

Elaborating on Events by means of English *by* and German *indem*

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This paper argues that English *by* and German *indem* ‘in that’ accommodate dual aspect types for events and thereby support their assessment under a certain conceptualization: that is, in examples such as *keep a promise by dancing*, both involved event types are ‘copresent’ in such a way that the dancing is conceptualized as a keeping of a promise. The proposal, which is spelled out in terms of Asher’s (2011) type composition logic, captures *by*’s key traits: the global accessibility of the matrix event as opposed to the local role of the embedded event, the conceptual constraints and asymmetry of the construction, its intensional behavior, and the Anscombe intuition that it involves only one event. Finally, the core idea readily lends itself to extensions where called for; this is illustrated with a refined analysis of the German connective *indem* and its specific characteristics.

Keywords: Anscombe Thesis, event semantics, type composition logic

1 Introduction

Canonically, both *by V-ing* in English and adverbial sentences introduced by *indem* ‘in that’ in German describe in more precise terms the respective matrix event:

- (1) a. Ben kept a promise by dancing. (see Sæbø 2008:(21a))
b. Ben hielt ein Versprechen, indem er tanzte.
Ben kept a promise in that he danced

In view of previous work (see Dowty 1979, Bennett 1994, Kearns 2003, Sæbø 2008, Schnieder 2009 on *by*; see Behrens and Fabricius-Hansen 2002, Fabricius-Hansen 2006, Fabricius-Hansen 2011 on *indem* and *by*), the following key issues emerge. Typically, the *by/indem*-phrase combines with abstract predicates, notably criterion predicates and (manner-neutral) causatives; see Sæbø 2008:127–128 for these notions and the following examples:¹

- (2) a. Criterion predicates: *keep a promise, do me a favor, transgress Holy Law, ...*
b. Causative predicates: *save sb., madden sb., create a fiction, ruin my reputation, ...*

How do matrix predicates and *by/indem*-phrases relate to each other and how does the relation come about? Conflicting characteristics make answering these questions a challenging task: on the one hand, (1) seems to involve only one event. This intuition is captured within the so-called Anscombe Thesis; see (3) from Schnieder 2009:650. This basically says that the keeping of the promise *is* the dancing.²

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¹Criterion predicates – the term is due to Kearns (2003) – introduce conventional criteria; in turn, the events given in the *by/indem*-phrase are conceived of as fulfilling the imposed requirements.

²According to Schnieder, the term “Anscombe Thesis” goes back to Bennett (1994); the underlying intuition originated from an example from Anscombe 1957. Schnieder (2009:649–654) discusses the wording of the thesis.

- (3) If x ϕ 's by ψ -ing, then x 's ϕ -ing = x 's ψ -ing.

On the other hand, there is clear evidence against the Anscombe Thesis; see Sæbø 2008 for a recapitulation of the arguments.³ First, example (4) shows that the involved event descriptions cannot be interchanged; this asymmetry would be surprising if the involved events were in fact identical. Second, event identity predicts closure upon weakening. However, while simple sentences are closed, their embedding under *by/indem* bars the relevant implication, as in (5):

- (4) # Ben danced by keeping a promise.
 (5) a. Ben danced in public. \rightarrow Ben danced.
 b. Ben kept a promise by dancing in public. \rightarrow Ben kept a promise by dancing.

The present paper aims at a compositional analysis of *by/indem* that reconciles this conflict. Section 2 discusses merits and problems of Sæbø's (2008) unification-based proposal. In section 3, I will develop an alternative that builds upon Asher's (2011) type composition logic. Its upshot is that *by/indem* accommodate dual aspect types for events and establish their assessment under a certain conceptualization; hence, (1) is about dancing *as* a keeping of a promise. In section 4, I will focus on specific properties of *indem* in German and ponder how refinements of the core proposal can handle these. Section 5 offers a brief conclusion.

