

Buying and selling in Word Grammar

Richard Hudson

Abstract

The paper explores in some detail the semantics of the verbs which Fillmore classifies as 'commercial transaction' verbs: BUY, SELL, CHARGE, PAY, SPEND and COST. It shares Fillmore's belief that these meanings must be defined in terms of general semantic frames, but (like Lawler) it argues that more than one such frame is involved. In addition to the frame for Commercial transaction we need to invoke Trading, Consuming, Using, Giving and Getting, which interact to define the meanings of these verbs (and of course many others). The analysis is formalised in terms of Word Grammar theory, and assumes that each 'frame' is a concept represented as a node in a network of relations. The paper also considers the theoretical status of semantic relations (especially participant roles), and shows that these can be defined within the analysis through the network. One relation may be defined in terms of another either by being an example (in the 'isa' relation) of the other, or by sharing the same terms as the other.

1 Introduction

This paper is an exercise in Frame Semantics as advocated by Charles Fillmore, and in homage to his work it focuses on a semantic field which he first put under the microscope: commercial transactions (Fillmore 1976; Fillmore, Atkins 1992). The very richness of this field reflects the central position of buying and selling in our culture, and indeed it is very hard to find any boundary between semantics and culture (or encyclopedic knowledge). We clearly have a concept of Buying which guides our daily behaviour in shops; and we have a remarkably similar meaning for the verb BUY. I assume that they are in fact one and the same concept, with no distinction between its 'semantic' and 'encyclopedic' properties. More generally, I see no reason to distinguish 'semantic' concepts from 'encyclopedic' or 'pragmatic' ones (Hudson 1995; Hudson 2000; Hudson, Jasper Holmes 2000), so this paper is an exercise in cognitive psychology as well as in lexical semantics.

The main focus of this exercise will be the participant roles involved in this analysis. How can we reconcile the very specific roles such as Goods and Buyer with a parsimonious system of semantic roles (so-called thematic or theta roles)? This will not be the first attempt to answer the question (e.g. Charniak 1981, Fillmore, Atkins 1992; Lawler 1989) and my general conclusion will be the same as in these earlier discussions: specific roles co-exist with general ones - in Lawler's terms, 'local cases' co-exist with 'universalist cases'. However this is the first attempt to use the formal apparatus of Word Grammar to integrate these different relations into a single analysis. My analysis is somewhat similar to the detailed analysis in Croft, Taoka, Wood 2001, but will conclude that force-dynamic notions are combined with structures taken from other domains.

I shall build on one of the ideas that has become increasingly important in WG since 1990 (Hudson 1990:189-218, Fraser, Hudson 1992; Hudson 2000):

The relational hierarchy

Relations are related to one another in an inheritance hierarchy.

This idea applies most obviously to syntactic relations, where it is easy to see that both Subject and Complement are different kinds of Dependent, and that Object is a kind of Complement (when this term is applied in its modern meaning). Thus Object inherits some of its properties from Complement, which in turn inherits some properties from Dependent. However the idea applies almost as obviously to relations in semantics, including the familiar participant roles. The Patient of Baking is similar in some respects to the Patient of Eating - both are deeply affected by the action, in contrast with their respective Agents - but there are also important differences between being affected (eating) and effected (baking). If relations are organised hierarchically we can reconcile these two observations by treating Affected and Effected as distinct sub-types of Patient. This paper will apply the same basic idea to the area of commercial transactions.

2. Overview of the facts

A commercial transaction (CT) involves four participants:

- (a) Buyer
- (a) Seller
- (some) Goods belonging to the seller
- (some) Money belonging to the buyer

The CT consists of exchanging the money for the goods. Any event which satisfies this description qualifies as an example of a CT, and any typical CT does satisfy it.

On the language side, we have no fewer than six verbs which are specialised for describing CTs (Fillmore, Atkins 1992):

- | | | | | | |
|----------|--------|-----------------------|--------|--------------------|------------------|
| • BUY | Buyer | <i>buys</i> | Goods | <i>from</i> Seller | <i>for</i> Money |
| • SELL | Seller | <i>sells</i> | Goods | <i>to</i> Buyer | <i>for</i> Money |
| | | (or: ... <i>sells</i> | Buyer | Goods ...) | |
| • CHARGE | Seller | <i>charges</i> | Buyer | Money | <i>for</i> Goods |
| • SPEND | Buyer | <i>spends</i> | Money | <i>on</i> Goods | |
| • PAY | Buyer | <i>pays</i> | Money | <i>to</i> Seller | <i>for</i> Goods |
| | | (or: ... <i>pays</i> | Seller | Money ...) | |
| • COST | Goods | <i>cost</i> | Buyer | Money | |

These verbs all describe the same objective situation, but construe it (in the sense of Langacker 1998) differently according to which participant's point of view they take. For example, each of the following sentences is a description of the same scene in which John is in a shop and gives the assistant (Mary) a pound in exchange for some apples.

- (1)
- | | |
|---|---|
| a | John bought the apples from Mary for a pound. |
| b | Mary sold John the apples for a pound. |
| c | Mary charged John a pound for the apples. |
| d | John spent a pound on the apples. |
| e | John paid Mary a pound for the apples. |
| f | The apples cost John a pound. |

According to Frame semantics, the similarities among these sentences derive from their common 'frame', the network of encyclopedic knowledge in terms of which the verbs are defined. I accept this general principle totally. The only way to define the meaning of any word is, so to speak, to write an essay about the relevant area of meaning which relates this meaning to the meanings of all other relevant words; so in

the area of CT, we need a description of what happens when people go shopping which shows how buyers, sellers, money and goods are related - and in the process we shall no doubt need to link the analysis to other areas of knowledge about shops, income, shopping hours and so on - and on. In short, doing lexical semantics is just like any other area of linguistics. As good structuralists, we define every individual element - every word, phoneme, word-class or construction - in terms of how it fits into the total system. The virtues of this approach may seem obvious, but it contrasts diametrically with another popular approach to lexical semantics which assumes that our goal is to decompose all meanings into a universal vocabulary of primitives (Wierzbicka 1988; Wierzbicka 1996; Wierzbicka 1998). Frame semantics is compatible with universal primitives, but most of the work is done by derived (and parochial) concepts such as Trading or Buyer.

However, having accepted the general principle of defining meanings in relation to a conceptual frame I shall take issue with Fillmore's analysis of this particular area of meaning. One of the questions that this analysis leaves unanswered is why the six CT verbs listed above have different potential argument patterns; in particular, why is it so hard, and perhaps even impossible, to mention the seller when we use the verbs COST and SPEND? The seller SELLS and CHARGES, and we BUY from the seller and PAY to the seller, but there is no obvious way to add the seller to a sentence containing COST or SPEND: the goods COST money, but not 'to' the seller or from the seller; and likewise we SPEND money but not to the seller. If all these verbs take their meanings from the same frame, this gap is very strange and can be taken as a very clear example of totally arbitrary linking from semantics to syntax. I suggest instead that the gap is easily explained if COST and SPEND actually relate to a different frame, that of **Resource-management**, which includes Using and Consuming and which just happens to overlap with CTs because money is a consumable resource and purchasing goods is one possible use for the resource. This alternative analysis answers a number of questions:

- Why activities can COST us time and effort as well as money, and why we SPEND time and effort. In contrast the genuine CT verbs do not sit comfortably with time and effort as the 'money': we cannot CHARGE or PAY an hour, or BUY or SELL something for an hour. Almost by definition, CTs involve money, whereas COST and SPEND apply more generally to resources.
- Why COST and SPEND do not allow a seller. This is because Resource-management has no seller, so *it cost a pound to Mary* is uninterpretable because *to Mary* cannot relate to any relation which we can define in terms of Resource-management.
- Why SPEND is similar to other resource-management verbs such as WASTE, EXPEND and USE which also mark the target activity with the preposition ON (e.g. *I wasted a pound on that book*).

