

# A single-event analysis for German eventive *mit*-modifiers<sup>1</sup>

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**Abstract.** German adverbial modifiers headed by the preposition *mit* ‘with’ can have eventive internal arguments. The combinatorics of these modifiers with their verbal target raises the question whether the modifying and the modified event description are to be considered as referring to one or to two events. I argue that eventive *mit*-modifiers and their targets refer to one event, but they conceptualize this event in two ways. Furthermore, the interpretation of the modified verbal projection depends on the position at which the modifier is integrated. More precisely, eventive *mit*-modifiers can target either the event kind contributed by the matrix predicate or the full-fledged event particular. This is implemented in an analysis in terms of accommodation of a dual aspect event within the framework of Type Composition Logic.

## 1. Introduction

Current research on adverbials evolves around two central questions. One concerns a discussion about the flexibility of adverbial modifiers in the combinatorics with their target arguments, cf. Maienborn (2001), Buscher (2013) or Engelberg (2003). The other question is whether adverbials have syntactic base positions, cf. Cinque (1999), Haider (2000) and Frey (2003). German prepositional phrases headed by *mit* ‘with’ and equipped with an event denoting internal argument, e.g. *mit einem Plädoyer* ‘with a summation’ in (1), are a case in point for both perspectives. In this paper, I will show that they exhibit different combinatoric properties depending on the position at which they are integrated into the verbal projection. The puzzle posed by eventive *mit*-modifiers (EMMs) is the relation that holds between the two event descriptions involved in EMM-constructions: the modifying event and the target, which is typically an abstract verb like German *beenden* ‘to end’, *eröffnen* ‘to open’ or *verbinden* ‘connect’.<sup>2</sup>

- (1) Der Anwalt beendete die Verhandlung mit einem Plädoyer.  
The lawyer ended the trial with a summation.

At first glance, EMMs share some properties with instrumentals. Both modifier types are realized by a prepositional phrase headed by *mit* in German. Thus, *mit* can either combine with a physical object or with an event, cf. (2a). Additionally, both modifiers participate in the so-called instrument alternation pattern as discussed by Levin (1993), i.e. the internal argument of the *mit*-PP can appear in the subject position of an argument structural variant of the matrix verb, cf. the alternated variants of (2a) in (2b).

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<sup>2</sup>I use the judgments \* = ‘ungrammatical’; # = ‘conceptually odd’; ?? = ‘deviant, but not completely out’.

- (2) a. Paul verband die Pulloverteile mit blauen Fäden / mit wenigen Stichen.  
Paul connected the pullover-parts with blue threads / with few stitches.
- b. Blaue Fäden / wenige Stiche verbanden die Pulloverteile.  
Blue threads / few stitches connected the pullover-parts.

Nevertheless, EMMs cannot be considered an instrument, as instruments are participants and an eventive internal argument of *mit* does not meet the sortal prerequisites for participant-hood.

In order to answer the question about the relation between matrix and modifier event, I will proceed as follows: In section 2, I will briefly present the outlines of a two-event account as well as a single-event account for EMMs and discuss their advantages and disadvantages. Section 3 extends the data set that has to be covered by an adequate analysis of EMMs. Most importantly, I will show that EMMs have two syntactic base positions with covarying interpretations. In section 4, I will propose a formal analysis of EMMs in terms of dual aspect entities, a concept that has been prominently advocated for polysemous nouns by Asher (2011). Section 5 concludes the analysis.

## 2. A first approach to the meaning of eventive *mit*

### 2.1. Two-event account: EMMs as causes

In a two-event account, each event description in (3) denotes a different event, i.e. the summation and the opening of the trial are two events dissociated w.r.t. their spatiotemporal extension and their participants, cf. Maienborn's (2007) definition of events as particular spatiotemporal entities with functionally integrated participants. The relation holding between those two events has to be specified. Rapp (1997) suggests causality as the pertinent relation between EMMs and their targets, where the modifier event specifies the cause of the matrix event. Under an event-based account of causality, cause and effect are temporally dissociated entities, cf. Shibatani (1975). However, we can see from the entailments in (3) that the temporal and the spatial extension of the matrix event and the modifier event are identical. The duration of the summation is twenty minutes and the opening of the trial takes up the same twenty minutes. Parallel entailments hold for the spatial domain, cf. (3c) and (3d).

- (3) Der Anwalt eröffnete im Gerichtssaal mit dem Plädoyer zwanzig Minuten lang  
The lawyer opened in the courtroom with the summation for twenty minutes  
die Verhandlung.  
the trial.
- a. → The summation lasted 20 minutes.  
b. → The opening of the trial lasted 20 minutes.  
c. → The summation took place in the courtroom.  
d. → The opening took place in the courtroom.

Furthermore, a causal account of EMMs predicts that the modifiers can be paraphrased by a genuinely causal prepositional phrase like a *wegen*-PP in (4a). However, the paraphrase of (1) in (4a) does not preserve the initial meaning. Rather, the modal clause headed by *indem* in (4b) yields an appropriate paraphrase.

- (4) a. Der Anwalt beendete die Verhandlung wegen eines Plädoyers.  
 The lawyer ended the trial because of a summation.
- b. Der Anwalt beendete die Verhandlung, indem er ein Plädoyer hielt.  
 The lawyer ended the trial, subj<sub>modal</sub> he a summation held.

These observations indicate that a two-event analysis of EMMs cannot be on the right track. Instead, a look at the proposals on *indem* ‘by’ might help to understand the combinatorics of EMMs.

## 2.2. Single-event account: the Anscombe-thesis

Under a single-event account, modifier and target event denote the same event, they merely describe it in a different manner. In the philosophical literature following Anscombe (1957), the single-event account of eventive modifiers like English *by* or German *indem* has been summarized in the Anscombe-thesis.

