D. Francisco J. Ruiz de Mendoza Ibáñez
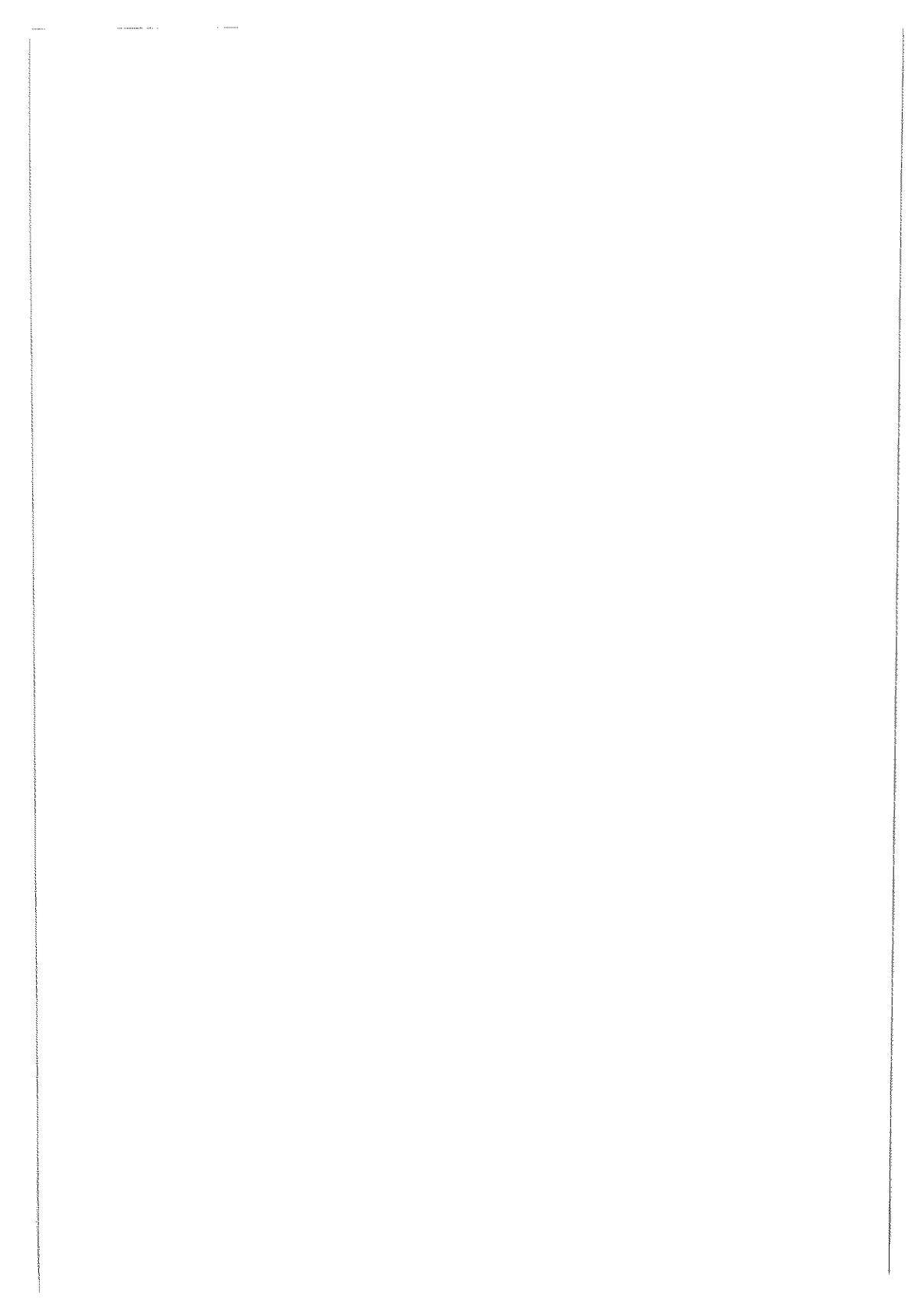
ON 'RELATIONAL FRAMES': THE CASE OF 'RISK' REVISITED

UNIVERSIDAD DE LA RIOJA

On 'relational frames': the case of 'risk' revisited[1]

