

## The semantics of causal *vor*-modifiers in stative copular sentences in German: *rot vor Wut* ‘red with rage’ vs. *rot vor Blut* ‘red from blood’

In this article, we investigate the semantics of causal modifiers headed by the German preposition *vor* (‘with’, ‘from’) in adjectival copular sentences with *sein* ‘to be’ as in (1) and (2). Such modifiers raise several questions for linguistic theory. First, their meaning and status in stative sentences with *sein* ‘to be’ need to be explained since their occurrence in stative expressions contradicts the traditional assumption that a causal relation can only hold between two events. However, both sentences are interpreted causally: the property of being red is attributed to the subject, and the causer of this property is the emotion of rage or the concrete substance of blood.

- (1) Ein Mann mit grauem Vollbart und Nickelbrille ist rot vor Wut.<sup>1</sup>  
A man with grey beard and glasses is red with rage
- (2) Sein Shirt ist rot vor Blut.  
His t-shirt is red from blood

Furthermore, these example sentences have different interpretations. In (1) there is a physical reaction of the subject referent (his redness) which is caused by the internal argument of *vor* (rage). In contrast, in (2) there is a localization relation between two objects: the t-shirt looks red because there is so much blood on it. Based on these observations, we distinguish two readings of causal *vor*-phrases: a pure, causal reading as in *rot vor Wut* ‘red with rage’ or *sprachlos vor Freude* ‘speechless with joy’, and a causal-local reading as in *rot vor Blut* ‘red from blood’ or *schwarz vor Menschen* ‘black with people’. This article investigates the precise nature of the causal relation introduced by *vor* and the selectional restrictions imposed in both readings.

Another starting point for this study is the comparison of *vor* with the German preposition *von* ‘from’, which also has a causal reading. *Vor* and *von* are interchangeable in some contexts as in *weiß vor/von der Kälte* ‘red from the cold’ or *rot vor/von(m) Blut* ‘red from blood’ but also exhibit differences in their distributions. For example, *von* cannot be used in *sprachlos vor Freude* ‘speechless with joy’ and the preposition *vor* is impossible in *müde von der Reise* ‘tired from the trip’. We try to describe the meaning of *vor* as opposed to *von* and to define the causal scope of both prepositions.

In order to provide an empirical basis for the formal semantic analysis and descriptive generalizations, a corpus study was conducted using two German reference corpora (the TAGGED-C archive in DEREKO and the DWDS). Only documents from Germany from the period 1989–2014 were included so as to avoid potential regional and temporal variance.

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<sup>1</sup> The examples in (1) and (2) are from *Die Zeit*, 18.3.2013 (online) and *Berliner Zeitung*, 15.1.2004 respectively.

The corpus study resulted in 313 sentences, which were then annotated manually with semantic categories. For the semantic classification of predicative adjectives, we applied the classification defined in Hundsnurscher/Splett (1982), which is also used in GermaNet. We have annotated the subject of the copular sentence and the internal argument of *vor* with its sortal category. The following categories were used for the sortal classification of these nouns: eventualities, abstract objects, concrete objects and tropes. Tropes play an important role in the semantic analysis of *vor*. They are concrete property manifestations in an individual (see, for example, Moltmann 2009) and they act as implicit arguments of adjectives and adjectival nominalizations like *Röte* ‘redness’ or *Glück* ‘happiness’. Tropes receive their spatiotemporal grounding from the bearer and as particularized properties tropes are causally efficacious, which is crucial for the current investigation.

The internal argument of *vor* was additionally annotated with its referential properties (mass reference, singular or plural) and a broader semantic category like emotion, physical state or ‘external’ state for weather conditions.

We determined the reading on sentence level based on the different inference behavior of the two meaning variants. From a local-causal reading as in (2) it follows that the referent of the internal argument of *vor* is located on the subject referent – the blood is all over the t-shirt. It also follows that the property of being red holds for the internal argument *and* for the subject. No such inferences can be made for a causal reading as in (1) since rage is not red itself and cannot be physically located on the subject referent. Another distinctive feature is the fact that, in the causal reading, the subject referent must be the bearer of the property encoded in the internal argument of *vor*: a person cannot be red with somebody else’s rage. In the causal-local reading there is no such constraint: a person can be red from their own blood or from somebody else’s blood.

