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Towards a theory of lexical meaning as ontologies and construals

CARITA PARADIS

Abstract
The purpose of this paper is to propose a framework of lexical meaning, broadly along the lines of Cognitive Semantics (Langacker 1987a). The paper focuses on interpretations of adjective-noun (ADJ N) combinations in English. Within the proposed model, all aspects of meaning are to be explained in terms of properties of *ontologies* in conceptual space, i.e. properties of content ontologies and schematic ontologies and *construals* which are cognitive operations imposed on the conceptual structures on the occasion of use. It is through the operations of construals on ontological structures that different readings of lexical expressions arise. Lexical meanings are dynamic and sensitive to contextual demands, rather than fixed and stable. In a dynamic usage-based model like this, polysemy and multiple readings emerge as a natural consequence of the human ability to think flexibly.

1 Introduction

This paper proposes a framework for the analysis of lexical meaning consisting of ontologies and construals, broadly along the lines of Cognitive Semantics (Langacker 1987a; Talmy 2000, Cruse 2002). It argues that concepts form the ontological basis of lexical knowledge. Conceptual space is structured relative to two types of knowledge structures: *content structures* and *schematic structures* (Cruse & Togia 1996; Paradis 1997; 2001). Content structures involve meaning proper and schematic structures provide various configurational templates. Both these structural domains are conceptual in nature and mirror our perception of the world. In addition to the conceptual realm, there is an operating system consisting of different types of *construals*, which are imposed on the domains by speakers and addressees on the occasion of use. They are not themselves conceptual, but ways of structuring conceptual domains, reflecting some broad basic cognitive abilities, such as (i) the choice of *Gestalt*, (ii) the focussing of attention, *salience*, (iii) the ability of making judgements, *comparisons*, and (iv) the selection of speaker *perspective* (Croft & Wood 2000). It is through the operations of construals on the ontological material that meanings of lexical expressions arise. Lexical meanings are dynamic and sensitive to contextual demands, rather than fixed and stable.

The framework has been tested in an empirical study of the interpretation of adjective-noun combinations in English, henceforth ADJ N combinations, extracted from a corpus of British English.[1] The methodological strategy for the

[1] The data that the framework has been tested on are 2,720 adj n combinations randomly selected from the spoken part of the ICE-GB corpus (approximately 1/10 of the total number of adj n combinations in the spoken part of the corpus). For each combination, the nouns and

analysis was thus from lexical items in each particular context to their interpretation. This method serves to highlight various generalizations across readings of lexical items and the construals that they profile in use. For instance, the expression 'She is a *clever girl'* presupposes knowledge about GIRL and the concept complex that GIRL activates. GIRL presupposes various constitutional properties, one of them being INTELLIGENCE, the range of which is specified by *clever*. The property of CLEVERNESS serves to highlight a particular aspect of GIRL, namely her functioning with respect to INTELLIGENCE. The observations made in the empirical study of ADJ N combinations are used as examples in this paper. However, the design of the model applies to readings of all lexical items from all word-classes and their various combinations with other lexical items.

The underlying assumptions of the framework are (i) that lexical items from different parts-of-speech have the same ontological structures in conceptual space at their disposal, but they are differently construed, (ii) there are systematic operations on the ontologies by the construals that account for the flexibility of meaning processing in a probabilistically predictable way, and (iii) lexical meanings arise from more or less probable combinations of content ontologies, schematic ontologies and modes of construal that are invoked by the formation of plausible inferences mainly related to encyclopaedic knowledge and situational demands on the occasion of use.

The procedure is as follows. Firstly, the theoretical foundation of the model is outlined. Secondly, the actual model of meaning as ontology and construal is described in general terms. It is argued that the meanings of nouns and adjectives are in principle based on the same types of ontological structures. Yet they are differently construed. Thirdly, the ontologies for nouns and adjectives are described in more detail. Fourthly, examples of construals of ADJ N combinations are presented and discussed. Finally, the conclusion provides a summary of the gist of the framework and a brief evaluation of the value of ontologies and construals in linguistic theorizing. The ultimate theoretical goal is to contribute to our understanding of the relation between linguistic expressions and meaning. Another, more practical, goal is to make the framework useful for implementation in the field of language technology.[2]

2 Theoretical framework

The primary goal for a theory of lexical semantics is to account for how meanings are represented and how they can be modelled for empirical study. Three basic questions are central to lexical semantic theory and to the modelling of lexical meaning:

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the adjectives have been analyzed in terms of their ontology in the actual context (Paradis forthcoming). For more information about the corpus, see Nelson, Wallis & Aarts (2002).

[2] For work on ontologies in the field of language technology, see Porzel & Gurevych (2003).

(i) What is meaning?
(ii) What is the relation between lexical items and meanings?
(iii) How do different readings arise?

The core idea in Cognitive Linguistics is that meanings are mental entities in conceptual space. Meanings are in people's minds. They are not independent entities in the external world, as is the case in objectivist models. The external world is only indirectly relevant in that meanings are constrained by how human beings perceive of the world.

The second question concerns the relation between lexical items and meaning. Lexical items map on to concepts, and meaning is the relation between the lexical item and the domain matrix that it activates. Lexical meaning is constrained by encyclopaedic knowledge, conventionalized mappings between lexical items and concepts, conventional modes of thought in different contexts and situational frames.[3] Meanings are thus not inherent in the lexical items as such, but they are evoked by lexical items. Moreover, there is no purely linguistic level of representation that is intermediate between concepts and lexical items, and there is no static one-to-one relationship between lexical items and meanings.[4] Multiple readings are natural and expected in a dynamic usage-based model. The components of the framework are shown in Figure 1.

The third question concerns the dynamics of language in terms of synchronic flexibility and diachronic change. Different readings in different contexts emerge from the intention that activates the expression or the wish to interpret the expression in a relevant way in order to obtain socially viable mappings between words and concepts. In other words, cognitive processes (construals) operate on the conceptual structures on all occasions of use. These operations are the source of all readings, conventional as well as *ad hoc* contextual readings, and possible lexical change takes place through new conventional, entrenched links between linguistic expressions and conceptual structures (Paradis 2003b).

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[3] In cognitive approaches to meaning, all linguistic expressions are profiled according to a 'base' (Langacker 1987a), or a 'frame' (Fillmore (1982), an 'idealized cognitive model' of a situation (Lakoff 1987) or a cycle of contextualization and decontextualization of word meaning based on linguistic and encyclopaedic knowledge (Warren 1999). All these constructs represent presupposed information in an expression that the speaker infers in situations. In my model the appropriate construal is employed on the basis of such knowledge. See also Croft (forthcoming) for a similar approach to verbs.

[4] This is the case in approaches to meaning that assume a lexicon consisting of formal features, e.g. Bierwich & Schreuder (1992), Levelt (1989), Pustejovsky (1998), Borschev & Partee (2001), Jackendoff (2002).

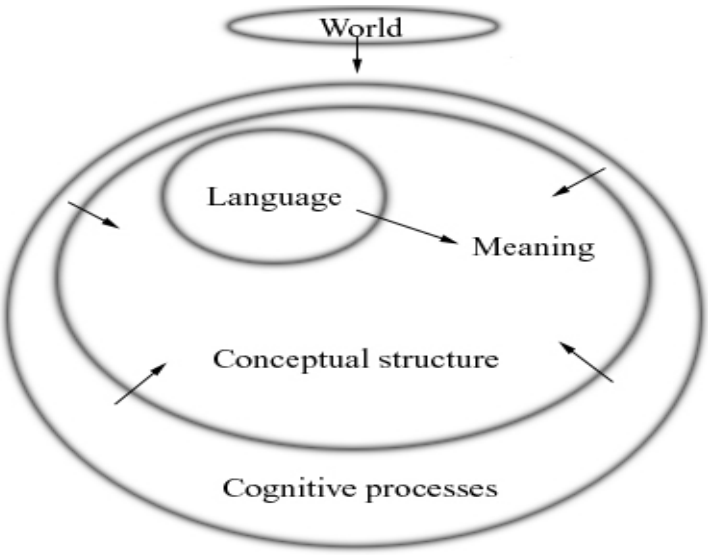

Figure 1. The components of the cognitive semantic framework.

