The Place of Linguistic Concepts within a General Ontology of Everyday Life

Dietmar Zaefferer
(Ludwig-Maximilians-Univeristy Munich)

1. Introduction

The ideas presented in this paper have arisen out of the work on a database system designed for the description and comparison of human languages in a theoretically well-founded and systematic way. The Cross-linguistic Reference Grammar (CRG) is a database application for unified descriptions of natural languages of any kind, including signed languages, that has been developed at LMU Munich. The core of the application is an XML-based client-server-DBMS called Systematics (Nickles 2001) that implements a class system of linguistic phenomena as a kind of Be-Have-tree representing taxonomic and meronomic subordination. The first version of this ontology of linguistic concepts is documented in Peterson (2002). Examples of linguistic expressions are uniformly coded in one of the interlinear representation formats provided by CRG for three ontological categories and modalities of linguistic signs: spoken, signed, and written. This aspect of CRG has been presented and discussed at the 2003 EMELD meeting (Zaefferer 2003, Dwyer 2003). One of CRG's design principles, the support of competing descriptions of the same (raw) data, has been argued for at last year's EMELD workshop (Zaefferer 2004). This year's paper presents and comments on the current state of CRG's upper ontology, called GOEdL, and the embedded domain ontologies for mental entities (DOME) and linguistic phenomena (DOLPhen). It is essentially a condensed version of the core parts of Zaefferer (in preparation c).

2 Ontology-based linguistic research: The ontolinguistic approach

If one takes seriously the idea that language is best conceptualized not in terms of its means of production (vocal, manual) or of perception (auditive, visual, tactile), but of its affordance of a general purpose unbounded sharing of thoughts, ideas, and other mental attitudes, several corollaries have to be taken into account.

The first corollary is that the basis of human communication lies in shared conceptual systems: For one agent to communicate with another one successfully, the two have to have at sufficiently overlapping ontologies. In a paper on the integration of GOLD into SUMO, Scott Farrar has formulated this as follows (Farrar 2003: 3):

> *Assumption 1: humans perceive, act in, and conceptualize their environment in the same way regardless of which language they happen to speak.*

This seems a little overstated, but if one restricts 'their environment' to 'the environment they communicate about' it hard to deny that this is a prerequisite for sucessful cross-linguistic (and in fact also intralinguistic) communication. Farrar goes on to argue that "strong linguistic relativism would imply that there could be no common upper model to mediate between various languages, rendering machine translation impossible." (loc. cit.) I agree that a (sufficiently, i.e., in the relevant respects) shared ontology is required for sucessful translation (not only for machine translation), but I don't think this depends on strong linguistic relativism, but simply on the absence of serious mismatches between ontologies, no matter what they arise from. But Farrar is of course right insofar as if strong relativism is right, the mere fact that translation is necessary, i.e., that there are different languages, would entail the possibility of a serious ontological incompatiblity and hence the impossibility of translation.

The second corollary is that in cross-linguistic grammatography the semasiological (decoding) and the onomasiological (encoding) perspective are not on a par, rather the latter has in a sense priority over the former[1]. The sense in which it has priority derives from the hypotheses that can be taken for granted: If comparison is based on assumptions like 'there must be a way, compact or complex, of expressing this given content in the language under consideration' (else it is not a language), it is safe, but if it is based on assumptions like 'there must be a copula or a noun-verb distinction in this language', it is not. (The first assumption is clearly falsified by many pidgins and creoles, the second assumption is quite controversial.) In order to fulfill its mind sharing function a language must enable its users to ask and answer questions, but it need not mark the difference between assertions and questions by sentence particles. Unfortunately, existing reference grammars are almost exclusively organized from a semasiological perspective (cf. Mosel forthcoming). The explanation is not hard to find: Linguistics has a longer tradition of precisely defining forms than of precisely defining contents.

The third corollary of the conceptualization of language proposed above is that shared ontologies precede shared language not only logically, but also onto- and phylogenetically. In a paper on the neural foundations of intentions and actions in primates the neuroscientists Thomas Metzinger and Vittorio Gallese (forthcoming) write:

> "To have an ontology is to interpret a world. [...] the brain, viewed as a representational system aimed at interpreting our world, possesses an ontology too. [...] the motor system constructs goals, actions, and intending selves as basic constituents of the world it interprets. [...] Empirical evidence demonstrates that the brain models movements and action goals in terms of multimodal representations of organism-object-relations. Under a representationalist analysis, this process can be conceived of as an internal, dynamic representation of the intentionality-relation itself."

The title of the paper just quoted from is "The emergence of a shared action ontology: Building blocks for a theory". It is obvious that intentions and a shared action ontology (in addition to suffiently overlapping upper ontologies) are also required for successful linguistic communication: Agents must agree on what, e.g., an assertive or erotetic speech act is and what kind of perceivable action counts as performing one. So the domain ontology of linguistic phenomena must include several speech act

concepts such as illocution and propositional content. This will be presented in section 5 below. The following section outlines the top distinctions of the general ontology.