- (5) **Anscombe-thesis:** If someone  $\phi$ s by  $\pi$ ing, and F is the act which makes it the case that she  $\phi$ s, and P is the act which makes it the case that she  $\pi$ s, then F is P.  
 (Bennett, 1994, 29)

Both matrix and modifier event refer to the same act and this act is described in two different ways. Though this intuition is undoubtedly on the right track, event identity in a strict sense entails an unwanted consequence: If an event is understood as a particular spatiotemporal entity with functionally integrated participants, event identity requires both identity of the spatiotemporal extension and of the participants. We have already seen in (3) that the spatiotemporal extensions of the modifier event and the target event are identical. However, in (6), for instance, the matrix and the modifier event can have partially different participants. Whereas the matrix event involves Lea and Paul as participants, the modifier event additionally involves a feather.

- (6) Lea annoyed Paul by tickling him with a feather.

Nevertheless, the basic intuition of the Anscombe-thesis that – in a coarse-grained, spatiotemporal sense – both event descriptions refer to the same event is to be implemented in a linguistic account

of EMMs. A concept that is particularly suitable to capture identity on different levels of fine-grainedness is provided by dual aspect entities in the sense of Asher (2011). Dual aspect entities have a dual nature inasmuch as they express two different and sortally independent, but equally valid conceptualizations of one and the same entity. For instance, the noun *book* is a dual aspect object, as it can be conceptualized both as a physical and as an informational object. Entities of this type have been argued to occur in two different linguistic domains. On the one hand, they figure as lexical typing of nouns like *book*, i.e. *book* is of type  $\text{PHYS} \bullet \text{INFO}$ ; on the other hand, they can emerge compositionally from a specific linguistic configuration. For example, Asher (2011) argues that *as* in *John as a judge is corrupt* introduces a dual aspect type. Here, the conjunction *as* adds an aspect to the typing of the target argument *John* and by doing so, it generates the dual aspect type  $\text{HUMAN} \bullet \text{JUDGE}$ .

Bücking (2014) implements the concept of dual aspect entities for *by/indem*-modifiers. In this account, the connective accommodates a dual aspect event consisting of the modifier event and the matrix event as its constituent aspects. More precisely, a sentence like (6) contains an event that is conceptualized as both an annoying and a tickling of Paul. In order to account for diverse locality effects, Bücking (2014) makes use of a special property of dual aspect entities within Asher's framework: Dual aspect entities are furnished with a morphism that takes one aspect of a complex entity and maps it to the dual aspect entity. This is encoded via the object elaboration relation 'o-elab(x,y)', where x elaborates on the sort of object that y is. In Bücking (2014), this feature is used to account for the fact that the referential argument of the overall VP has to denote a single aspect event that elaborates on a dual aspect event.

His proposal for a lexical entry of *by/indem* is shown in (7a). It takes two first-order predicates  $P$  (the modifier event description) and  $Q$  (the matrix event description) as arguments, as well as an individual  $x$  for the subject of the VP and an event  $e$  typed according to the matrix predicate. It introduces an additional existentially quantified variable  $e'$  that is typed as a dual aspect event with the head types of  $P$  and  $Q$  as its constituent aspects. *By/indem*'s meaning contribution is to connect these two event variables via the object-elaboration relation, i.e.  $e$  of matrix predicate type elaborates on the sort of object  $e'$  is, namely an event of dual aspect type. The truth conditions for (6) based on this semantics of *by/indem* and disregarding the instrumental within the modifier are given in (7b).

- (7) a.  $\llbracket \text{by/indem} \rrbracket = \lambda P \lambda Q \lambda x \lambda e : \text{TY}^+(Q) \exists e' : \text{TY}^+(P) \bullet \text{TY}^+(Q). P(e') \wedge$   
highest thematic arg.'( $e'$ ) = highest thematic arg.'( $e$ )  $\wedge$  o-elab'( $e, e'$ )  $\wedge$   $Q(x)(e)$   
(Bücking, 2014, 8, (28))
- b.  $\exists e' : \text{TICKLE} \bullet \text{ANNOY} \exists e : \text{ANNOY}. \text{tickle}'(e', l, p) \wedge \text{o-elab}'(e, e') \wedge \text{annoy}'(e, l, p)$

The analysis captures the Anscombe-thesis via the complex dual aspect event  $e'$ , an existentially bound variable that has the modifier type and the matrix type as its aspects. At the same time, the meaning representation is furnished with an additional event variable of the matrix event aspect,

which elaborates on this complex type. This variable is compositionally active. My analysis will build on Bücking's (2014) account of *by/indem*. However, it will be necessary to adapt the account in order to capture the data presented in section 3.

### 3. The combinatorics of eventive *mit*

#### 3.1. EMMs as dual aspect events

If EMMs in fact introduce dual aspect events, EMM-constructions should mirror the behavior that dual aspect nouns display w.r.t. their linguistic environment. Asher (2011) reports two effects that are specific for the interaction of dual aspect nouns with their environment. First, entities of dual aspect type can only be individuated by one of their constituent aspects at a time. This gives rise to so-called quantificational puzzles. The aspect quantified over is chosen by the predicational context in which the dual aspect entity appears. This is illustrated by the scenario and the predicational data in (8). The noun *book* is of dual aspect type. In the given scenario, one can coherently say (8a) referring to the informational aspect of the noun by the predicate *read* and counting the informational instances of *book* in the scenario. Similarly, one can predicate over the physical aspect of the noun by *dust off* and count the physical instances, cf. (8b). However, using the wide container *like* in (8c) that could theoretically predicate over both physical and informational entities still forces us to choose one of the aspects, as it is not possible to count pairs of physical and informational objects.

- (8) Nils has a bookshelf with five copies of the bible and an edition of Grass's 'Danzig Trilogy'-novels.
- Nils read<sub>info</sub> all the books on his shelf. That is, he read four books.
  - Nils dusted off<sub>phys</sub> all the books on his shelf. That is, he dusted off six books.
  - Nils likes<sub>info/phys</sub> all the books on his shelf. #That is, he likes eight books.