In spite of the fact that the world is only indirectly relevant to meaning, it is not possible to operate with ontological categories without making some assumptions about how human beings perceive of the world. The common-sense assumptions that have been made in this study are based on the fact that the world contains a number of physical objects or concrete entities as well as non-physical or abstract entities. However, the distinction is not always as easy to make as it first appears. There are cases of ontological ambivalence in the mappings between lexical items and structures in conceptual space, as we shall see in the subsequent sections.

There is no a-priori consensus on what an ontology is and therefore no indisputably natural way of building ontologies.[5] The guiding principles for the present project have been, firstly, to create an ontology that seems natural with respect to what Lyons calls 'naïve realism' (1977:442) and, secondly, to combine this ontology with a schematic ontology. The primary goal is to create an ontology that can be adapted to the levels of granularity that may be useful for different types of investigations. For the present purpose this means a coarse-grained level that can be further refined. Refinement of the model can be achieved by corpus studies with a scope that is restricted to specific domains in which case we can operate in a bottom-up fashion in order to cover increasingly

[5] The problems of ontological methodology have been discussed among others by Poli (2002). There is also a lively debate going on about ontologies from a philosophical point of view (Albertazzi 2001, Cicovacki 2001, Poli 2001a & b, Tegtmeier 2001 and Wildgren 2001 (from a linguistic angle) all of them with Hartmann's ontology as the common denominator. The idea of ontologies has also been elaborated by word-net projects such as the Princeton WordNet http://www.cogsci.princeton.edu/~wn/, the Euro WordNet (Vossen et al.1997) http://www.illc.uva.nl/EuroWordNet/docs.html) and FrameNet http://www.icsi.berkeley.edu/~framenet/, but this work has not resulted in widespread agreement on this topic.

larger domains and thereby accumulate knowledge for both specificity and generality.

As was mentioned in the introduction, conceptual structures are of two kinds: content structures and schematic structures, and the cognitive processes fall into four main construals in Figure 2.

Conceptual structures (ontologies)		Cognitive processes
Content ontologies	Schematic ontologies	Construals
concrete phenomena events, processes, states, abstract phenomena	thing/relation, part/whole, boundedness, scale, degree, frequency, focus, order, modality	*Gestalt*: e.g. thing/relation *Salience* : e.g. metonymization, generalization *Comparison*: e.g. metaphorization, categorization *Perspective*: e.g. grounding, foreground/background

Figure 2. Ontologies and cognitive processes relevant for ADJ N combinations in English

The left-most column of Figure 2 gives the three most general content ontologies. These top ontologies, in turn, involve more fine-grained categories, described in Section 3.1. The schematic ontologies in the middle column are free ontologies that apply to various content ontologies, not in a one-to-one fashion, but in a many-to-one as well as a one-to-many fashion. For the time being, I make no claims about whether schematic ontologies are hierarchically organized or not. What is clear is that BOUNDEDNESS, for instance, is a schematic template of high generality, which plays a role in other schematic templates, such as SCALE. The matching of schematic structures to content structures is constrained by how we perceive of the world. The actual matching operations are carried out by the four main construals, given in the right-most column of Figure 2, i.e. *Gestalt*, salience, comparison and perspective, with examples of each type. Section 3.1, 3.2, 3.3, 3.4 and 4 take a closer look at all of them one at a time and in combination. In each case, the level of specificity of the above ontologies has to be determined by the nature of the problem to be solved.

3 Parts-of-speech and ontologies

In objectivist, referential models, parts-of speech are defined as notional categories, i.e. nouns denote entities, verbs denote actions and adjectives denote qualities or properties in the world. In such models, these definitions presuppose that we are able to identify clear-cut ontological categories that are language independent. Category membership is thus unambiguous and based on necessary and sufficient features, and categories do not have internal structure in terms of centrality. There are obvious methodological problems with both clear-cut categories and the matching of encyclopaedic categories to grammatical categories. In other words, this view is problematic both from the ontological

and the linguistic perspective. For instance, if we say that the only reason for calling *car*, *disgrace* or *beauty* entities is that they are nouns, we cannot say that that the reason why they are nouns is that they denote entities. In like manner, if the only reason for calling *run*, *resemble* or *know* actions would be that they are verbs, we cannot say that the reason why they are verbs is that they denote actions. The same is true of adjectives such as *good*, *screaming* or *ideological*. If they are properties because they are adjectives, we cannot say that they are adjectives because they are properties.[6]

In contrast to referential models of meaning, the cognitive approach does not take reality as the point of departure for the identification of parts-of-speech. The reasons are that first of all for a lot meanings, such as 'beauty', 'know' and 'ideological', there are no real referents and as a consequence of that they cannot be determined in notional terms. It is also obvious that it is not always the case that that nouns equate entities, verbs equate actions and adjectives equate properties in the world. Moreover, in cognitive linguistics, categories are formed on a prototype basis. The source of ontologies is based in how we as human beings categorize phenomena in the world as we perceive them. Ontologies involve both (i) what things are (content structures) and (ii) their configurational templates (schematic structures). In other words, ontologies concern all kinds of knowledge, concrete and abstract, existent and non-existent, real and ideal (Poli 2002:640), and they concern different configurational templates that apply to content structures. In actual communicative situations, content structures and schematic structures are interwoven. If we, however, tear them apart for the sake of discussion we may say that content structures are tied to the nature of things in particular knowledge domains such as PEOPLE, ARTEFACTS and EVENTS, while schematic structures are free in that they may apply to all kinds of different content structures.[7] They are configurational templates such as THINGS/RELATIONS, PART/WHOLE, BOUNDARIES, SCALES, FOCUS, ORDER, DEGREE, FREQUENCYand MODALITY.[8]

Langacker (1987a & b) proposes a part-of-speech model where a noun is conceptually a THING, construed as a non-relational atomic notion conceived as static and holistic. Nouns are summary scanned, which means that all aspects of the concept are available at the same time and together form a *Gestalt*. Verbs are

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[6] Typological studies of word classes (Dixon 1982, Givón 1984, Wierzbicka 1986, Thompson 1988, Croft 1990, 2001, Bhat 1994, Wetzer 1996, Stassen 1997, Aikenvald 2000) reveal that the categorization of forms into grammatical categories such as parts of speech is not a trivial matter. There is considerable consensus among typologists that the category of noun is a universal category, while the category of adjective is not a universal category. 'The category of adjective is a notorious swing-category in language' (Givón 1979: 13).

[7] http://www.formalontology.it/index.htm (26 July, 2003) is a rich source of information about ontological research, including on-line papers and links to other sources.