2 Sæbø 2008

2.1 Sæbø's Unification-Based Account

The key ingredients of Sæbø's account are as follows: first, building, in particular, on Bennett 1994, Sæbø (2008:132) starts out with the idea that the abstract matrix predicates are "predicates of predicates of events," which leads to the hypothesis in (6).

- (6) If someone ϕ 's by π ing, then ϕ says that she does a ψ such that ... (for instance, ψ is something promised, or her doing ψ causes something), and ψ is π .

Accordingly, the *by*-construction builds upon an additional mediating variable ψ introduced via the matrix predicate and filled by the *by*-phrase; in turn, the whole construction denotes just one event token, namely the one of the *by*-phrase, capturing the intuition that underlies the Anscombe Thesis. Second, the relation between the involved event descriptions (for instance, the causing relation in the case of causatives) is not spelled out in terms of event tokens, but in terms of event types. This renders the construction intensional and therefore compatible with the evidence against the Anscombe Thesis. Notably, this goes hand in hand with a proposition-based notion of causation. Third, in order to develop these aspects into a compositional analysis, Sæbø relies on unification as inspired by Discourse Representation Theory.

A quick run through the analysis of the causative example in (7) illustrates the procedure.

- (7) madden me by dancing (= Sæbø's (22a))

The *by*-phrase is assumed to necessarily bind an indefinite predicate variable; this is captured via a so-called constant condition, as in (8). In turn, unification succeeds only if the matrix

³From a philosophical perspective, Schnieder (2009) offers a partly different criticism. He also sketches an analysis of *by*'s semantics in terms of "how"-explanations. His approach certainly deserves a thorough discussion. However, since it is less explicit with regard to composition than Sæbø's account and the focus of the present paper will be on compositional details, I postpone a comparison between his and my analysis till another occasion.

predicate provides such an indefinite predicate. This is exactly what underlies the hypothesis in (6). Accordingly, *madden* is equipped with an indefinite variable P , as in (9). Unification then yields for (7) the representation in (10).

$$\begin{aligned}
 (8) \quad \llbracket \text{by dancing} \rrbracket &= \left\langle \langle \langle \Pi, \text{constant} \rangle \rangle, \left[\Pi = \lambda e'. \text{dance}(e') \right] \right\rangle \\
 (9) \quad \llbracket \text{madden me} \rrbracket &= \left\langle \langle \langle e, \lambda \rangle, \langle P, \text{indef.} \rangle \rangle, \left[\frac{e_1}{P(e) \wedge \text{Bec}(\text{mad}(i))(e_1) \wedge \text{Cause}(\text{Bec}(\text{mad}(i))(e_1))(P(e))} \right] \right\rangle \\
 (10) \quad \left\langle \langle \langle e, \lambda \rangle \rangle, \left[\frac{e_1}{\text{dance}(e) \wedge \text{Bec}(\text{mad}(i))(e_1) \wedge \text{Cause}(\text{Bec}(\text{mad}(i))(e_1))(\text{dance}(e))} \right] \right\rangle
 \end{aligned}$$

(see Sæbø's (26) and (24))

(10) says that the *by*-construction in (7) as a whole denotes a set of dancing event tokens (see the corresponding λ -bound variable e); this captures the intuition that (7) is about just one event. In addition, an intensional causing relation relates the corresponding event type 'dance(e)' to the event type 'Bec(mad(i))(e_1)' provided by the matrix predicate; this accounts for the lack of closure and the asymmetry.⁴ The asymmetry is also reflected in the licensing condition of the procedure as such: in contradistinction to *dance*, the causative *madden* is a plausible candidate for lexically providing an adequate indefinite anchor.

While Sæbø's analysis accounts for basic characteristics of *by/indem* in an elegant way, the following discussion uncovers substantial shortcomings.

2.2 Problem I: Locality Effects

According to (10), the compositionally active λ -bound variable of the complex VP corresponds to the embedded event, not the matrix event. However, various diagnostics show that the complex VP is sensitive to the matrix event while the embedded event should be locally bound.