Notably, VPs modified by an EMM give rise to a parallel effect in the event domain. Consider the sentence in (9), where we have one ending of a game that is carried out by two moves. The sentence can be continued with a reference to the matrix aspect, i.e. to the ending of the game. This amounts to one event, cf. (9a). Likewise, reference to the modifier aspect is possible, as can be seen by the continuation in (9b) that counts the move events. However, it is impossible to refer to both aspects at the same time. This is shown by the oddness of (9c), where the anaphor *diese* is combined with three events.

- (9) Lea beendete das Spiel mit zwei Spielzügen.  
Lea ended the game with two moves.
- Dieses Ereignis hat Nils verärgert.  
This event AUX<sub>perf</sub> Nils annoyed

- b. Diese zwei Ereignisse haben Nils verärgert.  
 These two events AUX<sub>perf</sub> Nils annoyed.
- c. # Diese drei Ereignisse haben Nils verärgert.  
 These three events AUX<sub>perf</sub> Nils annoyed.

Second, entities of dual aspect type allow for co-predication, i.e. predications over each of the aspects can be linked by a conjunction. This is exemplified by the sentence in (10) where a predicate over physical objects is coordinated with a predicate over informational entities and both can conjointly predicate over the dual aspect noun *book*.

- (10) Nils dusted off<sub>phys</sub> and read<sub>info</sub> his books during his summer holidays.

Dual aspect eventualities show a similar behavior. Event anaphora that refer back to an event modified by an EMM can be connected by a conjunction, cf. (11). The anaphoric pronouns *das* and *es* take up the same event in the previous sentence, namely – as a default – the one denoted by the main predicate of the preceding sentence, which is the complex event of opening the show by balancing on the tightrope. Two different properties are predicated over the referent of these anaphora: one of the predicates targets the matrix aspect (*festive*) and the other one the modifier aspect (*centimeter by centimeter*).

- (11) Die Artistin hat die Show mit dem Balancieren über das Hochseil eröffnet. Das  
 The performer AUX<sub>perf</sub> the show with the balancing on the tightrope opened. That  
 war wenig feierlich<sub>open</sub>, da es nur zentimeterweise<sub>balance</sub> geschah.  
 was not very festive as it only centimeter by centimeter happened.

One of the central conceptual properties of dual aspect entities is their ability to combine two aspects that are sortally incompatible with each other. For instance, the two component types of *book* are neither subtypes of each other nor are they compatible w.r.t. to their individuation criteria, see the quantificational puzzles above. In the event domain, this property explains why EMMs and their matrix events can differ in aktionsart. Consider the examples in (12). Whereas the matrix predicate is telic in all the sentences, the internal argument of *mit* can either be telic as well, cf. (12a), or differ from the matrix predicate in being an activity, cf. (12b), or even a state as in (12c).

- (12) a. Nils beendete seine Wanderung mit dem Erreichen des Gipfels.  
 Nils ended his hike with the reaching of the summit.
- b. Nils unterbrach mit seinem Quatschen den Vortrag einer Mitschülerin.  
 Nils interrupted with his chatting the talk of a classmate.
- c. Nils eröffnete die Performance mit dem Stehen auf einem Bein.  
 Nils opened the performance with the standing on one leg.

The data presented in this section have shown that EMM-constructions pattern with dual aspect nouns. They give rise to quantificational puzzles, they support co-predication and the constituent types are sortally independent of each other.

### 3.2. EMMs as modifiers of event kinds and event particulars

There is both syntactic and semantic evidence showing that the interaction of EMMs with their linguistic environment is sensitive to the modifier's position relative to the direct object. EMMs can be integrated into the verbal projection at the V- and VP-level, i.e. below or above the direct object. This kind of sensitivity to the adjunction site has already been observed by Maienborn (2001) for locative modifiers and by Engelberg (2003) for eventive prepositional modifiers headed by *bei* 'while'.

#### 3.2.1. Syntactic evidence

I will use a subset of the syntactic tests established by Frey (2003) to show that EMMs have two base positions relative to the direct object. These diagnostics are focus projection, position relative to existentially interpreted *wh*-phrases and complex prefield construction.<sup>3</sup> Together these tests are used to establish base positions in the middle field.

In basic word order, putting the main accent on the verb-adjacent constituent leads to an interpretation of the sentence with wide focus, i.e. the focus feature borne by the stressed constituent is projected to the sentence level. If wide focus is present, the whole sentence belongs to the focussed information and it can function as an answer to a general question like *what's new?* For EMMs, this is illustrated in (13), where capital letters mark the syllable bearing the main sentence accent. Both the sentence with the EMM in verb-adjacent position, as in (13a), and the sentence with the direct object adjacent to the verb, as in (13b), are appropriate answers to such a general question. This means that both relative orders of direct object and EMM are basic.

- (13) Was ist            geschehen? – Ich habe       gehört, dass ...  
 What AUX<sub>perf</sub> happened? – I    AUX<sub>perf</sub> heard that ...
- a.    ... Lea eine Show mit    einem BalanCIERakt eröffnet hat.  
       ... Lea a    show with a       balancing act   opened AUX<sub>perf</sub>.
- b.    ... Lea mit    einem Balancierakt eine SHOW eröffnet hat.  
       ... Lea with a       balancing act the show   opened AUX<sub>perf</sub>.

<sup>3</sup>Due to the specific properties of event denoting nominals and the sortal properties of the direct objects of the matrix predicates, the remaining tests proposed by Frey (2003) are not applicable.