In short, the verbs COST and SPEND are not CT verbs at all; they are Resource-management verbs (just as, despite first appearances, CLEAR and CLEAN can be shown not to be simply 'verbs of removing' - Levin, Rappaport Hovav 1991).

Another question is why the 'goods' of CHARGE and PAY are so much more diverse than those for the verbs BUY and SELL. We PAY for a holiday, but we don't BUY it (unless it happens to be a package); a hotel CHARGES for a room but it doesn't sell it, and we PAY for the room but don't BUY it; we can BUY a pizza in a supermarket but not in a restaurant, but we PAY for it in both places. The verbs PAY and CHARGE seem to involve any transaction in which money changes hands,

whereas BUY and SELL are restricted to a particular scene which we can call (somewhat uncomfortably) Trading, in which typically:

- a. the transaction takes place in a shop,
- b. the 'goods' are concrete objects rather than services,
- c. the items are priced individually.

Not all of these features are required for buying and selling; for instance, we can buy

- a cup of coffee in a cafe (b and c)
- a package holiday (a and c)
- our week's groceries (a and b).

In short, PAY and CHARGE are genuine CT verbs, but BUY and SELL are verbs of Trading, whose frame includes an important link to the notion Shop.

The proposed analysis thus invokes not one frame but three:

- Resource-management: COST, SPEND
- Commercial transaction: CHARGE, PAY
- Trading: BUY, SELL

The second and third frames are closely related to one another because Trading is a kind of Commercial transaction; but they are only distantly related to the Resource-management frame. (Following Lawler 1989 we can further recognise Commercial transactions as a special case of Bartering.) However, we can push the analysis still further in order to distinguish the verbs in each pair. Clearly the relation between BUY and SELL is in some sense parallel to that between CHARGE and PAY: if I BUY a book from you I receive the book, and if I CHARGE a pound I receive the pound, whereas if I SELL the book or PAY the money I give it. The first two verbs are similar to verbs such as GET and RECEIVE, with a shared frame called Getting; while the second two line up with GIVE. This allows us to recognise each of the verb meanings as a complex interaction between two frames; for example, Buying relates both to Trading and Getting, as shown in Table 1.

	Getting	Giving
Commercial transaction	CHARGE	PAY
Trading	BUY	SELL

Table 1

It is the second of these two contrasts that determines the linkage between participant roles and the syntactic subject and object.

- Getting: Getter = subject, Get-ee = object
- Giving: Giver = subject, Receiver = indirect object, Gift = object

The first contrast contributes by determining what the "Get-ee" or Gift is:

- Commercial transaction Get-ee, Gift = Money
- Trading Get-ee, Gift = Goods

These patterns are interesting because they suggest that Getter and Giver are examples of the same semantic role, and likewise for the "Get-ee" (the thing received) and the Gift. Suppose we replace these pairs by the super-roles **Person** and **Thing**. This will allow a simpler statement of the linking rules:

- Commercial transaction Thing = Money
- Trading Thing = Goods
- All: Person = subject, Thing = object
- Giving: Receiver = indirect object.

This is the kind of analysis where a hierarchy of semantic roles is more helpful than a single list of roles - we need the super-roles for some generalisations, and the more specific ones for others.

The two verbs COST and SPEND fall outside the system of Giving and Getting because, as we saw above, they belong to the frame of Resource-management. SPEND is straightforward, as it is very similar to USE and WASTE and has a very standard linkage between semantic and syntactic dependencies - indeed, we can subsume it under the generalisation just proposed for the CT and Trading verbs. More precisely, the Person and Thing have just the same mappings, syntactically as well as semantically, as the true CT verb PAY:

- Person = Buyer = subject
- Thing = Money = object

In other words, SPEND and PAY both focus on the money, and differ only in whether they construe this as a resource (SPEND) or as the price of the goods (PAY).

(2) I spent all my savings (*a good price) on that holiday.

(3) I paid a good price (?all my savings) for that holiday.

The link between PAY and PRICE is also interesting from a theoretical point of view, because it shows how one semantic relation may be defined in terms of others: the price of an object is the money that one pays for it. Once the conceptual structures for paying are in place, the definition of Price involves nothing more than a direct link between the nodes for Money and Goods. One of the advantages of the WG approach to relations is that ad hoc relations such as Price can be recognised and fully defined within the system. We shall see below how this is done, but I should admit that this is by no means a new idea; it is very similar to the approach that Lawler takes in his analysis of the relations Value, Worth, Cost and Price in Lawler 1989.

3. The special case of COST

We now have reasonably satisfying analyses for five of the six so-called 'CT' verbs, which explain both their semantic similarities and differences and also their respective linkages to syntax. The remaining verb is much more difficult to analyse. The verb COST has a number of peculiarities which we can assume to be connected:

- It resists passivization strongly (Lawler 1989):

(4) *A pound is cost by all these books.

- It allows two complements which look just like the double-object construction found with verbs such as GIVE, but its semantics is quite different because the first complement defines the buyer, who is the source of the second rather than its goal.

(5) This book cost me a pound.

- It is partly similar to the verb TAKE, which in particular provides a good precedent for the (apparent) double-object pattern:

(6) The job took me an hour.

Moreover both verbs resist passivization of the first complement:

(7) *I was cost a pound.

(8) *I was taken an hour.

However, unlike COST, TAKE does allow its second complement to passivize:

(9) The time taken by this job was more than I expected.

These restrictions on passivization look rather arbitrary, but I believe they can be explained at least in part in terms of the semantics of COST.

Here are two relevant semantic peculiarities of this verb, and one peculiarity in the area of word formation:

- Uniquely among the 'CT' verbs, COST takes a thing (the goods) rather than one of the people as subject. This seems to be characteristic of other transitive verbs which (apparently arbitrarily) resist passivization, including SUIT, BECOME and STRIKE.
- Another difference between COST and the other five verbs is that it defines a relationship rather than an action. Buying, selling, paying, charging and spending are all things that one does, deliberately and purposefully, to money and goods; but costing merely defines the relationship between the money and goods. Thus we can accidentally buy, sell, pay, charge and spend the wrong goods or money; but a book cannot accidentally cost too much. In terms of the Vendler categories (Vendler 1967), costing is a state whereas all the other verbs define actions or achievements.
- Like PAY and CHARGE, COST has a homonymous noun; but unlike these other verbs, the noun COST defines a property of the verb's subject. If a book's cost is a pound, the book costs a pound, whereas a person's pay is what someone else pays them and a museum's charge is what it charges other people - a much more complicated relationship.

Here is how I believe we should analyse COST, both noun and verb, in such a way as to bring all these various peculiarities together.

- The noun COST is defined in terms of the structure for SPEND in just the same way that PRICE is related to PAY. As explained above, PRICE is a direct link between the goods and the money in the Paying frame; so in the same way Cost can be defined as a direct link between goods and money in the Spending frame.
- The verb COST is defined in a similar way. It is a more complex relationship linking all three participants in the Spending frame: the goods, the money and the buyer. In fact its semantic structure is very similar to that of its derived noun, differing only in that it involves an extra node ('Costing') which allows links to other nodes (most obviously the buyer, but also more general characteristics of relations such as time) Thus the goods have a cost, but they are the 'Coster' of a 'Costing' which also has the money as a 'Cost-ee' and the spender as the 'Cost-to'. (The names for these relations are unimportant.)
- This means that none of the semantic roles of Costing are in an 'isa' relationship to more general roles - the 'Coster' relation takes us to the same entity as the 'Spent' relation, but the only similarity between them is the identity of their values. In particular, it is not the case that Coster isa Spent. The Coster relation is simply a new relation invented specially for this particular verb, not part of the more general hierarchy of semantic roles. This is why the choice of names is so unimportant.
- In the absence of any isa links to more general relations, the participants of Costing cannot inherit any of the general linkages to syntactic dependencies; and in particular they cannot map onto the grammatical functions 'object' or 'indirect object'. If we assume that these are the only functions that can passivize, we have an explanation for the total ban on passivization: neither of the complements of COST is an object or indirect object, so neither undergoes passivization.