3. Conceptual building blocks of everyday life: GOEdL

The idea of GOEdL is to represent the most basic distinctions humans make in everyday life, i.e., the distinctions that seem to underlie their normal behaviour and which may contrast with what they think up when they start philosophizing. The acronym stands for General Ontology for Everyday Life and is intended to remind all users of its necessary incompleteness. The latest version of GOEdL is included in the appendix. Here only the first few top levels will be shortly commented on.

3.1. Top level distinctions

Many ontologies start out with a binary distinction between concrete and abstract entities[2], the distinguishing criterion being that the former are spatiotemporally located whereas the latter are not. But how about space and time and their kin themselves? They seem to be neither fully concrete (local space lacks temporal location, temporal space lacks localization) nor entirely abstract (they are not beyond both time and space) and so they are assigned to a third basic category called framing entity[3]. Finally there is a fourth top-level category for those entities that are both, albeit only partially, one part being concrete, the other one abstract. Therefore they are called concrete-abstract hybrids. Examples will be provided below. Here is the quaternary branching of the top node called Entity:

3.1. Top level distinctions

A. Framing entity   (provides spatiotemporal location)
B. Concrete entity   (spatiotemporally located)
C. Abstract entity   (not spatiotemporally located)
D. Concrete-abstract hybrid   (partially spatiotemporally located)

A better way of representation takes of course the form of a diamond:

```
    A
  B   C
    D
```

In order to understand the rest of the structure it is important to have a look at the daughters of the Concrete entity node first. The first one is obvious: External entities, located entirely outside anybody's mind are of core importance in any ontology of everyday life, since scepticism about the reality of the external world is restricted to philosophical contexts. The second one may be a little less obvious, since mental entities seem to be less graspable and therefore more abstract than, e.g., the tree across the street, but our criterion does not allow a choice: Mental entities like my intention to express this idea and your achievement in understanding it are clearly spatiotemporally located inside my and your mind (and hence also brain), respectively, and therefore concrete. Note that discontinuous entities are admitted both in the external and in the mental domain, and so the compound of my intention and your achievement is a mental entity again.

The third daughter of the Concrete entity node, the External-mental hybrid node, could be taken for granted as the meronomic combination of the other two, but it definitely deserves special mention because it is more important for everyday life than the other two taken in isolation. The reason is that I and you and the overt actions we perform are all external-mental hybrids. I will come back to this category below.

Each of the three category nodes has three daughters in turn. The following clip from GOEdL shows the parallelism between them:

B. Concrete entity   (spatiotemporally located)
I. External entity   (outside any mind)
A. External situation   (spatiotemporally coherent container)
B. External inventity   (content; primarily spatial meronomy)
C. External eventity   (content; primarily temporal meronomy)
II. Mental entity   (inside some mind or minds)
A. M-situation   (mental container; inherently bounded)
B. M-inventity   (mental content, primarily 'spatial' meronomy)
C. M-eventity   (mental content; primarily temporal meronomy)
III. External-mental hybrid   (located partially in and partially outside some mind or minds)
A. E-m hybrid situation   (compound of external situation and mental entities)
B. E-m hybrid inventity   (compound of external inventity and mental entities)
C. E-m hybrid eventity   (compound of external eventity and mental entities)

The first one of the three kinds of external entities is the situation kind. A situation is conceived of as a spatiotemporally coherent container with inherent boundaries. An external situation can be something very big like our universe from the Big Bang until today or something rather modest in size such as this room in Cambridge, MA, on this Sunday morning. Being conceived as containers, situations can be conceptualized exclusively, abstracting away from their contents, or inclusively, together with their contents.

The sister nodes of the situation node categorize the two kinds of content a situation can have. In a situation some state may prevail such as freezing, but most often there are also individuals that perform actions or are involved in other events. To achieve the proper generalizations GOEdL uses the labels inventity (short for individual or other inventory entity) and eventity (short for event or similar entity). The corresponding nodes in SUMO are labeled Object and Process, a similar distinction is made in DOLCE (Masolo et al. 2003) under the labels endurant and perdurant, whereas in philosophical circles the terms

continuant and occurrent seem to be preferred (Simons 1987).

Inventities include objects such as the coffee mug on my desk or substances such as the coffee in it. Although inventory entities exist both in local and temporal space, our everday life conceptualizations emphasize the former, local aspect at the expense of the latter, temporal one. So when we start to think about the parts of inventities we think about the handle of the mug (which just came off) and the portion of the coffee at the surface (which shows some crema) and not about the mug or the coffee half an hour ago, when the mug was still intact and the coffee consisted of beans.