0. Introduction

Cognitive semantics -as outlined in Lakoff (1987, 1989)- adopts a maximalist encyclopedic approach to meaning which takes advantage of a number of empirical findings in cognitive psychology, like basic-level categorization and prototype theory (see Rosch, 1978; Rosch & Mervis, 1975). In this approach traditional «objectivist» views of meaning as consisting of primitive categories mirroring external reality and sensitive to principles of logical combination are explicitly rejected in favour of an understanding of concepts as non-primitive «gestalt structures» directly grounded in bodily or social experience. With this background, Lakoff proposes that knowledge follows four kinds of structuring principle: propositional structure, image-schematic structure, metaphoric mappings and metonymic mappings. The activity of each of these principles is a source of prototype effects (ie. of goodness of example ratings) and results in one kind of knowledge structure or, in Lakoff's terminology, «idealized cognitive model» (ICM). By and large, the cognitive semantics literature has come to identify propositional ICMs with Fillmore's (1985) «frames», image-schemas with Johnson's (1987) analysis of abstract topological structures, and metaphoric and metonymic mappings with the proposals in Lakoff & Johnson (1980), and Lakoff & Turner (1989). The analyses carried out are often complex and make cognitive semantics appealing, at least in terms of its

---

purported empirical basis; however, some of the proposals, like Fillmore's frame semantics, are still largely programmatic and present some problems which we believe can be sorted out by making the account sensitive to the criterion of centrality and by applying the network model of knowledge organization, as set out in Ruiz de Mendoza (1996). It is on some aspects of frame semantics that we shall focus our attention in this paper.

1. Frame semantics

Fillmore (1985:223) has described frames as «specific unified frameworks of knowledge, or coherent schematizations of experience». In order to illustrate his views, we shall refer to the frame-semantics analysis of the word 'risk'[2] as expounded in Fillmore and Atkins (1992, 1994). Their overall aim is to show some of the most relevant shortcomings and inadequacies of the traditional lexicographical approach to word meaning and to sketch what an on-line frame semantics dictionary should look like. In their own words «frame semantics [...] begins with the effort to discover and describe the conceptual framework underlying the meaning of a word, and ends with an explanation of the relationships between elements of the conceptual frame and their realizations within the linguistic structures that are grammatically built up around the word» (Fillmore and Atkins, 1994: 370). In other words, a frame semantics dictionary needs to specify semantic frame elements and then look for regularities between these and their grammatical realizations. To do this, they start by distinguishing three schema types in the 'risk-frame', all of which have the following elements:

> Protagonist [Pr]: the central person in the frame.
> Bad [Ba]: the possible bad outcome, or harm.
> Decision [De]: the decision that could trigger this.
> Goal [Go]: the desired outcome.
> Setting [Se]: the situation within which the risk exists.
> Possession [Po]: something or someone valued by the Protagonist and endangered in the situation.
> Source [So]: something or someone which could cause the harm.

This set of conceptual tools permits Fillmore and Atkins to explain some of the differences in meaning that we find in sentences like:

---

2. Because of space limitations, it is impossible for us to do justice to their account. We shall attempt to outline the essentials and use a selection of their own examples throughout.

(1) Newborn babies run the risk of hypothermia. [Pr, Ba]
(2) I had no idea I was risking my life. [Pr, Po]
(3) You'll have to calculate the risks involved. [Pr, De]

Each of these sentences, in turn, responds to each of the following three schemas:

- Schema A: a path leads to two alternative uncertain futures, one of them being bad.
- Schema B: the protagonist makes a decision which renders him or her vulnerable to some sort of harm.
- Schema C: the same as Schema B, but the protagonist has in mind a desired outcome and he or she is aware of the potentially bad outcome.