This discussion has suggested a network of rather intricate inter-relations which may have been hard to follow. What we need is a notation for displaying such networks and a theoretical framework which explains and defines them, so the rest of

this paper will present such a framework - Word Grammar - and apply it to the 'CT' verbs.

4. Word Grammar and the classification of events

The main claim of Word Grammar (WG) is that language is a conceptual network (Hudson 1984:1, Hudson 2000) which is fully integrated into the general network of cognition. The nodes of the network represent all kinds of element that a linguist or cognitive scientist might wish to represent - words, morphemes, word classes, meanings, more encyclopedic categories, individuals, variables - and the links represent the relations between these nodes. The most important type of link is the 'isa' link which is the basis for all classification, so nodes are classified by means of isa links - for example, the word DOG isa Noun, and its sense, the category Dog, isa Animal. As mentioned earlier, classification applies not only to nodes, but also to the links between nodes; this being so, it follows that links themselves may be interlinked in a network of isa relations. We shall come back to this important point below.

Isa links are shown by a distinctive notation - a small triangle sitting on the super-category and linked by lines to the sub-categories. Figure 1 applies the notation to some very simple cases:

- the word DOG isa Noun
- Noun isa Word
- the inflectional category Plural isa Noun (i.e. a plural noun isa noun)
- DOG:plural (the plural of DOG) isa DOG
- DOG:plural isa Plural
- Dog isa Mammal (i.e. the category 'Dog' isa the category 'Mammal')
- Dog isa Pet
- Mammal isa Animal
- Pet isa Animal

Perhaps the most important thing to notice in this diagram is that WG allows multiple isa relations; for example, 'DOG: plural' isa both DOG and Plural, and Dog isa both Mammal and Pet. The names of categories are merely mnemonics, but they follow two general principles:

- Names of lexemes are in capitals throughout: DOG (= the lexeme DOG, covering both *dog* and *dogs*).
- Names of other categories have initial capitals: Dog (= the category of dogs).

When the word for a category is used in the usual way, it is written in the usual way.

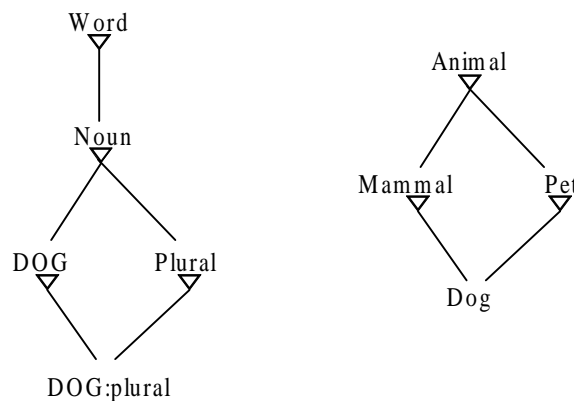


Figure 1

The same notation allows us to bring together the situation types related to CTs that I discussed above, and also to relate them to some more general categories such as Bartering (Lawler 1989), Exchanging, Giving and Getting, as well as two activities from the area of resource-management: Using and Consuming. Where possible I use the gerund of the verb as the name for its sense - Buying, Costing, etc - but in the case of commercial transactions there is no single verb. The diagram obviously tells only part of the story, but we anticipate the rest of the story by locating Paying and Charging on the same level as Commercial transaction, in contrast with Selling and Buying which are on the level of Trading. As explained earlier, Spending and Costing have nothing specific to do with commercial transactions as such, but they are related via the shared concept of Getting. All these categories will be explained more fully below.

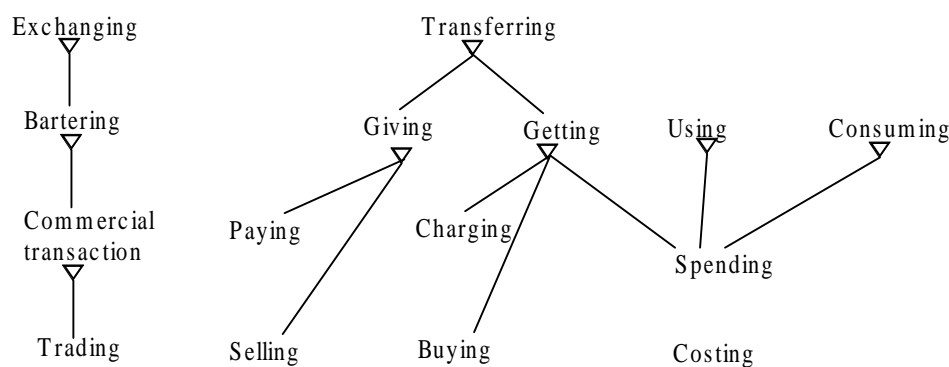


Figure 2

The isa links provide a hierarchical scaffold which ultimately holds all the concepts together; for example, even though Costing is an isolate in Figure 2, in a more comprehensive network it would be connected to the other concepts via a super-category such as Situation or State-of-affairs. More importantly, however, it provides the basis for the basic logic of the system, **Multiple Default Inheritance**, whereby properties are generalised down the hierarchy. For example, since Paying and Selling both isa Giving, they inherit all the characteristics of Giving by default - i.e. unless they are overridden lower down the hierarchy; and since Spending isa Getting, Using and Consuming, it inherits (by default) all the characteristics of all three super-categories. Exactly what these characteristics are, and how they are shown in the network, will be explained in the next section.

5. Defining event-types by links to other nodes

If knowledge (including language) really does consist of a network of interrelated nodes for concepts such as event types, words, people and so on, it follows that all the characteristics that we know about these concepts must also be shown by means of links in the network. This view is a commonplace in cognitive psychology (Reisberg 1997, chapter 7), but its consequences have hardly been explored in linguistics outside Cognitive Linguistics (Aitchison 1997; Barlow, Kemmer 2000; Bates, Goodman 1997; Bybee 1998; Goldberg 1998; Hudson 2000; Lamb 1966; Lamb 1998; Langacker 2000a). This principle is important because it shifts the focus from labels to links: instead of asking how to label some element, we ask how it relates to other

elements. In other words, a node receives both its definition and the whole of its content from its links rather than from its name.

For example, take the nodes in Figure 2 labelled Exchanging and Giving. These are connected because if two people exchange things they each give the thing to the other - exchanging is mutual giving. The network must therefore show that exchanging involves giving. First, exchanging must have two parts which are assumed, by default, to be simultaneous, and each of which isa Giving. This is shown in Figure 3. In words:

- Exchanging has two parts, each shown as an unnamed dot (standing for a variable - an entity that varies from one instance of exchanging to another).
- The links to these two variables are labelled 'part', implying an isa relation to the super-category 'part'. Strictly speaking these labels should be distinguished because they are distinct examples of the super-category.
- Each variable isa Giving, so Exchanging consists of two acts of giving.
- Both variables are linked to a third variable by a link labelled 'time', which shows that the givings are simultaneous. As with 'part', these are actually distinct examples of the 'time' link so they should have distinct labels.