A first case in point is the combinatorics with mental-attitude adverbials such as *involuntarily* or *unintentionally*. These are VP-adjuncts that assign the highest ranked verbal argument a specific attitude towards the VP's event (Wyner 1994, Frey 2003). The examples in (11) show that the attitude relates to the matrix event while the embedded event remains opaque. If it got projected, the given implications should be valid, contrary to fact.

- (11) a. Ben involuntarily caused a dispute by raising religious questions.
 \rightarrow Ben involuntarily raised religious questions.
 b. Ben unintentionally dismissed Helen by signing the contract.
 \rightarrow Ben unintentionally signed the contract.

These findings militate against Sæbø's account in two respects: the embedded event should not be the referential argument of the complex VP, and the matrix predicate should involve an event, not just a propositional relation. Notably, this consequence also threatens Sæbø's way of capturing the Anscombe Thesis.⁵

⁴Note that e_1 is the event token for the sublexical part *become mad*, but not for the matrix verb *madden* as such. The referential argument of *madden* is the underspecified one that is unified with the event token contributed by the *by*-phrase; this is why Sæbø can speak of having only one relevant event token here (as suggested by Anscombe).

⁵One might argue that evaluative or agent-oriented adverbials support a similar argument: *Unfortunately / Stupidly, Ben dismissed Helen by signing the contract*. Clearly, the evaluation may relate to the dismissal. However, it is less clear whether these adverbials relate to VPs/events; see Maienborn and Schäfer 2011.

A second piece of evidence comes from combinatorial restrictions with manner adverbials and instrumentals such as *carefully* and *with a knife*, as in (12) and (13). Compared to their counterparts with *by*-phrase internal projection, their matrix projection is deviant.

- (12) a. Ben saved the deer by disinfecting its wounds carefully.
 b. # Ben saved the deer carefully (by disinfecting its wounds).
- (13) a. Frank kept a promise by killing Jill with a knife.
 b. # Frank kept a promise with a knife (by killing Jill).

Plausibly, these contrasts arise because the matrix event descriptions do not match the selectional restrictions imposed by the respective adverbials. However, this explanation is at odds with Sæbø's account: why are the adverbials in (12) and (13) unable to access the indefinite event variable introduced by the matrix predicate, particularly as it is projected? The indefinite variable, finally to be filled by *by*'s embedded event, should provide an adequate anchor for the adverbial even if the latter is integrated at the matrix level. This prediction is not borne out.⁶

Perceptual reports and locatives offer a third test bed. They are attractive criteria since they operate at the VP-level and are sensitive to the abstractness of verbal meanings.⁷ While, for instance, *dance* allows for direct perception, *keep a promise* and *forget* denote more abstract entities, which bar perceptual reports, as in (14). Crucially, the corresponding *by*-constructions pattern with the matrix predicates, as in (15). According to Sæbø's account, where the *by*-phrase projects its embedded event, (15a)/(15b) should be as good as (14a), contrary to fact.

- (14) a. Ben saw Martha dance.
 b. ?? Ben saw Martha keep her promise.
 c. ?? Ben saw Martha forget her pain.
- (15) a. ?? Ben saw Martha keep her promise by dancing.
 b. ?? Ben saw Martha forget her pain by dancing.

Analogous restrictions on localization confirm this observation. Since the event slot of the matrix VP is determined by the verb in the *by*-phrase according to Sæbø, he cannot explain why locatives at the matrix VP-level are clearly sensitive to the matrix predicate:

- (16) a. Ben kept a promise by weeding in the garden.
 b. ?? Ben kept a promise in the garden by weeding.
- (17) a. Ben forgot his pain by weeding in the garden.
 b. ?? Ben forgot his pain in the garden by weeding.

