

Scale based particles and prefixes in German de-adjectival verbs

The paper presents a compositional theory of verb-particle- and prefix- constructions with *auf* (up), *an* (no Engl. equivalent), *ab* (down) and *über* (over) with an adjectival core from their roots. The analysis builds on principles from Kennedy and Levin [2008] and Pedersen [2015] but implement them as building blocks of meaning at the syntax-semantics interface in a framework combining *Minimalist Syntax* with *Discourse-Representation-theory* (DRT) (cf. Rossdeutscher [2015] and references therein). At the bottom of the construction the adjectival roots combine with functional heads that introduce different types of scales, which in turn undergo modification at higher functional levels introducing particles or prefixes and the verbalizer. (Details must be skipped for reasons of space).

Background Pedersen [2015] following Kennedy and Levin [2008] presents a taxonomy of gradable adjectives (ADJs), the properties of which are decisive for structural properties of the derived verbs. Total adjectives ADJs correspond to scales that are at least top-closed, partial ADJs to scales that are only bottom-closed, relative ADJs to scales that are neither bottom- nor top-closed (cf. Table 1). German ADJs (italics) are added to the taxonomy accordingly, telling apart the relative ADJs into those with positive and with negative degrees (typewriter).

gradable		
absolute		relative
total	partial	
dry, straight, empty... <i>trocken</i> (dry), <i>heil</i> (healthy) <i>sauber</i> (clean), <i>leer</i> (empty),...	wet, blurry, dirty,... <i>reif</i> (ripe), <i>scharf</i> (sharp), <i>schmutzig</i> (dirty), <i>spitz(ig)</i> (peaky),...	wide, tall, strong,... <i>heiß</i> (hot), <i>warm</i> (warm), <i>stark</i> (strong), <i>hell</i> (light), <i>kühl</i> (cool), schwach (weak), dunkel (dark), kurz (short),...

Table 1. Taxonomy of Adjectives

The theory of derived verbs with a (gradable) adjectival core in Kennedy and Levin [2008] builds on the idea that the Aktionsart of the verbs is predictable from scale properties of the respective ADJs. The denotation of an adjective is a measure-function **m**. For (relative) ADJs such as *wide* the measure-functions are difference functions that represent a property that is true of an individual if it stands out relative to some standard degree of comparison. E.g. an object is *wide* if its width exceeds the standard width of comparison. The adjectival core of a Degree Achievement (DA) is a special kind of measure function, the MEASURE OF CHANGE FUNCTION **m_Δ** derived from the measure-function **m** at work in determining the denotation of an A. A MEASURE OF CHANGE FUNCTION **m_Δ** measures the amount that an object changes as the result of partaking in the event e. Its individual argument x is mapped onto a derived scale whose minimal degree is the degree to which x is measured by **m** at the initiation of e.

What is important for our application is the fact that the derived MEASURE OF CHANGE FUNCTIONS have a derived minimal degree, but 'inherit' the maximum of the scale from the original measure functions **m**, — if they have one. With this and a general principle of *Interpretive Economy*, which makes the contextual standard of comparison a matter of 'last resort', only, Kennedy and Levin [2008] predict (default) telic readings of DAs derived from 'top-closed' and exclusively atelic readings for those derived from 'top-open' As; e.g. for the verb *widen*.

The contribution of scale based particles and prefixes There are telling restrictions on the constructions with particles and prefixes in the context of verbs with adjectival cores. Table 2 exemplifies the grammatical and the ungrammatical combinations of scalar

readings of *auf* (up), *an* () and *ab* (down) for the classes in Table 1.