Illustration of the other frame elements can be seen in these examples:

(4) The health risk *from apples* is 'minuscule' (So)
(5) *Living in San Francisco* is a risk (Se)
(6) They were willing to risk everything *for their faith* (Go)

This description allows Fillmore and Atkins to eliminate dictionary senses, which may be described in terms of different underlying schemas or as different grammatical structurings of elements from a single schema. It also deals with polysemy, in a very elegant way, as the instantiation of different schemas. For example, in *He risked his life*, both schemas B and C can be called up (ie. 'he risked his life but was not aware of it'; or 'he risked his life for a worthless cause'). One more advantage is found, according to the authors, in that the proposed framework provides a way to make a difference between the two common phrases 'take a risk' and 'run a risk'): only 'run a risk' fits Schema A; then, both 'run' and 'take' are acceptable with [Ba] as complement, but [De] forces the use of 'take'. Consider the following examples, some of them simplified from the ones provided by the authors:

(7) Newborn babies run (*take) the risk of hypothermia [Pr, Ba] (example 1 above). (Schema A).
(8) He was running/taking the risk of collapsing, though he didn't know it [Pr, Ba]. (Schema B).
(9) He chose to run/take the risk of being hit by a car as he started to cross the road. [Pr, Ba] (Schema C).
(10) He took the risk of jumping off the cliff [Pr, De]. (Schema C).

This may give us some idea of the power of a frame semantics analysis. However, it still misses some points as it stands. First, the account lacks the idea of centrality, which has often been pointed out to be a key characteristic of semantic specifications (see, for example, the discussion in Langacker, 1987). Thus, while it is true that the risk frame should allow for the possibility of Schema A above, where there is no apparent choice on the part of the protagonist, this is indeed a less central characterization than Schemas B and C, where the protagonist makes a decision with a potential bad outcome. In fact the decision element is central to the idea of risk. Example (7) is only an apparent exception. Consider the following related sentence:

> (11) We were crazy to run/take the risk of hypothermia being out in the cold for so long.

The idea is that the protagonists made some choice that led to a risky situation which could have been avoided. Thus, the word «risk» typically describes a situation in which at least one person (or something valued by someone[3]) is put in danger as the result of a choice made either by that person or by any other person. In the case of (7) we assume the newborn children do not voluntarily take any risk, since they cannot exercise their free will; the implication is that they have not been (or could possibly not be) adequately taken care of, which suggests someone else's choice. The idea of choice is therefore implicit in (7), if only because it belongs to our central characterization of the concept of 'risk'.

2. Radial categories

The inadequacies pointed out above may be sorted out if we see the 'risk' frame as a 'radial category'. A radial category is -according to Lakoff (1987)- a cluster of converging cognitive models with a number of non-central extensions. These are not generated by rule but rather motivated by the central model plus some general principles of extension. Thus, for 'risk' we would have a central category with the elements of choice and potential

---

3. Consider sentences like *More jobs were put at risk with that policy, The whole project was risked, That's a health risk for the community.* Whatever is risked is felt to be of some value. This is in direct relation to the amount of harm that can be done. If we say *We all thought he was crazy to risk his job, but he didn't like anyway*, we suggest that the risk was not great since there could not be much harm in losing a job that was not wanted.

danger. Then, other representations would be extensions of the central category. For example, if we talk of a 'calculated risk' we are placing in focus the idea that one can be aware of the bad consequences of taking a specific risk; the implication is that the possible bad outcome can be disregarded because the intended potential benefit makes it worthwhile to run the risk. Or take the idea of 'security risk'; in it the focus is on the 'danger' element of the frame (for instance, when a person is felt to be a potential threat to the safety of an organization). The phrases «run a risk» or «take a risk» can also be explained as expressions of radial categories: the former is associated with the idea of 'danger' over that of 'decision', while the reverse is true of the latter. However, there is something to note about the applicability of either expression: when the entity at risk has done nothing to deserve the situation, as in (7), only «run a risk» is possible; on the other hand, when the protagonist is fully aware of the danger involved in his or her decision only «take a risk» is used. The other cases, midway between these two, can naturally be expressed by either locution, although the meaning will vary slightly with each, our attention being directed either to the danger element or to the decision element.

Take now these sentences:

(12) John risked his life for his country [Pr, Po]
(13) John risked death for his country [Pr, Ba]

Sentences (12) and (13) mean the same: there is someone called John who has faced death for his country. But how can they be synonymous if John risks opposite things in each (life against death)? Of course the idea conveyed by (12) is that John has exposed his life to danger, while the idea in (13) is that John has taken the chance of dying. In (12) we apply a model where the emphasis is on danger; in (13), on the other hand, the model is primarily based on choice. We can explain the difference between them by using the schemas proposed by Fillmore and Atkins: (12) is an instance of Schema B, and (13) of Schema C, and also by referring to the frame elements: in 'risk death', the verbal complement is the potential bad outcome; in 'risk his life' the complement is the valued possession.