A fourth and final diagnostic builds on biased anaphoric accessibilities. The example in (18) provides a case in point:

⁶One might defend Sæbø's account by arguing that the embedded event enters the matrix level as a whole (consider the unification of VPs, not Vs). Thus, verb-related manner adverbials and instrumentals cannot relate to it for independent reasons. However, this presupposes a detailed compositional set-up. I do not know whether the unification-based approach complies with this.

⁷See Maienborn 2005 and the commentaries on it in the same volume. For Maienborn, these criteria indicate a fundamental distinction between events, which are amenable to perception and localization, and statives, which bar both. I do not delve into this discussion here, so I use the criteria only to heuristic ends. For instance, the example based on the non-stative *forget* is inspired by Dölling (2005), who challenges Maienborn's perspective.

- (18) A: She [maddened me]_i [by dancing]_j.
 B: Yes, that_{i/(#)j} could not be overlooked.

The anaphor *that* seems to preferentially pick up the matrix event. That is, again: a referential anchor for the matrix event is needed while a merely propositional relation as proposed by Sæbø does not suffice. Furthermore, the matrix event (rather than the embedded one) should be globally accessible.⁸

2.3 Problem II: Free Variables and Constraints

Sæbø argues that his account can predict why examples such as (19) are deviant. Since the involved matrix predicates are too concrete to provide indefinite predicates, unification fails.

- (19) a. # spew all over a man and a woman by getting blind drunk [...]
 b. ?? Fred tied his necktie / combed his hair / buttoned his shirt by ...
 (= Sæbø's (33)/(18))

On the one hand, tracing the deviance of (19a) back to the lack of an indefinite predicate strikes me as too weak. According to my intuition, (19a) is out for ontological reasons: getting blind drunk cannot be conceptualized as a spewing. While one may spew because one got blind drunk, the spewing cannot in any possible way specify the process of getting drunk itself.⁹ The following examples corroborate this claim: (20a) and (21a) are clearly ill-formed. However, this cannot be explained in terms of \pm indefinite predicates since the respective matrix predicates are abstract in Sæbø's sense, as shown by (20b) and (21b), which are perfect.

- (20) a. # Ben repaired his bicycle by planning a trip.
 b. Ben repaired his bicycle by replacing all the broken parts.
 (21) a. # Ben destroyed the falsified documents by hearing on the radio news that inquiries have been ordered.
 b. Ben destroyed the falsified documents by burning them.

Again, conceptual constraints are at work: one cannot conceive of a planning of a trip in terms of a repairing process; analogously, a hearing of something on the radio news never amounts to a destruction of documents. Notably, the important role attributed to conceptual reasoning leaves room for less clear-cut examples. Cases in point are those in (22):

- (22) a. (#) Ben insulted all by getting blind drunk.
 b. (#) Ben praised all by serving champagne.

In a strict sense, one can hardly conceive of getting blind drunk as an insulting, or, of serving champagne as a praising of someone. In a looser sense, these conceptualizations are possible and, thus, render (22a)/(22b) acceptable.

On the other hand, Sæbø's approach to the examples in (19b) seems to be too strong. A case in point is the manner-specific, non-abstract verb *nod*, discussed by Bennett (1994:43),

⁸I do not say that reference to the embedded event is strictly impossible. As will become clear later on, there will be an argument for the dancing in the corresponding representation. I would like to leave it open how exactly constraints on discourse structure control anaphoric links.

⁹The distinction between causal explanations and *by*-predication is also highlighted by Schnieder (2009:666–667), who adduces the nonsensical example #to cry by hitting oneself on the toe.

