

On the interplay of compositionality and coercion:

The case of German causal *von*-PPs

Problem and data: German causal *von*-PPs that act as modifiers in adjectival copula sentences support both an eventive (1) and a stative (2) reading, and they tolerate certain coercive adaptations of their causal relata.

- (1) Paul war müde von der Reise / von den Tabletten. eventive reading
 Paul was tired from the trip / from the pills
- (2) Der Platz war rot von den Blättern. stative reading
 The square was red from the leaves

In (1), *von* expresses a causal relation between a trip / some event related to the pills and an inferred result state of Paul becoming tired. In (2), the square's property of being red is based on the redness of the leaves, which are supposed to be holistically located on the square. (Sentence (2) is ambiguous, i.e., it supports also an eventive reading of the *von*-PP, according to which the leaves stained the square red.) Note furthermore that German *von* appears to impose stronger restrictions on the internal argument than its English cognate *from*: Whereas *von* (as opposed to *wegen* 'because-of') is clearly ruled out in (3), the *from*-version is judged as acceptable by (some) native speakers of English.

- (3) *Paul war arm von schlechten Geldanlagen. ✓ wegen schlechter Geldanlagen
 Paul was poor from bad investments because-of bad investments

As for the syntax, eventive and stative *von*-PPs can be shown to have different adjunction sites within the AP. Syntactic tests concerning sentential negation, topicalization, pseudo-clefts and manner anaphora (e.g. Frey 2003) suggest that eventive *von*-PPs are AP-modifiers, whereas stative *von* attaches to A; see, e.g., the negation and topicalization data in (4) and (5).

- (4) a. Paul war (nicht) von der Reise(nicht) müde.
 Paul was (not) from the trip (not) tired
 b. Der Platz war (nicht) von den Blättern (*nicht) rot.
 The square was (not) from the leaves (not) red
- (5) a. Von den Blättern ist der Platz rot gewesen. only eventive reading
 From the leaves has the square red been
 b. Rot gewesen ist der Platz von den Blättern. only eventive reading
 Red been has the square from the leaves

The data in (1)-(5) raise the question of how compositional semantics, coercion mechanisms, and the lexicon conspire to derive eventive/stative readings of *von*-PPs in copula sentences.

Proposal: We propose to account for the above data in the following way: **1.** Both readings express direct causation, i.e., the causal chain is not interrupted by other causal factors (e.g. Wolff 2003), and cause and effect exhibit spatiotemporal contiguity (e.g. Vecchiato 2011). **2.** The two readings differ wrt. what Shibatani (1973) calls ballistic vs. continuous causation (ballistic causation: the cause precedes the effect, e.g. *Paul threw the box into the river*; continuous causation: cause and effect occur almost simultaneously, e.g. *Paul pulled the box into the river*). **3.** More specifically, the eventive reading is based on a ballistic causal relation between events: cause (e, e'), and the stative reading is based on a continuous causal relation between tropes: cause (r, r'). **4.** We understand tropes with Moltmann (2007, 2013) as concrete manifestations of a property in an individual. They act as implicit arguments of adjectives and can be referred to by adjective nominalizations such as German *Müdigkeit* 'tiredness', *Röte* 'redness'. Most importantly, tropes share with events the property of being causally efficacious. **5.** The ontological axioms in (6) and (7) spell out the conditions on spatiotemporal contiguity for direct ballistic and continuous causation.

- (6) **ballistic causation:** eventive reading
 a. $\forall e \forall e'$ cause (e, e') $\rightarrow \tau(e) \supset \tau(e')$ \supset : temporal abutment
 b. $\forall e \forall e'$ cause (e, e') $\rightarrow p(e) \circ p(e')$ \circ : spatial contact; p: place function
- (7) **continuous causation:** stative reading
 a. $\forall r \forall r'$ cause (r, r') $\rightarrow \tau(r') \subseteq \tau(r)$
 b. $\forall r \forall r'$ cause (r, r') $\rightarrow p(r') \subseteq p(r)$

These axioms (which are independently motivated) account for many of the observed properties of causal *von*-PPs. (3), e.g., can be ruled out due to (6a) (whereas the preposition *wegen* and maybe also English *from* do not require direct causation). Furthermore, the holistic location of the internal argument in the stative case (2) follows from (7b): The spatial extension of the square's redness falls within the spatial extension of the leaves' redness. Thus, the leaves must be spread over the square. **6.** Within certain well-defined limits, conflicts between the type requirements of a lexical item and its compositionally supplied argument may be solved via coercion. We will argue, following Asher (2011), that coercion is crucially a matter of lexical semantics, not of general pragmatics. Specifically, *von* tolerates the inference of a suitable event or trope if its internal argument is of type object instead of the expected type (e.g. the pills in (1) and the leaves in (2)), and it supports the interpolation of an inchoative event in the eventive reading (e.g. (1)); see *von*'s lexical entry in (11). **7.** Whether *von* expresses eventive or stative causation is determined by the syntactic adjunction site of the modifier. Close to A, the *von*-PP targets the adjectival trope argument. We will argue for an existential closure operation for predicative APs at the AP-boundary, which binds the trope argument and introduces a state argument as target for potential modifiers; see (9).