In German, existentially interpreted wh-phrases resist any sort of syntactic movement. Hence, their position identifies base positions of constituents. In (14a), the direct object precedes the EMM. Replacing the direct object by a wh-pronoun yields a grammatical result. As the wh-pronoun has to be base-generated in this position, the EMM must be base-generated below it. Otherwise, it would be necessary to assume downward scrambling for the EMM, which would conflict with the constraint forcing moved constituents to bind their traces. However, the syntactic order in (14b) must also be basic. Here, the direct object is next to the verb and the higher EMM is replaced by a wh-pronoun. As scrambling of the direct object below the EMM is not possible, the superficial relative order between direct object and EMM has to be base generated as well.

- (14) a. Paul hat was mit einer Rede eröffnet.  
 Paul AUX<sub>perf</sub> wh<sub>Akk</sub> with a speech opened.
- b. Paul hat mit was einen Festakt eröffnet.  
 Paul AUX<sub>perf</sub> with wh<sub>Dat</sub> a ceremony opened.

Any number of constituents from the VP of German sentences can be moved to the prefield together with the main predicate. There is, however, one constraint on this movement: the moved part of the VP must not include traces of preceding scrambling operations. The reason for this constraint is the above-mentioned necessity for moved constituents to bind their traces. (15) illustrates that both the EMM and the direct object can constitute a complex prefield with the main verb. In particular, the direct object in (15a) must have been above the EMM prior to the topicalization of the modifier and the matrix verb. Likewise, the EMM in (15b) must have been located above the direct object in the deep structure.

- (15) a. Mit dem Plädoyer beendet hat der Anwalt die Verhandlung.  
 With the summation ended AUX<sub>perf</sub> the lawyer the trial.
- b. Die Verhandlung beendet hat der Anwalt mit dem Plädoyer.  
 The trial ended AUX<sub>perf</sub> the lawyer with the summation.

These observations provide converging evidence that EMMs can be base generated both as V- and as VP-adjuncts. However, the data presented in the next section indicate that the two base positions are accompanied by different interpretations.

### 3.2.2. Semantic evidence

Maienborn et al. (2014) show that modifiers targeting V have access to the conceptual information their anchor argument provides. By virtue of this, the modifier and its anchor form an ad hoc concept. Modifiers that adjoin higher than V lack this power. I will now present a range of evidence showing that EMMs have an analogous effect on their target.



Maienborn (2005) demonstrates that perceptual reports are sensitive to the abstractness of their infinitival complement. Only VPs denoting an event can appear as complements of perception verbs, as these verbs select for an entity that is accessible to perception. As can be seen in (16a), the abstract verb *unterbrechen* ‘interrupt’ is an unsuitable complement for a perception verb, whereas the concrete *sprinten* ‘sprint’ in (16b) denotes a perceptible entity and can figure as infinitival complement of a perception verb.

- (16) a. \*Lea sah Paul ein Finale unterbrechen.  
 Lea saw Paul a finale interrupt.  
 b. Lea sah Paul sprinten.  
 Lea saw Paul sprint.

Bücking (2014) argues that *by/indem* requires an abstractness gradient from the matrix event to the modifier event, i.e. the matrix predicate has to be more abstract than the event embedded under *by/indem*, cf. (17). EMMs have a similar constraint, cf. (18). This is reflected in the fact that EMM-constructions always involve an abstract verb as their target argument.

- (17) Ben {kept a promise by dancing / #danced by keeping a promise.} (Bücking, 2014, (36))  
 (18) a. Paul unterbrach mit dem Sprint über das Spielfeld das Finale.  
 Paul interrupted with the sprint over the playing field the finale.  
 b. #Paul sprintete mit dem Unterbrechen des Finales über das Spielfeld.  
 Paul sprinted with the interrupting of the finale over the playing field.

Pursuing the idea that EMMs accommodate dual aspect events, we may expect that EMMs render their matrix predicate more concrete, as they add a concrete aspect to the typing of their target argument. The combination of an abstract verb with a more concrete EMM should make the non-perceptible abstract matrix predicate a suitable infinitival complement of perception verbs. However, this is only expected if the modifier accesses the conceptual information of its target and re-types the referential argument. The data in (19) show that the acceptability of abstract verbs in perceptual contexts increases only, if the EMM is located close to the verb, i.e. below the direct object, cf. (19a), but not if it is above the direct object, cf. (19b).

- (19) a. Lea sah Paul ein Finale mit einem Sprint unterbrechen.  
 Lea saw Paul a finale with a sprint interrupt.  
 b. ??Lea sah Paul mit einem Sprint ein Finale unterbrechen.  
 Lea saw Paul with a sprint a finale interrupt.

These data suggest two different interpretations depending on the integration site of the EMM. Below the direct object, the modifier is integrated at the word boundary and accesses the conceptual

information provided by the matrix verb. By adding a concrete aspect to the conceptual information of the matrix verb, the EMM renders its target more concrete. However, above the direct object, the EMM has no such effect.

Event anaphora like those discussed in the previous section supply analogous evidence. An event description can be taken up by the anaphoric expression *das geschah...* ‘this happened...’ in the subsequent context. By default, the event referred to by this anaphor is the matrix event of the preceding sentence. Independently of the position of the modifier, the matrix aspect of an event modified by an EMM is always discourse transparent, cf. (20). By contrast, the modifier aspect can only be accessed easily if it is located next to the matrix verb, cf. (21a). Above the direct object, the access to the EMM-aspect is significantly harder, cf. (21b).

- (20) a. Die Artistin hat die Show mit dem Balancieren über das Hochseil  
The performer AUX<sub>perf</sub> the show with the balancing on the tightrope  
eröffnet. Das geschah auf feierliche Weise.  
opened. That happened in festive manner.
- b. Die Artistin hat mit dem Balancieren über das Hochseil die Show  
The performer AUX<sub>perf</sub> with the balancing on the tightrope the show  
eröffnet. Das geschah auf feierliche Weise.  
opened. That happened in festive manner.
- (21) a. Die Artistin hat die Show mit dem Balancieren über das Hochseil  
The performer AUX<sub>perf</sub> the show with the balancing on the tightrope  
eröffnet. Das geschah zentimeterweise.  
opened. That happened centimeter by centimeter.
- b. Die Artistin hat mit dem Balancieren über das Hochseil die Show  
The performer AUX<sub>perf</sub> with the balancing on the tightrope the show  
eröffnet. ?? Das geschah zentimeterweise.  
opened. That happened centimeter by centimeter.

