

## RESEARCH

Accompaniment by participation: The interpretation of *mit* as a free particle in German

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This paper is about the interpretation of free *mit* ‘with’ in German as exemplified by *Ben bastelt mit am Rad* (lit. Ben tinkers with with the bike) ‘Ben is participating in a tinkering with the bike’ and *Ben ist mit der größte* (lit. Ben is with the tallest) ‘Ben belongs to the tallest people’. It provides a uniform compositional semantics according to which free *mit* distributes its target predication over the explicit subject and implicit alternatives in such a way that the subject is said to accompany an implicit host situation by participation. The proposal thus argues against previous approaches that treat free *mit* as a focus particle or an elliptical PP and that consider its combination with the superlative a separate construction. The evidence is drawn from a wide range of semantic-pragmatic properties not disclosed before: free *mit* is insensitive to focus and projection, while it introduces a distinction between a discourse-transparent accompaniment by the subject referent and discourse-opaque alternatives. Most crucially, free *mit* is only compatible with predication types that support an extension by accompaniment. While the analysis zooms in on a special lexeme, it also advances more general topics: the opposition between constructional and compositional approaches to the constitution of meaning, accompaniment relations as a vital diagnostic for the ontological foundation of predication types, and the intriguing behavior of the superlative in distributional contexts.

**Keywords:** compositional semantics; natural language ontology; particles; states and events; superlative

## 1 Introduction

This paper is concerned with *mit* ‘with’ as a free particle in German. In this use, *mit* forms an independent syntactic constituent that contrasts with typical prepositions by lacking an explicit internal argument; see (1) for exemplification.<sup>1</sup>

- (1) a. Ben bastelt mit an einer Seifenkiste.  
Ben tinkers mit<sub>adv</sub> with a soapbox  
‘Ben belongs to a set of people tinkering with a soapbox.’
- b. Ben fährt mit nach Rom.  
Ben rides mit<sub>adv</sub> to Rome  
‘Ben belongs to a set of people riding to Rome.’

The previous work agrees that *mit* in these cases relates to the verbally introduced eventuality; see Zifonun (1996/1997; 1999); Zifonun et al. (1997); Bücking (2012). However, the particular analyses of this adverbial free *mit* (= *mit*<sub>adv</sub>) differ considerably. According

<sup>1</sup> English does not have an equivalent expression. For ease of presentation, I will generally use the verb ‘belong to’ for the translation of free *mit*. However, this translation is simplified compared to the particular analysis of free *mit* that I will develop in this paper.

to Zifonun (1996/1997; 1999), *mit<sub>adv</sub>* consists of a preposition and a retrievable internal argument. This ellipsis approach assigns (1a) the interpretation in (2).<sup>2</sup>

(2) Ben is tinkering with a soapbox with someone else.

By contrast, Bücker (2012) considers *mit<sub>adv</sub>* an additive particle such as *auch* ‘also’. This additive approach assigns (1a) the bipartite interpretation in (3).

(3) a. assertion: Ben is tinkering with a soapbox.  
b. presupposition: Someone different from Ben is tinkering with a soapbox.

The first aim of this paper is to disprove both analyses by a close inspection of the semantics and pragmatics of *mit<sub>adv</sub>*. For instance, *mit<sub>adv</sub>* is not focus-sensitive in the way *auch* is, which is why it cannot adjoin the alleged focal expression in the prefield; see the contrast in (4).

(4) {Auch / \*Mit} Ben bastelt an einer Seifenkiste.  
{also / mit<sub>adv</sub>} Ben tinkers with a soapbox

Furthermore, the additive analysis does not capture that *mit<sub>adv</sub>* introduces an accompaniment by participation in an eventuality. One indication is that (1a) suggests that Ben and the implicit alternative are tinkering with the same soapbox; the additive analysis in (3) does not provide an anchor for such a conclusion. The ellipsis account is sensitive to an accompaniment, but in the wrong way: according to (2), the retrievable PP-internal participant is a comitative. This supports various interpretations; for instance, the relevant participant could be a co-agent of the tinkering, but he could also relate to it without tinkering himself. This does not comply with intuitions regarding the example in (1a). For one, (1a) identifies the explicit subject as the participant that is accompanying an eventuality; furthermore, the interpretation is restricted to some form of co-agency. I will therefore argue that (1a) receives an interpretation as paraphrased in (5).

(5) Ben is accompanying an implicit tinkering with a soapbox by himself tinkering with the soapbox.

According to this alternative proposal, *mit<sub>adv</sub>* modifies the verbal eventuality description in such a way that the explicit subject is said to accompany an implicit eventuality by participating in a corresponding eventuality. In contrast to the previous work, I will also sketch a formal treatment of *mit<sub>adv</sub>*.

In addition to examples such as (1), free *mit* licenses an intriguing second use, namely, it can also be combined with the superlative, as in (6) (= *mit<sub>sup</sub>*). As predicted by the distribution of the superlative in general, *mit<sub>sup</sub>* can contribute to predicatives, as in (6a), to adverbials, as in (6b), or to objects, as in (6c); see also Zifonun et al. (1997: 2147–2148).

(6) a. In diesem Raum ist Ben mit der größte.  
in this room is Ben mit<sub>sup</sub> the tallest  
‘Ben belongs to the tallest people in this room.’

<sup>2</sup> Notably, this analysis does not imply that *mit<sub>adv</sub>* is a regular prepositional phrase. In fact, Zifonun considers *mit<sub>adv</sub>* a syntactically defective phrase. For the purposes of this paper, I am agnostic to these details and instead focus on questions of interpretation.

- b. In dieser Gruppe kocht Mia mit am besten.  
 in this group cooks Mia mit<sub>sup</sub> PTC best  
 ‘Mia cooks in a way that belongs to the best ways of cooking in this group.’
- c. In seiner Klasse hat Paul mit das eleganteste Outfit.  
 in his class has Paul mit<sub>sup</sub> the most elegant outfit  
 ‘Paul has an outfit that belongs to the most elegant outfits in his class.’

Zifonun (1996/1997; 1999) and Bücker (2012) assume that *mit<sub>sup</sub>* forms a separate construction. They argue that the uniqueness condition of the superlative is incompatible with their respective analyses of *mit<sub>adv</sub>* as an additive or as a retrievable PP. One indication is that the superlative is incompatible with an additive and a PP, as shown in (7). Furthermore, only *mit<sub>adv</sub>* can be veridical, as shown by the entailment contrast in (8); see also Bücker (2012: 216).

- (7) #Ben ist {auch / mit anderen} der größte.  
 Ben is {also / with others} the tallest  
 ‘Ben is {also / together with other people} the tallest.’
- (8) a. Ben ist mit der größte. → Ben ist der größte.  
 Ben is mit<sub>sup</sub> the tallest Ben is the tallest
- b. Ben bastelt mit an einer Seifenkiste. → Ben bastelt an einer Seifenkiste.  
 Ben tinkers mit<sub>adv</sub> with a soapbox Ben tinkers with a soapbox

The second aim of this paper is to show that the alternative accompaniment-based analysis of *mit<sub>adv</sub>* supports a transfer to *mit<sub>sup</sub>* and thus their uniform treatment in terms of a generalized free *mit* (= *mit<sub>free</sub>*). This transfer is based on the independent assumption that the superlative introduces a partition of a context-set according to some context-sensitive cutoff. *mit<sub>free</sub>* then induces the subject argument to accompany an implicit state of complying with this cutoff as borne by at least one implicit alternative individual; in other words, (6a) conveys that Ben belongs to the implicit unique group of tallest people. This compositional approach is attractive because it spares an additional construction; even more importantly, it links the behavior of *mit<sub>free</sub>* to more general questions of distribution and accompaniment that call for principled explanations. For one, the constructional approach does not consider the obvious analogy between the pattern in (8a) and the so-called distributivity problem of plural superlatives in general; see (9) for exemplification and Stateva (2005) and Fitzgibbons et al. (2008) for discussion. The compositional approach will provide a solution that covers both cases; this is certainly more revealing than a treatment of (8a) as a random effect of a separate *mit<sub>sup</sub>* construction.

- (9) Ben und Paul sind die größten. → Ben ist der größte.  
 Ben and Paul are the tallest Ben is the tallest

Furthermore, the uniform analysis paves the way for an explanation of puzzling constraints not discussed before. For instance, *mit<sub>free</sub>* is incompatible with the positive and the comparative counterparts of (8a); see (10). Notably, this is completely unexpected under Bücker’s (2012) additive approach to free *mit*, given that the additive *auch* would be grammatical here.

- (10) #Ben ist mit {groß / größer als Paul}.  
 Ben is mit<sub>free</sub> {tall / taller than Paul}

The crucial independent assumption will be that the positive and the comparative denote particularized properties—so-called tropes—that are inherent to their bearers; see Moltmann (2009; 2013). This inherence renders these predications incompatible with the accompaniment as introduced by *mit<sub>free</sub>*. That is, the variants in (10) are odd because Ben cannot join the height of someone else (irrespective of whether this height is also compared to the height of some further individual). Therefore, *mit<sub>free</sub>* is a revealing test case for the general question of how to capture accompaniment relations within different types of stative expressions; see in addition to Moltmann’s work Bücking (2012); Maienborn (2015); McNally & de Swart (2015); Maienborn & Herdtfelder (2017) for the relevant ontological background.

The present study focuses on a detailed interpretation of *mit<sub>free</sub>* in German from a semantic and pragmatic perspective. Therefore, I will not thoroughly discuss the following aspects. First, I will not dwell on the morpho-syntactic status of *mit<sub>free</sub>*. Based on the results in Zifonun (1996/1997; 1999), I take it for granted that *mit<sub>free</sub>* is not a bound verbal particle, but an independent syntactic constituent. In contrast to verbal particles, *mit<sub>adv</sub>* has a neutral base position in front of prepositional objects and adverbial complements and is thus not bound to the final verb position; see (11) and (12). One further indication is that only *mit<sub>adv</sub>* can be combined with a particle verb without yielding a new complex particle; see the contrast in (13).<sup>3</sup>

- (11) a. Ben hat mit am Rad gebastelt. (*mit<sub>adv</sub>*)  
Ben has mit<sub>adv</sub> with the bike tinkered
- b. Ben hat am Rad mitgebastelt. (verbal particle)  
Ben has with the bike with:tinkered
- (12) a. Ben ist mit zur Werkstatt gefahren. (*mit<sub>adv</sub>*)  
Ben is mit<sub>adv</sub> to the garage ridden  
'Ben belonged to a set of people riding to the garage.'
- b. Ben ist zur Werkstatt mitgefahren. (verbal particle)  
Ben is to the garage with:ridden
- (13) a. Mia sprang {mit [?]auf / \*mitauf}. (*mit<sub>adv</sub>*)  
Mia jumps {mit<sub>adv</sub> up / with:up}  
'Mia belonged to a set of people jumping up.'
- b. Mia läuft {\*vor [?]an / voran}. (verbal particle)  
Mia runs {forward at / forward:at}  
'Mia is running ahead.'

Second, I will ignore object-oriented examples, as in (14). Here, the implicit participant is an alternative to the entity in object position.

- (14) Ben stellt das Rad mit in den Flur.  
Ben puts the bike mit<sub>adv</sub> in the hall  
'Ben is putting the bike in the hall, which accompanies Ben’s putting at least one other thing in the hall.'

<sup>3</sup> Although I will not tackle them here, *mit<sub>adv</sub>* still raises intricate morpho-syntactic questions. For instance, according to Zifonun (1996/1997: 220), *mit<sub>adv</sub>* cannot be fronted on its own, which calls for a principled explanation. An anonymous reviewer notes that the syntactic behavior of *mit<sub>adv</sub>* could be related to the controversy of whether particles should be treated as syntactic heads or as maximal projections; see, for instance, Bayer (1996), Buring & Hartmann (2001), Sudhoff (2010), and Bayer & Trotzke (2015) for discussion.

It is a reasonable working hypothesis that, in principle, the interpretation is analogous to the standard subject-oriented case. However, the implementation of the different orientation is a compositional challenge in its own right, which I will leave for another occasion.

Third, I will confine the discussion to free *mit* in German. Except for English, other Germanic languages have a comparable free particle as well; see Hoekstra (2004) for a brief overview that takes the situation in Frisian as a starting point. However, the particle's distribution is not exactly the same across languages. The detailed discussion of the German case might be inspiring for a better understanding of the facts in the other languages, but a proper comparison will be left to future work.

The paper is structured as follows: in Section 2, I will provide a survey of the core descriptive properties of *mit<sub>adv</sub>*, which is followed by the sketch of a formal analysis in Section 3. Section 4 is concerned with the opposition between a constructional and a compositional approach to *mit<sub>sup</sub>*. Based on a general discussion of free *mit* within stative predications, I propose a uniform entry for *mit<sub>free</sub>* and spell out its application to the various stative predications. Section 5 offers a conclusion.

## 2 Adverbial *mit*: Survey of descriptive properties

### 2.1 Focus sensitivity

I will start with some general background information on the interpretation of additives. According to standard assumptions (usually building on the analysis of *only* and *even* in Horn 1969; see Sudhoff 2010 for an overview), *auch* is an additive focus particle that conveys a bipartite interpretation as sketched in (16) for the example in (15); recall (3) from the introduction.

(15) Ben bastelt AUCH an einer Seifenkiste.  
Ben tinkers also with a soapbox  
'Ben is ALSO tinkering with a soapbox.'

(16) a. assertion: Ben is tinkering with a soapbox.  
b. presupposition: Someone different from Ben is tinkering with a soapbox.

One well-known trait is that the relevant alternative is determined by focus. For instance, if *auch* is located in the middlefield, the association with the subject in the prefield hinges on stressing *auch*, as in (15). Alternatively, the association can be made syntactically transparent by moving *auch* to the prefield as well, as in (17) (recall (4) from the introduction).

(17) Auch BEN bastelt an einer Seifenkiste.  
also Ben tinkers with a soapbox

If, by contrast, *auch* in the middlefield does not bear stress, or *auch* joins the verbal predication in the prefield, as in (18), the interpretation changes: Ben's tinkering is now presupposed to relate to other things than a soapbox.

(18) Auch an einer SEIFENKISTE basteln wird Ben.  
also with a soapbox tinker will Ben  
'Ben will be tinkering also with a SOAPbox.'

Crucially, *mit<sub>adv</sub>* is not focus-sensitive in a comparable way. It cannot join the alleged focal expression in the prefield, as in (19) (recall (4)). Furthermore, the relevant alternative implication (the status of which will be discussed in the subsequent sections) unequivocally

relates to the subject. Correspondingly, both (20) and (21) convey that Ben's tinkering involves other agents, irrespective of the fact that *mit<sub>adv</sub>* does not bear stress in (20) and that it adjoins the verbal predication in the prefixed in (21).<sup>4</sup>

- (19) \*Mit BEN bastelt an einer Seifenkiste.  
mit<sub>adv</sub> Ben tinkers with a soapbox
- (20) Ben bastelt mit an einer SEIFENKISTE.  
Ben tinkers mit<sub>adv</sub> with a soapbox
- (21) Mit an einer SEIFENKISTE basteln wird Ben.  
mit<sub>adv</sub> with a soapbox tinker will Ben  
'Ben will belong to a set of people tinkering with a SOAPBOX.'