Fabricius-Hansen (2006:50–51) and Schnieder (2009:662). Usually, one does not nod by doing something else; but if a person is disabled in a certain way, it may be conceivable that he nods “by watching himself in the mirror, conducting fast micro-experiments with various movements, and eventually hitting on the right ones to get his head to move in that way” (Bennett 1994:43). In fact, it seems to be easy to find counterexamples to (19b) such as those in (23):

- (23) a. (Bob is disabled:) He combs his hair by moving his head over a fixated brush.
 b. Shampooieren Sie Ihre Haare, indem Sie das Siroco mit der glatten Handfläche
 shampoo your hair in that you the Siroco with the flat palm
 in das Haar einarbeiten.
 in the hair work in
 (<http://www.hairfax.de/pflegeanleitungen.html>, accessed on 19/09/2013)

Following Fabricius-Hansen’s evaluation of Sæbø’s proposal, I conclude that relative degrees of abstractness or (un)specificity are crucial, but not a static lexical feature such as \pm indefinite.

Examples with *by*-phrases that literally modify non-abstract activities and achievements, as in (24), pose another threat to Sæbø’s analysis. They touch upon the interaction between inherent aspectual properties of verbs, transitions between aspectual classes, and the role modifying *by*-phrases play in their constitution.¹⁰

- (24) He was forced to forfeit the medal he had won by cheating. (= Sæbø’s (43))

In order to reconcile this example with his approach, Sæbø argues that the *by*-phrase triggers a shift to a causative accomplishment. This introduces a DO component which provides an adequate anchor for the *by*-phrase predicate and, in turn, characterizes the referential argument of the complex VP.

In general, Sæbo’s explanation suffers from a conceptual flaw. The core of his proposal builds on the assumption that *by* merely ensures the identification of predicate variables via unification. However, in order to facilitate aspectual changes, it seems to be inevitable that *by* contributes something more substantial. These assumptions are in conflict; the same worry (though with regard to another example) is articulated by Fabricius-Hansen (2006:52). One may try to save Sæbø’s approach by liberalizing unification and, thus, rendering shifts obsolete. But this is at variance with the hard constraints that are exemplified by (19a), (20a), and (21a) above.

Furthermore, since the DO component forms the λ -bound variable of the complex VP, Sæbø’s account predicts a change in the aspectual class on the matrix level. However, the distribution of durative vs. punctual adverbials, as in (25), indicates that there is no global change.

- (25) a. Ben had won the medal (*for an hour) by cheating (for an hour).
 b. Ben reached the church (at 12 o’clock sharp) by speeding (*at 12 o’clock sharp).

That is, even if a shifting analysis is on the right track, it must be only locally operative; see section 4.1 for some remarks on corresponding questions with regard to *indem* in German.

2.4 Taking Stock

Regardless of its merits, Sæbo’s unification-based account of *by/indem*-constructions suffers from serious deficiencies. The envisaged alternative should preserve previous insights, that is,

¹⁰This is different from the examples with *nod*, *comb*, etc. above. The latter prompt the question of whether not all predicates, no matter how specific they are, allow for an even more specific description and, thus, a *by*-phrase.

capture the Anscombe Thesis, the asymmetry, and the lack of closure. But it should also comply with the following key observations: first, the matrix event description contributes the referential argument of the complex VP while the event introduced by the embedded description remains local. Second, the matrix event abstracts over the embedded one in an ontologically apt way; more concretely, the embedded event must be conceivable as one of the matrix type. Finally, the semantics of *by/inDEM* should leave room for potentially fine-grained lexical information that goes beyond a purely identifying function.

3 An Alternative: *by/inDEM* Accommodate Complex Event Types

The envisaged account builds on Asher's (2011) type composition logic, which supplements ordinary intensional semantics of terms with an extra layer that encodes rich typing information. This typing information plays a crucial role during composition: predication only succeeds if the types presupposed by predicates are met by the preferred types of their arguments. If type conflicts arise, the composition may either crash or resort to dynamic adaptive mechanisms. Notably, suitable accommodations and repairs are not arbitrary, but are also dependent on appropriate typing information; this roots them in the lexical system in spite of their sensitivity to dynamic conceptual knowledge. I will now apply Asher's approach to the case at hand.