[8] Content structures and schematic structures can be compared to Poli's (2002:642) descriptive and formal ontologies respectively.

conceptually PROCESSES. They are relational and sequentially scanned over time. Adjectives are similar to both nouns and verbs. They are relational like verbs, but they differ from verbs in being atemporal instead of temporal and summary scanned like nouns instead of being sequentially scanned like verbs.
Langacker (1999:11) gives *yellow* as a concrete example to illustrate the crucial function of construal in the classification of parts of speech. The conceptual content of 'yellow' in the colour domain is kept constant over its various construals into different parts of speech. *Yellow* as a noun, as in 'yellow is a warm colour', profiles a particular kind of THING in colour space. Yellow as an adjective, e.g. 'yellow paper', profiles a TEMPORAL RELATION of a colour sensation to a THING. In other words, the colour space (YELLOW) is the profiled region of a THING (PAPER). Yellow as a verb, e.g. 'the paper yellowed' profiles a PROCESS in which the colour of the THING (PAPER) gradually changes. Finally, he contrasts the verbal sense, which profiles a sequential PROCESS with the stative-adjectival meaning of the participle yellowed (the yellowed paper). The verb and the participle evoke the same content. In fact, the process profiled by the verb serves as the base for the participle in that something can only be yellowed, if it has undergone a process of yellowing. Langacker states that this reveals that semantic contrast resides in profiling, i.e. a difference with respect to construal. Within the process evoked, the participle profiles only the final state, which makes it atemporal and non-verbal. He points out that the verb and the participle have the same conceptual content but different profiling.

Ontologies are central to the debate about the putative linguistic/ encyclopaedic distinction in meanings of lexical expressions. Lexical knowledge is neither totally part of what is traditionally referred to as encyclopaedic knowledge nor to linguistic knowledge. It holds information of both kinds (Murphy 2000; Paradis 2003b). Ontological categories such as ANIMALS, PLANTS and EVENTS are content ontologies. Categories such as NOUNS, VERBS and ADJECTIVES are schematic ontologies. NOUNS are THINGS, and VERBS and ADJECTIVES are RELATIONS . In other words, parts-of speech foreground schematic categories, such as THINGS and RELATIONS, while ANIMALS, PLANTS and EVENTS foreground content structures. Both types of structures are activated in meanings of lexical items of all kind, albeit to a greater or lesser extent for different types of meanings. Both types of ontologies are prototype-based (Croft 2001: 63-107). This way of modelling lexical meaning is of course not without problems either, since it is based on people's perceptions. Methodologically, it means that we have to rely on judgements made by the analyst and/or on experiments based on informant judgements.

On modelling ADJ N meanings, we need a system of ontological categories which is reasonably rich and which can be further refined into increasingly more specific knowledge domains. The reason for this position is both methodological and philosophical in nature. Methodologically, ontologies provide us with a manageable instrument in the design of databases. Our perception of the nature

of things and their functions in the world make the creation of ontological database entries natural. Ontologies also serve as a vehicle in the pursuit of the enigma of the semantic chemistry of lexical meaning. Codification into ontologies is not only useful for semantic analysis in general but also for automatic language processing, where it is a tool in the procedures of discoursal domain analyses.[9]

3.1 The content structures of nouns

Following Lyons (1977: 442-445), I distinguish three types of nominal content structures: first-order entities, second-order entities and third-order entities, which are taken equivalent to my top ontologies in Figure 2.[10]

First-order entities	concrete phenomena
Second-order entities	events, processes/activities, states
Third-order entities	shells

Figure 3. The top ontologies

Generally speaking, first-order entities are physical objects such as ANIMALS, PEOPLE, PLANTS, ARTEFACTS, e.g. 'dog', 'woman', 'tulip' and 'car'. These entities are relatively stable from a perceptual point of view. They exist in three-dimensional space, at any point in time, and they are publicly observable. The ontological status of both second- and third-order entities is vague in the sense that they are not associated with as many stable properties as first-order entities. They are more variable and therefore also more difficult to define and consequently more controversial. Second-order entities are EVENTS, PROCESSES and STATES, such as 'victory', 'discussion' and 'happiness' respectively. These entities are located in time and are said to occur rather than exist. Finally, third-order entities are abstract entities that are outside both space and time. They are entities such as 'facts', 'concepts', 'ideas', 'possibilities' and 'propositions', 'days' and 'years', referred to as SHELLS in this paper.[11] Figure 4 gives examples of subcategories of first-order entities.

[9] In addition to the analysis of how we perceive and categorize the world around us, ontologies are important in other disciplines such as mathematics, philosophy and technology (http://www.mitteleuropafoundation.it/research.htm).

[10] It should be noted that Lyons' semantic model is a structuralist model and not a conceptual model. Lyons' model has also been used by EuroWordNet (Vossen et al. 1997:22) in which his three-order entity model has been further refined by a subclassification into a modified version of Pustejovsky's qualia roles (Pustejovsky 1998) for first-order entities and situation components for second-order entities.

[11] The term shell is borrowed from Schmid (2000) whose definition is more narrow than mine.

Animal	animal, cat, snake, fish, Alsatian
People	man, girl, carpenter, person, wife, grandfather
Plant	daffodil, beech, plant, tree, weed
Artefacts	vehicle, jacket, tool, table, bag, hotel, money, picture, office, plastic
Natural o/p*	cells, skin, yellow, organs, stone, finger, lightening, carrot, meat, food
Location	place, country, village, area, Sweden, centre, North
Substance	water, soup, air, ozone

Figure 4. First-order entities and examples of possible linguistic exponents.
***Natural o/p* stands for natural objects and phenomena**

ANIMALS, PEOPLE, PLANTS, ARTEFACTS, NATURAL OBJECTS/PHENOMENA and LOCATIONS are typically bounded, concrete entities, whereas SUBSTANCE is typically unbounded and represented by mass nouns. ANIMALS, PEOPLE and PLANTS are entities that have life and represent wholes. ARTEFACTS are man-made entities. NATURAL OBJECTS are parts of living beings or anything produced by natural forces, while NATURAL PHENOMENA are perceivable by human beings, such as 'lightening', 'yellow' 'sound'. LOCATIONS are concrete places. SUBSTANCE has the form of an unbounded entity which can be a liquid or a gas. The heuristic method of identification of first-order entities is that they exist in time and space.

Second-order entities comprise EVENTS, PROCESSES/ACTIVITIES and STATES. They relate to a situation profiled as THING, and they retain their situation type characteristics (in terms of DYNAMICITY and BOUNDEDNESS). The situation type reflects the way the situation is distributed over time, i.e. whether it is dynamic or not and whether it is associated with a boundary or not. The standard way of distinguishing between different types of situations makes use of the temporal unfolding of the situation. It is assumed that EVENTS have a beginning and an end, PROCESSES/ACTIVITIES do not have natural beginnings or ends and neither do STATES. STATES and PROCESSES/ACTIVITIES are compatible with temporal expressions such as 'lasted for hours/days/years/ever'. By contrast, 'took two seconds/minutes/hours' or 'happened at 12 o'clock', which denote a definite end point go well with events or accomplishments. The aspects dealt with here are, at least in theory, commonplace and relatively uncontroversial among researchers in the field of aspectuality (Levin 1993, Verkuyl 1993, Brinton 1998, Croft forthcoming). Second-order entities fall into three types, as is shown in Figure 5.