Eventities, by contrast, especially events, tend to be subdivided primarily into temporal sections or phases (initial, central and final part of my talk) rather than local parts (portions of this talk projected to the screen as opposed to those that come from my mouth).

Internal or mental entities show a structure that is roughly analogous to that of the external entities, but there are some significant differences. The intrapersonal maximal mental situation of a person at some time is her mind frame a the given time and includes all mental contents. The inventory of a mental situation consists of all the mental inventities it contains including the mental images of what there is outside the mind. The eventities of a mental situation include processes such as solving a puzzle and states such as having in memory.

As mentioned above, external-mental hybrids are of prime importance for humans. The prototype of an external-mental hybrid inventity is the person. A person is a compound consisting of a external inventity, the person's body, and a mental situation, the person's mind[4]. The prototype of an external-mental hybrid eventity is an (overt) action. An action is a compound consisting of a external eventity, an agent's bodily movements, and a mental inventity, a currently activated representation of a reward-oriented goal-state[5]. And therefore a linguistic action or speech act is a compound consisting of an agent's (mostly sound producing) bodily movements and a currently activated representation of a goal-state (which in general includes a state where the agent has been understood).

3.2. Further distinctions and reentrancy

At the next level of specificity the subcategories of the three types of external entities introduced above include what is more or less known from the literature on noun-related and verb-related classes of entities and what is treated under labels such as count-mass distinction, aspectualities etc. Less familiar from other approaches is the important fact that at this level the GOEdL category of situation contains a crucial instance of reentrancy: An inclusive situation is defined as the meronomic sum (marked by '+') of an exclusive situation and an external entity (labels between asterisks are categories that occur elsewhere in the ontology, so asterisks mark points of reentrancy). Here are the five top levels of the external entity subontology of GOEdL:

I. External entity   (outside any mind)
  A. External situation   (spatiotemporally coherent container; inherently bounded)
      1. Exclusive situation   (situation without its content)
      2. Inclusive situation   (situation including its content)
       [= *1. Exclusive situation* + *I. External entity*]
  B. External inventity   (content; primarily spatial meronomy)
      1. Individual   (inherently space-bounded, question of completeness central)
        Count entity
        a. Absolute individual   (meronomically free)
        b. Relational individual   (meronomically bound)
            i. Super-individual   (meronomically superordinated)
            ii. Sub-individual   (meronomically subordinated)
      2. Dividual   (not inherently space-bounded, question Mass entity of completeness peripheral, homogeneous)
        a. Substance   (non-atomic)
        b. Collection   (atomic)
  C. External eventity   (content; primarily temporal meronomy)
      1. Characteristic   (not inherently time-bounded)
        a. Property   (inalienable)
        b. Stage   (alienable)
            i. Static stage: (force required for termination)
              State
            ii. Dynamic stage: (force required for maintenance)
              Activity
      2. Transition (stage changing)   (doubly time-bounded change)
        a. Transitional event: (not extended)
          Achievement
        b. Transitional process: (extended)
          Accomplishment
      3. Transient (stage preserving)   (doubly time-bounded interlude)
        a. Transient event: (not extended)
          Semelfactive
        b. Transient process: (extended)
          Intergressive

Among the eventities, the familiar distinction between states and activities is represented as two daughters of the common category of stage, defined as alienable or stage-level characteristic. Inalienable characteristics are called properties and correspond to individual level predicates. The three subcategories of external eventities include the distinction between the transitions and the transients. By contrast with the latter, the former are partially definable in terms of the associated stage

changes, they are a central category not only for computer science but also for verbal semantics[6]. We will see that for a proper categorization of oral illocutions both are required.

4. A Domain Ontology of Mental Entities: DOME

The five top levels of DOME can be looked up in the appendix under B. II. Mental entity. In order to develop DOLPhen, however, two categories will be required, which are more specific and therefore presented in a different place (they can also be found in the appendix). They are special cases of mental individuals on the one hand and of mental states on the other and will be presented shortly in turn.

4.1. An ontology of propositional contents

The concept of propositional content that is used in DOLPhen is not based on possible worlds (whole worlds don't show up in GOEdL at any place), but on an idea that goes back to Austin and has been revived and reshaped under the name of Austinian propositions by Barwise and Etchemendy (1987). According to this idea propositions are compounds consisting of a situation token and a situation type. Whereas Barwise and Etchemendy give a completely formal definition, DOME (and based on it DOLPhen) uses a cognitivized version of Austinian propositions where a mental image of a situation (be it concrete or abstract, external, mental or e-m-hybrid) is paired up with a mental representation of a situation type (which is always abstract).

A DOME-proposition is true (exactly in the spirit of Austin and Barwise and Etchemendy) if the given token is of the given type, and false else. Since propositional contents of interrogatives are neither true nor false, the are treated as underspecified or near-propositions, as opposed to the full propositions that can be the content of assertions. The situation token of a near-proposition is an exclusive situation only, so its truth value must remain indeterminate until the situation is completed to become an inclusive situation.