However, once again, Fillmore and Atkins miss one generalization which can be incorporated into their account. We have seen before that Schema A should be discarded. Then we are left with schemas B and C. These share the two central elements of choice and danger. The rest of the elements are more peripheral. Thus, we feel it becomes unnecessary to account for the different uses of 'risk' in terms of the distinction between these schemas.

403

Rather, it will be more productive to look for what they have in common and then explain the different uses as ways of perspectivizing the situation described by focusing on some elements rather than others. This leads to a reanalysis of sentences (12) and (13) into (12') and (13') below:

> (12') John risked his life for his country [Pr, Po, (Ba)]
> (13') John risked death for his country [Pr, (Po), Ba]

In it we make a difference between elements in focus (explicit) and out of focus (implicit) by placing the latter between round brackets. Still, the account can be improved. First, we need to introduce the decision element, which is also implicit, since it is central to the concept. Second, the idea of danger, the other central element, seems to cover the elements Po and Ba, and third, since the choice may put in danger someone other than the protagonist and this element is not central, we may dispense with it:

> (12") John risked his life (= put it in danger) for his country [(De), Danger]
> (13") John risked death (= took the risk of dying) for his country [De, (Danger)]

That the two elements are present, whether in an implicit or an explicit way, accounts for the plausibility of the following extensions of (12) and (13):

> (14) John risked his life without knowing/because he loves danger
> (15) John risked death without knowing/because he loves danger

We can conclude from the evidence that the 'risk' frame is a propositional model (or propositional ICM) whose central category consists of two submodels: the 'decision' model and the 'danger' model. In the 'decision' model we have a situation in which:

[1]
    (a) There is at least one person that makes a choice
    (b) There is a purpose for the choice
    (c) There is an outcome of the choice, either beneficial or harmful
    (d) There is one or more entities that are affected by the choice. These can be the same as the person/s in (a).
    (e) The person/s making the choice may be unaware of (d).

In the 'danger' model we have the following propositions:

404

[2]

    (f) An activity or situation may cause harm

    (g) If harm is caused, the harm may be caused to the person/s or to any other entity that became involved in the activity or situation.

The two situations described by the two models converge in the 'risk' frame in such a way that we obtain the following unified description, which also incorporates the idea that the affected entity is valued:

[3]

    If somebody makes a choice, this may be harmful to either the choice-maker or to some other valued entity, of which the choice-maker may be unaware.

The combination of two models is made possible by the elements they have in common. In the case of 'risk' there is one such element: the idea of 'harm' in (c) and (f) above. The resulting unified model provides a specification of all the conditions that must be met for an activity to be considered a risk. These conditions constitute what I have elsewhere called the *definer* for the concept (see Ruiz de Mendoza, 1996).

3. Frame structure

What we have done so far amounts to little more than scratch the surface of the problem of frame structure. In previous work on knowledge organization (see Ruiz de Mendoza, 1996) I have suggested that some propositional models take the form of conceptual networks, consisting of an access node plus a number of relational arcs which, when activated, provide sets of propositions that structure the concept internally. Successive levels of activation provide increasingly peripheral associations of meaning elements with the model in question. Thirteen relation types have been distinguished provisionally. We give a very brief description of them below:

- Agentive: an entity is seen as typically performing a controlled activity: carpenters work wood; donkeys bray; etc.
- Factitive: an entity is seen as typically performing a controlled activity and another entity results from this activity: a shoemaker makes shoes; a musician composes music; a singer sings songs, etc.
- Purposive: an entity is seen as instrumental for agentive and factitive relations to take place: a carpenter cuts wood with a saw; a hammer is used for hitting; etc.

