to this criterion, even for expressions that by other criteria can be judged as prototypical support verb constructions, e.g.:

(59) *Begehung eines Verbrechen (*The committing of a crime*)*
(60) *prise d'une decision (*making of a decision*)*

Therefore this criterion only has restricted value for delimiting borderline cases.

Nominalising the support verb construction as a whole

In lexicalised verb-noun constructions, it is often possible to nominalise the full construction using a synthetic compound:

(61) *etwas in Frage stellen (*to call into question*)*
(62) *die Infragestellung (*the calling in question*)*

This is usually not possible in support verb constructions:

(63) *Kritik an etwas üben*
(64) ** die Kritikübung*

This is due to the fact that in support verb constructions the noun alone can convey the predicative meaning of the construction and constitutes the nominalisation. This criterion only applies to language with synthetic compounds, such as German, Dutch and the Scandinavian languages.

Zeugma test

Earlier it was mentioned that it is possible to co-ordinate two predicative nouns with the same support verb. It is not possible to co-ordinate a noun from a non support verb construction with a non-predicative noun:

(65) **He gives a lecture and a lot of money.*
(66) **He commits a crime and a file.*

However, Namer/Schmidt (1997: 407) mention an alleged support verb construction where co-ordination with a non-predicative noun seems possible.

(67) *Luc donne un livre et un baiser à Marie.*
(68) *He gives Mary a gift and a kiss.*

It seems that "give a kiss" has a metaphoric reading, where kiss is viewed as an object that is passed from one person to another. This is not typical for support verb constructions in general.

Replacement of the support verb construction by a verb

In many cases there is a synonymous verb that can replace the support verb construction as a whole. Often, this verb is morphologically related to the predicative noun - in most cases the noun is deverbal:

(69) *Il a pris une decision.*
(70) *Il à décidé.*
(71) *He has made a decision.*
(72) *He has decided.*

There are also some cases of denominal verbs, e.g. German kritisieren or English prioritize.

(73) *Er übte Kritik an der Regierung.* (he critized the government)
(74) *Er kritisierte die Regierung.*
(75) *The government gives priority to infrastructures.*
(76) *The government prioritizes infrastructure.*

In some cases, the verbal synonym has a slightly different argument structure. In the following case the verb alone is not fully synonymous to the support verb construction, having a habitual reading.

(77) *He committed a murder.*
(78) *He murdered someone.*
(79) *He murdered.*

Passive support verb constructions have to be replaced by a passive verbal paraphrase.

(80) *He received support.*
(81) *He was supported.*

In case of support verb constructions that denote a state rather than a event, often a paraphrase using a copula and an adjective is possible, in most cases, again, the adjective is morphologically related to the predicative noun.

(82) *He suffers from a severe illness.*
(83) *He is very ill.*
(84) *Il souffre d'une maladie sévère.*
(85) *Il est très malade.*

The replacement criterion is suitable to differentiate support verb constructions from compositional verb-noun combinations where such a replacement is not possible.

Replacement of the support verb

When the predicative noun denotes an action, there often exists an approximative paraphrase with the verb *to make / to do* (en) *faire* (fr) or *machen* (de). In many cases this paraphrase is ungrammatical, but still understandable.

(86) *He takes an excursion.*
(87) *He makes an excursion.*

This is only possible in cases, where the support verb is semantically empty and does not carry aspectual information or attenuation/amplification meaning.

Deletion of the support verb

If the verb is omitted from the construction, no semantic information is lost (also see Giry-Schneider, 1987: 28). This means that an NP containing the predicative noun is synonymous to the full construction including the support verb. This property can be checked by substituting a subordinate clause with the NP:

(88) *William was happy that John had committed the murder.*
(89) *William was happy about John's murder.*
(90) *Willi freute sich, dass John den Mord begangen hatte.*
(91) *Willi freute sich über Johns Mord.*

In cases of support verbs that carry aspectual meaning, this replacement is more difficult, but still possible in many cases:

(92) *She told me how John got into difficulties.*
(93) *She told me about the start of John's difficulties.*

Several support verbs for one predicative noun

For many predicative nouns there exist several support verb constructions, expressing different diathesis or different aspectual information; apart from these differences the constructions are synonymous:

    (94) *William placed an order with Shakespeare Ltd.*
    (95) *Shakepeare Ltd received an order from William.*

Interchangeability of adverb and attribute

Above we showed that the predicative NP in support verb constructions is variable and can take attributes. Often, adverbs and attributes are interchangeable while keeping the semantics. This is called "descente de l'adverbe" in Giry-Schneider 1987: 31, giving the following example, which is also possible in English (94)-(97). The German translation of the sentence with the adjective is problematic, but the same phenomenon occurs in many other constructions (98).