There is one further indication for the assumption that *mit<sub>adv</sub>* is independent of the focus-sensitive introduction of alternatives. Namely, its combination with true focus particles yields regular results. For instance, the addition of the additive *auch* in (22) is not redundant. Instead, the usual bipartite meaning contributed by the additive operates on top of the meaning contributed by *mit<sub>adv</sub>*; compare the rough interpretation of (22) in (23).<sup>5</sup>

- (22) Ben fährt AUCH mit nach Rom.  
Ben rides also mit<sub>adv</sub> to Rome  
'Ben ALSO belongs to a set of people riding to Rome.'
- (23) a. assertion: Ben is joining a set of people riding to Rome.  
b. presupposition: Someone different from Ben is joining a set of people riding to Rome.

The same observation holds for the restrictive particle *nur* 'only'. According to standard assumptions (again building on Horn 1969), *nur x P* contributes the assertion that nobody except for *x P*, and the presupposition that *x P*. This is exactly what can be observed for the combination with *mit<sub>adv</sub>*, as shown by (24) and its interpretation in (25).

- (24) Nur Ben ist mit nach Rom gefahren.  
only Ben is mit<sub>adv</sub> to Rome ridden  
'Only Ben belonged to a set of people riding to Rome.'
- (25) a. assertion: Nobody except for Ben joined a set of people riding to Rome.  
b. presupposition: Ben joined a set of people riding to Rome.

The exclusion of alternatives by *nur* thus does not contradict the contribution made by *mit<sub>adv</sub>*: (24) still conveys that Ben must *not* be the only one who took a ride to Rome. This

<sup>4</sup> The accent on *Seifenkiste* 'soapbox' induces that alternatives to soapboxes are pragmatically relevant as well. However, this effect does not interact with the contribution by *mit<sub>adv</sub>*.

<sup>5</sup> The stacked interpretation is obvious for situations involving an established set of travelers: it is asserted that Ben is joining this set, while it is presupposed that someone else is joining the set as well. However, (22) can also be used in a situation lacking an established set. In this case, the identification of alternatives—independently of whether they are required by *mit<sub>adv</sub>* or *auch*—can proceed in circles and thereby blur the stacked interpretation. (22) is then even compatible with a situation with only two travelers. The assertion in (23a) would involve a set consisting of, for instance, only Mia, while the presupposition in (23b) would involve a set consisting of only Ben. That is, 'a set of people riding to Rome' is identified differently in the assertion and in the presupposition. As the context does not specify a particular set, this complementary identification of alternatives is a regular option.

suggests that the introduction of alternatives by *mit<sub>adv</sub>* differs from their introduction by focus-sensitive items.<sup>6</sup>

I conclude that *mit<sub>adv</sub>* is not focus-sensitive. Instead, it forms a regular constituent with the right-hand verbal predication. This argues against Bücker's (2012) treatment of *mit<sub>adv</sub>* as an additive particle.

## 2.2 The semantic-pragmatic status of the accompaniment relation and the alternative implication

This section is concerned with the content contributed by *mit<sub>adv</sub>* and its semantic-pragmatic status. The hypothesis is that *mit<sub>adv</sub>* introduces an accompaniment of an implicit eventuality by participation in a corresponding eventuality; recall the paraphrase in (5), repeated in (26b).

- (26) a. Ben bastelt mit an einer Seifenkiste.  
 b. Ben is accompanying an implicit tinkering with a soapbox by himself tinkering with the soapbox.

This predicts differences from both *auch* and *mit*-PPs: *auch* does not convey an accompaniment (irrespective of the fact that it does not exclude it), and the alternative is not merely implicit, but presupposed. Examples based on *mit*-PPs such as (27) are also different: they introduce the alternative explicitly; what is more, they associate the co-participant with the internal argument of *mit*, but not with the subject, as *mit<sub>adv</sub>* according to (26b) does.

- (27) Ben bastelt mit Mia an einer Seifenkiste.  
 Ben tinkers with Mia with a soapbox  
 'Ben is tinkering with a soapbox together with Mia.'

Before testing the given hypothesis by various semantic-pragmatic diagnostics, a very general constraint on the interpretation of *mit<sub>adv</sub>* must be made explicit. It is well known that *mit*-PPs license a fairly broad range of interpretations; see Seiler (1974), Strigin (1995), and Rapoport (2014). In addition to the so-called comitative use exemplified in (27), the *mit*-PP can introduce an instrument or a manner, as in (28), or a concomitant circumstance, as in (29). Furthermore, it can also fill argument(like) slots, as in (30). (This list is focused on the verbal domain and is not exhaustive; see Seiler 1974: (27i), (10i), (29i), (37i) for similar examples.)

- (28) Ben bastelt {mit seinem neuen Werkzeug / mit Sorgfalt} an Mias Rad.  
 Ben tinkers {with his new tool / with care} with Mia's bike  
 'Ben is tinkering with Mia's bike {with his new tool / with care}.'

<sup>6</sup> An anonymous reviewer notes that this last evidence is only conclusive if the interaction between *nur* 'only' and *auch* 'also' is different. To my intuition, (i) is in fact worse than (24) (given that both *nur* and *auch* relate to alternatives of the subject).

- (i) ??Nur Ben ist auch nach Rom gefahren.  
 only Ben is also to Rome ridden  
 'Only Ben is also riding to Rome.'

In order to sidestep a conflict between the focus-related exclusion and inclusion of alternatives, *nur* would have to relate to the presupposition made by the additive: Ben would be said to be the only one riding to Rome in addition to someone presupposed. This mixture of meaning dimensions could account for the given intuition; I thank Stefan Sudhoff for this suggestion. However, the anonymous reviewer considers (i) inconspicuous.

- (29) Mia fährt mit der Dämmerung in die Stadt.  
Mia rides with the dawn to the town  
'Mia is riding to town at dawn.'
- (30) Paul füllt das Glas mit Murmeln.  
Paul fills the glass with marbles  
'Paul is filling the glass with marbles.'

It is obvious that *mit<sub>adv</sub>* cannot receive any of these readings. For instance, the examples with *mit<sub>adv</sub>* in (31) cannot receive an instrument reading.

- (31) a. Ben bastelt mit an Mias Rad.  
Ben tinkers mit<sub>adv</sub> with Mia's bike
- b. #Das neue Werkzeug bastelt mit an Mias Rad.  
the new tool tinkers mit<sub>adv</sub> with Mia's bike

This foundational constraint on the interpretation of *mit<sub>adv</sub>* shows that the explicit subject and the implicit participants must share their participant roles in relation to the verbal predication. This constraint is a first clear piece of evidence against an ellipsis account of *mit<sub>adv</sub>*; at least there is no obvious reason why the silent constituent should unequivocally introduce a co-participant of the subject argument. Notably, there *are* elliptical examples; see (32) (building on Strigin 1995: (4), Zifonun 1996/1997: (23a)). These, however, should not be conflated with *mit<sub>adv</sub>*-based examples. For one, the example in (32b) enforces the introduction of a suitable antecedent in the preceding context, as in (32a); furthermore, this *mit* can be coordinated with *ohne* 'without', which does not have a true free use.

- (32) a. [context: Mia and Paul are arguing about whether Ben was wearing his bathing cap while swimming to an isle.]
- b. Und nun? Ist Ben mit oder ohne zur Insel geschwommen?  
and now is Ben with or without to the isle swum  
'Well then? Did Ben swim to the isle with or without the bathing cap?'

The only candidate for a serious comparison to *mit<sub>adv</sub>* then is the comitative use of *mit*-PPs.<sup>7</sup> As already suggested above, I will however argue that even these two uses are not the same.

### 2.2.1 Projection tests

I will first test the accompaniment relation and the alternative implication for their projection properties. In their overview of projective contents, Tonhauser et al. (2013) argue that the standard family-of-sentence diagnostic for projective content (Chierchia & McConnell-Ginet 1990) should be applied in different ways depending on whether an expression is subject to so-called Strong Contextual Felicity or not. Let us therefore start with the latter. Strong Contextual Felicity tests whether a content is strongly presupposed, that is, whether it must be contextually given and cannot be accommodated. The example in (33a) shows that *auch* is at odds with a context that does not introduce an explicit alternative; *auch* is thus subject to Strong Contextual Felicity. (This is also the standard assumption for the additive *too* in English; see Tonhauser et al. 2013.) The example in (33b) shows that *mit<sub>adv</sub>* is different. The

<sup>7</sup> Zifonun (1996/1997) also suggests that *mit<sub>adv</sub>* should not be conflated with true elliptical cases such as (32b). However, she does not seem to notice that reconstruction accounts (including her own) are at odds with the fact that *mit<sub>adv</sub>* is limited to a comitative use.



alternative implication ('Someone different from the bus driver is working on a broken-down car.') is compatible with the given context and thus not subject to Strong Contextual Felicity. The same is true for the accompaniment relation ('The bus driver is accompanying an implicit working on a broken-down car.'), which need not be introduced before either. In other words, while *auch* introduces strong presuppositions, *mit<sub>adv</sub>* does not.

- (33) [context: A is sitting in a bus. The bus driver has left the bus; A does not know what is happening outside. B comes in and says:]
- a. #Der Busfahrer schraubt AUCH an einem kaputten Auto.  
the bus driver screws also with a broken-down car  
'The bus driver is ALSO working on a broken-down car.'
  - b. Der Busfahrer schraubt mit an einem kaputten Auto.  
the bus driver screws mit<sub>adv</sub> with a broken-down car  
'The bus driver belongs to a set of people working on a broken-down car.'

With this distinction in place, we can turn to the family-of-sentence diagnostic. According to this diagnostic, only projective content survives if it is embedded under family-of-sentence variants such as modals, conditionals, or negation. As *mit<sub>adv</sub>* is not subject to Strong Contextual Felicity, the relevant variants need not be contextualized in a particular way. The examples in (34) then show that the accompaniment is clearly not projective: None of the examples conveys that Ben is accompanying an implicit tinkering with a soapbox.

- (34)
- a. Es ist unmöglich, dass Ben mit an einer Seifenkiste bastelt; er hasst  
it is impossible that Ben mit<sub>adv</sub> with a soapbox tinkers; he hates  
jede Form von Teamarbeit.  
every kind of teamwork  
'It is impossible that Ben belongs to a set of people tinkering with a soapbox;  
he hates all kinds of teamwork.'
  - b. Wenn Ben mit an einer Seifenkiste bastelt, kann sich das entsprechende  
if Ben mit<sub>adv</sub> with a soapbox tinkers can REFL the corresponding  
Team freuen; er ist ein echter Kenner.  
team rejoice he is a true expert  
'If Ben belongs to a set of people tinkering with a soapbox, the team in  
question can rejoice; he is a true expert.'
  - c. Ben bastelt nicht (bloß) mit an einer Seifenkiste, sondern er bastelt  
Ben tinkers not (merely) mit<sub>adv</sub> with a soapbox but he tinkers  
daran allein.  
with it alone  
'Ben does not (merely) belong to a set of people tinkering with a soapbox, but  
he is tinkering with it on his own.'

Furthermore, as the accompaniment requires that there are alternatives, the alternative implication does not project either; see (35).

- (35) Mia bastelt nicht mit an einer fliegenden Seifenkiste. An so etwas  
Mia tinkers not mit<sub>adv</sub> with a flying soapbox with such a thing  
bastelt niemand!  
tinkers nobody  
'Mia does not belong to a set of people tinkering with a flying soapbox. Nobody  
tinkers with such a thing!'

The situation for *auch* is again not the same. The family-of-sentence diagnostic shows that the alternative presupposition associated with *auch* is projective (see Tonhauser et al. 2013 for the same claim regarding the additive *too* in English). For instance, in (36), it survives the embedding under a modal and is therefore at variance with the given context.<sup>8</sup>

- (36) a. [context: A and B are talking about hobbies of their friends; they have not yet talked about tinkering with soapboxes. They know Ben as being a tinkerer. A says:]  
 b. #Es ist möglich, dass Ben AUCH an Seifenkisten bastelt.  
 it is possible that Ben also with soapboxes tinkers  
 ‘It is possible that Ben ALSO tinkers with soapboxes.’

Tonhauser et al. (2013) discuss the so-called Obligatory Local Effect as a third diagnostic for projective content. It tests whether a (projective) content must scope under an embedding operator such as *glauben* ‘believe’ (see also Gazdar 1979; Potts 2005). *auch* and *mit<sub>adv</sub>* are both subject to the Obligatory Local Effect and thus do not contrast here. However, this commonality can be used in order to reveal that both expressions introduce different propositional contents; compare (37).

- (37) [context: Ben is tinkering with a soapbox with Mia. Paul knows about the people tinkering with a soapbox; however, he does not know anything about a cooperation.]  
 a. #Paul glaubt, dass Ben mit an einer Seifenkiste bastelt.  
 Paul believes that Ben mit<sub>adv</sub> with a soapbox tinkers  
 ‘Paul believes that Ben belongs to a set of people tinkering with a soapbox.’  
 b. Paul glaubt, dass Ben AUCH an einer Seifenkiste bastelt.  
 Paul believes that Ben also with a soapbox tinkers  
 ‘Paul believes that Ben is ALSO tinkering with a soapbox.’

By hypothesis, *mit<sub>adv</sub>* involves an accompaniment by participation; therefore, a context that negates any knowledge of a cooperation by the attitude holder is incompatible with a belief report to the contrary. This is different for *auch*. By hypothesis, it is not bound to an accompaniment; therefore, the given context is compatible with the given belief report.

In sum, all three projection tests reveal clear differences between *mit<sub>adv</sub>* and *auch*: in contrast to *auch*, *mit<sub>adv</sub>* introduces neither strong presuppositions nor projective content. Furthermore, only *mit<sub>adv</sub>* contributes an accompaniment by participation.

### 2.2.2 Tests for discourse transparency

Although both the accompaniment and the alternative implication as introduced by *mit<sub>adv</sub>* are not projective, they do not share the same semantic-pragmatic status. In particular, according to (26b), the accompaniment is identified as explicit content, whereas the host situation including its participants is identified as merely implicit content. This suggests that only the former is discourse-transparent and thus a potential target for anaphors, cross-sentential operators, and explicit questions; see Farkas & de Swart (2003); Potts (2005); Amaral et al. (2007); Jayez (2010); Tonhauser (2012) for elaborate discussions of these diagnostics.

The example in (38) shows that *mit<sub>adv</sub>* does not license a pronominal anaphor to the alternatives or to the relevant team. Similarly, the anaphor *das* ‘that’ in (39) can relate to Mia’s accompaniment by participation, but not to the cooperation as such.

<sup>8</sup> Notably, if the object instead of the subject were focused in (36b) (correlating with deaccenting *auch*), the clause would be felicitous. In this case, Strong Contextual Felicity would be satisfiable via the context information that Ben is known as a tinkerer; plausible alternative objects would be bikes or cars.

- (38) #Mia schraubt mit an einem Bentley. Sie treffen sich montags.  
 Mia screws mit<sub>adv</sub> with a Bentley they meet REFL Mondays.  
 ‘Mia belongs to a set of people working on a Bentley. They meet on Mondays.’
- (39) Mia schraubt mit an einem Bentley. Das ist toll.  
 Mia screws mit<sub>adv</sub> with a Bentley that is great  
 ‘Mia belongs to a set of people working on a Bentley. That (= her accompaniment / ≠ the cooperation) is great.’

Notably, given *mit*<sub>adv</sub>, corresponding anaphoric descriptions are feasible, as shown in (40). In contrast to pronouns, definite descriptions can convey indirect anaphors that lack an explicit antecedent. The examples thus support the assumption that *mit*<sub>adv</sub> introduces the relevant information implicitly.