Formalization: Our proposal is spelled out within Asher's (2011) framework of a type-driven, context-sensitive compositional semantics. Due to lack of space, we can only provide the relevant lexical entries in a somewhat simplified notation as in (8)-(11). Skipping intermediate steps, the resulting compositions are given in (12)-(14). (Type specifications for a variable are provided in bold after the colon. The coercive potential of a lexeme is specified by means of Asher's polymorphic types $\alpha - \alpha(\beta)$: if a type requirement α cannot be met compositionally, α may be justified via β .)

- (8) *rot* ('red'): $\lambda x \lambda r:\mathbf{trope}$ [bearer (x, r) & redness (r)]
- (9) Existential closure operation at AP-boundary: $\lambda P \lambda x \lambda s:\mathbf{state} \exists r [s: P(x)(r)]$
- (10) *sein* ('to be'): $\lambda P \lambda x \lambda s [P(x)(s)]$
- (11) a. *von* eventive reading: $\lambda c:\mathbf{event} - \mathbf{event}$ (object) $\lambda c':\mathbf{event} - \mathbf{become}$ (state) [cause (c, c')]
 b. *von* stative reading: $\lambda c:\mathbf{trope} - \mathbf{trope}$ (object) $\lambda c':\mathbf{trope}$ [cause (c, c')]
- (12) Der Platz war [_{AP} [_A *rot*] [_{PP} *von den Blättern*]]: stative reading
 $\exists s \exists r \exists r' [s: \text{bearer (def-square, } r') \text{ \& redness (} r') \text{ \& cause (} r, r') \text{ \& } \phi_{\text{trope(leaves)}}(\text{def-leaves, } r)]$
 [The underspecified predicate $\phi_{\text{trope(leaves)}}$ is introduced compositionally in the course of type accommodation and can be specified pragmatically via defeasible type specification rules (\approx world knowledge), e.g.: $\phi_{\text{trope(leaves)}}(\text{def-leaves, } r) \approx \text{redness (} r) \text{ \& bearer (def-leaves, } r)]$
- (13) Paul war [_{AP} [_{AP} *müde*] [_{PP} *von der Reise*]]: eventive reading
 $\exists s \exists r' \exists e': \mathbf{become} [s: \text{bearer (paul, } r') \text{ \& tiredness (} r') \text{ \& cause (def-trip, } e') \text{ \& become (} e', s)]$
- (14) Paul war [_{AP} [_{AP} *müde*] [_{PP} *von den Tabletten*]]: eventive reading
 $\exists s \exists r' \exists e \exists e': \mathbf{become} [s: \text{bearer (paul, } r') \text{ \& tiredness (} r') \text{ \& cause (} e, e') \text{ \& become (} e', s)]$
 & $\phi_{\text{event(pills)}}(\text{def-pills, } e)$
 prag specification, e.g.: $\phi_{\text{event(pills)}}(\text{def-pills, } e) \approx \text{release-ingredients (} e) \text{ \& theme (def-pills, } e)$

Summary: Our proposal accounts for the observed interpretive flexibility of causal *von*-modifiers in adjectival copula sentences by combining three independent resources: (a) availability of two compositional integration sites at A- and AP-level; (b) incorporation of fine-grained type information and coercive mechanisms within the lexicon; (c) ontological properties of tropes and events as causally efficacious categories. In more general terms, the talk aims at contributing to a Lexical Semantics that provides the link between compositional meaning constitution and richer conceptual knowledge structures.

Asher, N. (2011) *Lexical Meaning in Context. A Web of Words*. New York: CUP. Moltmann, F. (2007) Events, Tropes and Truthmaking. *Philosophical Studies* 134: 363-403. Moltmann, F. (2013) On the Distinction Between Abstract States, Concrete States, and Tropes. In A. Mari et al. (eds), *Genericity*. Oxford: OUP, 292-311. Shibatani, M. (1973) *A Linguistic Study of Causative Constructions*. PhD diss, Univ of California, Berkeley, CA. Vecchiato, A. (2011) *Events in the Grammar of Direct and Indirect Causation*. PhD diss, Univ of Southern California. Wolff, P. (2003) Direct Causation in the Linguistic Coding and Individuation of Causal Events. *Cognition* 88 (1), 1-48.