405

- Causative: an entity or an event is seen as responsible for the coming about of an event: a hurricane causes destruction; heat causes iron to expand; etc.
- Resultative: an entity is the necessary result of a controlled activity: ash is the result of burning wood or paper.
- Processual: an entity is typically seen as involved in an activity over which it has no control: people live; a river flows; etc.
- Originatory: an entity is seen as becoming another related entity with some distinguishing features: water turns into ice; a seed develops into a plant; etc.
- Positioner: an entity is related to another entity and it is up to one of the two entities to decide whether the relation holds: a husband has a wife; parents have children; etc.
- Material: an entity is described as being the material of which another entity is typically made: a tombstone is made of marble; a table is (usually) made of wood; etc.
- Container: an entity is seen as typically or necessarily holding another entity in its interior: the sea has water; there is blood in your veins; etc.
- Partitive: an entity is described as consisting of other entities: a table consists of a board and (typically) four legs; a handle is part of a knife; etc.
- Locative: an entity is typically associated with a certain location: game is found in the woods, a rabbit in its burrow, a lion in its den, etc.
- Attributive: an entity is either necessarily or typically ascribed a certain property: rubber is elastic; steel is strong; a tree is tall; etc.

A subset of these relations applies to each basic-level non-complex concept (eg. 'cat', 'mother', 'table'). Other concepts (eg. 'party', 'furniture', 'animal') enter a network either as composites of or as abstractions from the former. For example, we have the agentive, partitive and attributive relations at the base of propositions like *Cats chase mice*, *Cats have whiskers*; and *Cats are swift and silent*, respectively. Propositions like these are part of our folk knowledge about cats. Then, since we know that cats, dogs, cows, elephants, tigers, etc. have some properties in common (eg. they breathe), these can be safely assigned to superordinates like 'mammal' or 'animal'. Other concepts are composites of non-complex categories: for example a 'party' is a social gathering with a host, guests, and a number of merry-making activities (eg. games, jokes, songs, etc.), among other constituting

elements. Finally, other relations not stated above (like traditional antonymy, synonymy, and the like) are external to the concept and consequently do not structure the frame (see Ruiz de Mendoza, 1996, for details).

Relation types help us describe the structure of entity-denoting frames. But relation types are conceptual primitives and as such they are not frames. However, the different conceptual specifications of a relation type and their related linguistic expressions have frame status. Thus, 'risk' -just like other agentive predicates such as 'kiss', 'break', 'kill', 'open', etc.- has frame structure. This structure is sensitive, as has been shown before, to radial categorization: it has a central member (our proposed «definer» which, for 'risk', is expressed in agentive terms) and a number of conventional extensions. The extensions result in different perspectives on the frame elements. In this way, 'risk' can be part of linguistic expressions which denote not only agentive but also processual, positioner, and attributive relations. Consider the following examples[4]:

(16) He *took the risk* of losing all his money on that bet (agentive)
(17) A lot of people *ran the risk* of being killed without knowing (processual)
(18) *At the risk of* offending him, I told him the truth (positioner)
(19) Heart disease could be prevented if people *at risk* took measures (attributive)

These observations are enough to justify making a distinction between «nodal frames» and «relational frames». Nodes refer to entities, and their frame structure is, as we have seen, a network of properties and relations with other entities. A relation or a set of relations which have some element in common constitutes a cognitive model. Each of the nodes accessed by the activation of a relation in a network is in turn a cognitive model. A relational frame, on the other hand, consists of one or more cognitive models

---

4. In making a choice, the protagonist can be seen as participating in an agentive relation; the entity affected by the choice undergoes a process (processual relation); also, once someone has given rise to a risky situation, the protagonist can be presented as maintaining that situation (positioner relation); finally, in the attributive relation only the 'danger' model is called up and its potential bad consequences are ascribed to the protagonist as a property. One final observation must be made. It must be noted that in order for the processual, positioner and attributive relations to be possible as instantiations of the 'risk' frame, the linguistic system has opted for the use of special devices like metaphoric mappings. This is further evidence that the agentive relation, which needs no special device, is the most central one.

which can combine but which have no network structure (that is, although relations are part of a network configuration, the network has no role in providing the semantic specification of the relational frame). A model in a relational frame contains a central specification formulated as a proposition (this is the case of proposition (a) for [1] above) plus a set of related generic propositions each of which is formulated in terms of one of the primitive relations set out above.