If the EMM targets V as in (21a), the balancing-aspect is accessible to the event anaphora, which indicates that this aspect is part of the event type denoted by the matrix verb. By contrast, if the EMM is adjoined at VP level as in (21b), the matrix event keeps its initial typing and thus the target of the anaphor is incompatible with the property predicated over the anaphoric pronoun.<sup>4</sup>

Causal relations are another source of evidence for two adjunction sites of EMMs. In order to establish a causal relation between two events, these events must be conceptually plausible candidates for a causal relationship. If this condition is not met, a causal conjunction of two events is pragmatically anomalous. This is illustrated by the examples in (22). An accident is a plausible

<sup>4</sup>In (21b), bridging to less accessible event referents is possible, i.e. the EMM-event can be taken up by the anaphor. However, as this is a strongly dispreferred referent, (21b) remains odd.

cause for being in hospital. By contrast, Lea's ending of a skiing trip and her being in hospital do not stand in an obvious direct causal relation to each other.

- (22) a. Lea liegt im Krankenhaus, weil sie einen Unfall hatte.  
 Lea lies in the hospital because she an accident had.
- b. # Lea liegt im Krankenhaus, weil sie einen Skiurlaub beendet hat.  
 Lea lies in the hospital because she a skiing trip ended  $AUX_{perf}$ .

If the EMM accesses the conceptual information introduced by the matrix event, it should be able to render an implausible causal relation plausible, as long as the modifier event is a suitable cause in the relevant situation. In fact, the data in (23) show that an EMM has this effect only in case it is below the direct object. That is, the implausible causal relation in (22b) is rendered plausible only by a modifier targeting V, cf. (23a), but not by a modifier adjoined to VP, cf. (23b).

- (23) a. Lea liegt im Krankenhaus, weil sie einen Skiurlaub mit einem Unfall  
 Lea lies in the hospital because she a skiing trip with an accident  
 beendet hat.  
 ended  $AUX_{perf}$ .
- b. # Lea liegt im Krankenhaus, weil sie mit einem Unfall einen Skiurlaub  
 Lea lies in the hospital because she with an accident a skiing trip  
 beendet hat.  
 ended  $AUX_{perf}$ .

In (23a), the modifier event is an integral part of the matrix event, as the EMM adds a second aspect to the type of the projected event information. If this aspect is suitable as a cause of the event of Lea being in hospital, the causal relation becomes more plausible. In (23b), the modifier cannot manipulate the information relevant for the causal relation and the incoherence remains.

The last type of evidence comes from intensional contexts. The existence presupposition of definite DPs is preserved, for instance, under sentence negation. In (24), the definite article of the DP *the sofa* introduces an existence presupposition and this presupposition is resistant to negation.

- (24) a. Nils strickt (nicht) auf dem Sofa.  
 Nils knits (not) on the Sofa.
- b. >> There is a sofa.

Interestingly, the existence presupposition of the definite article within EMMs is projected only in case the modifier is above the direct object, cf. (25b). By contrast, the presupposition disappears when the EMM targets V, cf. (25a).

- (25) a. Es ist nicht wahr, dass Paul das Konzert mit dem Spielen der  
 It is not true that Paul the concert with the playing of the  
 Mondscheinsonate beendet hat.  
 moonlight sonata ended AUX<sub>perf</sub>.
- b. Es ist nicht wahr, dass Paul mit dem Spielen der Mondscheinsonate das  
 It is not true that Paul with the playing of the moonlight sonata the  
 Konzert beendet hat.  
 concert ended AUX<sub>perf</sub>.

(25a) is compatible with a context where Paul did not play the moonlight sonata at all during the concert under discussion, i.e. the presupposition of existence introduced by the DP *the playing of the moonlight sonata* is cancelled. Sentence negation thus scopes over the EMM (among other constituents). By contrast in (25b), the presupposition of existence introduced by the definite article within the EMM persists. The sentence is only compatible with a context where Paul did, in fact, play the moonlight sonata at some point during the concert. What is in the scope of the sentence negation is the claim that this happened at the end of the concert.

A similar effect arises when EMMs are embedded under the opaque verb *glauben* ‘believe’. Usually, the existence presupposition introduced by definite DPs is preserved in such contexts, but for EMMs the projection of the presupposition again depends on the position at which their meaning is integrated into the overall VP-meaning. If EMMs appear below the direct object as in (26a), the presupposition does not percolate to the sentence level. However, if the EMM is located above the direct object as in (26b), the presupposition stays intact.

- (26) a. Lea glaubt, dass Bayern München die Saison mit dem Siegen über Real  
 Lea believes that Bayern Munich the season with the winning over Real  
 Madrid eröffnet hat.  
 Madrid opened AUX<sub>perf</sub>.
- b. Lea glaubt, dass Bayern München mit dem Siegen über Real Madrid die  
 Lea believes that Bayern Munich with the winning over Real Madrid the  
 Saison eröffnet hat.  
 season opened AUX<sub>perf</sub>.

(26a) can be true in a context where Bayern Munich actually did not win the game against Real Madrid. The object of Lea’s belief is then the opening of the season qua winning the game against Real Madrid. Hence, the existence presupposition is not projected to the sentence level and the EMM is in the scope of the intensional operator. By contrast, (26b) requires a context where Bayern Munich did, in fact, win the game against Real Madrid, but it is uncertain whether this was the opening of the season. The presupposition of existence introduced by the definite article within the EMM is projected to the sentence level.