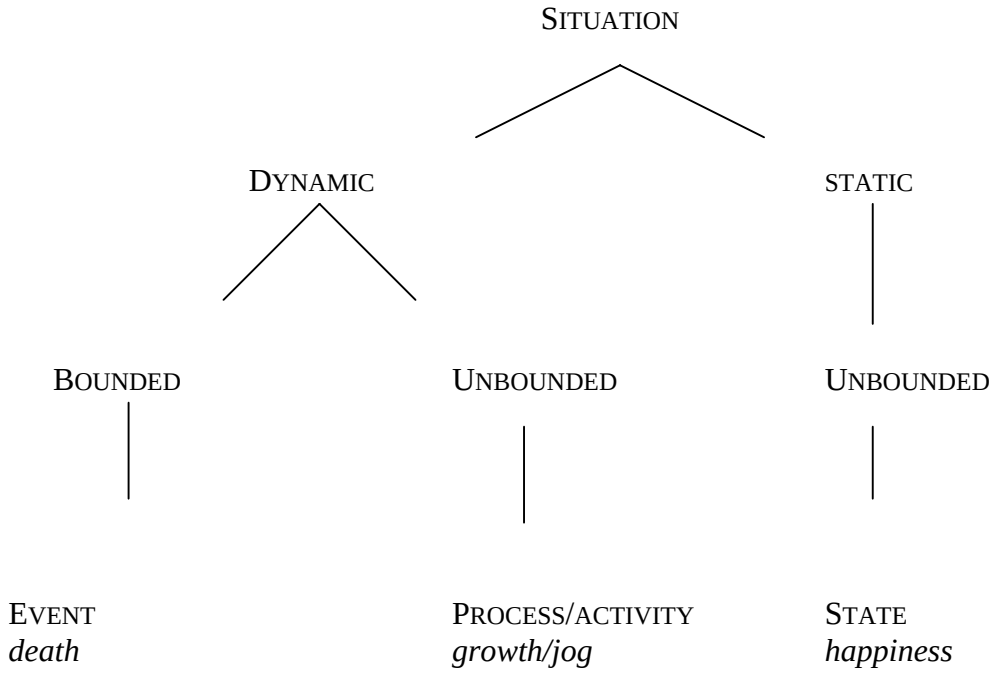

Figure 5. The build-up of second-order entities with respect to content and boundedness

The categories in Figure 5 represent different types of situational frames. They all involve at least one participant. There can be no 'death', 'growth', 'jog' or 'happiness' without participants. These nominal meanings need to be conceptually moored in the sense that they have to be profiled in relation to something or somebody else in order to make full sense. In that respect they resemble RELATIONS, such as adjectives and verbs. The conceptual relation profiled by these nouns involves not only participants but also a dimension that can be more exactly specified in terms of changeability. Dynamic notions such as 'death' and 'growth'/'jog' involve a change, while states such as 'happiness' do not. Moreover, events such as 'death' involves a boundary or a temporal limit. Consider Figure 6.

Event	change of state	death
Process/activity	state of change	growt/jog
State	state of no change	happiness

Figure 6. Conceptualization of second-order entities

Again, EVENTS such as 'death' involves a boundary or a temporal limit. 'Growth', 'jog' and 'happiness', on the other hand, are unbounded and viewed in terms of ongoingness. This property of boundedness is part and parcel of the property of duration; 'death' is momentary, while 'growth', 'jog' and 'happiness' are durational (Dirven & Radden 1999:550).[12] Like other linguists

[12] Note, however, that Dirven & Radden (1999) view boundedness and duration as two different properties. I take duration to be corollary of boundedness. Boundedness in dynamic concepts is strongly related to aspectuality, in the same way as it corresponds to countability

who work on these categories for verbs, Dirven & Radden, also make finer distinctions of events into punctual events ('kick'), terminal events ('die'), cumulative events ('lay eggs'), and of states into habitual states ('he smokes'), indefinitely lasting states ('the box contains chocolate') and everlasting states ('the sun rises in the east'). The heuristic method of identification of second-order entities is that they occur in time, rather than exist in space and time. Figure 7 shows the division of second-order entities into three types.

Event	destruction, jump, death, arrival, wedding, change, end
Process/activity	jog, ride, bake, growth, flow, debate, speed, course, investigation
State	happiness, relationship, life, resemblance, knowledge, absence

Figure 7. Second-order entities and examples of possible linguistic exponents

Finally, third-order entities are represented as conceptual SHELLS by Schmid. They are negatively defined by Lyons in neither being first-order entities nor second-order entities. This means that neither of the heuristics used for these two apply to third-order entities. On a continuum from concrete to abstract entities, third-order entities represent the more abstract entities. They resemble first-order entities in that they are not associated with participants in the same way as second-order entities are. They are similar to objects, but instead of being specified with a stable set of properties, they are like shells that can be filled with different properties as long as they fit the abstract notion in question and people's pragmatic needs. Either they may quite simply profile abstract entities, such as IDEA, or they may profile the CONTENT of a written document, or they form a shell for propositions, such as in 'the (big) problem was that I had no money', where 'problem' is the shell for 'I had no money'. Figure 8 gives examples as well as classes of shell nouns (adapted from Schmid 2000:4).

factuality	fact, thing, point, problem, system, focus
linguistics	news, message, text, question, sentence
thought /modality	idea, notion, belief, assumption, aim, plan, possibility
knowledge	science, history, technology, psychology
circumstance	situation, context, area
measure	frequency, degree, amount
time	year, day, autumn

Figure 8. The knowledge structures of SHELLS

Schmid (2000:14) describes the cognitive function of shell nouns as that of temporary concept formation. With regard to this they are more like anaphoric pronouns than full nouns. However they differ from pronouns in carrying more

with respect to objects and gradability in the context of stative concepts (Declerck 1979, Dahl 1981, Langacker 1987a, Talmy 1988, Jackendoff 1991, Frawley 1992, Verkuyl 1993, Depraetere 1995, Brinton 1998, Paradis 2001).

encyclopaedic meaning.[13] As we shall see later, many of these nouns have more than one side to them. In certain contexts, they may very well be first-order entities, while in other cases they may be second-order or third-order entities. For instance, report may profile a document, a first-order entity, e.g.' The report is lying on the table'. It may profile the actual process of reporting, a second-order entity, 'His report was filled with pauses and stutters', and it may profile the actual text as information, a third-order entity, 'I didn't understand the report'.

In an attempt to define first-order, second-order and third-order entities, Asher (1993: 57) makes a basic distinction between concrete objects, eventualities (cf. second-order entities) and purely abstract objects (cf. third-order entities) representing an increasing order of abstraction along the spectrum of world immanence: concrete objects > processes/activities > states > abstract objects. Abstract objects differ from concrete objects in that they are our own categorizations of them in answer to our own pragmatic needs; when our needs change, so may our categorizations accordingly. This description highlights a characteristic of these levels that is inherent in my definition.

3.2 Schematic structures of nouns

In addition to content ontologies, there are also schematic ontologies. Schematic structures are free and may apply to different content structures. First of all, if some content structure profiles a noun, it is based on a THING schema and consequently the Gestalt construal employed is one of THING and summary scanning. Furthermore, a schematic representation that applies to nominal content structures is qualia structure. The observation that noun meanings are based on a structure of qualia roles was first suggested by Aristotle, and this insight has been brought to the fore again in contemporary linguistics by Pustejovsky (1998). In recent years, the idea has been employed by other scholars such as Jackendoff (2002), Cruse (2000:117-119), Warren (2003) and Paradis (2003b; forthcoming). Pustejovsky, Jackendoff and Warren model qualia structure as properties of lexical items and locate them in the lexicon, whereas Cruse and Paradis consider qualia structure to be conceptual in nature and shaped by construals. The configurational template consists of four qualia roles: the formal, the constitutive, the telic and the agentive roles. The different qualia of a noun encode information about particular properties, such as their constituent parts, their place in an inheritance structure and activities associated with them, such as their function and mode of creation.

In the present analysis, constitution and form have been conflated into constitutional aspects, i.e. the configuration of an entity as an object and the

[13] For a discussion of the relation between full nouns, pronouns and shell nouns in terms of the stability of concept-formation, anaphoric properties and potential for characterization, see Schmid (2000:18-20).

conceptual possibilities are thereby delimited to their make-up (KIND-OF links and HAS-A links[14]). For instance, CAR has an engine and four wheels and it is a hyponym of VEHICLE. Telicity and agentivity have been conflated into function, which involves a restriction to aspects of role/use and creation. For instance, CAR can be used for 'driving', 'fast driving' or 'slow driving', and cars are put together by people in a factory. Qualia structure is essentially a PART-WHOLE schema, where one part of the grid is made salient.

