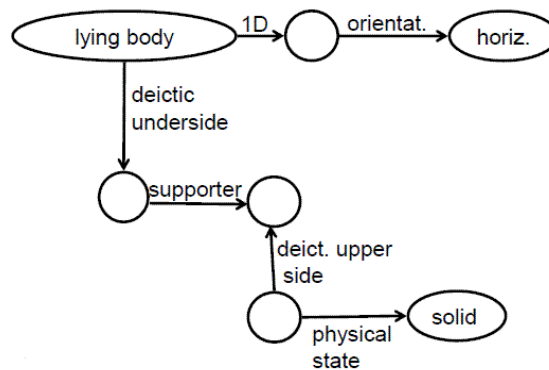


## Sitting, Standing, and Lying in Frames: a frame-based approach to stative verbs of location

Stative verbs of location (SVLs) such as *stand*, *sit*, and *hang* encode gestalt properties and positional information, which are perceived by means of cognitive modules such as gestalt recognition and spatial orientation. Like spatial prepositions and dimensional adjectives, stative verbs of location are thus an excellent object of the investigation of cognition and language. The properties that are relevant to the choice of a specific SVL in German were established, among others, by Berthele 2004, Kaufmann 1995, Kutscher & Schultze-Berndt 2007, and Serra Borneto 1996. These properties include (i) the way the localized object is kept in its position (e.g. support from below in the case of *sitzen* ‘sit’ and support from above in the case of *hängen* ‘hang’), (ii) the state of matter of the supporting medium (e.g. *schwimmen auf* ‘be afloat on’ versus *liegen auf* ‘lie on’) and (iii) the orientation of the most prominent object axis (e.g. *die Leiter steht* ‘the ladder is standing’ versus *die Leiter liegt* ‘the ladder is lying’). Moreover, properties of the localized object such as animacy determine the choice of the SVL. Kaufmann (1995) proposes an analysis in which these properties are explicitly implemented as conjuncts in predicate logic representations. Following Lang (1989), she assumes that part of the spatial requirements that are imposed by the SVL on the localized object is captured in object schemata.

In our talk, we present a frame analysis of German SVLs which builds upon Kaufmann’s analysis and in which the relevant properties of the meaning of the above-mentioned SVLs as well as Lang’s object schemata are translated into frame representations. Following Barsalou (1992), we define frames as recursive attribute value structures, which are represented as directed, labeled graphs with arcs corresponding to the attributes and nodes corresponding to the values (Petersen 2007). Attributes constitute the basic elements of frames and correspond to partial functions. Figure 1, which is an excerpt of the frame representation for *lie*, illustrates how the relevant meaning components of an SVL, in particular its selectional restrictions, are captured in a frame:



**Figure 1: excerpt of the frame representation for the SVL *lie***

The support relation is analyzed by decomposing it into the supported part of the localized object (deictic underside) and the supporting ground (deictic upper side). The state of matter of the ground is determined by the value ‘solid’ of the attribute ‘physical state’ and the spatial orientation of the localized object is specified by translating Lang’s object schema into the attribute ‘1D’ (for the most prominent object axis) and its embedded attribute ‘orientation’ with the value ‘horizontal’. Note that the frame excerpt is embedded into a larger frame representation that models the general figure-ground schema we assume for verbs of location. By capturing the selectional restrictions of SVLs uniformly in terms of frame representations, the combinatorics of the SVL, the subject, which refers to the localized entity, and the local PP, which introduces the ground, is described as the unification of the frames provided by these elements. A violation of the selectional restrictions of the SVL then corresponds to a failure of unification.

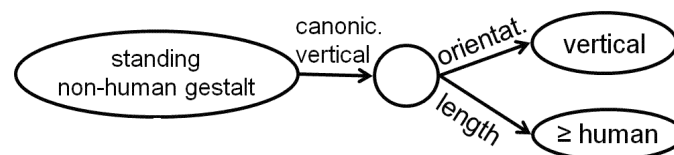
We argue that the confinement to recursive attribute value structures with attributes as basic elements will lead not only to more explicitness but also to a cognitively more plausible, variable-free analysis. Our approach enables us to capture the SVLs attested in a given language as a licensed combination of attributes, which can be modeled in a type hierarchy. The resulting type hier-

rarchy of SVLs is part of the model rather than being an informal, extra-representational taxonomy as in some of the existing approaches. Moreover, specific uses of an SVL can be captured as a subtype of a general supertype or of an abstract supertype ‘be localized’ in the type hierarchy. Due to its flexibility, the frame approach also allows for capturing alternative analyses which identify different factors for the selection of a specific SVL or put different emphasis on the semantic components of an SDV. For example, Kutscher & Schultze-Berndt (2007) following Serra-Borneto (1996) assume that *stehen* ‘stand’ is generally used for figures having a clearly distinguishable “base” such as the legs/feet of animates. In the talk, we will shortly discuss alternative accounts and their adoption in a frame analysis.

Finally, we will show that frame representations are particularly suitable for capturing the language specific use of SVLs and that language-specific contrasts can be traced to the contrast between admissible and non-admissible types in the type hierarchy, as we will illustrate by a comparison between German, French and Korean SVLs. For instance, properties of the located figure play a role in contrasts between German and French: the German verb *liegen* ‘lie’ in (1a) can be translated into French by the three variants given in (1b) if the subject referent is animated. If, however, the subject referent is non-animated such as *Buch/livre* ‘book’ in (2) only the first variant is accessible in French.

- (1) a. German: *Maurice liegt auf der Wiese.*  
 b. French: *Maurice se trouve / est allongé / est couché dans le pré.*  
 ‘Maurice is lying on the meadow.’
- (2) a. German: *Das Buch liegt auf dem Tisch.*  
 b. French: *Le livre se trouve / \*est allongé / \*est couché sur la table.*  
 ‘The book is lying on the table.’

Similarly, the (complex) Korean verbs *nwuwe-issta* ‘lie’ and *anca-issta* ‘sit’ exhibit an animacy restriction while the verb *se-issta* ‘stand’ allows for a non-human subject referent but only if it is as tall as or taller than humans (Song 2002). We show that the restrictions that hold for French and Korean SVLs can be captured elegantly in a frame analysis by means of a restriction on the type of the subject referent. Figure 2 indicates how the size restriction of the Korean verb *se-issta* ‘stand’ can be modeled in a frame.



**Figure 2: excerpt of the frame representation for the Korean SVL ‘stand’**

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