Open situation types are parametric in at least one respect, so they describe the corresponding token only partially. Here are the two top levels of the propositional content token subontology:

Propositional content token
1. Near-proposition token   (*exclusive i-situation* + *i-situation type*)
   a. Closed near-proposition   (*exclusive i-situation* + *closed i-sit type*)
   b. Open near-proposition   (*exclusive i-situation* + *open i-sit type*)
2. Full proposition token   (*inclusive i-situation* + *i-situation type*)
   a. Closed proposition   (*inclusive i-situation* + *closed i-sit type*)
   b. Open proposition   (*inclusive i-situation* + *open i-situation type*)
1. Plain proposition token   (*i-situation* + *plain i-situation type*)
2. Modalized proposition token   (*i-situation* + *modalized i-situation type*)
   a. Externally modalized proposition token
   b. Attitudinally modalized proposition token

Italicized category numbering codes cross-classification with categories on the same level that have roman numbers, i.e., both full and near-propositions can be either plain or modalized. The different kinds of modalization will be shortly addressed below (section 6).

4.2. An ontology of propositional attitudes

The notion of a propositional attitude used in DOME is that of a mental role of propositional content, i.e., of a mental stage (state or activity) of an agent with respect to such a content. SUMO classifies PropositionalAttitude as an abstract asymmetric binary relation, which is certainly correct for propositional attitude types, but misses the connection to concrete mental occurrences of this kind of attitude. Here are the four top levels of the subontology of propositional attitudes included in DOME:

Propositional attitude token
1. Presentative attitude token   (mental role of a blueprint proposition)
   a. Intention token   (feasibility by attitude holder required)
   b. Volition token   (feasibility required)
   c. Wish token   (feasibility irrelevant)
2. Representative attitude token   (mental role of a picture proposition)
   a. Knowledge token   (uncontroversially true)
     i. Transparent knowledge token   (content: *full proposition token*)
       A. Passive transparent knowledge   (*mental state*)
       B. Activated transparent knowledge   (*mental activity*)
     ii. Opaque knowledge token   (content: *near-proposition token*)
       A. Passive opaque knowledge   (*mental state*)
       B. Activated opaque knowledge   (*mental activity*)
   b. Belief token   (content: *full proposition token*; assumed to be true by attitude holder)
   c. Hypothetical assumption token   (content: *full proposition token*; truth irrelevant)

The first binary branching is in line with what most theoreticians assume, although under different labels: Davidson (1963) for instance speaks of conative or 'pro' attitudes as opposed to cognitive attitudes. In DOME the labels are presentative as opposed to representative attitudes, the former correspond to a world-to-mind direction of fit of their content ('blueprint'), the latter to a mind-to-world direction of fit of their content ('picture'). Of the three presentative attitudes the volitional one will be of prime importance for illucions, but wishes play a role as well and intentions are of course required for the performance of an illocution to take place at all.

Among the representative attitudes knowledge has the most central role for language use. In line with Zaefferer (2004, 2005) an important distinction is made between transparently conceptualized knowledge, where the content including its truth value is

fully visible because it is a full proposition, and transparently conceptualized knowledge, where the content is only partially visible and the truth value is excluded because it is a near-proposition. The distinction will be mainly needed for capturing the ontological difference between the propositional contents of questions and assertions.

Finally, the difference between passive and activated knowledge is shown, which goes back to the state vs. activity distinction at higher levels of DOME. It will be needed for the description of the range of goals of epistemic volitionals below.

5. A Domain Ontology of Linguistic Phenomena: DOLPhen

All building blocks that are needed for DOLPhen have been presented in the preceding sections. Here is one way of putting them together, a conceptualization of language use that is intended to be compatible with most if not all linguistic research programs, schools, enterprises and theories that are currently in use. The first thing to note is that linguistic phenomena show up in six different places in GOEdL. For the sake of illustration only the top categories of oral illocution tokens will be discussed here.

An oral illocution token is an action and hence an external-mental hybrid. Therefore it can be either monadic, involving only the agent's mind, or polyadic, involving also what happens in the mind(s) of the addressee(s) or other witnesses. In both cases it is an external-mental hybrid eventity where an external eventity causes one or more internal eventites. The subcategories of these eventities, however, are significantly different: Externally, the sound waves fade away, and the external situation shows no traces of a change, therefore the external part of an oral illocution is a (semelfactive or intergresssive) transient. Internally, however, the situation representations of the involved minds have changed in a characteristic way[7], therefore the internal parts of oral illocutions are transitions, in general internal achievements.