We have seen converging evidence for two different adjunction sites of EMMs. Yet, the question about the reasons for the differences in interpretation is unanswered so far. A constant pattern in the data presented in this section is the observation that an EMM accesses the conceptual information introduced by the verb if the modifier is adjacent to the matrix verb. This is manifested in the fact that abstract matrix verbs behave like concrete predicates when modified by a V-level EMM. By contrast, these effects do not arise if the EMM is adjoined at the VP-level. These observations can be explained by the dichotomy of event kind vs. event particular modification. At the V-level, the EMM is integrated into the verbal concept at the word boundary and is therefore involved in the constitution of the event kind. For instance, *mit einem Unfall beenden* in (23a) is a specific kind of ending-event that is built *ad hoc*, cf. Maienborn et al. (2014) for a parallel modifier-target-configuration in adjectival passives. It is interpreted as a complex event kind that can be realized with different participants. At the VP-level, on the other hand, the EMM modifies a full-fledged event particular constituted by the matrix event and furnished with participants. The EMM adds another predication over this particular, without manipulating the abstract concept of the target argument. In other words, in the V-modification case the referential variable of the overall VP is re-typed in terms of a complex type that has the matrix event type and the modifier event type as its constituent aspects; in the VP-modification case the referential variable of the overall VP keeps its initial typing and the modifier adds an event variable of dual aspect type to the meaning. This event variable is related to the referential VP-variable by an object-elaboration relation.

The distinction between modifiers targeting event kinds and event particulars accounts for the peculiar scope behavior within intensional contexts. EMMs in verb-adjacent position are part of the verbal cluster. They are integrated into the verbal meaning prior to event type closure. In this configuration, EMMs form a tight unit with their matrix predicate and they lose their independence, as they become an integral part of the verbal complex. By virtue of this, they contribute a property that specifies the event kind projected by the matrix verb, i.e. they introduce an aspect of the matrix predicate. This accounts for the peculiar behavior EMMs exhibit in intensional contexts. As integral parts of the event kind, they are in the scope of sentence-level operators.

To sum up, there are both syntactic and semantic reasons to assume two different integration sites for EMMs. We have seen that EMMs come either as modifiers of event kinds or as modifiers of event particulars. This is mirrored by two different syntactic base positions. EMMs that target the event kind are base generated at the word boundary, i.e. as V-adjuncts, whereas EMMs that modify event particulars are VP-adjuncts. These insights will feed into a formal account of the semantics of EMMs in the next section.

## 4. Compositional meaning constitution

### 4.1. Some remarks on Type Composition Logic

Type Composition Logic (TCL) by Asher (2011) is a formal semantic apparatus based on the standard  $\lambda$ -calculus. It is furnished with a fine-grained type system which is built to account for

differentiated type restrictions that a predicate imposes on its argument. These type restrictions are understood in terms of type presuppositions that have to be justified by the argument in the course of composition. Type information is percolated via a  $\lambda$ -bound variable  $\pi$ , the type parameter functioning as an additional argument of every predication. Type information is concatenated via the connective  $*$ . TCL comprises type-driven functional application as well as alternative mechanisms for a meaning adjustment, in case the argument is not of the presupposed type. Crucially, these mechanisms only come into play if the predicate is lexically equipped for the repair of a type conflict. For an example of the integration of the  $\pi$ -parameter consider (27). As a result of adding the parameter, a DP as generalized quantifier is not of type  $\langle\langle e, t \rangle, t\rangle$  in TCL, but of type  $\langle\langle e \langle \pi, t \rangle \rangle, \langle \pi, t \rangle\rangle$ .<sup>5</sup> The DP *the show* takes a first-order property  $P$  and a type parameter  $\pi$  and maps it to 1, iff there is exactly one  $s$  such that  $s$  is a show and of type event and  $P$  holds of  $s$ .

$$(27) \quad \llbracket \text{the show} \rrbracket \\ \lambda P \lambda \pi \exists! s. \text{show}'(s, \pi * \text{ARG}_1^{\text{show}} : \text{EVT}) \wedge P(\pi)(s)$$

#### 4.2. Compositional integration of eventive *mit*

The lexical entry for eventive *mit* is presented in (28a). The preposition combines a generalized quantifier  $\Phi$  with a property  $P$  and its referential variable  $e$  which can be either an event kind or an event particular. It is furnished with an argument vector  $\overleftarrow{e}$  that percolates  $\lambda$ -bound variables of the argument  $P$ , so that they can be satisfied after the integration of the modifier. Eventive *mit* contributes to the meaning constitution in four ways. First,  $e$  is determined to be the referential variable of the overall VP, i.e. this variable is compositionally active. Second, an existentially quantified variable  $e'$  is introduced into the meaning constitution. This additional variable is of dual aspect type; its constituent types are the fine-grained types of the internal and the external argument of the preposition. These fine-grained types are selected by the type functor  $\text{TY}^+$ . Third, eventive *mit* contains an object elaboration relation holding between  $x$  (which is the future internal argument) and  $e'$ , which is the dual aspect entity. Fourth, *mit* contributes an underspecified relation  $R$  that holds between the referential variable  $e$  and the existentially quantified variable  $e'$ . The specification of this relation depends on the adjunction site, cf. the condition in (28b): If the EMM modifies an event kind,  $R$  is specified to the identity relation. This accounts for the fact that the referential variable of VPs that are modified at the V-level are of complex type. If the EMM modifies an event particular,  $R$  is specified to another object elaboration holding between  $e$  and  $e'$ . In this syntactic configuration, the referential variable of the VP keeps its original typing. However, it is an aspect of a complex type and this is expressed by the specification of  $R$  in terms of an object elaboration.