3.1 Complex • Types in Asher's (2011) Type Composition Logic

Asher (2011:ch. 5–7) advocates the existence of dual aspect objects that justify complex • types. The underlying intuition is that • types are types where “both constituent types, the types of the aspects, are in some sense present” (Asher 2011:132). For instance, books are both physical and informational objects and, thus, of type `INFO • PHYSICAL`; lunches are both events and food and, thus, of type `EV • FOOD`. The selection of aspects depends on the predication, as in (26): *pick up* selects for the physical aspect of book while *master* selects for the information.

(26) Mary picked up and mastered three books on mathematics. (= Asher's (5.4))

Asher discusses at length that • types do not correspond to intersective types, pair types, type-token (or other forms of simple) ambiguities, part-whole relations, groups, or collections; see, in particular, Asher 2011:ch. 5.1–5.2.¹¹ Instead, • types have a specific relational interpretation: the aspects of • types are objects under a certain conceptualization, namely, they depend on the object they are aspects of, as Asher (2011:149–150) says:

[A]n aspect is, metaphysically speaking, a bare particular combined with some property or some property instance that it has [...]. A lunch object is *wholly* an event (under one aspect) and *wholly* food (under another aspect). [... • types] provide for a morphism to an aspect in a particular predicational environment, a morphism that [...] leads to the creation of a new object that is related to the one of • type.

In order to encode this specific dependence between aspects and objects of complex type, Asher (2011:150) introduces the relation “Object Elaboration,” $o\text{-elab}(x, y)$, which says that “x is an

¹¹To get an idea of how arguments go, a selective illustration may suffice: • types cannot be intersective because, for instance, the intersection of the types `INFO` and `PHYSICAL` (associated with *book*) would yield the absurd type; • types are not ambiguous between types and tokens either since, for instance, a lunch may involve both a particular event and food token. On problems of the pair-type hypothesis, see section 3.2.

aspect of y , or x ‘elaborates’ on the sort of object y is.” The following analysis employs this kind of elaboration in order to model the relation between events involved in the *by*-construction.

3.2 Accommodating Complex • Types for Events

• types are not limited to single lexemes; they can also be dynamically accommodated. For the nominal domain, Asher argues that *as*-phrases within restricted predication, as in (27), are a case in point: here, John receives a • type with JUDGE as one constituent type. The JUDGE type is made accessible to the predication, which captures that it holds for John in his judge role.

(27) John as a judge is corrupt. (= Asher’s (7.17b))

My proposal for the *by/indem*-construction builds on the core idea that a dynamic accommodation of • types is also feasible in the verbal domain; more concretely: I propose that *by/indem* are means of turning embedded events into complex events on which the matrix event description elaborates. That is, for instance, *keep a promise by dancing* involves a dancing conceptualized as a keeping of a promise. A corresponding lexical entry is given in (28); $\text{TY}^+(V)$ is short for a function that picks out the most specific type of a property V .¹²

(28) $\llbracket \text{by/indem} \rrbracket = \lambda P \lambda Q \lambda x \lambda e : \text{TY}^+(Q) \exists e' : \text{TY}^+(P) \bullet \text{TY}^+(Q) . P(e')$
 $\wedge \text{highest thematic arg.}'(e') = \text{highest thematic arg.}'(e) \wedge \text{o-elab}'(e, e') \wedge Q(x)(e)$

According to (28), the event variable e' must justify a complex • type that combines the specific types of both the embedded event predicate P and the matrix event predicate Q . As intended, *by/indem* thereby presuppose the accommodation of a complex event type for the embedded event. Correspondingly, ‘o-elab’ takes care of appropriately relating the involved events at the level of logical form; in short, the referential argument e of Q , namely the matrix event, is said to elaborate on the embedded event argument e' introduced by P . Finally, the condition imposed on the highest thematic arguments captures that both clauses have identical subjects.¹³

If applied to (29) and its meaning components in (30), (28) yields first (31) and then (32).