The first branching seperates the holistic from the structured illocutions. Holistic illocutions are performed with the help of interjections, they lack a propositional content. Structured illocutions are subdivided according to the major attitude they express. The largest group are the volitionals which aim at a clearly inferable goal: Either their propositional content describes that goal directly, in which case it is to be realized or the realization is granted, or the propositional content has to be interpreted as being epistemically modalized, in which case the goal is activated knowledge of the propositional content. For further details of this content-type driven approach to the question-assertion distinction see Zaefferer (in preparation).

The group of purely expressive illocutions is rather small, but there is an interesting group of hybrids that combine knowledge sharing with emotion sharing. It is proposed to subsume the rhetorical questions under the expressive assertives and to distinguish three kinds of exclamations. Here are the four top levels of DOLPhen's category 'Oral illocution token':

```
Oral illocution token
    a. Holistic illocution token                      (without propositional content)
    b. Structured illocution token                    (with propositional content)
        i. Volitional illocution
            A. General volitional                     (for goal sharing)
                I. Directive
                II. Permissive
            B. Epistemic volitional                   (for knowledge sharing)
                I. Assertive                          (content is a *full proposition*)
                    1. Assertion
                    2. Commissive
                    3. Declaration
                II. Erotetic                          (content is a *near-proposition*)
                    1. Polar question                 (content is a *closed near-proposition*)
                    2. Constituent question           (content is an *open near-proposition*)
        ii. Expressive illocution                     (for emotion sharing)
            A. Optative
                I. Narrow optative
                ii. Imprecative
        iii. Hybrid illocution                        (for knowledge and emotion sharing)
            A. Expressive assertive
                I. Direct expressive assertion        (content is a *full proposition*)
                ii. Indirect assertion                (rhetorical question)
                    1. Rhetorical polar question      (content is a *closed near-proposition*)
                    2. Rhetorical constituent question (content is an *open near-proposition*)
            B. Exclamation
                I. Overt constituent exclamation
                    1. Interrogative constituent exclamation   (content is an *open near-proposition*)
                    2. Demonstrative constituent exclamation   (content is an *open proposition*)
                II. Covert constituent exclamation    (content is an *open proposition*)
```

Finally it should be noted that oral illocution types as well as other types of language use are neither actions nor external-mental hybrids, but homogeneously abstract entities.

6. How to COPE with modal categories: Basic ideas of DOMCats (Domain Ontology of Modal Categories)

The conceptualization of illucutions presented in the preceding section is based on modal categories of different kinds: What is expressed in a structured illocutionary act is a certain propositional attitude towards a certain propositional content. And the achievement of sharing (part of) this attitude is the core of performing an illocution. But in order to share the internal I have to make external, I have to express it

Expressing a propositional attitude is conceptualized in DOLPhen as making ascribable: If an agent expresses her wish to be famous she entitles her audience to ascribe this attitude to her. In other words she causes or brings about a situation in which (assuming sincerity) this attitude can be inferred. In DOMCats propositions that are about acts of causation are treated as modalizations of the propositions that are about the outcome of such acts. Causation belongs to the external modalizations in DOMCats, which are a sister category of attitudinal modalisations. For further details compare Zaefferer (forthcoming a) This rather encompassing notion of modal category makes it possible to construct all higher ingredients of DOLPhen from other parts of GOEdL.

Modal categories are of course of prime importance for language description. Therefore the current version of GOLD contains 15 morphosyntactic features that are modality features (cf. below). I will conclude this paper with two very short remarks on this highly plausible proposal.

LinguisticFeature
  MorphosyntacticFeature
    ModalityFeature
      AnyModality
        NecessityModality
        PossibilityModality
          AbilitiveModality
            MentalAbilitiveModality
            PhysicalAbilitiveModality
              ConditionalPhysicalAbilitiveModality
        EpistemicModality
          EpistemicNecessityModality
          EpistemicPossibilityModality
        DeonticModality
          PermissiveModality
          ObligativeModality
          WeakObligativeModality
        OtherModality

First, since DEONTICMODALITY and EPISTEMICMODALITY are cross-classified with POSSIBILITYMODALITY and NECESSITYMODALITY the question arises whether the latter two should not be cross-classified with all other modalities, that is with ABILITIVEMODALITY as well as with OTHERMODALITY. In Zaefferer (fourthcoming a) I have argued that this is in fact unavoidable, because modal operators on propositions admit of inner and outer negation and come therefore in duality groups or instances of the square of opposition. Necessitiy and possibility are just two operators that occupy two vertices of such a square. One could of course presume that the reason for the absence of ABILITIVEPOSSIBILITYMODALITY and ABILITIVENECESSITYMODALITY from this subontology of GOLD (or rather the latter, the former is implicitly there, but need not be expressed because its dual counterpart is missing) may be due to the assumption, that no natural language codes the latter (agent is unable to suppress some behavior) by grammatical means. But this brings me to the second point.