- (40) Mia schraubt #(mit) an einem Bentley.  
 Mia screws (mit<sub>adv</sub>) with a Bentley  
 ‘Mia belongs to a set of people working on a Bentley.’
- a. {Das Team / Die Teamarbeit} ist toll.  
 {the team / the teamwork} is great  
 ‘{The team / The teamwork} is great.’
  - b. Die Partner sind sehr kompetent.  
 the partners are very competent  
 ‘The partners are very competent.’

The example in (41) shows that *mit*<sub>adv</sub> licenses operator attachment to the accompaniment. Ben’s preference for working on his own is a plausible reason against his accompaniment of a tinkering with a soapbox. Therefore, the use of *mit*<sub>adv</sub> in the matrix clause is compatible with a concessive adverbial, but incompatible with a causal one.

- (41) Ben bastelt mit an einer Seifenkiste, {obwohl / #weil} er gern für sich arbeitet.  
 Ben tinkers mit<sub>adv</sub> with a soapbox {although / because} he gladly for himself works  
 ‘Ben belongs to a set of people tinkering with a soapbox {although / because} he likes to work on his own.’

By contrast, operators cannot attach to the alternative implication, as shown in (42). Notably, the context provides candidates for relevant alternatives; that is, although *beide* ‘both’ within the adverbial clause refers to Lilli and Mia, the adverbial cannot relate to their participation in the tinkering. This argues against an ellipsis account of *mit*<sub>adv</sub>: if there were a silent internal argument of the preposition that could be recovered from the context, (42) should be fine.

- (42) #Ben hat sich gestern mit Lilli und Mia getroffen. Er hat mit an einer Seifenkiste gebastelt, weil beide gerne basteln.  
 Ben has REFL yesterday with Lilli and Mia met he has mit<sub>adv</sub> with a soapbox tinkered because both gladly tinker  
 ‘Ben met Lilli and Mia yesterday. He belonged to a set of people tinkering with a soapbox because both like to tinker.’

Finally, the given picture is corroborated by question-answer pairs. The examples in (43) show that *mit*<sub>adv</sub> supports answers to questions that are sensitive to an accompaniment. It

is noteworthy that *mit<sub>adv</sub>* can be contrasted with *allein* ‘alone’; this can only be explained if *mit<sub>adv</sub>* is the bearer of the relevant accompaniment.<sup>9</sup>

- (43) a. Beteiligt sich Ben an einem Basteln an einer Seifenkiste?  
 participates REFL Ben in a tinkering with a soapbox  
 – Ja, Ben bastelt mit an einer Seifenkiste.  
 – yes Ben tinkers mit<sub>adv</sub> with a soapbox  
 ‘Does Ben participate in a tinkering with a soapbox? – Yes, Ben belongs to a set of people tinkering with a soapbox.’
- b. Bastelt Ben ALLEIN an der Seifenkiste? – Nein, Ben bastelt nur MIT  
 tinkers Ben alone with the soapbox – no Ben tinkers only mit<sub>adv</sub>  
 an der Seifenkiste.  
 with the soapbox  
 ‘Does Ben tinker with the soapbox ALONE? – No, Ben only belongs to a SET of people tinkering with the soapbox.’

The examples in (44) show that questions that are sensitive to the alternative implication are not feasible. Note that the question provides explicit potential alternatives; their inaccessibility is again at odds with an ellipsis account of *mit<sub>adv</sub>*.

- (44) #Was tun Mia und Lilli? – Ben bastelt mit an einer Seifenkiste.  
 what do Mia and Lilli – Ben tinkers mit<sub>adv</sub> with a soapbox  
 ‘What are Mia and Lilli doing? – Ben belongs to a set of people tinkering with a soapbox.’

In sum, the diagnostics show that *mit<sub>adv</sub>* involves a discourse-transparent accompaniment and a discourse-opaque alternative implication.

Let me conclude this subsection with a brief comparison to *mit*-PPs. They support anaphors to alternatives, the attachment of alternative-sensitive operators, and answers to alternative-sensitive questions; see the contrast between (45) and (38), (42), (44).

- (45) a. Mia schraubt mit anderen an einem Bentley. Sie treffen sich montags.  
 Mia screws with others with a Bentley they meet REFL Mondays  
 ‘Mia works on a Bentley with others. They meet on Mondays.’
- b. Ben hat sich gestern mit Lilli und Mia getroffen. Er hat mit ihnen  
 Ben has REFL yesterday with Lilli and Mia met he has with them  
 an einer Seifenkiste gebastelt, weil beide gerne basteln.  
 with a soapbox tinkered because both gladly tinker  
 ‘Ben met Lilli and Mia yesterday. He was tinkering with a soapbox with them because both like to tinker.’
- c. Was tun Mia und Lilli? – Ben bastelt mit ihnen an einer Seifenkiste.  
 what do Mia and Lilli – Ben tinkers with them with a soapbox  
 ‘What are Mia and Lilli doing? – Ben is tinkering with a soapbox with them.’

This is as expected, given that the relevant alternatives are explicit here. Recall, however, that the contrasting behavior of *mit<sub>adv</sub>* does not follow from an ellipsis account; the examples in (42) and (44) above show that *mit<sub>adv</sub>* does not introduce analogous silent slots for PP-internal arguments. This is a clear difference between *mit*-PPs and *mit<sub>adv</sub>*. In the next

<sup>9</sup> The focus particles *auch* ‘also’ and *nur* ‘only’ do not license such content-related contrasts. The finding thus provides further evidence against a focus particle treatment of *mit<sub>adv</sub>*.

section, I will argue that the involved accompaniment relations differ as well. The difference in interpretation between the example in (43b) with *mit<sub>adv</sub>* and the analogous example with a *mit*-PP in (46) is already suggestive of a distinction.

- (46) Bastelt Ben *allein* an der Seifenkiste? – Nein, Ben bastelt nur *mit* Lilli und tinkers Ben alone with the soapbox – no Ben tinkers only with Lilli and Mia an der Seifenkiste.  
Mia with the soapbox  
‘Does Ben tinker with the soapbox *alone*? – No, Ben only tinkers with the soapbox with Lilli and Mia.’

In (43b), *mit<sub>adv</sub>* conveys that Ben is playing only an accompanying role in the tinkering. In (46), however, the *mit*-PP conveys a condition; it says that Ben is tinkering with the soapbox only if Mia and Lilli accompany him. That is, the forced contrast to *allein* ‘alone’ shows that the roles are reversed.

### 2.2.3 Accompaniment by participation: Adverbial *mit* vs. prepositional *mit*

With regard to *mit*-PPs such as (47), Seiler (1974: 235) writes that “it is precisely the function of the Comitative [...] to leave unspecified the extent of participation in the action”; see also Strigin (1995: 320) and Rapoport (2014: 161).

- (47) Ben bastelt *mit* Mia an einer Seifenkiste.  
Ben tinkers with Mia with a soapbox  
‘Ben is tinkering with a soapbox with Mia.’

Accordingly, this example does not specify whether Mia and Ben are coequal agents or whether Mia is accompanying Ben’s tinkering without tinkering herself (in Strigin’s words, she could just be being cheerful). How does *mit<sub>adv</sub>* fit into this picture?

The continuations (48a) and (48b) in (48) show that *mit<sub>adv</sub>* does not specify the extent of participation either.

- (48) Ben bastelt *mit* an einer Seifenkiste.  
Ben tinkers *mit<sub>adv</sub>* with a soapbox  
‘Ben belongs to a set of people tinkering with a soapbox.’
- a. Allerdings trägt er nur wenig bei.  
however contributes he only little to  
‘However, he only is contributing little to it.’
  - b. Tatsächlich macht er das meiste.  
in fact does he the most  
‘In fact, he is doing the most.’

However, there are two crucial differences from *mit*-PPs. First, the co-participant the varying contribution of whom is under consideration in (48) is the subject argument. This comes to light most clearly in cases that make an asymmetric interpretation prominent; see (49) and (50).

- (49) a. [context: Ben is listening to a concert on the radio; Mia is in the concert.]  
b. {Ben / #Mia} hörte das Konzert *mit* an.  
{Ben / Mia} listens the concert *mit<sub>adv</sub>* to  
‘{Ben / Mia} belonged to a set of people listening to the concert.’

- (50) a. [context: The speaker knows that Mia will be traveling to Canada and that Ben has decided spontaneously to join her.]  
 b. {Ben / #Mia} reist mit nach Kanada.  
 {Ben / Mia} travels *mit<sub>adv</sub>* to Canada  
 ‘{Ben / Mia} will belong to a set of people traveling to Canada.’

This reversal of argument assignments provides clear evidence against an ellipsis account of *mit<sub>adv</sub>*: the co-participant is not introduced as an implicit internal argument of a putative *mit*-PP.

Second, the co-participant as introduced by *mit<sub>adv</sub>* is related more closely to the explicit event description than the co-participant as introduced by a *mit*-PP is. Most notably, examples based on *mit<sub>adv</sub>* entail that the event predication is predicated of the subject argument; recall the entailment in (51) (= (8b)). (Qualifications of this observation will be discussed in Section 3.) This is different for *mit*-PPs such as *mit Mia* in (47). As said, Mia could just be cheerful and would thus not be an agent of the relevant eventuality.

- (51) Ben bastelt mit an einer Seifenkiste. → Ben bastelt an einer Seifenkiste.  
 Ben tinkers *mit<sub>adv</sub>* with a soapbox Ben tinkers with a soapbox

This difference can be conceived of as a natural byproduct of the fact that *mit<sub>adv</sub>* promotes the co-participant to the subject position. In other words, the subject is not just a ‘comitative’ to an independent event; instead, *mit<sub>adv</sub>* brings about the introduction of a separate event that accompanies an implicit host event. The accompaniment conveyed by *mit<sub>adv</sub>* thus does not relate participants to events, but rather events of the same kind to each other. I suppose that this is also the reason why only *mit<sub>adv</sub>* is sensitive to asymmetric interpretations. For instance, even in a context as given in (50), a *mit*-PP can be used for the primary participant, as in (52).

- (52) a. [context: The speaker knows that Mia will be traveling to Canada and that Ben has decided spontaneously to join her.]  
 b. Ben reist mit Mia nach Kanada.  
 Ben travels with Mia to Canada  
 ‘Ben will be traveling to Canada with Mia.’

The proposed distinction between comitatives on the one hand and accompaniment by participation on the other can explain this as follows. With *mit*-PPs, the particular justification of the comitative role is left fully unspecified; with *mit<sub>adv</sub>*, by contrast, it is the co-participant’s participation as such that is marked as an accompaniment.

I conclude that *mit<sub>adv</sub>* is clearly different from *mit*-PPs and thus not elliptical. It introduces a participation in an eventuality that is conceived of as accompanying an eventuality of the same kind.

### 2.3 Interim conclusions

I have argued for the following key traits of *mit<sub>adv</sub>*. It is not focus-sensitive, but a regular modifier to the verbal projection; as such, it induces the explicit subject to accompany a host eventuality by participation in a corresponding eventuality. More specifically, the introduced accompaniment is identified as explicit content. It is neither presupposed nor projective, but discourse-transparent and thus accessible to cross-sentential anaphors, operators, and questions. The host eventuality including its alternative participants is

identified as implicit content. While this content is neither presupposed nor projective either, it is discourse-opaque and thus inaccessible to anaphors, cross-sentential operators, and questions.

I conclude that *mit<sub>adv</sub>* can be neither an additive such as *auch* ‘also’ (which, for instance, is focus-sensitive and lacks any explicit information about an accompaniment) nor a PP with a retrievable internal argument (which, for instance, supports contextual accessibility of co-participants and does not enforce that the subject receives an accompanying role). The overview of descriptive properties thus very clearly calls for a new proposal, which I will tackle next.

### 3 Adverbial *mit*: Analysis

In order to sketch a formal analysis of *mit<sub>adv</sub>*, I make two simplified assumptions. First, following Farkas & de Swart (2003), I distinguish between discourse-transparent ‘normal’ discourse referents on the one hand and discourse-opaque variables on the other. The basic idea is that discourse-opaque variables depend on predicative content, but lack referential force; one prime example is implicit arguments. For instance, a passive such as *The problem was solved* does not introduce an explicit agent; nevertheless, the underlying predicate *solve* still entails the existence of a corresponding implicit entity. For the purposes of the present paper, I will not dwell on an appropriate formal model of this distinction, but merely use it for a representation of the distinction between discourse-transparent explicit arguments and discourse-opaque implicit ones; the latter are identified by the subscript *i* (which stands for *implicit*).<sup>10</sup> Second, I assume that the domain of entities is structured in terms of ontologically different types. Specifically, I will use *e*, *e<sub>i</sub>*, etc. for eventualities, *s*, *s<sub>i</sub>*, etc. for states, and *r*, *r<sub>i</sub>*, etc. for so-called tropes (more on this less familiar type in Section 4.2.1). I do not associate the variables *x*, *x<sub>i</sub>*, *y*, *y<sub>i</sub>*, etc. with specific types; instead, I assume that they either represent entities of some general type or that their specific typing can be read off the predicates they are related to. Furthermore, I will use ‘ $\leq$ ’ and ‘ $\not\leq$ ’ for the relations ‘is part of’ and ‘is not part of’, respectively. I take for granted that these part relations are relativized appropriately to the types of entities they relate; for instance, if ‘ $\leq$ ’ relates two individuals, it introduces a part relation on individuals, if ‘ $\leq$ ’ relates two events, it introduces a part relation on events, etc. (see, for instance, Lasnik 1998).

Based on these ingredients, I propose the following meaning representation for *mit<sub>adv</sub>*.

$$(53) \quad \llbracket \text{mit}_{adv} \rrbracket = \lambda P \lambda x \lambda e \exists e'_i \exists x'_i [P(x)(e) \wedge P(x'_i)(e'_i) \wedge \text{accomp}'(e, e'_i) \wedge x \not\leq x'_i \wedge e \not\leq e'_i]$$

According to (53), *mit<sub>adv</sub>* modifies a predication of eventualities in such a way that the predication is distributed over a discourse-transparent explicit eventuality and a distinct discourse-opaque implicit eventuality (where each predication includes its respective highest-ranked participant role). The variable for the explicit eventuality is compositionally active, while the variable for the implicit eventuality is existentially closed. Furthermore, both eventualities are related to each other by *accomp'*, for which I propose the following truth conditions:

$$(54) \quad \text{For any eventualities } e, e': \text{accomp}'(e, e') = 1 \text{ iff (i) } e \text{ and } e' \text{ form an integrated whole and (ii) } e \text{ is an extension of } e'.$$

<sup>10</sup> Correspondingly, I will also remain agnostic as to the question of how the implicit arguments introduced by *mit<sub>adv</sub>* relate to the distinction between at-issue content and not at-issue content as discussed in, for instance, Potts (2005); Amaral et al. (2007); Jayez (2010); Simons et al. (2010); Tonhauser (2012).

Condition (i) builds on aspects of the analysis of adverbial ‘together’ in Moltmann (2004). The key idea is that the parts of an integrated whole share relevant properties that are not shared by entities that are not part of the integrated whole. The choice of relevant properties depends on the type of entities that form the integrated whole and on perspective. For eventualities, spatio-temporal contiguity and the sharing of participants is particularly relevant (a further option is discussed below). Condition (ii) is about the different roles  $e$  and  $e'$  play within the integrated whole. The key idea here is that  $e'$  provides a spatio-temporal structure that can host  $e$  as an additional concomitant component. Crudely put,  $e$  is parasitic on  $e'$ . Notably, this does not say that  $e$  is necessarily less important than  $e'$ ; it merely says that one conceives of  $e$  as the part that secondarily joins  $e'$ .