To the best of my knowledge, qualia structure has been applied to first-order entities only. However, it is valid for other types of noun meanings too, such as EVENTS, PROCESSES, STATES and SHELLS.[15] For instance, qualia structure involves the following parts for an activity noun such as 'jog'. The constitutional quale of 'jog' would mean that it is a type of moving where somebody moves on a certain route. This corresponds to the argument structure of the cognate verb. It also involves the manner of the motion, i.e. 'not too fast'. The functional quale highlights the reason for jogging, e.g. 'feeling fit and healthy, losing weight'. The different qualia are drawn out in different contexts.

3.3 Content structures of adjectives

Adjectives, such as *long*, *good* and *heavy*, are considered to be typical adjectives. They are expressive of STATES in the domains of LENGTH, MERIT and WEIGHT respectively. Following Gärdenfors (2000:137), I define the term property as a region in one domain in conceptual space.[16] Concepts, on the other hand, are regions based on several separable domains in conceptual space. In other words, properties are seen as special cases of concepts. They are independently defined and not only seen as parts of more complex concepts.[17] For instance, there is a property BIG in the domain of SIZE which is independent, but it obtains its exact application on the occasion of use in different conceptual combinations. BIG in combination with ANT is different from BIG in combination with ELEPHANT in that the size of 'a big ant' is different from the size of 'a big

[14] For a discussion of structural and semantic relationships and the above terms in the area of object-oriented analysis and methods in computing, see, for instance, Graham (2001:2-36).

[15] In his account of Pustejovsky's work, Jackendoff (2002:373) also makes an informal note on the rather selective examples used by Pustejovsky. He too draws our attention to the potentially wider application of qualia structure and its importance for a theory of semantic compositionality.

[16] Gärdenfors does not distinguish between content structures and schematic structures. He conflates the two and does not model schematic structures as free structures. He sees schematic structures as integral dimensions (2000: 24), since they do not occur on their own.

[17] Langacker (1987a: 197: 198) does not provide definitions of concepts and properties. He defines nouns as things, i.e. as a set of interconnected entities (a region) in some domain. The interconnections (temporal or atemporal relations) are defined in relation to some entity in a region. Relations are thus not independently defined in Langacker's model in the way properties are in Gärdenfors' model.

elephant'. BIG expressed by *big* is in either case located in the domain of SIZE. There are, however, also cases where one and the same adjectival properties are expressed by the same lexical item but located in different domains. For instance, HOT in the domain of SPICES as in 'hot spices' is different from HOT in the domain of TEMPERATURE as in 'a hot day'. In the same way, HEAVY in the domain of WEIGHT in relation to ARTEFACT, as in 'a heavy vehicle', is different from HEAVY in the domain of MEASURE in relation to WORK, as in 'a heavy workload' or DEGREE of an ACTIVITY, as in 'heavy smokers' and so on. As a consequence of this, 'hot' and 'heavy' represent different readings of the lexical items, which is not the case for 'big'.[18]

Like nouns, adjectives profile both first-order, second-order, or third-order entities. However, what we have referred to as typical adjectives are second-order entities, namely STATES, expressing simple properties such as 'a long road', 'a good book' and 'a heavy sofa'. Apart from STATES, adjectives may also be expressive of PROCESSES such as 'growing rifts', 'screaming babies' and 'praying pilgrims'. There are no EVENTS, since atemporal relations expressed by adjectives from potentially eventive meanings profile STATES, e.g. 'He peeled the potatoes' > 'Peeled potatoes for sale', 'The cow died' > 'The dead cow was removed from the field'.

Furthermore, there are adjectives that are based on first-order entities, e.g. 'a woollen skirt' (ARTEFACT), 'a male nurse' (PEOPLE), 'the Swedish countryside' (LOCATION) and 'red lights' (NATURAL PHENOMENON), and there are variety of adjectives that are third-order entities or SHELLS, such as 'linguistic research', 'problematic situations', 'democratic party', 'criminal law', 'main reason', 'absolute idiot', 'frequent occurrences', 'possible solution' and 'poor guy!'. What is obviously important for the interpretation of adjectives is the nature of the noun and the salience of the aspect of the meaning of the noun that is modified by the adjective. In other words, the modelling of adjective meanings is thus complicated by the conceptual combination with the noun. The issue of the patterns of conceptual combinations of ADJS and NS is not altogether clear. Much work remains to be done in this area. At this stage, it can be stated that conceptual combinations proceed by finding a slot of the head noun that the modifying adjective can best fit into.

Stative adjectives, such as *long, good,* and *heavy,* that are expressive of simple property specifications such as LONG, GOOD and HEAVY have been shown to be easy to process because they themselves denote the same property that they specify in the modified noun, e.g. 'long' for 'length of X' (Murphy 1990; 2002:454-455). There is also a number of adjectives that map on to simple third-order notions, SHELLS, such as '*main* reason', '*absolute* idiot', '*frequent* occurrences', '*possible* solution'. This group of adjectives are schematicity-

[18] It should be noted that I use readings for various kinds of meaning differences, because I do not want to indulge in a discussion about the thorny problem of polysemy and vagueness.

biased (see Section 3.4). *Main, frequent, possible* and *poor* express properties that are extrinsic to the noun, i.e. they do not specify an inherent property of the combining concept. Their functions are to specify FOCUS, FREQUENCY, MODALITY and ATTITUDE. *Absolute* is different in that it specifies a schematic property of DEGREE that has to find its match in the noun (Paradis 2000b).

Finally, there is a large group of adjectives that are denominal adjectives, first-order, second-order or third-order, 'a wooden chair' 'emotional reaction' and 'linguistic research' respectively. Like stative property concept 'wooden' modifies an inherent property of CHAIR. Wooden is based on the domain of MATERIAL, which is a domain that is central to CHAIR. This is not the case in 'emotional reaction' and 'linguistic research'. 'Emotional' and 'linguistic' both add new properties to 'reaction' and 'research'. The relation between the combining concepts is additional and conjunctive. What we do when we put them in the slot before a noun is that we cut the links to the whole domain matrix and focus on a single dimension relevant in the context of the concept they modify. Naturally, there is a possible valency match between 'reaction' and 'emotional' and 'linguistic' and 'research' respectively, in that we have encountered these subtypes of 'reaction' and 'research'. 'Emotional chair' is possible to interpret, but it would require a special context. 'Linguistic chair', on the other hand, has conventional application, construed through metonymization, i.e. piece of furniture for position held by the linguist sitting on it' (see Section 4). The interpretation of such adjectives is not always immediately transparent. Very often they have special conventionalized meanings. Murphy (2002: 450) gives 'corporate car' and 'corporate building' as examples. In combination with 'car', the adjective corporate relates to the 'owner' in the domain matrix of CAR, while for BUILDING it activates LOCATION. For many of these combinations, people must decide which aspect makes the best match. The decision made by the addressee is a relatively knowledge-intensive process. It does not make sense to talk about a corporation being located in a car, but it does make sense in our culture for a corporation to own a car for business activities.