The above subontology is of course nothing that is restricted to morphosyntactic features. Rather it is the core of a semantic or even purely notional ontology of proposition types. Therefore it should show up at different positions of GOLD, that is, it should be a case of reentrancy. And one could start of course also from the other end: Define first notional and then semantic categories and then see which ones are also useful in the context of morphosyntactic features. In Zaefferer (2003: 6) I have proposed to make a distinction between grammatical components that are semantically anchored and other ones that are purely formal. "Semantically anchored grammatical components are in the default case intepeted as the conceptual categories they are anchored in (e.g. singular number in cardinality one). Purely formal grammatical components only codetermine the coding of semantically anchored grammatical components (e.g. inflexion classes)." If that is correct, all semantically anchored morphosyntactic features can be defined via reentrancy of categories that are needed in other places of GOLD anyway.

7. Conclusion

In this paper I have tried to give a very rough overview of GOEdL and DOLPhen and to compare them sporadically with SUMO and GOLD. It turned out that especially with GOLD there are only very points of contact so far, since GOLD, despite its connections with SUMO, is being built mostly bottom-up whereas DOLPhen is derived top-down from other categories that are needed in GOEdL anyway. This is a good basis for safely predicting mutually fruitful exchange between the enterprises in the near future.

Appendix

App.1. GOEdL (General Ontology of Everyday Life)
A. Framing entity (provides spatiotemporal location)
  I. Local space (not inherently directed)
  II. Temporal space (inherently directed)
  III. Direction (directed, not bounded or closed)
  IV. Path (bounded or closed directed space)
    A. bounded open path (semi-bounded)
      1. allative path (goal bounded)
      2. ablative path (source bounded)
    B. bounded closed path (completely bounded)
    C. unbounded closed path (cyclic)
B. Concrete entity (spatiotemporally located)
  I. External entity (outside any mind)

A. External situation (spatiotemporally coherent container; inherently bounded)
  1. Exclusive situation (situation without its content)
  2. Inclusive situation (situation including its content)
[= *1. Exclusive situation* + *I. External entity*]
B. External inventity (content; primarily spatial meronomy)
  1. Individual (inherently space-bounded, question of Count entitycompleteness central)
    a. Absolute individual (meronomically free)
    b. Relational individual (meronomically bound)
      i. Super-individual (meronomically superordinated)
      ii. Sub-individual (meronomically subordinated)
  2. Dividual (not inherently space-bounded, question Mass entity of completeness peripheral, homogeneous)
    a. Substance (non-atomic)
    b. Collection (atomic)
C. External eventity (content; primarily temporal meronomy)
  1. Characteristic (not inherently time-bounded)
    a. Property (inalienable)
    b. Stage (alienable)
      i. Static stage: (force required for termination)
State
      ii. Dynamic stage: (force required for maintenance)
Activity
  2. Transition (stage changing) (doubly time-bounded change)
    a. Transitional event: (not extended)
Achievement
    b. Transitional process: (extended)
Accomplishment
  3. Transient (stage preserving) (doubly time-bounded interlude)
    a. Transient event: (not extended)
Semelfactive
    b. Transient process: (extended)
Intergressive
  DOME (Domain Ontology of Mental Entities, cf. below)

II. Mental entity (inside some mind or minds)
  A. M-situation (mental container; inherently bounded)
  B. M-inventity (mental content, primarily 'spatial' meronomy)
    1. M-individual (inherently space-bounded, question of completeness central)
      a. Absolute m-individual (meronomically free)
        i. I-situation (mental image of a situation)
        ii. I-inventity (mental image of an inventity)
        iii. I-eventity (mental image of an eventity)
      b. Relational m-individual (meronomically bound)
        i. M-super-individual (meronomically superordinated)
        => Propositional content token
        ii. M-sub-individual (meronomically subordinated)
  C. M-eventity (mental content; primarily temporal meronomy)
    1. M-characteristic (not inherently time-bounded)
      a. M-property (inalienable)
      b. M-stage (alienable)
        i. Static m-stage: Mental state
        => Propositional attitude token
        ii. Dynamic m-stage: Mental activity
    2. M-transition (doubly time-bounded mental change)
      a. Transitional m-event: Mental achievement
      => Understanding token
      b. Transitional m-process: Mental accomplishment
    3. M-Transient (doubly time-bounded mental interlude)
      a. Transient m-event: Mental semelfactive
      b. Transient m-process: Mental intergressive
III. External-mental hybrid (located partially in and partially outside some mind or mind)
A . E-m hybrid situation (compound of external situation and mental entities)
  B. E-m hybrid inventity (compound of external inventity and mental entities)
  => Person
    => Self
    => Other
  C. E-m hybrid eventity (compound of external eventity and mental entities)
  => Action performance token
  => Oral illocution token: DOLPhen-o
  => Signed illocution token
C. Abstract entity (not spatiotemporally located)
  I. Abstract framing entity (provides abstract location)
  II. Type of concrete entity
    A. Type of external entity
    B. Type of mental entity
    C. Type of external-mental hybrid
      1. Type of e-m hybrid situation
      2. Type of e-m hybrid inventity
    => Inscription type