The resultant compositional derivation for the example in (55) is fully regular. The combination of  $mit_{adv}$  with the verbal predication yields the representation in (56); the subsequent integration of the subject and the binding of the explicit eventuality yield the truth conditions in (57) for the sentence as a whole.

- (55) Ben bastelt mit an einer Seifenkiste.  
Ben tinkers mit<sub>adv</sub> with a soapbox  
'Ben belongs to a set of people tinkering with a soapbox.'

- (56)  $\llbracket mit\ an\ einer\ Seifenkiste\ basteln \rrbracket$   
=  $\llbracket mit_{adv} \rrbracket(\llbracket an\ einer\ Seifenkiste\ basteln \rrbracket)$   
=  $[\lambda P \lambda x \lambda e \exists e'_i \exists x'_i [P(x)(e) \wedge P(x'_i)(e'_i) \wedge accomp'(e, e'_i) \wedge x \not\leq x'_i \wedge e \not\leq e'_i]]$   
 $(\lambda x \lambda e \exists b [tinker-with'(e) \wedge ag'(e, x) \wedge th'(e, b) \wedge soapbox'(b)])$   
=  $\lambda x \lambda e \exists e'_i \exists x'_i [\exists b [tinker-with'(e) \wedge ag'(e, x) \wedge th'(e, b) \wedge soapbox'(b)] \wedge$   
 $\exists b [tinker-with'(e'_i) \wedge ag'(e'_i, x'_i) \wedge th'(e'_i, b) \wedge soapbox'(b)] \wedge accomp'(e, e'_i)$   
 $\wedge x \not\leq x'_i \wedge e \not\leq e'_i]$

- (57)  $\llbracket Ben\ bastelt\ mit\ an\ einer\ Seifenkiste \rrbracket$   
= 1 iff  $\exists e \exists e'_i \exists x'_i [\exists b [tinker-with'(e) \wedge ag'(e, Ben) \wedge th'(e, b) \wedge soapbox'(b)]$   
 $\wedge \exists b [tinker-with'(e'_i) \wedge ag'(e'_i, x'_i) \wedge th'(e'_i, b) \wedge soapbox'(b)] \wedge accomp'(e, e'_i)$   
 $\wedge Ben \not\leq x'_i \wedge e \not\leq e'_i]$

In prose: (57) is true iff there is a tinkering with a soapbox by Ben and an implicit tinkering with a soapbox by at least one implicit other person such that Ben's tinkering is the accompanying part of the integrated joint tinkering consisting of both tinkering. This result captures the key traits of  $mit_{adv}$ : Ben's accompaniment of a tinkering with a soapbox by himself tinkering with a soapbox is identified as the explicit discourse-transparent content and thus predicted to be accessible to anaphors, operators, and questions. By contrast, the tinkering with a soapbox by some alternative is identified as implicit discourse-opaque content and thus predicted to be inaccessible to discourse-related operations. While  $mit_{adv}$  thus introduces a distinction between explicit and implicit content, it does not introduce any presuppositions, as for instance *auch* would.

Furthermore, both tinkering form an integrated whole with Ben's tinkering as the additional concomitant part. This has three crucial consequences. First, the representation captures the asymmetry between both eventualities; in particular, it reverses and strengthens the role assignment of *mit*-PPs by assigning the accompanying role to the explicit subject and by enforcing its participation in the relevant eventuality as an agent and thus prohibiting pure concomitance. As desired, there are thus clear differences from the representation of a corresponding clause with an ordinary *mit*-PP, as in (58). According to (58), the accompanying part is contributed by the PP-internal referent, the



assignment of a comitative role licenses pure concomitance, and the referent is explicit and thus discourse-transparent.

- (58) [[Ben is tinkering with someone else with a soapbox.]  
 = 1 iff  $\exists e \exists x \exists b [\text{tinker-with}'(e) \wedge \text{ag}'(e, \text{Ben}) \wedge \text{th}'(e, b) \wedge \text{soapbox}'(b) \wedge \text{comitative}'(e, x) \wedge \text{Ben} \not\leq x]$

Second, the imposed integrity condition for *accomp'* in (57) requires a justification: the implicit and the explicit tinkering should share time, location, and participants. This licenses the identification of the existentially closed soapboxes and thereby captures the intuition that—the distributive effect of *mit<sub>adv</sub>* notwithstanding—Ben and the implicit alternative are tinkering with the same soapbox. I have emphasized above that the particular criteria for integrity depend on the type of the conjoined entities and perspective. For instance, the example in (59) shows that the semantics should not require participant identification across the board.

- (59) Ben raucht eine Zigarette mit.  
 Ben smokes a cigarette mit<sub>adv</sub>  
 'Ben belongs to a set of people smoking a cigarette.'

Our knowledge of smoking says that cigarettes are usually not shared and that spatio-temporal contiguity alone supports integrity. In fact, the integrity criteria are not set in stone for tinkering events either. For instance, let there be a soapbox competition where soapboxes are fabricated by single persons. One could use (55) here in order to indicate that Ben participates in the competition; integrity would not be achieved by the identity of the soapboxes, but by the common time, location, and purpose of the competition as a whole.

The third consequence relates to entailment patterns. Recall once more the entailment in (60) (= (8b), (51)). The entry in (53) predicts this veridicality effect of *mit<sub>adv</sub>* in a straightforward way; it simply follows from the distribution of the verbal predication.

- (60) Ben bastelt mit an einer Seifenkiste. → Ben bastelt an einer Seifenkiste.  
 Ben tinkers mit<sub>adv</sub> with a soapbox Ben tinkers with a soapbox

However, there is a complication that has not yet been addressed. The examples in (61) (which I partly owe to an anonymous reviewer) show that not all predicates support veridicality (but see below for qualifications).

- (61) a. Ben trug das Klavier mit hoch. → Ben trug das Klavier hoch.  
 Ben carried the piano mit<sub>adv</sub> up Ben carried the piano up  
 'Ben belonged to a set of people carrying up the piano.' → 'Ben carried up the piano.'
- b. Ben schließt das Projekt mit ab. → Ben schließt das Projekt ab.  
 Ben closes the project mit<sub>adv</sub> off Ben closes the project off  
 'Ben belongs to a set of people finishing the project.' → 'Ben finishes the project.'
- c. Der Sessel füllt den Raum mit aus. → Der Sessel füllt den Raum aus.  
 the armchair fills the room mit<sub>adv</sub> out the armchair fills the room out  
 'The armchair belongs to a set of things filling out the room.' → 'The armchair fills out the room.'

Intuitively, these predicates differ from the activity predicates discussed before by involving a causal effect that hinges on the joint contribution by all participants the predicate relates to. The predicates in (61a) and (61b) suggest that the change they involve depends on both the explicit agent and the implicit alternatives. Similarly, the achievement of maximal fullness as imposed by the stative *ausfüllen* ‘fill out’ in (61c) depends on the participants as a group. As my analysis of *mit<sub>adv</sub>* builds on joint participation, it is thus not surprising that the entailments in (61) are invalid. In fact, analogous findings are well known for comitatives (in the relevant co-subject reading) and collective interpretations of plurals; for instance, *Ben carried up the piano with Paul* and *Ben and Paul carried up the piano* do not entail that Ben carried up the piano; see Parsons (1990: 83), Moltmann (2004: Section 2), Lasersohn (2011: Section 4), and Schein (2017: Chapter 2). For reasons of space, I cannot provide a full-fledged formal treatment of these observations, but I will sketch a possible take on it in terms of the proposed analysis. The crucial ingredient is again the integrity condition. According to Moltmann (2004: 311–312), the integrity of a sum of parts can also be justified by the fact that the sum constitutes an entity of a particular type only in virtue of being a whole, that is, in virtue of being more than the sum of the parts. This integrity criterion is typical for predicates that involve a causal effect that depends on joint forces; see Moltmann’s own example: if two agents contribute to the solution of a problem, the sum of both contributions constitute a solving of a problem only in virtue of the fact that both contributions as a whole (not as individual contributions) yield the relevant change. I propose that this integrity criterion is at the heart of the entailment failures in (61); see the representation in (62).

$$(62) \quad \llbracket \text{Ben hat das Klavier mit hochgetragen.} \rrbracket \\ = 1 \text{ iff } \exists e \exists e'_i \exists x'_i [\text{carry-up}'(e) \wedge \text{ag}'(e, \text{Ben}) \wedge \text{th}'(e, \text{p}[\text{piano}'(p)]) \wedge \text{carry-up}'(e'_i) \wedge \\ \text{ag}'(e'_i, x'_i) \wedge \text{th}'(e'_i, \text{p}[\text{piano}'(p)]) \wedge \text{accomp}'(e, e'_i) \wedge \text{Ben} \not\leq x'_i \wedge e \not\leq e'_i]$$

According to  $\text{accomp}'(e, e'_i)$  in (62),  $e$  and  $e'_i$  must form an integrated whole. In view of our knowledge about the carrying up of pianos, this strongly suggests that it is only this whole that constitutes an event of carrying up the piano. Therefore,  $e$  alone does not constitute such an eventuality, which predicts the entailment failure in (61a). A crucial formal consequence is that the distributed event predication in (62) must be understood in a loose activity sense such as ‘contribute to the carrying up of the piano’. Notably, this is in keeping with the intuition that, in this activity reading, the entailment in (61a) becomes valid.<sup>11</sup>

In the following, I will argue that this basic analysis of *mit<sub>adv</sub>* can be extended to a generalized version that also covers the use of free *mit* within superlative structures.

<sup>11</sup> Predicates denoting self-propelled motions provide independent evidence for the assumption that *mit<sub>adv</sub>* singles out the activity component of verbal predicates. These predicates support both an atelic activity interpretation and a telic accomplishment interpretation. However, *mit<sub>adv</sub>* renders the telic interpretation grammatically inaccessible, as shown in (i). The compositionally active variable for the explicit eventuality licenses an activity-sensitive *for*-adverbial, but not an accomplishment-sensitive *in*-adverbial.

- (i) Ben ist {2 Minuten lang / #in 2 Minuten} mit zur Hütte gelaufen.  
Ben is {2 minutes long / in 2 minutes} mit<sub>adv</sub> to the cottage walked  
‘For 2 minutes Ben belonged to a set of people walking to the cottage.’ /  
‘In 2 minutes Ben belonged to a set of people walking to the cottage.’

One might be puzzled by the additional observation that these predicates still support veridicality. This, however, can be easily explained by the fact that the causal effect of self-propelled motions do not depend on the joint forces of all participants.

#### 4 Generalizing free *mit*: Construction vs. composition

The example in (63) (= (6a)) again exemplifies the combination of free *mit* with the superlative (= *mit<sub>sup</sub>*).

- (63) In diesem Raum ist Ben mit der größte.  
 in this room is Ben mit<sub>sup</sub> the tallest  
 ‘Ben belongs to the tallest ones in this room.’

Recall that Zifonun (1996/1997) and Bückler (2012) consider *mit<sub>sup</sub>* a separate construction that cannot be subsumed under their respective analyses for the adverbial counterpart. The uniqueness condition of the superlative would be at odds with a treatment of *mit<sub>sup</sub>* in terms of an additive or an elliptical PP; see (64) (= (7)). Furthermore, *mit<sub>sup</sub>* is generally not veridical; see (65) (= (8a)).

- (64) #Ben ist {auch / mit anderen} der größte.  
 Ben is {also / with others} the tallest  
 ‘Ben is {also / together with other people} the tallest.’

- (65) Ben ist mit der größte. → Ben ist der größte.  
 Ben is mit<sub>sup</sub> the tallest Ben is the tallest

I will argue against this approach from two angles. To begin with, I will discuss the distributional properties of free *mit* within stative predications more generally. The observations will reveal substantial shortcomings of a constructional approach to *mit<sub>sup</sub>*. I will then show that the alternative proposal for *mit<sub>adv</sub>* developed above supports a generalized version that also covers *mit<sub>sup</sub>*. Crucially, this uniform compositional treatment will offer a promising systematic explanation for the specific distribution of free *mit* and interpretational effects such as (65).<sup>12</sup>

##### 4.1 The distribution of free *mit* within stative predications

A first intriguing observation, already mentioned in the introduction, relates to the adjectival domain. In contrast to their counterparts in the superlative form, positive and comparative adjectives are typically incompatible with a free *mit*; see (66a) and (66b). (Qualifications of this assessment will be discussed in Sections 4.2.1 and 5.)

- (66) a. #Ben ist mit {groß / blond / müde / wütend}.  
 Ben is mit<sub>free</sub> {tall / blond / tired / angry}  
 ‘Ben belongs to a set of {tall / blond / tired / angry} people.’  
 b. #Ben ist mit {größer / müder / wütender} als Mia.  
 Ben is mit<sub>free</sub> {taller / more tired / more angry} than Mia  
 ‘Ben belongs to a set of people that are {taller / more tired / more angry} than Mia.’

This contrast seems to argue for a specific superlative construction that excludes other adjectival forms. But this approach does not explain why the putative alternative construction based on the adverbial *mit<sub>adv</sub>* is not felicitous either. Given the fine paraphrases

<sup>12</sup> For reasons of space, I will not be able to discuss the full range of relevant environments. In particular, I will confine the discussion to predicative uses of *mit<sub>sup</sub>*. Furthermore, I will not discuss noun-based direct predications such as *be a baker* or *be a reason for*; see the conclusion in Section 5 for a few remarks.

in (66), there is no obvious explanation for the restriction. Furthermore, the examples in (67) show that a true additive is clearly compatible with both the positive and the comparative.

- (67) Ben ist AUCH {groß / größer als Mia}.  
 Ben is also {tall / taller than Mia}  
 ‘Ben is ALSO {tall / taller than Mia}.’

Second, free *mit* can be combined with locative PPs and APs, as in (68) and (69). (I owe (69) to an anonymous reviewer.)

- (68) a. Ben ist mit {auf dem Dachboden / im Keller}.  
 Ben is mit<sub>free</sub> {in the attic / in the basement}  
 ‘Ben belongs to a set of people {in the attic / in the basement}.’  
 b. Der Schlüssel ist mit in der Kiste.  
 the key is mit<sub>free</sub> in the box  
 ‘The key belongs to a set of things in the box.’

- (69) Ben ist mit anwesend.  
 Ben is mit<sub>free</sub> present  
 ‘Ben belongs to a set of people present.’

This additional option shows that the use of free *mit* within copula structures is not limited to the superlative. Hence, either the constructional approach must posit yet another copula-based construction, or these examples have to be subsumed under the adverbial case (which would, however, make all the more puzzling why neither the positive nor the comparative in (66) can resort to this option).

A third observation relates to state expressions in general. Maienborn (2003; 2005) distinguishes between Kimian states and Davidsonian states. While K(imian)-states are conceived of as exemplifications of a property at a bearer (a conception based on Kim 1976), D(avidsonian)-states are conceived of as ordinary eventualities in the world (a conception based on Davidson 1967). As a consequence, only D-state verbs pass standard event diagnostics. For instance, direct perception reports are licensed by D-state verbs such as *lie* (*stand*, *sleep*, *gleam*, etc.), but not by K-state verbs such as *resemble* (*love*, *weigh*, *belong to*, etc.) and copula structures such as *be in the box*, which are taken to always convey K-states; see (70).