3.4 Schematic structures of adjectives

In contrast to nouns, which are based on a THING schema, adjectives are RELATIONS. They express properties that connect to a concept. Adjectives fall into four subgroups based on the nature of the property, see Figure 9

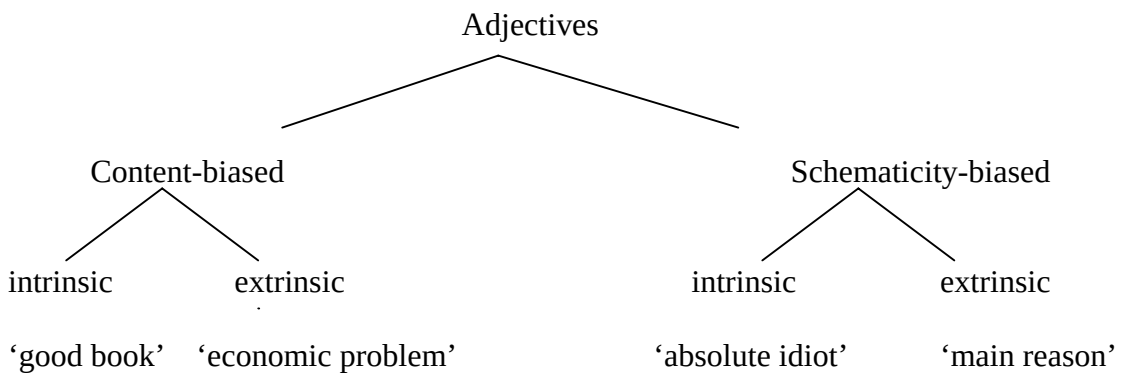

Figure 9. The subtypes of adjectives

Two main types of adjectives are distinguished: those that profile content relations, content-biased adjectives, and those that profile schematic relations, schematicity-biased adjectives.[19] Content-biased relations foreground content properties, which may be more or less central to the nominal meaning. Moreover, there are two types of both content-biased and schematicity-biased adjectives: intrinsic and extrinsic. Intrinsic adjectives specify a property that is already inherent and salient the nominal meaning, either a content-property or a schematic property. Extrinsic relations, on the other hand specify a property that is not inherent, or peripheral, to the nominal meaning. These divisions are not definite gradient.

Firstly, content-biased adjectives that modify a salient intrinsic property of the noun are either gradable adjectives or non-gradable adjectives. In 'good book' the gradable property of MERIT in book as TEXT [THIRD-ORDER ENTITY] is specified by good. Content adjectives such as 'good' express simple properties which are gradable, either in terms of an UNBOUNDED SCALE, e.g. 'a fairly good book', 'a very good book' or in terms of a definite BOUNDARY, e.g. 'an almost blind dog', 'a totally blind dog' 'an absolutely fascinating story' (for a detailed account of gradability and boundaries, see Paradis 1997 and in particular 2001). All gradable adjectives of this type may also be used in predicative position, as in 'the book is good'.

Intrinsic properties may also be of a non-gradable nature, e.g. 'wooden chair' and 'red apple' and 'peeled potatoes'. Non-gradable adjectives do not combine with degree modifiers, e.g. '*a fairly wooden chair', '*a very wooden chair', '*an absolutely wooden chair'. It should be noted however, that it is often possible to use schematic structures for alterations of the configurational basis of a content structure. For instance, some content structures may be viewed as either BOUNDED or UNBOUNDED configurations; the meanings 'a coffee' and 'absolutely clear' are BOUNDED, while 'coffee' and 'very clear' are UNBOUNDED

[19] The term biased is used since all lexical items have both a content side to them and a schematic side. Their mutual weighting may differ both in a stable way in conventionalized readings and for ad hoc purposes.

(Paradis 1997: 59-64: 2001). Configurational changes may also be used for *ad hoc* purposes, e.g. 'a very wooden chair' referring to 'an uncomfortable chair'. Schematic alterations may eventually result in diachronic change of encoded meanings (Ekberg 2004; Paradis 1997:71-76; 2000 a & b, 2003a). Like gradable adjectives, these non-gradable intrinsic adjectives occur freely in predicative position, 'these chairs are wooden' and 'the potatoes are peeled'.

In contrast to intrinsic adjectives, which select and profile a property that is part of the conceptual make-up of the noun, there are extrinsic adjectives that express properties that are peripheral or extrinsic to the meaning of the noun, e.g. 'economic problems' and 'criminal law'. These adjectives are all non-gradable. Extrinsic relations are conjunctive. They add a property that is not already expressed by the noun and thereby together with the modified noun they tend to form a subcategory. An 'economic problem' is a special type of problem. There are other 'problems' such as 'emotional problems', 'financial problems' and 'back problems'. Content-biased extrinsic adjectives are mainly de-nominal adjectives, e.g. *criminal*, *economic*, *medical*, *emotional*. Some of these combinations obtain lexical status as conventionalized units, e.g. *criminal law*, while others are formed in an *ad hoc* fashion, e.g. *economic problem*.[20] Extrinsic non-gradable adjectives are typically not used in predicative position, unless in cases of contrast, e.g. '?This instrument is musical', 'the instruments are not musical, they were medical', nor are they normally gradable '?a very economic problem'.

The tendency for this kind of adjectives to form subcategories is due to the additive nature of the combination and to the absence of the property expressed by the adjective in the semantics of the noun. Note, however, that all kinds of adjectives can be categorizing. Category formation is motivated by usefulness. If an ADJ N combination such as 'green food' 'fast food or 'slow food' are useful and deserve special status for any reason, conventional lexicalized categories may be formed. These combinations are not gradable, '*very fast food' nor can they occur predicatively, '*the food is fast' (cf. 'a very fast car' and 'the car is fast'). Among them there are both conventionalized categorizing adjectives, such as 'fast food' and unconventionalized occurrences which are possible for all combinations if it is required by the context, e.g. 'Put the big prawns there and the small prawns here, please!'.[21]

Schematicity-biased adjectives also fall into intrinsic and extrinsic relations. Intrinsic adjectives that are schematicity-biased match a schematic property of the noun that may be more or less salient much in the same way as content-biased adjectives do in relation to the content properties of their nouns. Salient matches are adjectives that express DEGREE. There are DEGREE adjectives that

[20] Adj n combinations of this kind are similar to n n combinations, such as 'apple pie' and 'linguistics seminar' (Warren 1984).

[21] Note that changes of schematic structures are ultimately results of construal operations (Section 4). Categorizing is a construal which may or may not undergo lexicalization.

specify a UNBOUNDED properties in the modified nouns, e.g. ‘terrible mess’ or BOUNDED properties, e.g. absolute idiot’. Adjectives that are modifiers of DEGREE can be graded, but not used predicatively, e.g. ‘an almost absolute idiot’, but not ‘*The idiot is absolute’.[22]

Moreover, there are adjectives more loosely connected to their nouns. They take extrinsic scope over the noun and express schematic notions of FREQUENCY, FOCUS and ORDER, such as ‘frequent occurrences’, ‘main reason’ and ‘first example’ and MODALITY, such as ‘possible solution’ and ‘poor guy!’. Some of these can be used predicatively, e.g. ‘This solution is possible’ and some of them may even be graded, e.g. ‘a very possible solution’ (UNBOUNDED), or ‘an almost certain disaster’ (BOUNDED), but ‘*the guy is poor!’ or ‘*the very poor guy!’.