<sup>5</sup>This is, in fact, a slight simplification w.r.t. the original DP-type in Asher (2011), as it disregards the polymorphism of the type requirement posed on the individual argument. In order to account for subtyping of functional types, the precise type of a DP is  $\langle\langle \exists x \sqsubseteq e.x \langle \pi, t \rangle \rangle, \langle \pi, t \rangle\rangle$ . As I will not touch the question of functional subtyping in any way, I will stick to the simpler DP-type variant for ease of presentation.

- (28) a.  $\llbracket \text{mit} \rrbracket = \lambda \Phi \lambda P \lambda \overleftarrow{e} \lambda \pi \exists e'. P(\pi * \text{ARG}_1^P : \text{TY}^+(P) \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})(e) \wedge$   
 $\Phi(\pi * \text{ARG}_1^\phi : \text{TY}^+(\Phi) \sqsubseteq \text{EVT})$   
 $(\lambda x \lambda \pi'. \text{o-elab}'(x, e', \pi' * \text{ARG}_2^{\text{o-elab}} : \text{TY}^+(\Phi) \bullet \text{TY}^+(P) \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})) \wedge R(e, e', \pi)$
- b. Condition on the application of *mit*:  
 $(e \sqsubseteq \text{EVT-KIND}) \rightarrow (R = \text{identity})$   
 $(e \sqsubseteq \text{EVT}) \rightarrow (R = \text{o-elab})$

The second ingredient needed to model the two readings of EMMs is event type closure, cf. Maienborn et al. (2014). Event type closure applies at the boundary of the verbal complex. It takes an event kind  $e_k$  and returns an event particular  $e_1$  that instantiates the event kind. Crucially, the type of the event particular is the same as the type of the event kind it instantiates.

- (29) Event type closure:  $\lambda P \lambda \overleftarrow{e}_1 \lambda \pi_1 \exists e_k. P(\pi_1)(e_k) \wedge \text{inst}'(e_k, e_1, \pi_1 * \text{ARG}_2^{\text{inst}} : \text{TY}^+(P))$

The compositional meaning constitution for (30) is presented step by step in (31). The lexical entry for *mit* first combines with its internal argument *the balancing on the tightrope*, cf. (31a). In the next step (31b), the event kind denoting *end* is integrated as an external argument<sup>6</sup>. The result is subject to event type closure, cf. (31c). Then, the direct object (31d) and the subject (31e) are integrated. Existential closure of the referential argument and binding the type presuppositions result in (31f).

- (30) Lea hat die Show mit dem Balancieren über das Hochseil beendet.  
 Lea AUX<sub>perf</sub> the show with the balancing on the tightrope ended.
- (31) a.  $\llbracket \text{mit the balancing on the tightrope} \rrbracket =$   
 $\lambda P \lambda \overleftarrow{e} \lambda \pi \exists e'. P(\pi * \text{ARG}_1^P : \text{TY}^+(P) \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})(e) \wedge$   
 $\exists ! b. \text{BoT}'(b, \pi * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{TY}^+(P) \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge R(e, e', \pi)$
- b.  $\llbracket \text{mit the balancing on the tightrope end} \rrbracket =$   
 $\lambda \Psi \lambda e \lambda \pi \exists e'. \Psi(\pi * \text{ARG}_1^{\text{end}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})(\lambda x \lambda \pi_3. \text{end}'(e, x, \pi_3)) \wedge$   
 $\exists ! b. \text{BoT}'(b, \pi * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge \text{identity}'(e, e', \pi)$
- c. Event type closure:  
 $\lambda \Psi \lambda e_1 \lambda \pi_1 \exists e' \exists e_k. \Psi(\pi_1 * \text{ARG}_1^{\text{end}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})$   
 $(\lambda x \lambda \pi_3. \text{end}'(e_k, x, \pi_3)) \wedge \exists ! b. \text{BoT}'(b, \pi_1 * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi_1 * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge \text{identity}'(e_k, e', \pi_1) \wedge$   
 $\text{inst}'(e_k, e_1, \pi_1 * \text{ARG}_2^{\text{inst}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})$

<sup>6</sup>Note that I simplify the lexical entry for transitive verbs insofar as I assume a subjectless target VP with only one individual argument left for justification, namely the referential event argument, cf. Kratzer (1996).

- d.  $\llbracket$ the show mit the balancing on the tightrope end $\rrbracket =$   
 $\lambda e_1 \lambda \pi_1 \exists ! s \exists e' \exists e_k. \text{show}'(s, \pi_1) \wedge$   
 $\text{end}'(e_k, s, \pi_1 * \text{ARG}_1^{\text{end}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge$   
 $\exists ! b. \text{BoT}'(b, \pi_1 * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi_1 * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge \text{identity}'(e_k, e', \pi_1) \wedge$   
 $\text{inst}'(e_k, e_1, \pi_1 * \text{ARG}_2^{\text{inst}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})$
- e.  $\llbracket$ Lea the show mit the balancing on the tightrope end $\rrbracket =$   
 $\lambda e_1 \lambda \pi_1 \exists ! s \exists e' \exists e_k. \text{agent}'(e_1, l, \pi_1) \wedge \text{show}'(s, \pi_1) \wedge$   
 $\text{end}'(e_k, s, \pi_1 * \text{ARG}_1^{\text{end}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge$   
 $\exists ! b. \text{BoT}'(b, \pi_1 * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi_1 * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge \text{identity}'(e_k, e', \pi_1) \wedge$   
 $\text{inst}'(e_k, e_1, \pi_1 * \text{ARG}_2^{\text{inst}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND})$
- f. Existential closure of  $e_1$  and binding of the type presuppositions:  
 $\lambda \pi \exists ! s \exists e' : \text{BALANCE} \bullet \text{END} \exists e_k : \text{BALANCE} \bullet \text{END} \exists ! b : \text{BALANCE} \exists e : \text{BALANCE} \bullet \text{END}.$   
 $\text{agent}'(e, l, \pi) \wedge \text{show}'(s, \pi) \wedge \text{end}'(e_k, s, \pi) \wedge \text{BoT}'(b, \pi) \wedge \text{o-elab}'(b, e', \pi) \wedge$   
 $\text{identity}'(e_k, e', \pi) \wedge \text{inst}'(e_k, e, \pi)$

The sentence in (30) denotes the event particular  $e$  that is an ending and that instantiates the event kind  $e_k$ .  $e$  and  $e_k$  are both of complex type characterized as a balancing and an ending type event.  $e$  has the agent Lea and there is a show  $s$  such that  $s$  is ended. Additionally, there is a balancing on the tightrope  $b$  that elaborates on the complexly typed event kind  $e'$  identified with  $e_k$ .