- (70) Paul saw {the key lie in the box / #Mia resemble her sister / #the key be in the box}.

Maienborn (2003: Chapter 6) also discusses the distribution of comitative *mit*-PPs as one further diagnostic. She argues that K-states are generally at odds with participants and thus incompatible with comitatives. However, according to the above findings, free *mit* is partially compatible with K-state denoting copula structures. I therefore conclude that the distinction between K-states and D-states as such cannot be the ultimate crucial factor. In Section 4.2, I will argue that it is rather the type of the underlying predication—that is, the content of the predicative AP, DP, or PP—that determines the distribution of free *mit*. This refined perspective on the role of K-states as opposed to D-states is also reflected in the distribution of *mit<sub>adv.</sub>*. K-state verbs such as *ähneln* ‘resemble’, *70 kg wiegen* ‘weigh 70 kg’, and *lieben* ‘love’ are in fact infelicitous with *mit<sub>adv.</sub>*, as shown by (71a). However, a K-state verb such as *gehören zu* ‘belong to’ is felicitous with *mit<sub>adv.</sub>*, as shown by (71b).

- (71) a. #Ben {ähnelt Tim mit / wiegt mit 70 kg / liebt Mia mit}.  
 Ben {resembles Tim mit<sub>adv</sub> / weighs mit<sub>adv</sub> 70 kg / loves Mia mit<sub>adv</sub>}  
 ‘Ben belongs to a set of people that {resemble Tim / weigh 70 kg / love Mia}.’
- b. Dies gehört mit zu unseren Aufgaben.  
 this belongs mit<sub>adv</sub> to our tasks  
 ‘This belongs to a set of things that are our tasks.’

This suggests that the constraint in (71a) is not rooted in the K-state as such, but in the underlying content as provided by the lexical verb. D-state verbs do not behave in a uniform way either. Locative D-state verbs such as *stehen* ‘stand’ or *liegen* ‘lie’ license *mit<sub>adv</sub>* if the locative component is made explicit. This can be achieved either by a prepositional locative, as in (72), or by an adjective that makes a locative relation prominent, as in (73). (I owe (73) to an anonymous reviewer.)

- (72) a. Ben steht mit an der Ecke.  
 Ben stands mit<sub>adv</sub> at the corner  
 ‘Ben belongs to a set of people standing at the corner.’
- b. Der Schlüssel liegt mit in der Kiste.  
 the key lies mit<sub>adv</sub> in the box  
 ‘The key belongs to a set of things lying in the box.’

- (73) Das Kalb steht schattig, und die Mutterkuh steht mit schattig.  
 the calf stands shadily and the mother cow stands mit<sub>adv</sub> shadily  
 ‘The calf is standing in the shade, and the mother cow belongs to a set of entities standing in the shade.’

However, once the locative component is dropped such that a position mode interpretation is enforced, the use of *mit<sub>adv</sub>* becomes infelicitous, as in (74) (see Kaufmann 1995: 98–120 for a general discussion of the distinction between a locative and a position mode component within the lexical semantics of locative verbs). The D-state verb *schlafen* ‘sleep’ provides an analogous minimal pair, as in (75). Finally, D-state verbs that introduce a specific mode of sensory perception such as *glänzen* ‘gleam’ or *duften* ‘smell’ are also at odds with *mit<sub>adv</sub>*, as shown in (76).<sup>13</sup>

- (74) #Das Kalb steht schon, und die Mutterkuh steht mit.  
 the calf stands already and the mother cow stands mit<sub>adv</sub>  
 ‘The calf is already standing, and the mother cow belongs to a set of entities standing.’
- (75) a. Das Kind schläft in der Hängematte, und die Katze schläft mit in der Hängematte.  
 the child sleeps in the hammock and the cat sleeps mit<sub>adv</sub> in the hammock  
 ‘The child is sleeping in the hammock, and the cat belongs to a set of entities sleeping in the hammock.’
- b. #Das Kind schläft, und die Katze schläft mit.  
 the child sleeps and the cat sleeps mit<sub>adv</sub>  
 ‘The child is sleeping, and the cat belongs to a set of entities sleeping.’

<sup>13</sup> I thank Johanna Herdtfelder for drawing my attention to *duften*. See footnote 19 for qualifications regarding *schlafen* and *glänzen*.

- (76) a. #Der Teller glänzte, und die Tasse glänzte *mit*.  
 the plate gleamed and the cup gleamed *mit<sub>adv</sub>*  
 ‘The plate was gleaming, and the cup belonged to a set of entities gleaming.’
- b. #Die Tulpe duftete süßlich, und die Rose duftete *mit* süßlich.  
 the tulip smelled sweet and the rose smelled *mit<sub>adv</sub>* sweet  
 ‘The tulip had a sweet scent, and the rose belonged to a set of entities having a sweet scent.’

Given these fine-grained distinctions, an adequate explanation for the distribution of *mit<sub>adv</sub>* cannot rely on the contrast between K-state verbs and D-state verbs as such, but must be sensitive to their underlying predications. Irrespective of such an explanation, it is unclear how the constructional approach to free *mit* can account for the constraints. Obviously, the adverbial case would have to be split into possible and impossible construction types as well. Furthermore, *auch* is not sensitive to any of these restrictions, as shown by (77); this renders the approach by Bücker (2012) a non-starter.

- (77) a. Ben {ähnelt Tim AUCH / wiegt AUCH 70 kg}.  
 Ben {resembles Tim also / weighs also 70 kg}  
 ‘Ben {ALSO resembles Tim / ALSO weighs 70 kg}.’
- b. Das Kalb steht schon, und die Mutterkuh steht AUCH.  
 the calf stands already and the mother cow stands also  
 ‘The calf is already standing, and the mother cow is ALSO standing.’
- c. Der Teller glänzte, und die Tasse glänzte AUCH.  
 the plate gleamed and the cup gleamed also  
 ‘The plate was gleaming, and the cup was ALSO gleaming.’

I conclude that the constructional approach to *mit<sub>sup</sub>* and *mit<sub>adv</sub>* runs the risk of a proliferation of construction types without advancing any systematic explanation for relevant constraints. Building on the analysis of *mit<sub>adv</sub>* in Section 3, the following section will spell out a generalized compositional proposal for free *mit* that complies with such an explanation.

#### 4.2 Generalizing the composition of free *mit*

According to the analysis in Section 3, *mit<sub>adv</sub>* relates eventualities to each other. A generalized version is provided in (78); the only difference from the entry for *mit<sub>adv</sub>* is that the referential argument *y* of the target predication *P* need not be an eventuality.

$$(78) \quad \llbracket \textit{mit}_{free} \rrbracket = \lambda P \lambda x \lambda y \exists y_i \exists x'_i [P(x)(y) \wedge P(x'_i)(y'_i) \wedge \textit{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]$$

Nevertheless, given *accomp'*, the generalized *mit<sub>free</sub>* still comes along with a conceptual prerequisite: it is only compatible with predications that denote entities that can be extended by the additional participation of others, one prime example being eventualities such as run-of-the-mill activities as discussed in Section 2. The uniform compositional perspective on *mit<sub>free</sub>* then suggests the following hypothesis. Typical positive and comparative adjectives, most K-state verbs, and mode-oriented interpretations of D-state verbs are incompatible with *mit<sub>free</sub>* because they introduce entities that forbid such an accompaniment, whereas superlatives, locatives, a K-state verb such as *gehören zu* ‘belong to’, and location-oriented interpretations of D-state verbs are compatible with *mit<sub>free</sub>* because they introduce entities that license it. The crucial task now is to motivate this distinction on independent grounds.

#### 4.2.1 Accounting for the constraints on the positive, the comparative, and Kimian state verbs

I will first tackle the adjective-related constraints. To this end, a more detailed look at the semantics of adjectives is necessary. Over the last decade, several researchers have argued that typical adjectives provide both an argument position for the bearer of a certain property and an argument position for the property itself; see Moltmann (2009; 2013); Bücking (2012); Maienborn (2015); McNally & de Swart (2015); Maienborn & Herdtfelder (2017) for discussion. Following Moltmann, I will call these particularized properties tropes. A corresponding entry for *groß* ‘tall’ is given in (79). Nominalizations such as in (80) render the referential trope argument explicit: they denote the properties themselves instead of their bearers (compare the corresponding well-known ‘externalization’ of silent verbal event arguments by event nominalizations).

$$(79) \quad \llbracket \text{groß} \rrbracket = \lambda x \lambda r. \text{height}'(r) \wedge \text{bearer}'(r, x)$$

$$(80) \quad \text{height, tiredness, anger}$$

For the present purpose, the crucial ontological trait of tropes is that they are bound to their bearers in a particularly tight way: they are inherent to their respective bearers without providing a spatio-temporal structure that other tropes could live on. That is, Ben’s height is invariably bound to Ben alone and cannot be extended by the accompaniment of some additional bearer; this then provides a plausible reason why free *mit* is incompatible with both the positive and the comparative. I will spell out the corresponding compositions in turn.<sup>14</sup>

It is a standard assumption that the positive involves a context-sensitive standard of comparison such that a bearer that complies with this standard ‘stands out’ relative to the property under discussion; see Kennedy (2007) for an elaborate defense of such an approach within a degree-based system. I will use the simplified trope-based variant of it in (81).

$$(81) \quad \llbracket \text{groß}_{\text{pos}} \rrbracket = \lambda x \lambda r. \text{height}'(r) \wedge \text{bearer}'(r, x) \wedge r \geq f_{\text{pos}}(\text{height}')$$

According to (81), a context-sensitive function  $f_{\text{pos}}$  maps the trope-type for *height* (that is, the set of possible instances of *height*, roughly corresponding to measure functions in degree-based systems) onto one of its subtypes, namely, the standard of comparison. For instance, a context could be such that one must be 70 inches tall in order to stand out in height. Correspondingly, the standard of comparison  $f_{\text{pos}}(\text{height}')$  would be a trope-type  $R$  that comprises all possible instances of *height* (that is, tropes including their bearers) that involve exactly 70 inches. The ordering relation  $\geq$  relates a trope  $r$  to either a trope  $r'$  or a trope-type  $R$ . If, as is the case here,  $\geq$  relates a trope  $r$  to a trope-type  $R$ ,  $r$  must exceed or equal all possible instances of  $R$ ; in a context as just sketched, this would say that  $r$  must

<sup>14</sup> The example in (i) shows that particularized properties are not referentially identical to each other. This affirms the assumption that tropes are particulars inherent to their bearers.

(i) #Ben’s height is Mia’s height.

This conclusion is not contradicted by the fact that tropes can be equivalent, as in (ii).

(ii) Ben’s height is the same as Mia’s height.

Roughly, the equivalence builds on the identity of the degrees that are associated with Ben’s and Mia’s height, but not on the identity of the properties themselves; see Moltmann (2015) for analogous examples and further discussion.

be a height that involves at least 70 inches.<sup>15</sup> The simple example in (82) then receives the truth conditions in (83); I assume that the state  $s$  comes in via the copula or some other trope-closure operation (see Maienborn 2005; 2015; Maienborn & Herdtfelder 2017; the notation ‘ $s$ ’ says that  $s$  is characterized by the content that follows): (82) is true iff there is a state  $s$  such that Ben’s height exceeds or equals all possible instances of the standard of comparison for height as determined by contextual needs.

(82) Ben ist groß.  
Ben is tall

(83)  $\llbracket \text{Ben ist groß}_{pos} \rrbracket$   
= 1 iff  $\exists s \exists r [s: \text{height}'(r) \wedge \text{bearer}'(r, \text{Ben}) \wedge r \geq f_{pos}(\text{height}')] ]$

Based on the entries in (78) and (81), the combination of the positive with  $mit_{free}$  yields (84), which in turn yields the final result in (86) for the full sentence in (85) (see (66a) above).

(84)  $\llbracket \text{mit groß}_{pos} \rrbracket = \llbracket \text{mit} \rrbracket (\llbracket \text{groß}_{pos} \rrbracket)$   
=  $[\lambda P \lambda x \lambda y \exists y' \exists x' [P(x)(y) \wedge P(x')(y') \wedge \text{accomp}'(y, y') \wedge x \not\leq x'_i$   
 $\wedge y \not\leq y'_i]] (\lambda x \lambda r. \text{height}'(r) \wedge \text{bearer}'(r, x) \wedge r \geq f_{pos}(\text{height}'))$   
=  $\lambda x \lambda y \exists y' \exists x' [\text{height}'(y) \wedge \text{bearer}'(y, x) \wedge y \geq f_{pos}(\text{height}') \wedge \text{height}'(y'_i)$   
 $\wedge \text{bearer}'(y'_i, x'_i) \wedge y'_i \geq f_{pos}(\text{height}') \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]$

(85) #Ben ist mit groß.

(86)  $\llbracket \text{Ben ist mit groß}_{pos} \rrbracket$   
= 1 iff  $\exists s \exists y \exists y' \exists x'_i [s: \text{height}'(y) \wedge \text{bearer}'(y, \text{Ben}) \wedge y \geq f_{pos}(\text{height}') \wedge \text{height}'(y'_i)$   
 $\wedge \text{bearer}'(y'_i, x'_i) \wedge y'_i \geq f_{pos}(\text{height}') \wedge \text{accomp}'(y, y'_i) \wedge \text{Ben} \not\leq x'_i \wedge y \not\leq y'_i]$

In prose: (85) is true iff there is a state such that both Ben’s height and some implicit height of some implicit bearer comply with a standard of comparison for height. Furthermore, the condition  $\text{accomp}'(y, y'_i)$  requires that both heights form an integrated whole and that Ben’s height extends the implicit height. However, given that the implicit height is a trope and thus an inherent property of its bearer lacking a spatio-temporal structure that other tropes could live on, it cannot be extended by another trope. Hence, the result is incoherent, and (85) is predicted to be infelicitous for ontological reasons.

It is noteworthy that the following well-formed examples do not contradict this reasoning.

(87) a. Ben is also tall.  
b. Ben and Mia are (both) tall.

(88) Ben and Mia are (together) 11 feet tall.

The example in (87a) with the additive *also* presupposes that the height of someone different from Ben complies with the contextual standard. In contrast to  $mit_{free}$ , however, the additive does not enforce any specific relationship between both tropes; hence, there is no conflict with the ontological requirement that tropes are bound to their bearers. (This

<sup>15</sup> See Moltmann (2009) for a formally elaborate trope-based system of comparative concepts; the given simplified implementation suffices for the present purpose. It is also not crucial to spell out the way the context-sensitive function  $f_{pos}$  works; see Kennedy (2007) for details.



substantiates one more time why I consider the analysis of free *mit* in terms of an additive wrong.) The example in (87b) receives a straightforward distributive reading; again, the relevant tropes—Ben’s height and Mia’s height—are independent of each other, which renders their copredication unremarkable. The example in (88) is a bit more tricky. It suggests that tropes are closed under sum formation (that is, the sum of two tropes yields a trope; see also Moltmann 2013: 53–54). However, in contrast to examples based on *mit<sub>free</sub>*, the example in (88) involves a simple collective interpretation. Therefore, it is not about a separate trope that extends another separate trope, but about a complex trope (that is, height of 11 feet) that has a collective entity (that is, Ben and Mia) as its unique bearer. In other words, such collective interpretations do not build on the specific accompaniment between distributed tropes that causes *mit<sub>free</sub>*’s conflict with trope predications.