As was shown in Section 3.3, these schematic ontologies operate across abstract SHELL domains. Sections 3.3 and 3.4. are summed up in Figure 9.

ontent-biased adjectives	Content structures	Schematic structures	Lexical examples
Intrinsic	first- second - and third -order		*big* boots, *fast* car, *fascinating* story, *dead* body, *peeled* potatoes, *screaming* babies. *wooden* chair, *red* tomatoes
Extrinsic			*criminal* law, *medical* treatment, *acid* rain
Schematicity-biased adjectives			
Intrinsic		DEGREE, FREQUENCY	*absolute* idiot , *frequent* occurrences
Extrinsic		FOCUS, ORDER MODALITY	*main* reason, *first* example *possible* solution, *poor* guy

Figure 10. The subtypes of adjectives in relation to their various content structures and schematic structures

Figure 10 provides no specifications of schematic structures for content-biased adjectives and no specifications for content structures for schematicity-

[22] It is interesting to note that nouns that may occur with degree adjectives are adjective-like in being simple property notions, e.g. idiot, bliss, bitch, crap, nonsense, coward, mess, muddle, bore and pleasure. Moreover, they form paradigms in the same way as degree adverbs do, e.g. the totality modifiers: absolute-absolutely, total-totally etc. and the scalar modifiers: terrible-terribly, extreme-extremely etc. (Paradis 2000b). From a diachronic perspective, the degree readings have developed from content-biased readings, such as ‘absolute measure’ and ‘terrible nightmare’ (Paradis 2000b).

biased adjectives. This does not mean that they do not map on to such structures, but only that these structures are backgrounded. For instance, gradability/non-gradability are backgrounded structures of content-biased adjectives and in a similar way the content structures (third-order structure) are backgrounded in schematicity-biased adjectives.

4 Construals

Construals are the cognitive processes that operate on the ontological representations in conceptual space. This dynamic component of the model is important for our interpretation of different readings of all kinds of linguistic expressions. Construals have been described in the cognitive literature by Talmy (2000) in terms of schematic systems, which embrace configurational structure, deployment of perspectives, distribution of attention and force dynamics. Langacker (1987a:99-146; 1999:3-5) deals with construals under the rubrics of comparison, attention and focal adjustments. The focal adjustments are further subdivided into selection of the facets of a particular scene, the perspective from which a scene is viewed and the level of abstraction or level of specificity. Lakoff & Johnson (1980) treat construals under metaphor.

Croft & Wood (2000:55-56) point out that the full range of construal operations have not been presented in a systematic way. They make important progress when they propose a classification of construals based on the cognitive processes as they are described in psychology and phenomenology. Their argument is that if the construals are truly cognitive they should be identical with the cognitive processes described in the psychological literature. Croft & Wood match the cognitive processes from psychology and phenomenology with the construals presented in the cognitive linguistics literature and thereby create a more comprehensive and coherent picture of this aspect of language and cognition.

More precisely, Croft & Wood suggest that the construal operations discussed in the linguistics literature are special cases of four general cognitive processes, namely (i) *Gestalt* (constitution), (ii) salience (focus of attention), (iii) comparison (judgement), and (iv) perspective (situatedness).[23] These four classes represent four distinct processes in different realms of experience, which in turn subsume different construal operations. Figure 10 shows the four basic cognitive processes in the left hand column and examples of construal operations from the linguistics literature in the right-hand column. It is important to emphasize that these construals are not mutually exclusive, but co-occur and are highly interrelated. It is only by definition that we keep them apart.

[23] The terms in parentheses are not used as labels in this paper.

	Cognitive processes	Examples of construal operations
I	Gestalt	Thing/relation, structural schematization
II	Salience	Metonymization, generalization/specification, summary and sequential scanning, profiling
III	Comparison	Metaphorization, categorization
IV	Perspective	Viewpoint, deixis, subjectivity/objectivity

Figure 11. Cognitive processes and their related construal operations (adapted from Croft & Wood 2000:57)

The first process is the configuration of a *Gestalt*, which subsumes the THING/RELATION distinction and structural schematization.[24] As has been discussed before, a THING is a complex autonomous Gestalt located in conceptual space. A RELATION, on the other hand, is conceptually underspecified and typically based on one domain. Relations require the concomitant activation of autonomous concepts for their location in conceptual space (cf. Gärdenfors 2000:101-122). The THING/RELATION dichotomy is relevant for how we conceive of parts-of-speech, i.e. nouns (THINGS) on the one hand and verbs and adjectives (RELATIONS) on the other. I have argued that nouns and adjectives can be based on the same types of content structures, but that they are differently construed in all cases and that is why they are traditionally categorized as two different parts-of-speech in languages that make this distinction.

Structural schematization is an operation that operates in the schematic domain in my model. For instance, it involves the assignment of BOUNDARIES. BOUNDEDNESS has been discussed in the literature in the context of nouns, verbs and adjectives. Cross-categorial correspondences have been recognized between count and non-count structures in nouns (*car, mistake vs. milk, information*), and continuous and non-continuous structures in verbs (*know, hate, play vs. arrive, die, cough*) and scalarity and non-scalarity in adjectives (*good, long vs. dead, identical*). Count nouns, non-continuous verbs and non-scalar adjectives are BOUNDED, while non-count nouns, continuous verbs and scalar adjectives are UNBOUNDED. BOUNDEDNESS in nouns is associated with countability, which is a fundamental feature of nouns as entities or mass (count/non-count). BOUNDEDNESS in verbs is related to a fundamental property of verbs, i.e. the type of situation expressed by the verb (*Aktionsart*) as STATES or EVENTS (continuous/non-continuous, or telic/non-telic) and BOUNDEDNESS in adjectives is associated with GRADABILITY. For nouns, verbs as well as adjectives the dichotomy between BOUNDEDNESS and UNBOUNDEDNESS is related to a basic notional characteristic of the categories that are important for the interpretation of linguistic expressions as was discussed in Section 3.4.

[24] Only a selection of relevant construals are discussed in this section. For a more extensive coverage, see Croft & Wood 2000 and Croft & Cruse (2004).

Secondly, salience refers to the degree of activation of certain conceptual structures in the cognitive network.[25] Metonymization, abstraction, summary and sequential scanning and profiling are all special cases of construals of salience. For instance, metonymization is found in the data in examples such as (1).

(1) Three red shirts converge on him and the red shirts win out.

The metonymical expressions in (1) needs specific contextual boosting. It is firmly anchored in a sports event. RED SHIRTS is a first-order notion that is linked to the intended referents in their capacity of being PEOPLE ('football players'). The functional quale of 'people as players' is made salient through their shirts. Metonymization is a conventional way of manipulating readings in context and it is therefore important for a model of meaning to incorporate such construals. The phenomenon of metonymization was highlighted by the method of data retrieval employed in the present investigation in that the lexical item that was to be interpreted showed a clash in conventionalized lexical encoding and the contextual reading. In other words there is no conventional lexical relationship between 'football players' and 'red shirts', but a conventional mode of construal, namely PART for WHOLE.[26]

Summary and sequential scanning operations are associated with holistic conceptualizations on the one hand and conceptualizations that unfold on the other. This construal underlies the distinction between nouns and adjectives which are both summary scanned and verbs which are sequentially scanned. It is also relevant for the dynamic/static distinction of meanings within parts-of speech.

Profiling is pervasive in conceptualization. All meanings are understood on the basis of a profile and a base. For instance, 'car' is interpreted on the basis of a domain matrix of VEHICLE and TRAFFIC. At a more detailed level, it can be argued that 'big car' specifically profiles the constitutional quale of CAR with respect to its KIND-OF-link and its HAS-A- links, while 'slow car' suggests an image-schematic profile of 'car' with focus on its telic function.[27] Profiling is crucial for the placement of a specific reading within different inheritance

25 This definition of salience is different from meaning salience through conventionality, frequency, familiarity as in Giora (1997, 2003) and feature salience as in Ortony et al. (1985).
26 For a more detailed analysis of different construals of salience, such as metonymization, facetization and zone activation, see (Paradis forthcoming). For a discussion of generalization/specification, see also Langacker (1987:132-137) under the name of abstraction. I will not go into generalization/abstraction here.
27 Referent in the traditional sense can be translated into profiling in conceptualization in the cognitive framework. "An expression's profile is the entity it designates, and as such is a focus of attention within the overall conception evoked." (Langacker 1999:45).

structures. It is also related to other construals of salience on the basis of PART/WHOLE relationships.[28]

Furthermore, Cruse (2000:114-117, 2002) points out that some lexical items call up more than one set of qualia. They are called *facets* of meaning.