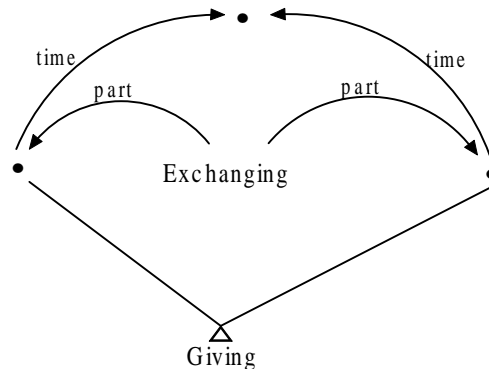


Figure 3

The next step in the analysis is to add the idea of mutuality - if A and B exchange gifts, then A gives something to B and B to A. This is easy once we expand the definition of Giving by adding its three participant roles which we shall explain more fully below - Giver, Getter and Gift. Each part automatically inherits these three roles by default inheritance, but as Figure 4 shows, the giver of one part is the receiver of the other, and vice versa. There is no need to show the gifts as well because these are inherited without change from Giving.

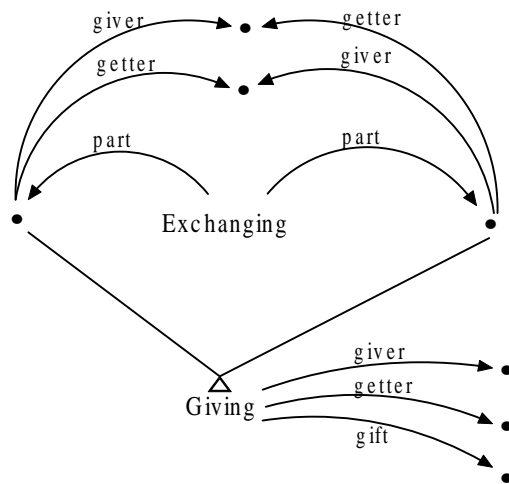


Figure 4

In Figure 2, Exchanging is the super-category for a series of more specific event-types including Bartering, Commercial transaction and Trading. Each of these inherits the characteristics of the one above, while adding one or more additional characteristics; and as usual, these characteristics are defined in terms of relational links. These links are shown in Figure 5.

- Bartering is purposeful, whereas (mere) exchanging need not be; for example when John and Mary exchange gifts at Christmas, neither of them gives to the other in order to get from the other (at least, not in principle), but if they bartered gifts this would be their purpose. So if A and B barter, A gives B something in order to get something else from B, and vice versa. All we need in order to show this is a Purpose link between the two sub-events so that each is the purpose of the other.
- A commercial transaction involves money, so one of the gifts must isa Money. In order to distinguish the two parts, we can arbitrarily call the money-giving 'part A' and the other giving 'part B'.
- According to my informal analysis, trading combines a number of characteristics in a prototype: it happens in a shop (its place isa Shop), the non-money gift is typically a concrete object (the gift of part B isa Concrete object), and the money paid is the price of this object (the gift of part A is the price of the gift of part B).

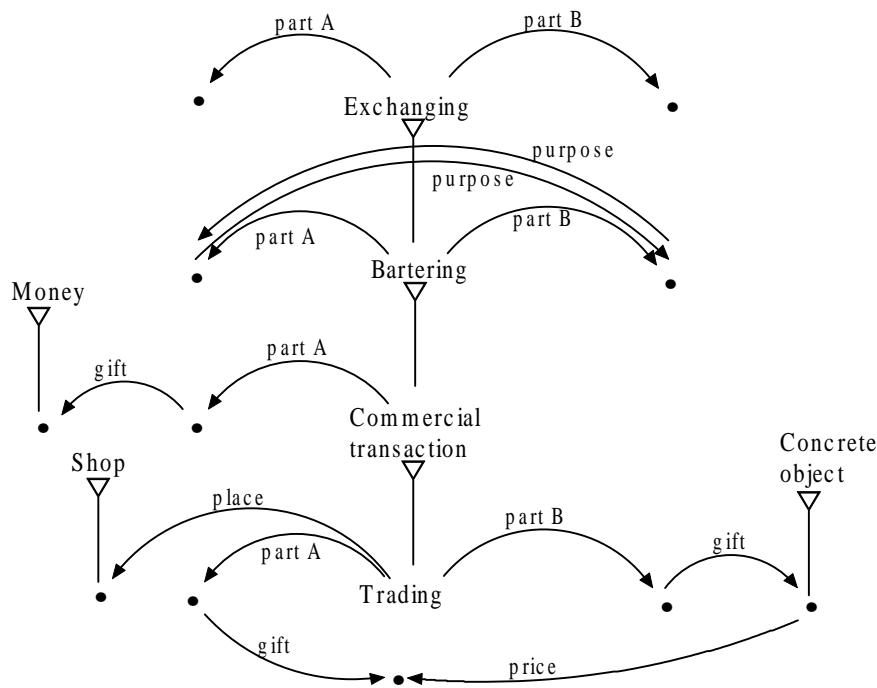


Figure 5

This hierarchy of event types will provide one of the foundations for an analysis of the so-called CT verbs, but we also need to define the other concepts in Figure 2 - Giving, Getting, Using and so on. Before we do this we shall take a small detour into theory.

6. The hierarchy of links

The analysis so far has assumed that every link is classified and that its classification is shown by a label - 'part', 'part A', 'place', 'price' and so on. However this is actually false to the assumptions of WG, and in particular to the idea of the Relational Hierarchy which I introduced at the start. Let us consider the problems with the analysis so far:

- It implies a fundamental difference between nodes and links, whereby nodes are classified hierarchically but links are not. This need not be true, so it should not be built into the theory or the notation; and common-sense tells us that it is not true - some links do show partial similarities (e.g. those labelled 'part', 'part A' and 'part B').
- It implies that two links may carry the same label, whereas this is not possible for nodes because identity is carried (in a network model) by the node itself rather than by its label. If a single diagram contains two nodes with the same label this is simply a matter of graphic convenience, so in principle the diagram could be redrawn with a single node carrying that label; but if two links carry the same label, they could not be collapsed into a single link because the nodes connected are distinct.
- It implies a very large unstructured set of link labels in which very general labels such as 'place' have the same status as specific ones such as 'price'.

The idea of a hierarchy of relations solves all these problems, as we shall see once I have explained the idea more fully.

Take the relation 'part', which we assume as the link between Exchanging and its component acts of giving. This is clearly an extremely general relation which goes well beyond exchanges or even event-types (Cruse 1986, chapter 7), and which can be defined by a cluster of characteristics, so for example if A is a part of B:

- A is smaller (or relevant dimensions of measurement) than B.
- If A is combined with all the other parts of B, then the result is B.
- A's properties are different from those of B - i.e. A does not inherit properties from B (e.g. my finger does not have a name, although I do).
- A is identifiable and classifiable as an individual entity (unlike a mere 'piece' of B) of type A'.
- Linguistically, we say that B has one or more examples of A' (e.g. I have ten fingers), but not the other way round (my fingers do not have me).

On the other hand, the parts of an event such as Exchanging are also very different from the parts of a human body or of a clock, or indeed from the parts of an event such as Eating where the parts are ordered in time (we put the food into our mouths before we chew it, and chew it before we swallow it). Moreover, even the parts of Exchanging are different from one another if the event involves money, and so on.

It seems clear that we are dealing with a hierarchy of more or less similar relations rather than a single relation:

- a very general relation Part, which presumably isa Relation;
- a relation between the parts of Exchanging which isa Part and which we might call 'Part_{exchange}';
- a relation between the money-part of a commercial transaction and the whole transaction, which isa 'Part_{exchange}'.