The explanation for the restriction regarding the comparative is now easy. Following standard assumptions, the comparative differs from the positive by involving a context-independent explicit measure for the comparison. For instance, a trope-based implementation such as (89) for *größer als Mia* ‘taller than Mia’ says that *x*’s height must exceed Mia’s height.

$$(89) \quad \llbracket \text{größer als Mia} \rrbracket = \lambda x \lambda r \exists r' [\text{height}'(r) \wedge \text{bearer}'(r, x) \wedge \text{height}'(r') \wedge \text{bearer}'(r', \text{Mia}) \wedge r > r']$$

However, as (89) is still a trope predication, this difference does not affect the combinatorics with *mit<sub>free</sub>*; see the composition in (90). Therefore, (91) (see (66b) above) yields the very same ontological mismatch as the positive does. According to the resulting (simplified) representation in (92), Ben’s height would have to extend the implicit height of some implicit bearer, which is impossible (irrespective of the fact that both heights are also said to exceed Mia’s height).

$$(90) \quad \begin{aligned} \llbracket \text{mit größer als Mia} \rrbracket &= \llbracket \text{mit} \rrbracket (\llbracket \text{größer als Mia} \rrbracket) \\ &= [\lambda P \lambda x \lambda y \exists y' \exists x' [P(x)(y) \wedge P(x')(y') \wedge \text{accomp}'(y, y') \wedge x \not\leq x' \wedge y \not\leq y']] \\ &\quad (\lambda x \lambda r \exists r' [\text{height}'(r) \wedge \text{bearer}'(r, x) \wedge \text{height}'(r') \wedge \text{bearer}'(r', \text{Mia}) \wedge r > r']) \\ &= \lambda x \lambda y \exists y' \exists x' [\exists r' [\text{height}'(y) \wedge \text{bearer}'(y, x) \wedge \text{height}'(r') \wedge \text{bearer}'(r', \text{Mia}) \\ &\quad \wedge y > r'] \wedge \exists r' [\text{height}'(y') \wedge \text{bearer}'(y', x') \wedge \text{height}'(r') \wedge \text{bearer}'(r', \text{Mia}) \\ &\quad \wedge y' > r'] \wedge \text{accomp}'(y, y') \wedge x \not\leq x' \wedge y \not\leq y'] \end{aligned}$$

$$(91) \quad \# \text{Ben ist mit größer als Mia.}$$

$$(92) \quad \begin{aligned} \llbracket \text{Ben ist mit größer als Mia} \rrbracket \\ &= 1 \text{ iff } \exists s \exists y \exists y' \exists x' \exists r' [s: \text{height}'(y) \wedge \text{bearer}'(y, \text{Ben}) \wedge \text{height}'(r') \wedge \text{bearer}'(r', \text{Mia}) \\ &\quad \wedge y > r' \wedge \text{height}'(y') \wedge \text{bearer}'(y', x') \wedge y' > r' \wedge \text{accomp}'(y, y') \wedge \text{Ben} \not\leq x' \\ &\quad \wedge y \not\leq y'] \end{aligned}$$

Next, I will turn to the constraints regarding typical K-state verbs (see Section 4.2.2 for a discussion of the constraints regarding D-state verbs). The general idea is that their semantics also involves tropes and thereby predicts that they are infelicitous with *mit<sub>free</sub>*. In fact, Maienborn (2015) has argued that the predications that characterize the K-state in K-state verbs can be conceived of as trope predications. For instance, *Ben weighs 70 kg* very obviously relates Ben’s particular weight to a measure of weights in general (see Moltmann 2013: 61–69 for more details on tropes and quantities). The sentences *Ben loves Mia* and *Ben resembles Mia* identify Ben as a bearer of relational tropes: he exhibits a particularized feeling for Mia or a particularized similarity to her (irrespective of the fact

that the specific content of this similarity is left unspecified). For concreteness, I will go through the composition for the example in (93) (see (71a) above).

(93) #Ben ähnelt Tim mit.

Based on the entry in (94) for *ähneln*, the combination with *mit<sub>free</sub>* yields (95).<sup>16</sup> The inclusion of the object, the subject, and the K-state yields the representation in (96) for the full sentence.

(94)  $\llbracket \text{ähneln} \rrbracket = \lambda v \lambda x \lambda r. \text{similarity}'(r, v) \wedge \text{bearer}'(r, x)$

(95)  $\llbracket \text{mit ähneln} \rrbracket = \llbracket \text{mit} \rrbracket (\llbracket \text{ähneln} \rrbracket)$   
 $= [\lambda P \lambda v \lambda x \lambda y \exists y'_i \exists x'_i [P(v)(x)(y) \wedge P(v)(x'_i)(y'_i) \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]]$   
 $(\lambda v \lambda x \lambda r. \text{similarity}'(r, v) \wedge \text{bearer}'(r, x))$   
 $= \lambda v \lambda x \lambda y \exists y'_i \exists x'_i [\text{similarity}'(y, v) \wedge \text{bearer}'(y, x) \wedge \text{similarity}'(y'_i, v) \wedge \text{bearer}'(y'_i, x'_i)$   
 $\wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]$

(96)  $\llbracket \text{Ben ähnelt Tim mit} \rrbracket$   
 $= 1 \text{ iff } \exists s \exists y \exists y'_i \exists x'_i [s: \text{similarity}'(y, \text{Tim}) \wedge \text{bearer}'(y, \text{Ben}) \wedge \text{similarity}'(y'_i, \text{Tim})$   
 $\wedge \text{bearer}'(y'_i, x'_i) \wedge \text{accomp}'(y, y'_i) \wedge \text{Ben} \not\leq x'_i \wedge y \not\leq y'_i]$

As before, the result is ill-formed due to *accomp'*: Ben's similarity to Tim cannot extend the similarity to Tim as borne by someone else. This trope-based explanation is further confirmed by the adjective-based counterpart in (97), which is infelicitous in a fully analogous way.

(97) #Ben ist Tim mit *ähnlich*.  
 Ben is Tim mit<sub>free</sub> similar  
 'Ben belongs to a set of people resembling Tim.'

The given reasoning is based on one noteworthy ingredient. According to the entry in (94), the K-state verb *ähneln* introduces a trope predication and thus renders the trope argument compositionally accessible to *mit<sub>adv</sub>*. That is, the given proposal takes the decomposition of the K-state verb into a trope predication on the one hand and a superordinate K-state predication on the other seriously. In fact, according to (94), the introduction of the K-state including the closure of the trope argument is not rooted in the verb itself, but it is rooted in some silent operation above it. This strengthens the parallel to copula structures with a trope-denoting lexical core (the adjective) and a closure operation introducing the K-state on a higher level (possibly indicated by the explicit copula). Notably, as mentioned in the introduction in Section 1, Zifonun (1996/1997) argues for a base position of the adverbial free *mit* in the vicinity of the verbal head below direct and indirect objects. Across frameworks, such a position is associated with the compositional access of modifiers to the lexical core of their target entities (see Maienborn & Schäfer 2011 and Bücking 2018 for overviews). This provides initial independent evidence for the given compositional set-up; a full-fledged analysis of the syntax-semantics interface of K-state verbs will be left for another occasion.

<sup>16</sup> Technically, the composition builds on the assumption that *mit<sub>free</sub>* is not restricted to two-place predicates, but that it can pass on additional argument slots; only this assumption renders *mit<sub>free</sub>* compatible with a three-place function such as *ähneln*. Such a polymorphism is typical of modifiers and thus a natural extension of the entry in (78).

In sum, given a uniform compositional approach, the cross-categorial restrictions for *mit<sub>free</sub>* fall under the purview of a uniform conceptual explanation. *mit<sub>free</sub>* is at odds with trope predications, as tropes denote particularized properties that are inherent to their bearers and thus inaccessible to an extension by the accompaniment of an independent other bearer.

I conclude this section with a note of caution. The following examples seem to challenge the given trope-based restriction; arguably, they are felicitous despite the fact that *mit<sub>free</sub>* is combined with a trope-denoting adjective. ((98b) is an abbreviated version of an example I owe to an anonymous reviewer; see <https://www.seniorenportal.de/community/forum/haustiere/hasi-ist-krank?tid=126413&page=1#126413>, accessed on 09/24/2018.)

- (98) a. Mia schreit vor Wut. Ihr Bruder Carl ist mit wütend.  
 Mia shouts with anger her brother Carl is mit<sub>free</sub> angry  
 ‘Mia is shouting with anger. Her brother Carl belongs to a set of people being angry.’
- b. Der süße Hase meiner Enkelin ist krank. Unsere ganze Familie ist  
 the sweet hare of my grandchild is sick our whole family is  
 mit krank.  
 mit<sub>free</sub> sick  
 ‘The sweet hare of my grandchild is sick. Our whole family belongs to a set of entities that are sick.’

However, it is well known that type-related restrictions of modifiers can often be side-stepped by adaptive strategies at the semantics-pragmatics interface (see de Swart 2011 for an overview). I hypothesize that examples such as (98) build on adaptations as well. (98a) does not say that Carl is joining the anger that is inherent to Mia; it rather says that Carl is joining the situation that is characterized by Mia acting out her anger. Similarly, (98b) does not say that the family members are joining the disease that is specific to the hare; it says that the family members are joining the unfortunate situation the hare is in by themselves being afflicted with a comparable negative sensation. In both cases, the extended entity is not a trope; it is a bigger situation in which the trope is embedded. This situation provides a spatio-temporal structure that supports an extension by further participants and that is therefore compatible with the contribution of *mit<sub>free</sub>*. The more general prediction is that the acceptability of *mit<sub>free</sub>* covaries with the question of whether adequate superordinate situations can be adapted. Arguably, predications that can be related easily to joint activities or to compassion (such as *wütend* ‘angry’ and *krank* ‘sick’ in (98)) are particularly appropriate for such adaptations, whereas an objective atemporal property such as height is not. This reasoning is further supported by the following examples. (I owe (99a) to an anonymous reviewer and (99b) to Frauke Buscher.)

- (99) a. #Vier ist mit gerade.  
 four is mit<sub>free</sub> even  
 ‘Four belongs to a set of even numbers.’
- b. Bei dem Auto ist die Kupplung mit kaputt.  
 at the car is the clutch mit<sub>free</sub> broken  
 ‘Regarding the car, the clutch belongs to a set of broken things.’

(99a) cannot be adapted at all: atemporal mathematical properties do not suggest superordinate spatio-temporal structures that could be relevant for an accompaniment. By contrast, (99b) is acceptable because the frame-setting modifier *bei dem Auto* ‘regarding the

car’ provides an explicit anchor for a relevant superordinate spatio-temporal structure: the dysfunctionality of the clutch can be related to the more general state the car is in, namely, its having dysfunctional parts. Correspondingly, the dysfunctionality of the clutch and the dysfunctionality of, say, the brake are still independent tropes; their integrity only follows from their being part of the superordinate state the car is in. While I will leave a thorough verification of this line of thought to future research, the following discussion will provide independent evidence for the assumption that the distribution of *mit<sub>free</sub>* depends in crucial ways on the distinction between tropes and states.

#### 4.2.2 Accounting for the well-formed locative predications and the behavior of Davidsonian state verbs

The strategy for an account of the feasible options is obvious: *mit<sub>free</sub>* should target a predication that involves an entity that supports an extension by accompaniment. This can be motivated easily for locative predications such as the locative copula structure in (100) (recall (68a) from above).

- (100) Ben ist mit auf dem Dachboden.  
 Ben is mit<sub>free</sub> in the attic  
 ‘Ben belongs to a set of people in the attic.’

Intuitively, locative predications do not contribute an inherent property of an individual, but an external relation of that individual to some region. The state of being located at a particular region is thus a spatio-temporal structure that other participants can live on; this is the conceptual foundation of why *mit<sub>free</sub>* is possible here. In order to spell out this intuition, the simplest assumption is that the target predications themselves provide locative state predications; see the meaning representation in (101). The combination with *mit<sub>free</sub>* yields (102); (100) then receives the final representation in (103).<sup>17</sup>

$$(101) \quad \llbracket \text{auf dem Dachboden} \rrbracket = \lambda x \lambda s.s: \text{in}'(x, \iota a[\text{attic}'(a)])$$

$$(102) \quad \llbracket \text{mit auf dem Dachboden} \rrbracket = \llbracket \text{mit} \rrbracket(\llbracket \text{auf dem Dachboden} \rrbracket) \\
= [\lambda P \lambda x \lambda y \exists y'_i \exists x'_i [P(x)(y) \wedge P(x'_i)(y'_i) \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]](\lambda x \lambda s.s: \\
\text{in}'(x, \iota a[\text{attic}'(a)])) \\
= \lambda x \lambda y \exists y'_i \exists x'_i [y: \text{in}'(x, \iota a[\text{attic}'(a)]) \wedge y'_i: \text{in}'(x'_i, \iota a[\text{attic}'(a)]) \wedge \text{accomp}'(y, y'_i) \\
\wedge x \not\leq x'_i \wedge y \not\leq y'_i]$$

$$(103) \quad \llbracket \text{Ben ist mit auf dem Dachboden} \rrbracket \\
= 1 \text{ iff } \exists y \exists y'_i \exists x'_i [y: \text{in}'(\text{Ben}, \iota a[\text{attic}'(a)]) \wedge y'_i: \text{in}'(x'_i, \iota a[\text{attic}'(a)]) \\
\wedge \text{accomp}'(y, y'_i) \wedge \text{Ben} \not\leq x'_i \wedge y \not\leq y'_i]$$

The result is well-formed. The state of Ben’s being in the attic is said to accompany the state of someone else’s being in the attic. As motivated above, such an extension of a locative relation is conceptually feasible: being at a particular region is not a trope bound to a unique bearer.

With this explanation in place, it is easy to see why the K-state verb *gehören zu* ‘belong to’ licenses *mit<sub>free</sub>*; recall (104) (= (71b)).

<sup>17</sup> The details of the relevant closure operation are not spelled out here. In contrast to the trope-based copula structures, the PP already provides an appropriate K-state here; this licenses the identification of the lexically given K-state with the one that is existentially closed. The particular implementation of this identification is not important for my main argument; notably, the fact that both APs and locative PPs can provide the lexical core of copula structures is independent of the distribution of *mit<sub>free</sub>*.

- (104) Dies gehört *mit* zu unseren Aufgaben.  
 this belongs *mit<sub>free</sub>* to our tasks  
 ‘This belongs to a set of things that are our tasks.’

The verb *gehören zu* provides an abstract relation of membership; that is, similarly to locatives and in sharp contrast to the K-state verbs discussed in Section 4.2.1, it does not contribute an inherent property of an entity, but an external relation of that entity to some group. As the state of belonging to some group licenses an extension, no conflict with the accompaniment introduced by *mit<sub>free</sub>* arises.<sup>18</sup>

The behavior of locative D-state verbs can be traced back to the patterns already established. The corresponding reasoning is based on the intuition that locative D-state verbs contribute a bipartite meaning structure: the subject referent is attributed both a locative state and a posture (see again Kaufmann 1995: 98–120 for a more general discussion). Furthermore, the posture relates to particular parts of the subject referent and their organization (for instance, according to Kaufmann’s work, standing involves a vertical orientation of the subject’s prominent axis). It is thus plausible that the posture amounts to a particularized property, that is, a trope. In well-formed examples such as (105a) (= (72a)), *mit<sub>free</sub>* scopes above the integration of the locative. In fact, Zifonun (1996/1997) shows that the reversed linearization is ungrammatical; see (105b).