(29) keep a promise by dancing

(30) a. $\llbracket \text{dancing} \rrbracket = \lambda e'' . \text{dance}'(e'', y)$ ¹⁴

b. $\llbracket \text{keep a promise} \rrbracket = \lambda z \lambda e''' . \text{keep a promise}'(e''', z)$

(31) $\llbracket \text{by dancing} \rrbracket = \llbracket \text{by} \rrbracket(\llbracket \text{dancing} \rrbracket)$

$= [\lambda P \lambda Q \lambda x \lambda e : \text{TY}^+(Q) \exists e' : \text{TY}^+(P) \bullet \text{TY}^+(Q) . P(e') \wedge \text{hth. arg.}'(e') = \text{hth. arg.}'(e)$
 $\wedge \text{o-elab}'(e, e') \wedge Q(x)(e)] (\lambda e'' . \text{dance}'(e'', y))$

¹²Asher handles presuppositions via parameters π that take care of adequately passing presuppositions from predicates to arguments during the composition. Since the respective merits are not crucial for the core of the present proposal, representations are greatly simplified here and presuppositions are added via a colon.

¹³Previous analyses also point out that the relation “elaboration” may be useful for relating objects and discourses, as in Behrens and Fabricius-Hansen 2002:46 and Sæbø 2008:146. In contradistinction to their suggestions, the present perspective is spelled out within Asher’s type composition logic. Notably, I propose that the matrix event elaborates on the embedded one, not vice versa. The proposal’s merits will be presented shortly.

¹⁴For simplicity, the highest argument corresponds to a free variable here. There might be better ways to integrate it. This paper does not properly deal with the compositional challenges that follow from an adequate integration of matrix and embedded subjects of *by/indem*-constructions; see section 4 for some remarks.

$$\begin{aligned}
&= \lambda Q \lambda x \lambda e:TY^+(Q) \exists e':DANCE \bullet TY^+(Q).dance'(e', y) \wedge hth. arg.'(e') = hth. arg.'(e) \\
&\quad \wedge o-elab'(e, e') \wedge Q(x)(e) \\
(32) \quad \llbracket \text{keep a promise by dancing} \rrbracket &= \llbracket \text{by dancing} \rrbracket (\llbracket \text{keep a promise} \rrbracket) \\
&= [\lambda Q \lambda x \lambda e:TY^+(Q) \exists e':DANCE \bullet TY^+(Q).dance'(e', y) \wedge hth. arg.'(e') = hth. arg.'(e) \\
&\quad \wedge o-elab'(e, e') \wedge Q(x)(e)] (\lambda z \lambda e'''.keep a promise'(e''', z)) \\
&= \lambda x \lambda e:KEEP-PROMISE \exists e':DANCE \bullet KEEP-PROMISE.dance'(e', y) \\
&\quad \wedge hth. arg.'(e') = hth. arg.'(e) \wedge o-elab'(e, e') \wedge keep a promise'(e, x)
\end{aligned}$$

After application to a subject, identification, and existential event closure, this results in (33b) for (33a). Presupposition justification may succeed; so the logical form is well formed.

- (33) a. Ben kept a promise by dancing.
b. $\exists e:KEEP-PROMISE \exists e':DANCE \bullet KEEP-PROMISE.$
 $dance'(e', Ben) \wedge o-elab'(e, e') \wedge keep-a-promise'(e, Ben)$

In prose: (33a) is true iff there is a keeping of a promise event e by Ben so that e elaborates on a complex dancing event e' by Ben that bears keeping a promise as one of its constituent types. That is, the dancing e' is conceptualized as a keeping of a promise whereupon this conceptualization feeds the matrix event the sentence is about. I will now comment on the merits and consequences of this analysis.¹⁵

Locality effects The compositional set-up according to (28) yields a logical form where the λ -bound referential argument of the complex VP is not provided by the embedded complexly typed event, but by the simply typed matrix event. That is, (29) is about a set of keeping of a promise events that elaborate on a dancing event that justifies a complex type. Notably, the respective logical form thereby also involves a token variable for the matrix event instead of a purely event-type-based propositional relation. In contradistinction to Sæbø's approach, these features correctly predict that adverbials and perception reports operating at the matrix level are sensitive to the type of the matrix event predicate while the embedded event remains local. Moreover, the event token variable for the matrix event licenses its anaphoric accessibility.