In (32), the modifier is integrated at the VP-level. The meaning of *mit* combined with *the balancing on the tightrope* from (31a) is combined with the VP *end the show* that denotes an event particular, cf. (33a). That is, the modifier targets the event variable  $e_1$  that instantiates the event kind  $e_k$  introduced by the verb. In the next step, the subject *Lea* is added, cf. (33b). After existential closure of the referential event variable and binding the presuppositions, we get the truth conditions in (33c).

- (32) Lea hat mit dem Balancieren über das Hochseil die Show beendet.  
 Lea AUX<sub>perf</sub> with the balancing on the tightrope the show ended.

- (33) a.  $\llbracket$ mit the balancing on the tightrope end the show $\rrbracket =$   
 $\lambda e \lambda \pi \exists ! s \exists e' \exists e_k. \text{show}'(s, \pi) \wedge \text{end}'(e_k, s, \pi * \text{ARG}_1^{\text{end}} : \text{END}) \wedge \text{inst}'(e_k, e, \pi * \text{ARG}_2^{\text{inst}} : \text{END})$   
 $\wedge \exists ! b. \text{BoT}'(b, \pi * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge \text{o-elab}'(e, e', \pi)$
- b.  $\llbracket$ Lea mit the balancing on the tightrope end the show $\rrbracket =$   
 $\lambda e \lambda \pi \exists ! s \exists e' \exists e_k. \text{agent}'(e, l, \pi) \wedge \text{show}'(s, \pi) \wedge \text{end}'(e_k, s, \pi * \text{ARG}_1^{\text{end}} : \text{END}) \wedge$   
 $\text{inst}'(e_k, e, \pi * \text{ARG}_2^{\text{inst}} : \text{END}) \wedge \exists ! b. \text{BoT}'(b, \pi * \text{ARG}_1^{\text{BoT}} : \text{BALANCE}) \wedge$   
 $\text{o-elab}'(b, e', \pi * \text{ARG}_2^{\text{o-elab}} : \text{BALANCE} \bullet \text{END} \sqsubseteq \text{EVT} \sqcup \text{EVT-KIND}) \wedge \text{o-elab}'(e, e', \pi)$
- c. Existential closure of  $e$  and binding of the type presuppositions:  
 $\lambda \pi_1 \exists ! b : \text{BALANCE} \exists ! s \exists e' : \text{BALANCE} \bullet \text{END} \exists e_k : \text{END} \exists e_1 : \text{END}. \text{agent}'(l, e_1, \pi_1) \wedge$



$$\text{show}'(s, \pi_1) \wedge \text{end}'(e_k, s, \pi_1) \wedge \text{inst}'(e_k, e_1, \pi_1) \wedge \text{BoT}'(b, \pi_1) \wedge \text{o-elab}'(b, e', \pi_1) \wedge \\ \text{o-elab}'(e_1, e', \pi_1)$$

The sentence in (32) denotes the event particular  $e_1$  that is an ending. It instantiates the event kind  $e_k$  of ending type.  $e_1$  has the agent Lea. Additionally, there is an individual  $e'$  of complex type that is typed as both an ending of the show and a balancing on the tightrope. Both the balancing on the tightrope  $b$  and the ending of the show  $e_1$  elaborate on the type of object that  $e'$  is.

Both the event kind and the event particular reading are generated from the same lexical entry for eventive *mit* and a condition on the syntactic environment to which it applies. In the event kind reading, the EMM is integrated into the event kind constituted by the matrix verb before event type closure applies. As the particular instantiation of the event kind is of the same type as the event kind it instantiates, the event particular and thus the referential argument of the VP is of complex type. In the case of event particular modification, the EMM targets the instantiation of a simple type event kind, i.e. the modified VP denotes a simply typed event particular that elaborates on a complex type introduced by the modifier.

## 5. Conclusion

EMMs constitute a tool to encode more specific and concrete information about the way in which an abstract event occurred. Eventive *mit* and its matrix event description were argued to refer to one event, but to conceptualize this event under two different aspects. This was modeled in terms of an accommodation of a dual aspect entity with two constituent eventive aspects: the modifier and the matrix event. Linguistically, EMM-constructions display the same properties as lexical dual aspect entities: they give rise to quantificational puzzles, support co-predication and allow for constituent types that are sortally incompatible with each other.

I presented syntactic and semantic evidence for the fact that EMMs have two different adjunction positions w.r.t. to the matrix verbal projection: They can be adjoined at the V- and the VP-level. At the V-level, EMMs access the conceptual information provided by the matrix predicate and manipulate the type of the referential argument projected from the matrix verb. In this position, EMMs are event kind modifiers and build a tight unit with their target. Hence, they contribute to the constitution of an ad hoc event kind. At the VP-level, EMMs add a specification of the abstract matrix event to an already full-fledged event description, which is the reason why they do not change the conceptual information contributed by the matrix predicate. That is, EMMs at the VP-level are modifiers of event particulars. In both positions, the meaning constitution proceeds compositionally. Eventive *mit* relates a generalized quantifier to a V- or VP-projection generating an event variable that is typed as dual aspect entity. The present account is, thus, a single-event account that builds on the concept of dual aspect entities: EMMs and their matrix predicates are taken to be two conceptualizations of one event.

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