3. Type of e-m hybrid eventity
   => Oral illocution type: DOLPhen-O
   => Signed illocution type: DOLPhen-S
  III. Type of abstract entity
  IV. Type of concrete-abstract hybrid
D. Concrete-abstract hybrid (partially spatiotemporally located)
  I. C-a hybrid situation (compound of concrete situation and abstract entities)
  II. C-a hybrid inventity (compound of concrete inventity and abstract entities)
    1. C-a hybrid individual
    => Inscription token
  III. C-a hybrid eventity (compound of concrete eventity and abstract entities)
    3. C-a hybrid transient (inherently doubly time-bounded;extended)
      a. Transient event: Semelfactive
      b. Transient process: Intergressive
      => Anadic oral language use token (oral illocution token) => DOLPhen-o'
      => Signed language use token

App.2. Two excerpts from DOME (Domain Ontology of Mental Entities):
App.2.1. Propositional content token (i-situation with i-situation type)
[Idea: Cognitivized Austinian propositions (cf. Barwise and Etchemendy 1987, Zaefferer 2005)]
1. Near-proposition token (exclusive i-situation with i-situation type)
  a. Closed near-proposition (exclusive i-situation with closed i-sit type)
  b. Open near-proposition (exclusive i-situation with open i-sit type)
2. Full proposition token (inclusive i-situation with i-situation type)
  a. Closed proposition (inclusive i-situation with closed i-sit type)
    i. True closed proposition token (mental image of a correctly typed sit)
    ii. False closed proposition token (mental image of an incorrectly typed s)
  b. Open proposition (inclusive i-situation with open i-situation type)
1. Plain proposition token (i-situation with plain i-situation type)
2. Modalized proposition token (i-situation with modalized i-situation type)
  a. Externally modalized proposition token
    i. Modalized action proposition token
    ii. Modalized general proposition token
  b. Attitudinally modalized proposition token
    i. Presentatively modalized proposition token [cf. *Presentative attitude token*]
    ii. Representatively modalized proposition token [cf *Representative attitude token*]

App.2.2. Propositional attitude token (mental role of *propositional content*, mental stage of an agent wrt a content)
1. Presentative attitude token (mental role of a blueprint proposition)
  a. Intention token (feasibility by attitude holder required)
  b. Volition token (feasibility required)
  c. Wish token (feasibility irrelevant)
2. Representative attitude token (mental role of a picture proposition)
  a. Knowledge token (uncontroversially true)
    i. Transparent knowledge token (content: full proposition token)
      A. Passive transparent knowledge (*mental state*)
      B. Activated transparent knowledge (*mental activity*)
    ii. Opaque knowledge token (content: near-proposition token)
      A. Passive opaque knowledge (*mental state*)
      B. Activated opaque knowledge (*mental activity*)
  b. Belief token (content: full proposition token assumed to be true by attitude holder)
  c. Hypothetical assumption token (content: full proposition token; truth irrelevant)

App.3. DOLPhen (Domain Ontology of Linguistic Phenomena)
App.3.1. DOLPhen-o (Oral illocution token)
Oral illocution token
  a. Holistic illocution token (without propositional content)
  b. Structured illocution token (with propositional content)
    i. Volitional illocution
      A. General volitional (for goal sharing)
        I. Directive
        II. Permissive
      B. Epistemic volitional (for knowledge sharing)
        I. Assertive (content is a *full proposition*)
          1. Assertion
          2. Commissive
          3. Declaration
        II. Erotetic (content is a *near-proposition*)
          1. Polar question (content is a *closed near-proposition*)
          2. Constituent question (content is an *open near-proposition*)
    ii. Expressive illocution (for emotion sharing)
      A. Optative
        I. Narrow optative
        ii. Imprecative
    iii. Hybrid illocution (for knowledge and emotion sharing)
      A. Expressive assertive
        I. Direct expressive assertion (content is a *full proposition*)
        ii. Indirect assertion (rhetorical question)
          1. Rhetorical polar question (content is a *closed near-proposition*)

    2. Rhetorical constituent question (content is an *open near-proposition*)

  B. Exclamation

    I. Overt constituent exclamation

      1. Interrogative constituent exclamation (content is an *open near-proposition*)

      2. Demonstrative constituent exclamation (content is an *open proposition*)

    II. Covert constituent exclamation (content is an *open proposition*)

Notes

[1]. In the CRG project, the priority of onomasiology was originally reflected in the development of a so-called concepticon, a universal inventory of linguistically codable concepts. But then it turned out that as soon as the rich network of interconceptual relations is also accounted for, such a concepticon turns out to be what people from artificial intelligence call an ontology. This is how the research program called ontolinguistics emerged.