It is also clear that the hierarchy cannot be carried by the labels because this would require the labels themselves to have an internal structure which is part of the analysis; for example, the label 'Part_{exchange}' is really shorthand for two separate labels, one showing that it is a part and the other showing the differences from other parts. This use of complex symbols is just a notation for showing the isa hierarchy which is explicit in Figure 6.

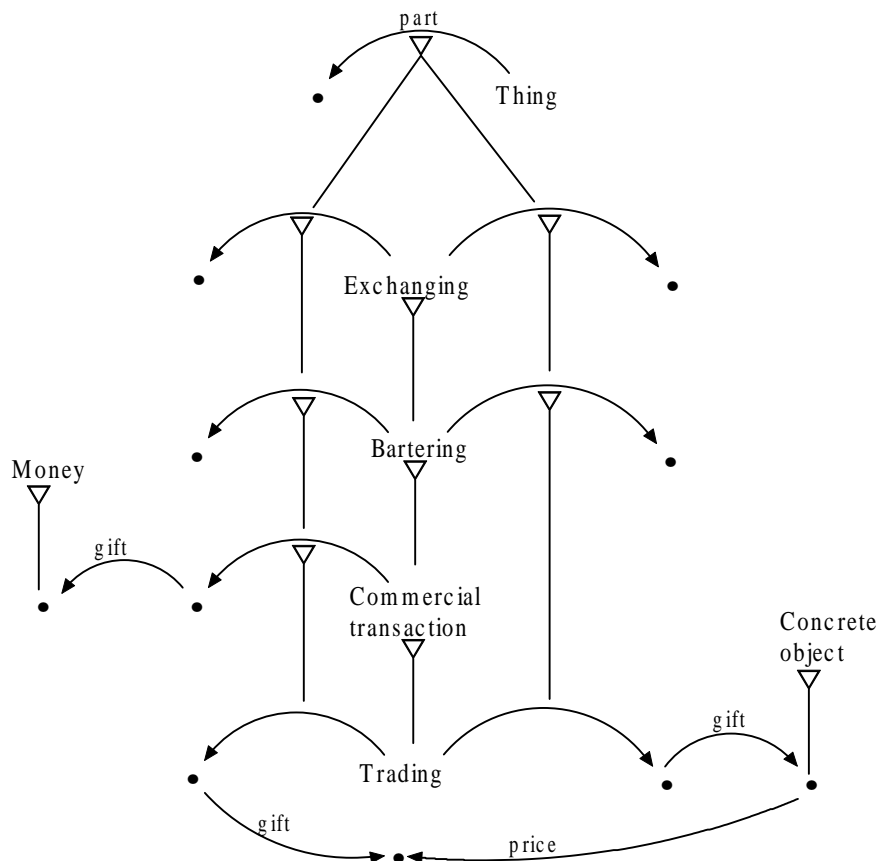


Figure 6

The point of Figure 6 is that all the 'part' labels of Figure 5 have been replaced by isa links to more general relations, terminating in the most general 'part' relation at the top of the diagram. Once these isa links are in place there is no further need for labels, and the three problems mentioned earlier disappear:

- There is no fundamental difference between nodes and links because links as well as nodes are classified hierarchically.
- Distinct links cannot carry the same label any more than distinct nodes can, although in both cases it may be convenient for graphical purposes to use labels for identity (as in the case of the three 'gift' labels in Figure 6).
- The set of link types is clearly structured, with very general (and possibly universal) types at the top of the hierarchy and increasingly precise and parochial types below.

A further advantage of organising relations hierarchically is that it allows us to distinguish the two kinds of definition which I hinted at in the discussion of Costing:

- Some relation types are specific versions of a more general type; this is the case for the different types of part discussed above. So relation R is a R', with a few extra characteristics on top of those inherited from R'.
- Others are defined by the convergence of other relations, as in kinship terminology:
 - Grandparent of X = Parent of parent of X,
 - Cousin of X = Child of Sibling of Parent of X.

In Figure 6 this method provides a definition for the relation Price: The price of X is the money which is the gift of the money-part of the transaction of whose other part X

is the gift. According to the analysis I presented earlier, this kind of definition also underlies the meaning of COST; I return to this analysis below.

The aim of the rest of this paper is to apply this theory of relations to the so-called CT verbs, paying particular attention to the participant roles Buyer, Seller, Goods and Money. For each of the verbs we have two questions:

- How are the relevant roles defined?
- Why are they assigned as they are to syntactic dependents?

7. Giving and getting

According to the analysis that I proposed above, the frames for Commercial transaction and Trading are mapped onto verb meanings via the very general frames for Getting and Giving; for example, Buying involves both Trading and Getting, whereas Selling involves Trading and Giving. The next target, therefore, is an analysis of Giving and Getting. These concepts are the senses of the ordinary English verbs GIVE and GET as in the following examples:

(10) I gave him a book.

(11) He got a book from me.

Such pairs provide an obvious parallel to SELL and BUY, and to PAY and CHARGE. The question is how their various participant roles are related to each other and to syntactic dependents.

Giving and Getting involve a succession of increasingly general concepts:

- Giving and Getting involve the transferring of some object (the 'mover') from one person (the 'source') to another (the 'goal'), so their participant roles are:
 - a giver or getter;
 - a mover;
 - a source;
 - a goal.
- Transferring involves some action (an example of Doing, performed by its 'doer') whose result is the movement of the mover from the source to the goal, so its participant roles are:
 - a doer;
 - a result;
 - a mover;
 - a source;
 - a goal.
- Moving involves:
 - a mover;
 - a source;
 - a goal;
 - an earlier state (the 'history') in which the source has the mover;
 - a result state in which the goal has the mover.
- Having is a special kind of Being (more precisely, Being located) in which the location has some kind of identifying relation such as control or domination over the thing located, so it has:
 - a figure (the thing);
 - a ground (the location or possessor).

We shall work through these concepts in reverse order, showing how each builds on the participant roles that it inherits from the more general notion. The following

discussion is heavily influenced by work in Cognitive Grammar (Langacker 1990; Langacker 1998; Langacker 2000b).

Being, in the locative sense, relates a 'figure' (the person or thing concerned) to a 'ground' (the location). For example, in (12) the fly is the figure and the soup is the ground, whereas in (13) the relation is the other way round:

(12) The fly is in the soup.

(13) The soup is round the fly.

The same objective situation may be 'construed' in different ways according to various contextual factors - what is relevant, what the participants have just been paying attention to, and so on. These different construals each lead to a ranking of the participants which can be understood in terms of the mental order in which the participants are presented (in a typical case - i.e. ignoring topicalisation, passivization and so on). We start with the 'vantage point' (Langacker 1990) or 'reference point' (Langacker 2000b), which is the element through which the situation is 'entered' - i.e. Halliday's 'theme' (Halliday 1967; Halliday 1985). If we enter the fly-in-soup situation via the fly, we have sentence (12) above, but we can shift the vantage point without changing the figure-ground relations in the first two sentences:

(14) The soup has a fly in it.

(15) The fly has soup round it.

These sentences still describe the same situation but view it via a different participant which I shall call the 'first' - the first element considered. This name provides the convenient label '1', which will be joined in later discussion by larger numbers for other roles based on . Thus one use of the verb HAVE is simply to shift first in a locative description from the figure to the ground.

An analysis of **Having** follows easily. It is well known that possession is often expressed in the same way as location (Lyons 1977:722-3). This can be illustrated from Scottish Gaelic:

(16) Tha an cat aig an teine.

is the cat at the fire 'The cat is at the fire.'

(17) Tha peann aig Calum.

is pen at Calum 'Calum has a pen.'