- (105) a. Ben steht *mit* an der Ecke.  
 Ben stands *mit<sub>free</sub>* at the corner  
 ‘Ben belongs to a set of people standing at the corner.’  
 b. \*Ben steht an der Ecke *mit*.  
 Ben stands at the corner *mit<sub>free</sub>*

I conjecture that *mit<sub>free</sub>* here combines with a predication that makes the locative component compositionally available, while the trope component is already closed; see the sketch in (106) and the result of its composition with *mit<sub>free</sub>* in (107).

- (106)  $\llbracket \text{an der Ecke stehen} \rrbracket = \lambda x \lambda s \exists r [[s: \text{at}'(x, \iota c[\text{corner}'(c)])] \wedge \text{stand}'(r) \wedge \text{bearer}'(r, x)]$

- (107)  $\llbracket \text{mit an der Ecke stehen} \rrbracket = \llbracket \text{mit} \rrbracket (\llbracket \text{an der Ecke stehen} \rrbracket)$   
 $= [\lambda P \lambda x \lambda y \exists y'_i \exists x'_i [P(x)(y) \wedge P(x'_i)(y'_i) \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]]$   
 $(\lambda x \lambda s \exists r [[s: \text{at}'(x, \iota c[\text{corner}'(c)])] \wedge \text{stand}'(r) \wedge \text{bearer}'(r, x)])$   
 $= \lambda x \lambda y \exists y'_i \exists x'_i [\exists r [[y: \text{at}'(x, \iota c[\text{corner}'(c)])] \wedge \text{stand}'(r) \wedge \text{bearer}'(r, x)]$   
 $\wedge \exists r [[y'_i: \text{at}'(x'_i, \iota c[\text{corner}'(c)])] \wedge \text{stand}'(r) \wedge \text{bearer}'(r, x'_i)]$   
 $\wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]$

<sup>18</sup> There is thus a clear distinction between ‘to belong to entities that bear a certain property’ and ‘to bear a certain property’. Notably, my simplified English paraphrases generally build on the former predication. Therefore, these paraphrases are not fully accurate and not sensitive to the specific constraints of the original clauses in German. An anonymous reviewer notes that the combination of *mit<sub>free</sub>* with *groß* ‘tall’ gets considerably better in partitive constructions; see his example in (i).

- (i) Peter ist *mit* einer der großen in der Mannschaft.  
 Peter is *mit<sub>free</sub>* one of the tall in the team  
 ‘Peter belongs to a set of tall people in the team.’

Arguably, partitive constructions introduce a superordinate relation of membership; that is, they convey ‘to belong to entities that bear a certain property’ instead of ‘to bear a certain property’. This correctly predicts that *mit<sub>adv</sub>* is better in (i) than in standard direct predications. Notably, the partition of entities into groups will also play a crucial role for the analysis of *mit<sub>adv</sub>* with the superlative.

Irrespective of how the composition proceeds (see below for a few remarks), (107) predicts (105a) to be well-formed. The state of  $x$ 's being at the corner is said to accompany the state of someone else's being at the corner, which is fully analogous to the simple copula structure in (103) above. It does not matter that  $x$  and its implicit alternative  $x'_i$  must also be bearers of posture tropes. According to (107), these tropes do not interact and thus do not cause a conceptual mismatch.

The situation is different for mode-oriented readings; recall the ill-formed example in (108) (= (74)).

- (108) #Das Kalb steht schon, und die Mutterkuh steht mit.  
 the calf stands already and the mother cow stands mit<sub>free</sub>  
 'The calf is already standing, and the mother cow belongs to a set of entities standing.'

As this reading demotes the locative component, it is plausible that it makes the posture component compositionally available; manner modification as in (109) corroborates this claim. Correspondingly, *mit*<sub>free</sub> would target a trope predication as sketched in (110), which yields the result in (111).

- (109) Das Kalb steht unsicher.

- (110)  $\llbracket \text{stehen} \rrbracket = \lambda x \lambda r [\text{stand}'(r) \wedge \text{bearer}'(r, x)]$

- (111)  $\llbracket \text{mit stehen} \rrbracket = \llbracket \text{mit} \rrbracket (\llbracket \text{stehen} \rrbracket)$   
 $= [\lambda P \lambda x \lambda y \exists y'_i \exists x'_i [P(x)(y) \wedge P(x'_i)(y'_i) \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]]$   
 $(\lambda x \lambda r [\text{stand}'(r) \wedge \text{bearer}'(r, x)])$   
 $= \lambda x \lambda y \exists y'_i \exists x'_i [\text{stand}'(y) \wedge \text{bearer}'(y, x) \wedge \text{stand}'(y'_i) \wedge \text{bearer}'(y'_i, x'_i)$   
 $\wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]$

As desired, (111) predicts that (108) is infelicitous. Due to  $\text{accomp}'(y, y'_i)$ , the particularized posture  $y$  inherent to  $x$  would have to extend the posture  $y'_i$  inherent to some other entity, which is conceptually impossible.

In a nutshell, the idea then is that locative D-state verbs provide two compositional anchors. The first anchor is a trope predication that is incompatible with *mit*<sub>free</sub>; the second anchor is a state predication that is available above a locative PP argument and that is compatible with *mit*<sub>free</sub>. This set-up begs the follow-up question of where the D-state is integrated. Given that locative D-state verbs and locative copula structures differ for instance with regard to perception reports (see Section 4.1 and Maienborn 2003; 2005 for details), the referential argument of the full verbal projection cannot be the locative K-state argument  $s$  in (107) as such. One option would be that the locative state predication and the trope predication are integrated within a higher-order D-state predication. This would mirror the situation with K-state verbs as discussed in Section 4.2.1, where I have also suggested that there is an independent higher-order closure operation. The difference would be that the closure introduces a D-state with D-state verbs and a K-state with K-state verbs. I would like to leave a more detailed discussion of these compositional challenges to future work. The solution should not affect the principled idea that I have put forward here in order to explain the distribution of *mit*<sub>free</sub> within the projection of locative D-state verbs.

I will conclude this subsection with a brief comment on D-state verbs that introduce a specific mode of sensory perception and on the D-state verb *schlafen* 'sleep'; recall the ill-formed examples in (112) (= (76a)) and (113) (= (75b)).

(112) #Der Teller glänzte, und die Tasse glänzte mit.  
 the plate gleamed and the cup gleamed mit<sub>free</sub>  
 ‘The plate was gleaming, and the cup belonged to a set of entities gleaming.’

(113) #Das Kind schläft, und die Katze schläft mit.  
 the child sleeps and the cat sleeps mit<sub>free</sub>  
 ‘The child is sleeping, and the cat belongs to a set of entities sleeping.’

It is intuitively plausible that the internal structure of these verbs does not introduce an abstract relation of membership, but a trope. More specifically, *glänzen* introduces a luster, that is, a particularized visual appearance rooted in the surface structure of its bearer. Correspondingly, the cup’s luster cannot extend the luster of the plate, which explains why (112) is odd. Similarly, dormancy as such (that is, the property disposed of its spatio-temporal coordinates; recall the contrast to (75a) above) is inherent to its bearer and thus inaccessible to an extension by someone else’s dormancy.<sup>19</sup>

#### 4.2.3 Accounting for the well-formed superlative predications

Finally, I will turn to the intriguing observation that the superlative is generally well-formed with *mit*<sub>free</sub> despite the fact that corresponding positives and comparatives are not. I argue that this contrast has the following principled explanation. The superlative contributes a type of meaning that is very different from the meaning of the positive and the comparative, namely, it partitions a context-set according to some measure. Therefore, *mit*<sub>free</sub> escapes the interaction with underlying trope predications and instead interacts with this partition in a predictable way. I will provide independent reasons for this perspective on the superlative and then spell out a corresponding composition with *mit*<sub>free</sub>.

The first observation relates to the lacking entailment in (114) (= (8a)).

(114) Ben ist mit der größte. → Ben ist der größte.  
 Ben is mit<sub>free</sub> the tallest Ben is the tallest

For Zifonun (1996/1997) and Bücker (2012), this behavior is idiosyncratic and thus a key argument for the treatment of free *mit* plus superlative as a separate construction: *mit* would eliminate the uniqueness condition of the superlative; moreover, the adverbial counterpart supports the corresponding entailment, which would speak against a uniform treatment in a principled way. However, this reasoning does not take into account that this entailment pattern is fully regular for the superlative in distributive contexts; see the

<sup>19</sup> Recall from Section 4.2.1 that certain trope-related restrictions can be sidestepped by the adaptation of appropriate superordinate spatio-temporal structures that support extensions. This is true for (112) and (113) as well. Let there be a situation where the dinnerware is gleaming as a whole; correspondingly, the gleaming of the cup can be conceived of as living on this superordinate temporal situation. Under this perspective, (112) is conceptually possible and thus receives a better grammaticality judgment. As for sleeping, examples such as the following are revealing. (I owe it to an anonymous reviewer.)

- (i) Newspaper article on anesthesia, see <https://www.wlz-online.de/magazin/digital/angst-schlaeft-5455316.html>, accessed on 10/08/2018  
 Die Angst schläft mit.  
 the fear sleeps mit<sub>free</sub>  
 ‘The fear belongs to a set of entities sleeping.’

(i) is acceptable. However, it does not convey that the dormancy inherent to the fear accompanies the dormancy inherent to some independent other entity. The fear rather belongs to a superordinate sleeping individual. Therefore, the dormancy of the fear can be easily conceived of as living on the dormancy of this superordinate individual. In other words, it remains within the limits of a higher-order inherent property; in fact, (i) specifies one aspect of what it means for individuals to sleep while under anesthetic. Finally, it is noteworthy that this use involves an adapted interpretation of the verb itself (usually, *sleep* selects individuals as wholes instead of their properties).

simple plural superlative in (115). Notably, (115) still involves uniqueness. The difference from a standard singular predication is merely that the predication does not relate to a unique individual, but to a unique set of individuals, which in this case consists of Ben and Paul.

(115) Ben and Paul are the tallest.  $\Rightarrow$  {Ben / Paul} is the tallest.

It is thus highly plausible that the entailment patterns in (114) and (115) have a common source. Both predications involve unique sets of individuals that comply with a certain height; as sets of individuals are involved, it is impossible for both cases to deduce which particular individual is the tallest. The difference between them is the following. The standard plural in (115) exhaustifies the individuals in the relevant set by explicit reference to them; *mit<sub>free</sub>* in (114), by contrast, merely indicates that there must be others in the relevant set without, however, specifying their number and identity. Furthermore, the distribution obtained by *mit<sub>free</sub>* does not yield an ordinary plural predication; it is still a modifier to the given singular predication, which is why (114) and (115) are morphologically distinct. In other words, *mit<sub>free</sub>* does exactly the same in the combination with the superlative as it does in its other uses. It is a modifier that marks the existence of implicit co-participants and thereby triggers plurality effects.

Given the analogy between *mit<sub>free</sub>* and the plural, a closer look at plural superlatives in general is necessary. The research on plural superlatives has identified two crucial challenges to their proper analysis: the distributivity problem and the cutoff problem; see Stateva (2005); Herdan (2008); Fitzgibbons et al. (2008). The distributivity problem is a direct consequence of the lacking entailment in (115). It says that the combination of a standard degree-based semantics for the superlative, as in (116) (see Heim 1999; Coppock & Beaver 2014), with a standard distributional operator for plural predication, as in (117) (see Lasersohn 1998; 2011), yields a contradictory and, thus, wrong result, as in (118). (I assume that *G* is some appropriate functor from sets of singular individuals to plural individuals.)

(116)  $\llbracket \text{the tallest} \rrbracket = \lambda x \exists d [\text{tall}'(x, d) \wedge \forall x' [[C(x') \wedge x' \not\leq x] \rightarrow \neg \text{tall}'(x', d)]]$   
 ‘set of *x* such that *x* is *d*-tall and nobody that is in the context-set *C*, but distinct from *x*, is *d*-tall’

(117)  $\lambda P \lambda x \forall y [y \leq x \rightarrow P(y)]$

(118)  $\llbracket \text{Ben and Paul are the tallest} \rrbracket$   
 $= 1 \text{ iff } \forall y [y \leq G(\{\text{Ben, Paul}\}) \rightarrow \exists d [\text{tall}'(y, d) \wedge \forall x' [[C(x') \wedge x' \not\leq y] \rightarrow \neg \text{tall}'(x', d)]]]$

In prose: A sentence such as *Ben and Paul are the tallest* would be true iff Ben is taller than everyone else in the context-set, and Paul is taller than everyone else in the context-set. This is clearly impossible, as Ben would have to be taller than Paul, while Paul would have to be taller than Ben. Intuitively, there is an obvious way out. The superlative should induce a partition of the context-set such that Ben and Paul are taller than all others in the context-set, irrespective of how their heights are ranked to each other. This already suggests an analysis of the superlative that is not about the assignment of particularized properties, but about the bipartite partition of a context-set into the set of those individuals that comply with a certain height and those that do not.

This reasoning becomes even more evident with regard to the second challenge, the so-called cutoff problem. This problem can be illustrated by the dialogue in (119), adapted from Fitzgibbons et al. (2008: (6)).



- (119) A: Ben and Paul are the tallest students.  
 B: You are forgetting Eric; he is only an inch shorter than Ben.  
 A: My mistake. Ben, Paul, and Eric are the tallest students.

Despite the fact that Ben and Paul could be the tallest students in the given scenario, A can accept a correction of his corresponding statement and include Eric in the set of the tallest students. This makes sense only on the assumption that the superlative semantics involves a context-sensitive cutoff that divides the context-set into the unique group that complies with this cutoff and the remaining individuals that do not comply with it. The given scenario could be such that a difference of just one inch should not matter for the partition, for instance, because all others in the context-set are significantly shorter than Eric. Fitzgibbons et al. (2008: 303) conclude that “the context supplies a natural cutoff point on the relevant scale which determines, for a given gradable predicate R, a unique group of R-est individuals”. In other words, the superlative contributes a cutoff that must be such that it is satisfied by exactly those individuals the superlative predicates of. Crucially, superlative constructions differ in the degree to which this unique group of individuals is made explicit. Standard direct predications exhaustify the members of the unique group of R-est individuals within their minimal predication domain. Therefore, A identifies different sets in his two statements in (119). This is also the reason why (120) with two separate minimal predications is infelicitous (irrespective of Ben’s and Paul’s actual heights). The first conjunct identifies Ben as the only member of the set, while the second conjunct identifies Paul as its single member.<sup>20</sup>

- (120) #Ben is the tallest, and Paul is the tallest.

Other uses of the superlative do not make the relevant set explicit. This is typical for the superlative in referential position (see Herdan 2008 for a general discussion). For instance, (121) does not identify the relevant family members directly; however, contextual needs guide the partition. If there are three rows, the cutoff should be such that roughly one-third of the people in the context-set belong to the unique group of the tallest family members. A speaker can also be precise about the cardinality of the relevant group and thereby guide the determination of the cutoff that is relevant for the partition; see (122), which could be used in a scenario with six apples that are all small, but distinguishable in size.

- (121) [At the photographer] The tallest family members should stand in the back row.

- (122) I would like to have the five biggest apples from that basket!

It now nearly goes without saying that *mit<sub>free</sub>* plus superlative involves facets of both direct predications and referential uses. While it is made explicit that the subject argument belongs to the unique set of R-est individuals, the alternatives are not made explicit, which is why the relevant unique set is not clearly identified. Crucially, however, this is exactly as expected, given the usual semantics of *mit<sub>free</sub>* in terms of implicit co-participants.