[2]. The first branching in SUMO is Physical versus Abstract, which makes a seemingly small, but as will become clear soon important difference.

[3]. This is of course inspired by Kant's (1781) idea of the exceptional role of the Formen der Anschauung.

[4]. There is no inconsistency if one reads 'located inside' as 'included' and conceives inclusion as weakly ordered relation.

[5]. This is in line with Metzinger and Gallese (forthcoming), who give the following definition: "Actions are a specific subset of goal-directed movements: A series of movements that are functionally integrated with a currently active representation of a goal-state as leading to a reward constitute an action."

[6]. For an interesting approach that brings them together in a two-dimensional meaning representation [7]. For Krifka (2004) "speech act types are commitment change potentials."

References

Ameka, Felix, Alan Dench, Nicholas Evans (eds.)(forthcoming): *Catching language: the standing challenge of grammar writing.* Berlin: Mouton de Gruyter.

Barwise, Jon, and John Etchemendy (1987). *The Liar. An Essay in Truth and Circularity.* Oxford: Oxford University Press.

Davidson, Donald (1963). *Actions, reasons and causes.* Journal of Philosophy, 60, 685-700.

Dwyer, Arienne M (2003): *Transcription and Annotation. Working Group Report* [http://emeld.org/workshop /2003/textannotation-summary.pdf]

Farrar, Scott (2003). "An ontological account of linguistics: Extending SUMO with GOLD." *Proceedings of the 2003 IEEE International Conference on Natural Language Processing and Knowledge Engineering.* Beijing: IEEE Press.

Kant, Immanuel (1781). *Kritik der reinen Vernunft,* Ditzingen: Reclam, 2003.

Krifka, Manfred (2004). "Semantics Below and Above Speech Acts." *Hand-out for a talk given at Stanford University*, April 9, 2004.

Masolo, C., Gangemi, A., Guarino, N., Oltramari, A., and Schneider, L. (2002). *WonderWeb Deliverable D17: The WonderWeb Library of Foundational Ontologies.*

Mayr, Ernst (2004). *What Makes Biology Unique?* Cambridge: Cambridge University Press.

Mosel, Ulrike (forthcoming): *"Grammaticography - the art and craft of writing grammars".* - In: Ameka, Felix, et al. (eds.).

Nickles, Matthias (2001): *Systematics - Ein XML-basiertes Internet-Datenbanksystem für klassifikationsgestütze Sprachbeschreibungen.* Universität München: Centrum für Informations- und Sprachverarbeitung CIS-Bericht-01-129. [http://www.cis.uni-muenchen.de/CISPublikationen.html]

Peterson, John (2002): AVG 2.0. *Cross-linguistic Reference Grammar. Final Report.* Universität München: Centrum für Informations- und Sprachverarbeitung, CIS-Bericht-02-130. [http://www.cis.uni-muenchen.de/CISPublikationen.html]

Schalley, Andrea C. (2004). *Cognitive Modeling and Verbal Semantics.* Berlin: Mouton de Gruyter.

Schalley, Andrea C. (in preparation). *"Relating ontological knowledge and internal structure of eventity concepts"*- In: Schalley and Zaefferer (eds.).

Schalley, Andrea C., and Dietmar Zaefferer (eds.)(in preparation). *Ontolinguistics. How ontological status constrains the coding of concepts.*

Simons, Peter (1987). *Parts: a Study in Ontology.* Oxford: Clarendon Press.

Zaefferer, Dietmar (2001): *Modale Kategorien.* - In: Martin Haspelmath, Ekkehart König, Wulf Oesterreicher, Wolfgang Raible (Hgg.), Sprachtypologie und sprachliche Universalien (HSK 20.1). Berlin: Mouton de Gruyter, 784-816.

Zaefferer, Dietmar (2003): *"A unified representation format for spoken and sign language texts"* [http://emeld.org/workshop/2003/zaeff-paper.doc]

Zaefferer, Dietmar (2004): *"Competition is Good for Descriptions: For a Consensus on Dissenting Entries as Desideratum for Linguistic Database Design"* [http://emeld.org/workshop/2004/proceedings.html]

Zaefferer, Dietmar (2005): *"Towards a principled typology of propositional contents"*, handout for talk give at ZAS Berlin, 31. March 2005.

Zaefferer, Dietmar (forthcoming a): *"A general typology of modal categories".* - Tidsskrift for Sprogforskning 3/2 2005, temanummer "Modalitet".

Zaefferer, Dietmar (forthcoming b): *"Realizing Humboldt's dream: Cross-linguistic grammatography as database creation".* - In: Ameka, Felix, et al. (eds.).

Zaefferer, Dietmar (in preparation): *"Language as mind sharing device. Mental and linguistic concepts in a general ontology of everday life".* - In: Schalley and Zaefferer (eds.).