In Ruiz de Mendoza (1996) it has been pointed out that relational systems regulate instantiation processes, inferential patterns and some coherence phenomena. To this we need to add one more property of our approach: it places the old notion of «selection restrictions» (that is, the compatibility between concepts or their associated lexical items) in a new perspective, where the constraints do not take the form of binary features (that is, they are not a matter of all or nothing). Consider the agentive relation which lies at the base of the 'risk' frame: we know people can take or run risks, but what about other entities? The answer seems to hinge on part (a) of the 'decision' model: if only people made choices, only people would take risks. But it would not be anomalous to say that an animal has taken a certain risk in so far as we think of the animal as capable of making decisions: our characterization in (a) is only prototypical. Also, we may say that an animal is running (but not «taking») a risk provided that it has somehow become involved in a potentially hazardous situation. We could also have a situation similar to the one in sentence (7) above, where an animal is put in danger by someone else's choice, or even one in which the animal becomes a choice-maker rather unintentionally.

What about things? At face value it would be rather strange to say that things run risks; and of course they do not take risks. But we could have a sentence like the following:

> (20) The house ran the risk of collapsing because of a fault in its
> foundations.

As with animals, the risk here may well be the result of someone's previous activity or simply the consequence of an unplanned accident.

It is therefore clear that for a proper instantiation of the elements of the 'risk' frame it is necessary to make links with other frames and their associated cognitive models. The links will be possible only to the extent that the internal structure of the models involved is not violated. Thus, in so far as the different models for the different types of animal allow for the possibility of thinking of them as capable of taking decisions, an animal

may become the choice-maker in an instantiation of part (a) of the decision model. (We would more readily think of a dog or a dolphin as capable of making intelligent decisions than of a fly or a turtle, to give one example).

4. Conclusion

Knowledge organization is a challenging issue which presents a large number of problems so far unresolved. It is the author's belief, however, that the proposals made in the present article represent a substantial improvement on previous approaches. They also constitute useful guidelines for future research. Thus, we have stressed that the nature of relational frames cannot be investigated independently of that of nodal frames; we have also seen how a theory of knowledge organization needs to establish degrees of compatibility between different frames and parts of frames. A thorough study of relation types is essential in this respect, since they tell us how we structure concepts, on the one hand, and permit us to look into the nature of their associated relational frames, on the other.

REFERENCES

DIK, S. C. 1989. *The Theory of Functional Grammar. Part I: The Structure of the Clause*. Dordrecht: Foris.

FILLMORE, C. & ATKINS, B. T. S. 1992. «Towards a frame-based lexicon: the semantics of RISK and its neighbours», in Lehrer, A. & Kittay, E. (eds.), *Frames, Fields and Contrasts*, Hillsdale, NJ.: Lawrence Erlbaum.

FILLMORE, C. & ATKINS, B. T. S. 1994. «Starting where dictionaries stop: the challenge of corpus lexicography», in Atkins, B.T.S. & Zampolli, A. (eds.), *Computational Approaches to the Lexicon*, Oxford: Oxford University Press.

FILLMORE, C. 1985. «Frames and the semantics of understanding», *Quaderni di Semantica*, vol. VI, no.2, pp. 222-254.

JOHNSON, M. 1987. *The Body in the Mind: the Bodily Basis of Meaning, Reason and Imagination*. Chicago: University of Chicago Press.

LAKOFF, G. & JOHNSON, M. 1980. *Metaphors We Live By*. Chicago: Chicago University Press.

LAKOFF, G. & TURNER, M. 1989. *More than Cool Reason. A Field Guide to Poetic Metaphor*. Chicago and London: The University of Chicago Press.

LAKOFF, G. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*. Chicago: University of Chicago Press.

LAKOFF, G. 1989. «Some empirical results about the nature of concepts», *Mind & Language*, vol. 4, nos. 1 and 2, 103-129.

ROSCH, E. & MERVIS, C. 1975. «Family resemblances: studies in the internal structure of categories», *Cognitive Psychology* 8: 382-439.

ROSCH, E. 1978. «Principles of categorization», in Rosch, E. & Lloyd, B. B. (eds.), *Cognition and Categorization*, 27-48. Hillsdale: Lawrence Erlbaum.

RUIZ DE MENDOZA IBÁÑEZ, F. J. 1996. «Semantic networks in conceptual structure», *EPOS*, Madrid: UNED, forthcoming.