A sentence such as *Calum has a pen* locates the pen in relation to Calum in somewhat the same way that the first sentence relates the cat to the fire. If someone asks where the pen is, "Calum has it" would be a good answer even in English. It seems natural, therefore, to take Having as a special case of Being in which the ground is also:

- the 'first' (as defined above)
- in some kind of relation which allows the figure to be identified (Taylor 1994) including the following:
 - ownership (e.g. *I have a bike.*)
 - temporary possession (e.g. *I have your bike.*)
 - the part-whole relation (e.g. *I have brown eyes.*)
 - any other kind of property (e.g. *I have a name.*)
 - a social relation (e.g. *I have a boss.*)

We can call this second relation simply 'identifier'.

The analysis just sketched is presented in Figure 7. Perhaps the most interesting point in this figure is that the relation 'first' provides a foundation for mapping one participant role to the syntactic dependency 'subject'. Although we are still some way from our target verbs such as BUY and SELL this is an important step.

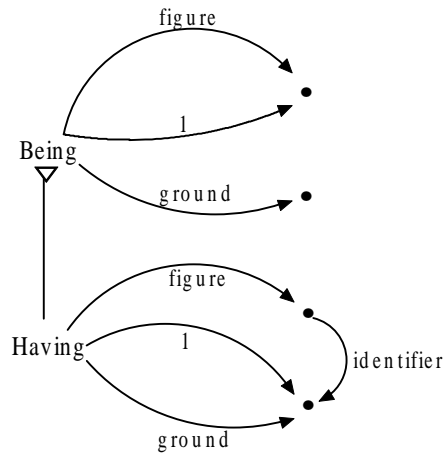


Figure 7

Moving involves a change from an earlier state (the 'history') to a later one (the 'result') in which the figure of the earlier state has a different ground (i.e. position, identifier or possessor), as shown in Figure 8. The time relation between the two states is shown by the 'less-than' symbol $<$, showing that the time of one state is less than (i.e. earlier than) that of the other. The point of this figure is to show how the new participant roles Source, Goal and Mover can be defined in terms of Figure and Ground.

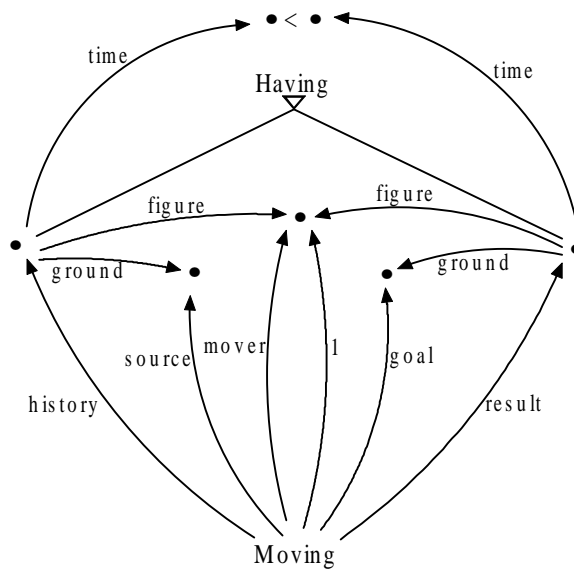


Figure 8

Transferring builds directly on the frame for Moving. It involves doing something or other whose result is the moving, so it introduces an extra participant, the doer. Figure 9 shows the structure of Transferring. The main innovation in this diagram is the introduction of another role based on construal ranking and labelled '3' (the missing number 2 will be introduced immediately below). Transferring automatically inherits 1 from Doing, where 1 is aligned with Doer; but 3 is stipulated in this diagram where it is aligned with Mover. General rules (not given here) will assign 3 by default to the syntactic object, and the source and goal to the prepositions FROM and TO respectively.

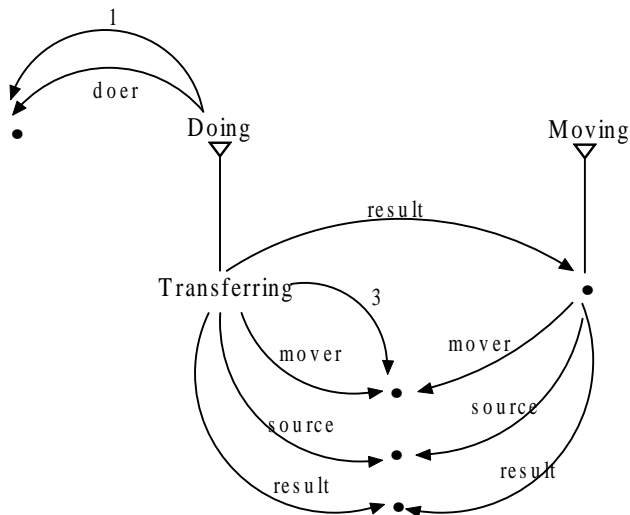


Figure 9

Finally we come to our target concepts, **Giving** and **Getting** (in the sense of getting for oneself, as in *I got a book from the library*). These are types of transfer, differing only in how the doer relates to the other participants as shown in Figure 10. In giving, the doer is the source because we can only give something if we already have it; so if I give you some money, it must be my money in the first place. If I get some money, on the other hand, the money ends up with me so I am the goal of the transfer. In most cases the same objective situation can be described in either way, so the difference between giving and getting is a matter of construal. For example, if I give you a book, you also get the book from me because we both qualify as 'doers' by virtue of the effort we put into the exchange. According to the linking rules alluded to above, the participants map to syntactic dependents as follows:

- Since the doer is also 1 it is expressed by the subject - even if it is also the source or goal.
- Since the mover is also 3 it is expressed by the direct object.
- Otherwise the goal is expressed by TO and the source by FROM.

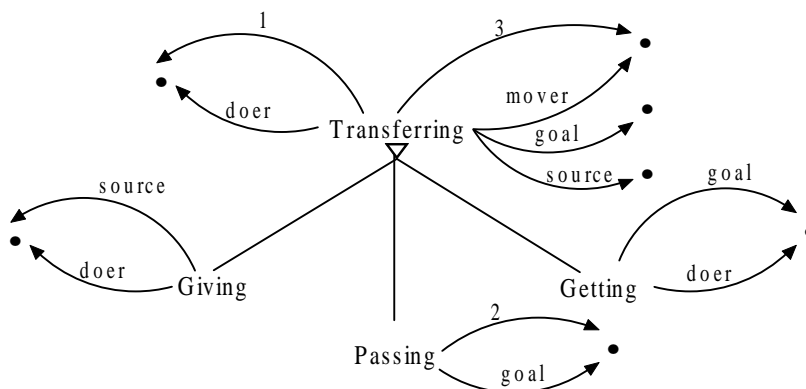


Figure 10

Figure 10 also includes a third type of transferring called Passing, whose function is to allow double-object patterns such as (18).

(18) I passed him the book.

Here the goal is identified with the role 2, which in turn will be mapped onto the indirect object. (The roles 1, 2 and 3 are borrowed from Relational Grammar - Blake 1990, but it should be borne in mind that they represent the 'construal structure' rather than purely syntactic notions.) The analysis thus provides three models for the syntactic treatment of the goal participant:

- by default it is expressed by TO;
- in 'verbs of getting' it is expressed by the subject;
- in 'verbs of passing' it is expressed by the indirect object.

For many verbs the rest of the semantic structure is compatible with either the default pattern or the indirect object pattern, which is why we have the so-called 'dative alternation' in pairs like these:

(19) I gave the book to him.

(20) I gave him the book.

and more relevantly:

(21) I sold the book to him.

(22) I sold him the book.

and

(23) I paid the money to him.

(24) I paid him the money.