Based on this overview, I propose the meaning representation in (123) for the superlative; (124) defines the crucial context-sensitive function  $f_{sup}$ . The proposal resorts to tropes instead of degrees because this makes it consistent with the above analyses of the positive and the comparative.<sup>21</sup>

<sup>20</sup> Fitzgibbons et al. (2008: 316–317) discuss an example that is analogous to (120). They also speculate on the role of minimal clauses for its account, but abandon this idea. In footnote 21, I briefly explain why I retain it instead of adopting the proposal that is finally preferred by Fitzgibbons et al. (2008).

<sup>21</sup> While the proposal is an original one, it builds heavily on aspects of previous analyses; see Fitzgibbons et al. (2008) for an overview. The partitioning of the context-set is inspired by the shrinking of the context-set

$$(123) \quad \llbracket \text{der größte} \rrbracket = \lambda x \lambda s \exists r [s: \text{height}'(r) \wedge \text{bearer}'(r, x) \wedge r \geq f_{sup}(\text{height}')] ]$$

(124)  $f_{sup}$  is a context-sensitive function that maps a trope-type to one of its subtypes such that, given a context-set  $C$ , all individuals in  $C_{pred}$  (that is, all individuals that are predicated of in the superlative's minimal predication domain) comply with this subtype, and no individual in the complementary set  $C_{contrast}$  complies with this subtype.

This proposal directly implements the idea that the superlative effectuates the partition of a context-set according to some appropriate cutoff, namely, an appropriate subtype of the trope type under discussion. It comes along with two crucial traits. For one, it is compatible with run-of-the-mill distribution; for instance, a standard direct plural predication receives the truth conditions in (125): Ben's height must exceed or equal the cutoff  $f_{sup}(\text{height}')$ , and Paul's height must exceed or equal this cutoff.

$$(125) \quad \llbracket \text{Ben and Paul are the tallest} \rrbracket \\ = 1 \text{ iff } \forall y [y \leq G(\{\text{Ben, Paul}\}) \rightarrow \exists s \exists r [s: \text{height}'(r) \wedge \text{bearer}'(r, y) \\ \wedge r \geq f_{sup}(\text{height}')] ]$$

This simple distribution is feasible because the value of the relevant cutoff is independent of the distribution, but dependent on the minimal predication domain as a whole. Therefore, the cutoff must be such that Ben's height and Paul's height comply with it (Ben and Paul are in  $C_{pred}$ ), whereas the heights of all others do not comply with it (all others are in  $C_{contrast}$ ).

The second crucial trait is that the superlative does not contribute a trope predication, but a state predication with the relevant trope arguments being closed and thus having narrow scope. This is conceptually sound: the superlative does not assign a certain particularized property; instead, it affects the question of whether an existing particularized property licenses the membership of its bearer to the unique group of individuals that comply with a certain cutoff.

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*C* in Stateva's (2005) original proposal, the role of cutoffs and of minimal predication domains is inspired by Herdan (2008) and Fitzgibbons et al. (2008), and the use of a context-sensitive function is inspired by the use of a context-sensitive function for the positive as in Kennedy (2007). For reasons of space, I cannot evaluate the various analyses of the (plural) superlative. However, I will briefly explain why I cannot use the analysis that is ultimately defended by Fitzgibbons et al. (2008). They propose a logical form that relies on the so-called 'double star' (\*\*\*) distributivity operator in the scope of the superlative morpheme, as in (i). (This operator is usually used for transitive relations with plural arguments such as *Ben and Paul love Mia and Pia*.)

- (i) Fitzgibbons et al. (2008: (21))  
[Ben and Paul [-est [\*\*\*tall]]]

I see two problems for a transfer of this proposal to *mit<sub>free</sub>* plus superlative. First, the distributive effect of *mit<sub>free</sub>* plus superlative hinges on *mit<sub>free</sub>* itself. However, *mit<sub>free</sub>* has a higher syntactic position than the superlative. In fact, *mit<sub>free</sub>* cannot project in a position that is closer to the adjective; see (ii). A surface-oriented syntax thus predicts that the distribution scopes above the contribution of the superlative structure, contrary to (i).

- (ii) \*Ben ist der mit<sub>free</sub> größte.  
Ben is the mit<sub>free</sub> tallest

Second, it is also semantically impossible that *mit<sub>free</sub>* has scope below the superlative. The narrow scope would enforce a combination of *mit<sub>free</sub>* with the meaning of the positive. However, as argued at length above, this option is ruled out on independent grounds. Against this background, the behavior of *mit<sub>free</sub>* plus superlative could even be used as a vital argument against the \*\*\*-analysis of distributive superlatives in general. A thorough discussion will be left to future research.

Both traits facilitate a straightforward combination of the semantics of the superlative with the semantics of *mit<sub>free</sub>*; see (126). (127) provides the corresponding final representation for the initial example.

$$\begin{aligned}
 (126) \quad \llbracket \text{mit der größte} \rrbracket &= \llbracket \text{mit} \rrbracket(\llbracket \text{der größte} \rrbracket) \\
 &= [\lambda P \lambda x \lambda y \exists y'_i \exists x'_i [P(x)(y) \wedge P(x'_i)(y'_i) \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]] (\lambda x \lambda s \exists r [s: \\
 &\quad \text{height}'(r) \wedge \text{bearer}'(r, x) \wedge r \geq f_{\text{sup}}(\text{height}')] \\
 &= \lambda x \lambda y \exists y'_i \exists x'_i [\exists r [y: \text{height}'(r) \wedge \text{bearer}'(r, x) \wedge r \geq f_{\text{sup}}(\text{height}')] \wedge \exists r [y'_i: \\
 &\quad \text{height}'(r) \wedge \text{bearer}'(r, x'_i) \wedge r \geq f_{\text{sup}}(\text{height}')] \wedge \text{accomp}'(y, y'_i) \wedge x \not\leq x'_i \wedge y \not\leq y'_i]
 \end{aligned}$$

$$\begin{aligned}
 (127) \quad \llbracket \text{Ben ist mit der größte} \rrbracket \\
 &= 1 \text{ iff } \exists y \exists y'_i \exists x'_i \\
 &\quad [\exists r [y: \text{height}'(r) \wedge \text{bearer}'(r, \text{Ben}) \wedge r \geq f_{\text{sup}}(\text{height}')] \wedge \exists r [y'_i: \text{height}'(r) \\
 &\quad \wedge \text{bearer}'(r, x'_i) \wedge r \geq f_{\text{sup}}(\text{height}')] \wedge \text{accomp}'(y, y'_i) \wedge \text{Ben} \not\leq x'_i \wedge y \not\leq y'_i]
 \end{aligned}$$

In prose: (127) is true iff the state of Ben bearing a height that exceeds or equals a context-sensitive cutoff for heights accompanies the state of someone else's bearing a height that exceeds or equals this cutoff. This is as desired. The accompaniment does not relate tropes, but states of being bearers of certain tropes, which is ontologically well-formed. Furthermore, given that the minimal predication domain involves both the explicit individual in subject position and the implicit individuals as introduced by the modifying *mit<sub>free</sub>*, the cutoff must be such that Ben's height and at least someone else's height comply with it (Ben and the implicit bearers are in  $C_{\text{pred}}$ ), whereas all others do not comply with it (all others are in  $C_{\text{contrast}}$ ). As expected, there is thus only partial explicit knowledge of who belongs to the unique set of the tallest individuals in the context. Therefore, and similarly to the situation with referential plural superlatives, contextual needs control the specification of the cutoff: it must be such that a reasonable partition of the context-set emerges.

Finally, I would like to mention one further welcome prediction. For the given analysis of *mit<sub>free</sub>* plus superlative, it is crucial that *mit<sub>free</sub>* interacts with a level of representation that is about the context-sensitive partition of individuals. However, there are also uses of the superlative that are not about this partition, but about the assignment of high-ranking particularized properties. This 'relative' interpretation comes along with the absence of the definite determiner, as in (128a). As expected, *mit<sub>free</sub>* is incompatible with this interpretation of the superlative, as shown by (128b).

- (128) a. Peter hat größte Mühe damit, dieses Problem zu lösen.  
 Peter has biggest trouble with it this problem to solve  
 'Peter is having a very hard time solving this problem.'
- b. #Peter hat mit größte Mühe damit, dieses Problem zu lösen.  
 Peter has mit<sub>free</sub> biggest trouble with it this problem to solve

## 5 Conclusion

This paper has been concerned with the semantics and pragmatics of *mit* 'with' as a free particle in German. I have proposed that *mit<sub>free</sub>* contributes a modifier with the following uniform interpretation. It distributes its target predication over the explicit subject and implicit alternatives in such a way that the subject is said to accompany an implicit situation by participating in a corresponding situation. The proposal covers the use of *mit<sub>free</sub>* within both eventive and stative predications, including its striking combination with the superlative form of adjectives. I have argued that this compositional approach considerably improves on previous analyses that consider *mit<sub>free</sub>* in its adverbial use to be an

additive focus particle or a retrievable prepositional phrase, and that are forced to posit a separate construction for its use with the superlative.

More specifically, the proposal is motivated by the following key pieces of evidence. First, *mit<sub>free</sub>* introduces a distinction between explicit discourse-transparent content and implicit discourse-opaque content. The accompaniment of a host situation by the subject is identified as the explicit content and is thus accessible to cross-sentential anaphors, operators, and questions. The host situation including its alternative participants is identified as the implicit content and is thus inaccessible to discourse-related operations. Notably, *mit<sub>free</sub>* is not sensitive to focus and does not introduce presupposed or projective content.

Second, the accompaniment is characterized by three traits in particular: it forms an integrated whole with the host situation, it extends its host situation, and finally, the subject receives a regular participant role in the situation under discussion. These traits make the right predictions concerning various details of interpretation. For instance, the subject is a regular co-agent or co-bearer within the joint situation, while it nonetheless plays a concomitant role in it. Furthermore, integrity conditions sensitive to situation types determine in principled ways whether conjoined situations share participants and whether *mit<sub>free</sub>* is veridical (see below for the superlative).

Third, the accompaniment-based analysis provides a principled explanation for a wide range of distributional contrasts that are unaccounted for in previous work: *mit<sub>free</sub>* is compatible with predication types that introduce entities that can be extended by the accompaniment of further participants; this applies to eventive and stative predications such as activity predications, locative predications including location-oriented interpretations of position verbs, and the predication that is introduced by the superlative form of adjectives. By contrast, *mit<sub>free</sub>* is incompatible with predication types that are conceptually at odds with a corresponding accompaniment; this applies to predications that denote tropes, that is, particularized properties inherent to their bearers. This group comprises predications that are introduced by the positive and the comparative form of typical adjectives, predications that are introduced by the internal core of typical so-called Kimian state verbs, and predications that underlie mode-oriented interpretations of other kinds of state verbs. Crucially, the decision of whether a certain predication licenses or prohibits an extension by accompaniment is justified by independent grammatical and conceptual considerations. In particular, the cross-categorical restrictions fall under the purview of a uniform conceptual explanation that makes crucial use of the notion of tropes; this corroborates the assumption that tropes should be considered an essential part of natural language ontology. I have also detailed why the superlative provides a higher-order semantics that yields a partition of a context-set according to a certain cutoff and therefore escapes trope-related restrictions. Furthermore, given the uniform distributive semantics of *mit<sub>free</sub>*, the seemingly irregular fact that *mit<sub>free</sub>* with the superlative is not veridical could be traced back to a regular general trait of the superlative in distributive contexts.

At first sight, *mit<sub>free</sub>* in German appears to be a rather peculiar lexical item. However, the present paper shows how fruitful an approach to it in terms of regular composition can be. This approach has disclosed regularities of *mit<sub>free</sub>* not recognized before. Crucially, it has also advanced our understanding of more general topics such as the internal semantic structure of stative predications, the role of accompanying relations within natural language ontology, and the question of how to model the interpretation of the superlative given its behavior in distributive contexts. I conclude by pointing out one of the remaining challenges.<sup>22</sup> There are types of predications the combinatorics of which with *mit<sub>free</sub>*

<sup>22</sup> One would also like to better understand the relation between *mit<sub>free</sub>* and its use as a bound particle; recall the examples (11) and (12) from the introduction. While the meaning of the bound particle is certainly close to the meaning proposed for *mit<sub>free</sub>*, it is an open question whether there are fine-grained differences.

has not yet been discussed. For instance, *mit<sub>free</sub>* seems to be generally incompatible with simple noun-based predications, as in (129).

- (129) #Ben ist mit {Linguist / ein Idiot / ein Berliner Bäcker}.  
 Ben is mit<sub>free</sub> {linguist / an idiot / a Berlin baker}  
 ‘Ben belongs to a set of people who are {linguists / idiots / bakers in Berlin}.’

The results of the present paper suggest that these nominal predications contribute particularized properties that cannot be shared. While I consider this hypothesis reasonable, its consequences should be spelled out in more detail in future work. In addition to such further constraints, there are also further feasible options. For instance, several predications for causal relations support *mit<sub>free</sub>*, as shown in (130); see also Zifonun et al. (1997: 2146) and Hoekstra (2004: 123/(13)).

- (130) a. Mia ist mit verantwortlich für den Vortrag.  
 Mia is mit<sub>free</sub> responsible for the talk  
 ‘Mia belongs to a set of people that are responsible for the talk.’  
 b. Mia ist mit in der Verantwortung für den Vortrag.  
 Mia is mit<sub>free</sub> in the responsibility for the talk  
 ‘Mia belongs to a set of people that bear responsibility for the talk.’  
 c. Dies sei mit {ein Anlass / ein Grund} für weitere Debatten.  
 this be mit<sub>free</sub> {an occasion / a reason} for further debates  
 ‘Let this belong to a set of things that {prompt / cause} further debates.’

Notably, these options are independent of syntactic categories. This is in line with the assumption that the distribution of *mit<sub>free</sub>* depends on conceptual conditions; these conditions can typically be associated with certain categories, but they are not necessarily bound to them. What could a conceptual explanation look like? A plausible hypothesis would be that these causal predications do *not* introduce particularized properties, but abstract relations for causes that, similarly to locative relations, license the accompaniment by secondary participants. I will leave it to future work whether this hypothesis can withstand closer scrutiny. In any case, the compositional approach forces one to consider such principled explanations for constraints and options instead of merely stating that they exist.

## Abbreviations

accomp' = accompaniment relation as defined in (54), ag' = agent relation, AP = adjectival phrase, bearer' = bearer relation, C = context-set,  $C_{contrast}$  = individuals of a context-set that are not in a minimal predication domain, comitative' = comitative relation,  $C_{pred}$  = individuals of a context-set that are in a minimal predication domain, DP = determiner phrase, D-state = Davidsonian state,  $f_{pos}$  = context-sensitive function relevant for the meaning of the positive form,  $f_{sup}$  = context-sensitive function relevant for the meaning of the superlative form, G = function from sets of singular individuals to plural individuals, *i* as a subscript = implicit, K-state = Kimian state, *mit<sub>adv</sub>* = adverbial free *mit*, *mit<sub>free</sub>* = generalized free *mit*, *mit<sub>sup</sub>* = free *mit* with the superlative, *pos* as a subscript = positive form, PP = prepositional phrase, PTC = particle, REFL = reflexive, th' = theme relation, ≤ = is part of, ≠ = is not part of

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### Competing Interests

The author has no competing interests to declare.

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