The corpus data show that the causal-local reading is less frequent than the causal reading (16% and 84% respectively). We also observe some striking differences between the two readings with respect to the semantics of the subject, the internal argument of *vor* and the adjective. In the causal reading the internal argument denotes a trope in 95% of the sentences. Among them, the most frequent semantic class constitutes emotions like *Glück* ‘happiness’, *Freude* ‘joy’ or *Angst* ‘fear’. For the causal reading the notion of animacy plays an important role since in 98% of the sentences it is a human being experiencing an emotion. In contrast, in causal-local sentences both the subject and the internal argument of *vor* denote concrete objects. The subject is often a spatial entity such as a city, street or other location and the prepositional phrase contains a concrete noun in the plural as in *schwarz vor Menschen/Mücken* ‘black from people/mosquitoes’ or a mass noun like *Blut* ‘blood’ or *Schmutz* ‘dirt’. With respect to the predicative adjective, the local-causal reading is more restrictive than the causal reading, allowing only material-related (*nass* ‘wet’, *feucht* ‘moist’) and perceptual (*schwarz* ‘black’, *rot* ‘red’, *bleich* ‘pale’) predicates. In the causal reading, adjectives from other semantic classes (e.g. *sprachlos* ‘speechless’, *steif* ‘stiff’, *blind* ‘blind’) are also possible. In a prototypical case of the causal reading, a strong emotion causes a reaction in an animate subject whereas in the causal-local meaning variant, in most cases a concrete object receives a certain (haptic or optical) property due to another concrete object located on it. Given the results of the corpus study, we suggest that tropes, as the most frequent category, are key to capturing the meaning of *vor*.

Since both readings can be coordinated (e.g. *der Teppich war schwarz vor Alter und Schmutz* ‘the carpet was dark from age and dirt’), they must have a common semantic base. We propose that the meaning of causal *vor* can be captured with a cause relation between two tropes (the formal semantic analysis is spelled out in terms of the Type Composition Logic of Asher 2011):

$$(3) \quad \text{vor:} \quad \lambda r_{\text{trope-trope}(\oplus \text{object})} \lambda r'_{\text{trope}} [\text{cause}(r, r')]$$

In the causal reading as in *rot vor Wut* ‘red with rage’ one trope causes the other trope, i.e. the rage of the subject referent causes his redness. The causal-local reading as in *rot vor Blut* ‘red from blood’ is derived by means of coercion of the internal argument of *vor*: the causing trope can be interpolated from the compositionally given concrete object provided it has a mass reference. The resulting trope may vary depending on the context and world knowledge. For example, in (2) it is the color of the blood that causes the redness of the subject referent. Such a division of labor between semantics and pragmatics also accounts for the possibility of an explicit deviation of two tropes as in *dunkel vor schwarzen Wolken* ‘dark with black clouds’.

The semantic structure in (3) and the independent assumptions about the nature of the causal relation of *vor* allow us to capture several interpretational idiosyncrasies of both readings. We classify the causal relation introduced by *vor* as direct and stative. Direct causation implies that a certain spatiotemporal overlap exists between the cause and the effect. In the case of the stative trope causation, the temporal and spatial characteristics of the resulting trope lie within the temporal and spatial extension of the causing trope (Maienborn/Herdtfelder 2015). In the causal reading, this leads directly to the subject referent simultaneously being a bearer of the causing trope and the resulting trope because otherwise the temporal and spatial characteristics of the two tropes would be different. This would contradict the assumption about the direct causation between the tropes. In the causal-local reading, the bearers of the causing and the resulting tropes are mentioned explicitly, which has two consequences. First, there must be a local relation between the two bearers since it is the only possible situation where the requirement of direct stative causation is fulfilled. Second, it explains the possibility for one person to be red from another person’s blood since the two bearers are independent and the color trope can be interpolated from the second person’s blood.

Finally, we compare *vor* with the causal *von* ‘from’ based on the analysis proposed in Maienborn/Herdtfelder (2015). They establish that *von* can express an eventive causal relation between two events *and* a stative causal relation between two tropes. In the eventive reading (e.g. *Paul war müde von der Reise* ‘Paul was tired from the trip’) there is a causal relation between the two events: the trip and the event of Paul getting tired. Since *vor* can only express a stative causal relation, it is impossible to use *vor* in this context. The two prepositions overlap in their stative readings: the internal argument may be a trope as in *weiß vor/von (der) Kälte* ‘white from the cold’ or a concrete object with mass reference as in *rot vor/von(m) Blut* ‘red from blood’.

Based on our corpus data and on the results in Maienborn/Herdtfelder (2015), we observe that *vor* and *von* exhibit strong differences in their use. First, *von* allows an ambiguity between the two readings as in *Das Dach ist weiß von den Tauben* (‘The roof is white from the pigeons’). In the eventive reading of this sentence, the roof is white because the pigeons, which are not necessary on the roof anymore, have soiled it. This interpretation is

ruled out for *vor*: the same sentence with *vor* can only have a stative interpretation such that the roof looks white due to the pigeons sitting all over it. Second, in contrast to *von*, *vor* does not allow definite phrases in its complement. Third, the internal argument of *vor* tends to express an emotion such as joy or happiness. The domain of non-controllable emotive causation seems to be covered by the preposition *vor* as other prepositions are not acceptable in this context: *sprachlos/verrückt vor/\*von der Freude* ‘speechless/crazy with joy’, *fassungslos vor/\*vom Glück* ‘stunned with happiness’. Nevertheless, *von* is compatible with an emotion in its complement when it triggers a physical reaction of the subject referent (e.g. *bleich vor/vom Kummer* ‘pale with grief’, *starr vor/vom Schreck/Schock* ‘paralyzed from fear/shock’).

## References

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