This part of the analysis explains why the same alternation between indirect objects and TO is found in some CT verbs as in verbs such as GIVE, but it does not explain the alternation between indirect objects and FOR which is found in pairs like these:

(25) I bought the book for him.

(26) I bought him the book.

This will have to wait for future work.

8. Paying, Charging, Selling and Buying

We now have all the parts that we need for the analysis of the four straightforward verbs of Commercial transaction or of Trading, so all we have to do is to show how they fit together. The relevant structures are:

- the one for Commercial transaction and Trading in Figure 5;
- the one for Giving and Getting in Figure 10.

As we explained in the informal analysis, these two structures combine to define the notions Paying, Charging, Selling and Buying, but we can now show precisely how these definitions work. The relevant parts of the total network are shown in Figure 11 which shows that:

- Paying and Charging both isa the part A (the money part) of Commercial transaction, but
 - Paying isa Giving,
 - Charging isa Getting.
- Selling and Buying both isa the part B (the goods part) of Trading, but
 - Selling isa Giving,
 - Buying isa Getting.

This diagram completes our analysis of these four 'CT' verbs.

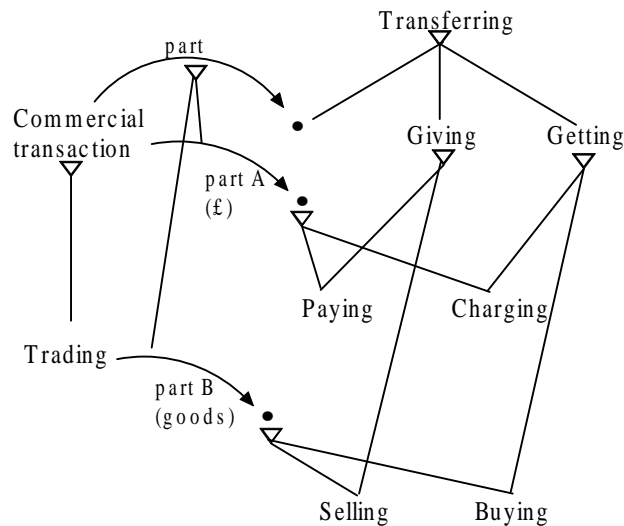


Figure 11

9. Spending and Costing

I argued in the informal introduction that SPEND and COST are not Commercial Transaction verbs at all, but happen to overlap with genuine 'CT' verbs in their extensions. Spending and Costing are ways of construing resource management, which has two parts:

- controlling the consumption of the resource,
- deciding how to use it as an instrument to achieve one's goals.

We start, therefore, with analyses of Consuming and Using.

Consuming a resource takes one from a prior state of having it to a result state of not having it, so the definition will build on the definition of Having that we constructed earlier in which we recognised a figure (the object) and a ground (the object's owner or identifier). Figure 12 shows this analysis. The only new feature in this diagram is the word 'not' written across the isa link in the bottom right corner to show that the result is 'not having' the resource concerned.

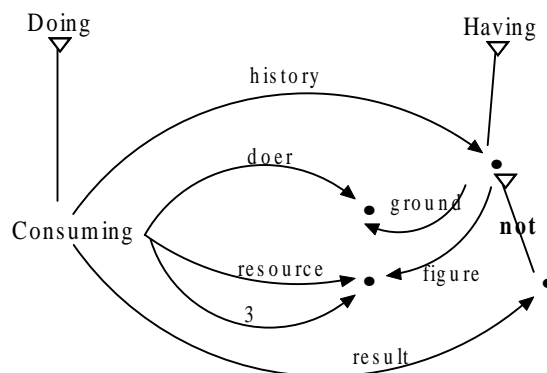


Figure 12

Using an instrument to achieve some effect involves dividing the job into two parts:

- the user acts on the instrument,
- the instrument achieves the effect.

This is in essence the 'force-dynamic' analysis of instrumental action (Croft 1991; Croft, Taaka, Wood 2001; Talmy 1988). Using is a kind of Doing so it has a doer and

a purpose, but it also has a result which is different from the purpose. The result is a second case of Doing whose doer is not the user but the instrument, and whose result is the overall purpose. The result typically involves a further participant which is affected and which we can call the Target; for example, if we use a hammer on the car in some way I hope to change the car by doing something with the hammer. (Notice the use of the preposition ON, which we shall exploit below.) This configuration is shown in Figure 13, and provides a definition of the role Instrument which can be invoked in other constructions.

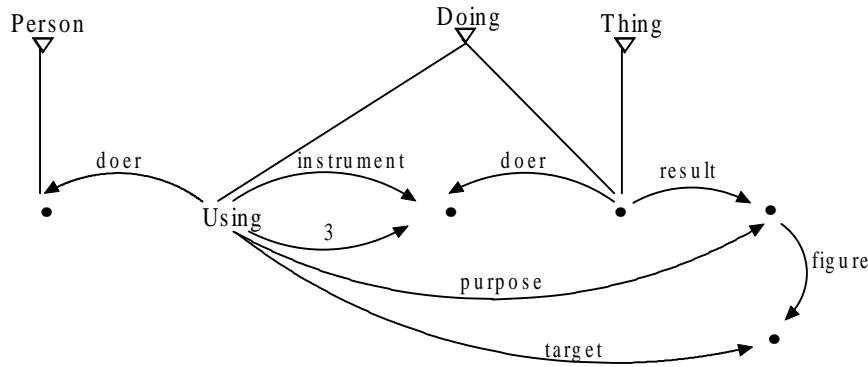


Figure 13

These two analyses provide the foundation for the analysis of **Spending**, which shows a combination of properties inherited from three models:

- Using contributes an instrument (the resource) and a target (the goods or services acquired, expressed by ON - e.g. I spent a lot of time on that book).
- Consuming contributes a resource.
- Getting contributes a goal and doer (the spender) and a mover which is also the target.

The construal ranking follows automatically from the inherited roles, in which the doer is 1 and the resource and instrument are 3. Figure 14 shows the structure for Spending.

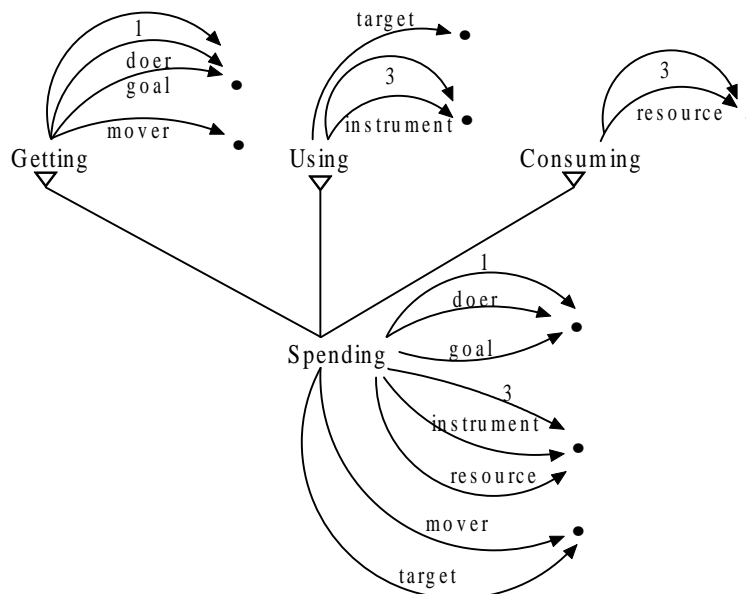


Figure 14

Finally we come to the problem verb COST, which behaves so differently from all the others, especially in respect of passivization. What I suggested in the informal discussion was that this verb is defined differently from the other verbs so that it does not inherit the '3' which normally maps to the object relation in syntax. Instead, its definition is based directly on the one for Spend which I have just presented. The three participants of Costing are the same as those of Spending with the crucial difference that in this case the construal role 1 is assigned to the target (which is the goods in a commercial transaction). The other participant roles are not examples of any roles found anywhere else, so it does not matter how we label them and they will be mapped onto syntactic complements. Since these complement relations are not classified more specifically as 'object' or 'indirect object', the normal rules for passivization do not apply to them and we have an explanation for the peculiarity of this verb. The analysis is shown in Figure 15.