    (96) *Marie fait fréquemment des faux pas.*
    (97) *Marie fait des faux pas frequents.*
    (98) *Mary makes frequent mistakes.*
    (99) *Mary makes mistakes frequently.*
    (100)*Er übte harsch(e) Kritik. (*he critized in a harsh manner*)*

Complement status

In the definition of support verb constructions we stated as a requirement for a prototypical construction that some semantic arguments of the noun are syntactically realised as complements of the support verb, whereas others are still subcategorized by the predicative noun. The former property is covered by some of the tests that have been listed in the previous sections, i.e. the replacement of the construction by the predicative noun alone and the status of possessive pronouns in the noun phrase. In addition, two more tests can be listed.

Double realisation of arguments

It is impossible to express any syntactic actant of the predicative noun twice as a complement of the support verb and of the predicative noun. In regular constructions, the complements of the verb and the noun are not mutually exclusive, because they have different underlying semantic actants.

(101) *?He committed Jack the Ripper's murder.*
(102) *He investigated Jack the Ripper's murder.*
(103) *?Il a commis les assasinats de Jacques l'Eventreur.*
(104) *Il a enquêté sur les assassinats de Jacques l'Eventreur.*

The complements of the predicative noun can be moved out of the noun phrase

Apart from the semantic arguments of the predicative noun that are syntactically subcategorized by the verb, there can be complements of the predicative noun, that are still syntactically dependent on the noun. Those become the complements of the full support verb constructions. This can be mainly tested by looking at the possible ordering of syntactic constituents in the sentence.

Therefore they can be moved out of the nominal phrases (see Barrier/Barrier 2003), which is not possible in compositional constructions:

(105) *C'est contre Luc que Max commet un crime.*
(106) *?C'est contre Luc que Max raconte un crime.*
(107) *It is against them that he committed the vast majority of his crimes.*
(108) *An Unschuldigen verübte er keine Verbrechen.*

Summary for linguistic tests

This section presented linguistic test that can be used to delineate support verb construction to superficially similar constructions. Most of those tests have exceptions and it is difficult to find examples that match all of them. Different degrees of lexicalisation, systematic polysemy of predicative nouns and idiosyncratic properties of all involved constituents make it impossible to design a definitory set of criteria. The best criteria seem the ones that test the referentiality of the nouns phrase; all others seem to have exceptions.

Support verb constructions and lexical acquisition

In the last 15 years, computational linguists and lexicographers have suggested methods to extract support verb constructions automatically from electronic text corpora. Most of the techniques presented rely on statistical methods to estimate the degree of association between words (for an account of those methods see Manning/Schütze, chapter 5).

Both from a theoretical point of view and from the practical outcomes of these experiments it can be clearly shown that these methods fail to extract support verb construction for the following three reasons:
1) Statistical association – whatever measure is used – cannot be equated with the semicompositionality. These two phenomena are often confounded in research literature by abusing the notion of collocation, which is ambiguous between statistical association and a linguistic definition meaning semicompositional construction. But statistical association is also induced by phenomena like semantic argument selection by verbs or idiomaticity; all the following word pairs will be statistically associated, but only one of them can be viewed as being induced by a support verb construction.

(109) *bark – dog*
(110) *bite – tongue*
(111) *give – lecture*

2) ambiguity of words and word forms have negative effect on the results of the statistical methods
3) All association measures work badly on infrequent words; the extraction only works for verb-noun pairs where the constituents are frequent enough to allow statistical inferences, the frequent SVCs however are the ones that will be identified and coded anyway, also without any statistical text analysis.

Krenn/Evert (2001) have given detailed statistics on the extraction performance of several statistical association measures on German data. It can be inferred from their results that even most adequate association measures fail to save much work for the lexicographer, compared to a purely frequency based consideration of the candidate data.

After these disappointing results, it could be argued that linguistically more adequate extraction techniques could improve the extraction performance. In the previous chapter could be shown that there is a whole

variety of tests that can be used to delimit support verb constructions, and some of them seem to be automatable. Candidates for automatable tests are especially the ones that check the referentiality of the predicative nouns phrase. It is questionable, however, whether even a significant improvement of the extraction results would be sufficient to save much work to a lexicographer in terms of detection. The gain from automate the test would rather be a quantitative summarization of interesting properties of already recognized or encoded support verb constructions.

Conclusions

In this article, I have tried to clarify the notion of support verb construction in a minimal theoretical environment. In the subsequent subchapter it could be shown that the linguistic tests that can be listed for delineating SVCs from other, superficially similar constructions, all have various exceptions.

These difficulties together with the fact that many of the presented test frames do not seem to be automatable in the context of corpus linguistics will make it hard to design any automatic detection and extraction of support verb constructions even from very large corpora. Consequently, any dictionary project dealing with support verb constructions will necessarily involve a high degree of manual classification, and also here, the different tests have to be applied with care and always with consideration of the underlying semantic concept the support verb construction. This notion, like many concepts used in natural language processing, is a (necessary) idealization of the very complex field of constructions situated between fully compositional constructions and idioms, and in the long run, the classification of an expression as a support verb construction will only serve to determine the matrix of properties that has to be filled in for any single construction separately.

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