<i>einen Patienten</i> (patient) * <i>aufheilen</i> , * <i>anheilen</i> , * <i>abheilen</i> ,...	<i>eine Banane</i> (a banana) * <i>aufreifen</i> , √ <i>anreifen</i> , * <i>abreifen</i> ,...	<i>eine Suppe</i> (a soup) √ <i>aufwärmen</i> , √ <i>anwärmen</i> , * <i>abwärmen</i> * <i>aufkühlen</i> , * <i>ankühlen</i> , √ <i>abkühlen</i> ,...
---	---	---

Table 2: Formation restrictions for 'scalar' particles with gradable adjectival cores

The reader should know that all ADJs with partial 'adjectival cores' in Table 1 combine with *an* but none with *auf* and all positive relative go with both, *an* and *auf*, although the constructions are sometimes built ad hoc. None of the particles combines with 'top-closed' ADJs; relative positive ADJs are found in constructions with both, *auf* (up) and *an*; *ab* (down) is exclusively found with relative negative ADJs.

Proposal Intuitively, *die Banane reifte an* (the banana partially riped) describes that the banana underwent change from a minimal degree of ripeness to some non-minimal degree that, however, is lower than the degree of ripeness that counts as 'ripe' for a banana. Similar things obtain for *anwärmen*. This supports the natural predication with participles such as *angereift*, *aber nicht reif*; *angewärmt*, *aber nicht warm*; (... , but not ripe; warm, resp.). *aufwärmen* describes a change from some degree of warmth in the pre-state to some degree at least as high as the standard degree of *warmth* in the resultant state. A predication like *aufgewärmt*, # *aber nicht warm* is an odd thing to say. *über* (over) in *überwärmen* contributes that the change exceeds a threshold of warmth to the effect of being undesirable or dangerous. *abkühlen* (to cool down) describes a change from some initial degree of coolness (which is a at the same time some degree on the warmth scale) to an undetermined higher element on the scale of coolness (i.e. lower degree on the warmth scale); *abgekühlt*, *aber nicht kühl* (cooled down, but not cool) is a natural thing to say.

Hypotheses: The contributions of the particles and prefixes (i) ***auf*** (up) selects adjectival cores with derived scales that have context dependent maximal elements as well as context dependent minimal elements; it determines some value above the context dependent standard comparison on the derived scale as its upper bound. A tentative principle that the changes of de-adjectival verbs do not involve change from both minimal up to maximal elements on a scale (for instance, *to empty* does not involve change from completely full to completely empty (cf. Pedersen [2015]:398)) might exclude *auf* to combine with de-adjectival cores from bottom-closed ADJs. (ii) ***an*** selects adjectival cores built on top-open scales of the ADJ's measure-functions. *an* provides a boundary on the derived scale, which, however, is lower than the standard value of ADJ's measure-function. (iii) ***ab*** (down) combines with DAs with negative degrees.

Consequences (among others): (i) The **Hypotheses** predict that both, (unmodified) *an*- and *auf*-verbs are telic, because the derived scales have an upper bound — while the simple de-adjectival verbs (e.g. *reifen* (to ripe), *wärmen* (to warm)) aren't. (Unmodified) *ab*-verbs are predicted to have atelic readings, just like the simple DAs (leaving special conventionalised meanings aside (cf. Kennedy and Levin [2008])). The predicted derived Aktionsart profiles can in fact be given evidence by standard tests. (ii) The verbs of exhaustiveness with the meaning 'get completely healthy, empty, clean', respectively, derived with ADJs from the 'total'-class all combine with *aus* (out), e.g. *ausheilen*, *ausleeren*.

References

C. Kennedy and B. Levin. Measure of change: The adjectival core of degree achievements. In L. McNally and C. Kennedy, editors, *Adjectives and Adverbs: Syntax, Semantics and Discourse*, pages 156–182. Oxford University Press, Oxford, UK, 2008.

Walter Pedersen. A scalar analysis of *again*-ambiguity. *Journal of Semantics*, 32:373–424, 2015.

Antje Rossdeutscher. Hidden universal quantification and change of argument structure in particle-verb constructions. In *Proceedings of Sinn und Bedeutung 19*, 2015.