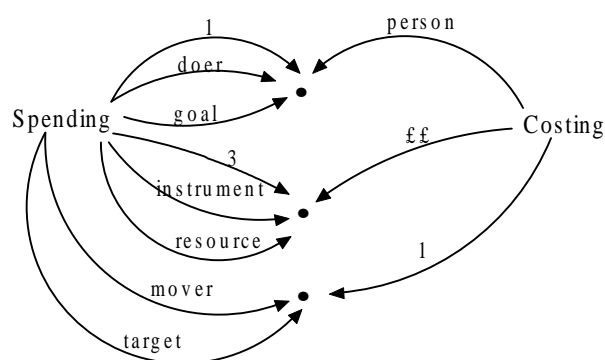


Figure 15

10. Conclusion

The main point of this paper has been to show how relations can be defined by the analysis itself. Instead of assuming a set of relations whose definitions are in some way defined in advance, such as the traditional thematic relations, I have shown that new relations can be defined on the basis of existing relations in a cumulative fashion. Once we have defined figure and ground we can build them into the definitions of other relations such as source and goal, which then help in defining giver and getter and ultimately the buyer, seller, goods and money of commercial transaction verbs. Maybe some of these relations are inborn, but it is extremely implausible that they all are and it is quite easy to imagine how they could be learned inductively.

Another slightly less general point that emerges from this discussion is that the idea of semantic 'frames' is most productive when applied rather loosely, so that meanings can be derived from a range of quite different frames at the same time. The clearest example of this is the concept Spending, which brings together three frames, but it also follows naturally from the first conclusion. If concepts (including relations) are defined in terms of other concepts, and if all the concepts fit together into a single gigantic network, then there is every reason to expect different areas of the network to be interconnected. It should be no surprise to find - as we have done in this paper - that buying or selling is ultimately connected to possession, money, movement and resource management.

Reference List

- Aitchison, Jean. 1997. *The language web*. Cambridge, Cambridge University Press.
- Barlow, Michael and Suzanne Kemmer. 2000. *Usage Based Models of Language*. Stanford, CSLI.
- Bates, Elizabeth and Judith Goodman. 1997. On the inseparability of grammar and the lexicon: evidence from acquisition, aphasia and real-time processing. *Language and Cognitive Processes*, 12, 507-584.
- Blake, Barry. 1990. *Relational Grammar*. London, Croom Helm.
- Bybee, Joan. 1998. The emergent lexicon. *Proceedings of the Chicago Linguistics Society*, 34, 421-435.
- Charniak, Eugene. 1981. The case-slot identity theory. *Cognitive Science*, 5, 285-292.
- Croft, William. 1991. *Syntactic Categories and Grammatical Relations*. Chicago, University of Chicago Press.
- Croft, William, Chiaki Taoka, and Esther Wood. 2001. Argument linking and the commercial transaction frame in English, Russian and Japanese. *Language Sciences*, 23, 579-602.
- Cruse, D. A. 1986. *Lexical Semantics*. Cambridge, Cambridge University Press.
- Fillmore, Charles. 1976. Frame semantics and the nature of language. *Annals of the New York Academy of Sciences*, 280, 20-32.
- Fillmore, Charles and Sue Atkins. 1992. Towards a frame-based lexicon: the semantics of RISK and its neighbours. In *Frames, Fields and Contrasts. New essays in semantic and lexical organisation*. A. Lehrer and E. Kittay, eds. pp. 75-102. Hillsdale, NJ, Erlbaum.
- Fraser, Norman and Richard Hudson. 1992. Inheritance in Word Grammar. *Computational Linguistics*, 18, 133-158.
- Goldberg, Adele. 1998. Patterns of experience in patterns of language. In *The new psychology*. M. Tomasello, ed. pp. 203-219. London, Lawrence Erlbaum.
- Halliday, Michael. 1967. Notes on transitivity and theme. Part 2. *Journal of Linguistics*, 3, 199-244.
- Halliday, Michael. 1985. *An Introduction to Functional Grammar*. London, Arnold.
- Hudson, Richard. 1984. *Word Grammar*. Oxford: Blackwell.
- Hudson, Richard. 1990. *English Word Grammar*. Oxford: Blackwell.
- Hudson, Richard. 1995. *Word Meaning*. London, Routledge.

- Hudson, Richard. 2000. Language as a cognitive network. *In A Cognitive Approach to the Verb Morphological and Constructional Perspectives*. H.G.Simonsen and R.T.Endresen, eds. Berlin, Mouton de Gruyter.
- Hudson, Richard and Jasper Holmes. 2000. Re-cycling in the Encyclopedia. . *In The Lexicon/Encyclopedia Interface*. B.Peeters, ed. Elsevier.
- Lamb, Sydney. 1966. *Outline of Stratificational Grammar*. Washington, DC, Georgetown University Press.
- Lamb, Sydney. 1998. *Pathways of the Brain. The neurocognitive basis of language*. Amsterdam, Benjamins.
- Langacker, Ronald. 1990. *Concept, Image and Symbol. The Cognitive Basis of Grammar*. Berlin, Mouton de Gruyter.
- Langacker, Ronald. 1998. Conceptualization, symbolization and grammar. *In The New Psychology of Language: Cognitive and functional approaches to language structure*. M.Tomasello, ed. pp. 1-39. Erlbaum.
- Langacker, Ronald. 2000a. A dynamic usage-based model. *In Usage-based Models of Language*. M.Barlow and S.Kemmer, eds. pp. 1-63. Stanford, CSLI.
- Langacker, Ronald. 2000b. Topic, subject and possessor. *In A Cognitive Approach to the Verb. Morphological and Constructional Perspectives*. H.G.Simonsen and R.T.Endresen, eds. pp. 11-48. Berlin, Mouton De Gruyter.
- Lawler, John. 1989. Lexical semantics in the commercial transaction frame: Value, worth, cost, and price. *Studies in Language*, 13, 381-404.
- Levin, Beth and Melka Rappaport Hovav. 1991. Wiping the slate clean: a lexical semantic exploration. *In Lexical and Conceptual Semantics*. B.Levin and S.Pinker, eds. pp. 123-151. Oxford, Blackwell.
- Lyons, J. 1977. *Semantics*. Cambridge, Cambridge University Press.
- Reisberg, Daniel. 1997. *Cognition. Exploring the Science of the Mind*. New York, Norton.
- Talmy, Leonard. 1988. Force dynamics in language and cognition. *Cognitive Science*, 12, 49-100.
- Taylor, John. 1994. "Subjective" and "objective" readings of possessor nominals. *Cognitive Linguistics*, 5, 201-242.
- Vendler, Zeno. 1967. *Linguistics in Philosophy*. Ithaca, NY, Cornell University Press.
- Wierzbicka, Anna. 1988. *The Semantics of Grammar*. Amsterdam, Benjamins.
- Wierzbicka, Anna. 1996. *Semantics: Primes and universals*. Oxford, Oxford University Press.

Wierzbicka, Anna. 1998. The semantics of English causative constructions in a universal-typological perspective. *In The new psychology*. M.Tomasello, ed. pp. 113-153. London, Lawrence Erlbaum.