(2) Please put the book back on the shelf. (tome: artefact)
(3) I find this book unreadable (text: shell)

The two facets of meaning, in (2) and (3), draw on two different ontologies, which form two different Gestalts. Facets differ from senses, such as 'book' and 'newspaper' in that facets do not produce a zeugma when co-ordinated, 'Put this book back on the shelf; it is quite unreadable', as shown by Cruse (2000:114). The co-ordination of these two propositions does not reveal any antagonism between the two facets. It (TEXT) in the second part of the sentence refers nicely back to book (TOME) in the first part. This anaphoric relation can be compared to *'Put this newspaper back on the shelf; it (BOOK) is quite unreadable'. In spite of the fact that facets do not show signs of antagonism in anaphoric reference, their qualia involve different content structures (as do senses of course). Consider this difference for the two readings of book.

tome
(i) CONSTITUTION: 'object made of paper with cover and pages'
(ii) FUNCTION: 'was printed and bound'

text
(i) CONSTITUTION: 'information, chapters, paragraphs, sentence'
(ii) FUNCTION: 'was written, to be read'

The two facets of books are thus construed according to different schematic configurations of sense boundaries of the whole use potential of the lexical item *book*. Similar to 'book', there are a number of nominal meanings that have two or more facets, e.g. 'poster', 'report', 'school', 'court', 'department' (Paradis: forthcoming). Examples (4), (5) (6) and (7) show four different facets of 'department'.

(4) The whole department has read the National Curriculum
(5) A big department has more representation within the faculty than a small department
(6) This is a huge department consisting of 35 offices and 10 teaching rooms.

28 For a discussion of structural and semantic relationships in the area of object-oriented analysis and methods in computing, see, for instance, Graham (2001: 2-36).

(7) The English department moved into the next building.

Department in (4) refers to PEOPLE who work there. In (5), the focus is on 'department' as an abstract administrative unit, i.e. SHELL, in (6) the BUILDING and in (7) the INTERIOR OUTFIT are made salient.

Thirdly, the process of comparison is the source of categorization and metaphorization. Categorization involves the comparison of experience of an entity or a situation to a prior experience and it is accompanied by a judgement of class affiliation. This process takes place between instances and targets (Langacker 1987a: 66-71) on the basis of aspects of centrality and gradience according the people's judgements. In like manner, metaphorization involves a process of comparison from a source domain to a target domain. Both conventional metaphors and novel metaphors are pervasive in language. Consider example (8).

(8) You're a hard person.

In (8) the source domain is the first-order entity PERSON that in the context of HARD would suggest concrete firmness. The target is a second-order entity STATE that calls up the idea of a character that is 'harsh', 'stern' and 'cold'. In other words, the personality of the person is likened to a firm cold entity.

The fourth process is the assignment of perspective which involves construals such as viewpoint, deixis and subjectivity/objectivity (Langacker 1987a: 124-132). Potentially all scenes can be conceptualized from different angles with different orientation, and in each case this imposes an alignment of foreground and background. In the case of ADJ N combinations two aspects of perspective are brought to the fore. Firstly, as was shown in Figure 9 and 10, some adjectives foreground content structures ('big boots', 'wooden chairs' and 'economic problems'), while others foreground schematic structures ('absolute idiot', 'possible solution' and 'poor guy'). There is also a difference between adjectives that foreground content structures and adjectives that foreground schematic structures in terms of subjectivity in which case 'absolute idiot', 'possible solution' and 'poor guy' are more subjective than 'big boots', 'wooden chairs' and 'economic problems', in which the speaker's subjective belief or attitude is in the foreground. This is particularly striking in cases of different readings of the same lexical item, e.g. 'absolute measure' vs. 'absolute idiot', 'terrible nightmare' vs. 'terrible bore', or 'poor guy'('not rich') vs. 'poor guy' ('I feel sorry for you').[29]

[29] The subjectivity/objectivity dyad is omnipresent in construals of situations. My example of subjectivity is more compatible with Traugott's communicative perspective of subjectivity (Traugott & Dasher 2002: 22-24). Langacker's focus is on how entities are portrayed on the conceptual scene (Langacker 1987a: 132). Traugott's and Langacker's definitions of subjectivity are essentially the same. Traugott's focus is on subjectification as a diachronic

5 Conclusion

In a cognitive account of meaning, multiple readings is expected as a natural consequence of the dynamic view of language. There are, however, not only possibilities but also constraints. At the lexical level there are conventionalized mappings between lexical items and concepts, e.g. *dog* for DOG, *report* as either ARTEFACT, PROCESS or TEXT, or conventional modes of thought such as metonymization, e.g. *red shirt* for PEOPLE as football players. In all usage events, only a portion of the total use potential of a lexical item is evoked. The present model of meaning as ontologies and construals aims at providing a basis for the analysis of linguistic expressions in use in order to make a principled description of this interplay. The ways that meanings in context can be manipulated are assumed to be partly predictable from their ontologies. The ontological constitution provides the possibilities on which the construal can act. The inferences that can be made grow out of the potential of the ontological system in combination with the potential of the construal operations in the actual situation.

The main advantages of the present model of lexical meaning are that, firstly, the components of the model are psychologically real in the sense that ontologies are based on our perception of the world and construals are grounded in general cognitive processes. Secondly, ontologies and construals form a theoretically independent basis for the specification of lexical meaning. Conceptual representations and cognitive processes are different substances from the actual linguistic expressions. Thirdly, the flexibility of the model mirrors the dynamicity of language in use. Lexical meanings are not static and situated in a lexicon which holds lexical items with set senses. In the present model, encyclopaedic knowledge is take seriously. There is no principled difference between world knowledge and linguistic knowledge. World knowledge foreground content proper, while linguistic knowledge foreground schematic knowledge. The method of analysis using the model has revealed that the members of the categories of NOUNs and ADJECTIVES are, to a large extent, based on the same ontological categories, both content structures and schematic structures, but they are differently construed as THINGS and RELATIONS. Fourthly, the model also serves as an explanatory basis for multiple readings and change in language. Through large-scale studies of mappings between lexical items and meanings, a more systematic picture of how different readings of lexical items emerge and how their various readings are related.

Finally, there is a potential for the model to be used in natural language processing and language technology. The building strategy of ontologies should be one that allows for increasingly more fine-grained ontologies for specific

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process of meanings becoming increasingly subjective over time, while Langacker's focus is on the set-up of the scene including or dissociating the speaker.

purposes, e.g. 'hikes in the mountains' or 'descriptions of accidents aimed for insurance companies'. In spite of all advantages, the model may be criticized for suffering from subjective judgements in the analysis of ontologies. This problem will always remain with us. It is inherent in all attempts at sense disambiguation and specification of lexical meaning in natural language. In all cases, the definitions of the various ontological types have to be learnt by the analysts. However, in spite of rigorous definitions for identification of categories, there will always be cases of disagreement. It is important to point out that the model as such is probabilistic in nature and the aim is one of a high level of predictability. Lexical meaning can only be approximated, since it is fostered by conceptual tensions caused by contextual forces. The level of approximation has to be the level required by the nature of the problem and the goal of the investigation. Work on evaluating the present model remains to be done.

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