Conceptual constraints Asher (2011:202, 207) briefly discusses restrictions on *as* phrases that are due to their \bullet type presuppositions. (34a) yields a presupposition failure since rocks bar a conceptualization in terms of the aspect ABSTRACT OBJECT. (34b), however, is well formed since books can bear the aspect PADDLE; this licenses the accommodation of the \bullet type.

- (34) a. # The rock as an abstract object is interesting.
b. This book as a paddle is useless. [...] (= Asher's (7.22a)/(7.20))

The conceptual constraints observed for *by/indem* can be captured in terms of analogous presupposition failures; see, for instance, (35a) (cf. (19a)) and its logical form in (35b).

¹⁵The proposal is exemplified with regard to the criterion predicate *keep a promise*. Notably, causatives such as *madden* would receive the very same analysis. Such a unified perspective is desirable: *o-elab* captures a certain ontological relation between matrix and embedded event; this builds on a common core of criterion predicates and causatives, namely their abstractness. However, it deliberately does not relate directly to differences between the ways this abstractness is encoded. Moreover, if needed (for other ends), the formalization may be amended by a decomposition of the involved predicates that reflects the distinction between different sorts of predication.

- (35) a. # spew by getting drunk
 b. $\lambda x \lambda e: \text{SPEW} \exists e': \text{GET DRUNK} \bullet \text{SPEW.get drunk}'(e', y)$
 $\wedge \text{hth. arg.}'(e') = \text{hth. arg.}'(e) \wedge \text{o-elab}'(e, e') \wedge \text{spew}'(e, x)$

The presupposition cannot be met in a plausible way: getting-drunk events can never bear the aspect SPEW. In other words, one cannot conceptualize a getting-drunk event as a spewing; thus, conceivable objects of type GET DRUNK • SPEW do not exist. Notably, there are of course plausible relations between getting drunk and spewing; the most prominent one is probably causal. However, the • type hypothesis put forward here is not about a causal connection, but about a specific ontological form of “copresence” (recall the remarks on the • type conception above). It is this copresence which is not feasible for the case at hand.¹⁶

Asymmetry and the role of layered abstraction In spite of the close relation between the involved events, the present analysis is clearly asymmetric since the embedded event and the matrix event play different roles, the former being accommodated to a complex event on which the latter elaborates. This paves the way for explaining the observation that the matrix event must abstract over the embedded one in a conceptually plausible way, as in (36) (= (1a)/(4) above):

- (36) Ben {kept a promise by dancing / #danced by keeping a promise}.

Following Asher (2011:149), • type accommodation renders a “thin” object “thicker,” that is, endows it with an instance of a more fine-grained property. Transferred to the • type accommodation with *by/indem*, this reasoning correctly predicts that the less abstract event can be endowed with a more fine-grained abstract event description, but not the other way around. Put in other words for (36): a dancing can comply with the necessary conceptual features of the more abstract keeping of a promise while a keeping of a promise cannot essentially be a more concrete dancing. The more general hypothesis is that since a less abstract event can obtain the role of a more abstract event, but not vice versa, an instance of a more abstract aspect elaborates on the type of object given by the less abstract event. It is finally noteworthy that nominalized event descriptions within *as*-phrases behave analogously. They are stylistically marked, but show the same kind of asymmetry, as in (37) and (38):¹⁷

- (37) I conceive of
 a. {this dancing as a keeping of a promise / #this keeping of a promise as a dancing}.
 b. {the disinfection of the deer as a saving of the deer / #the saving of the deer as a disinfection of the deer}.
- (38) a. The delivery of this JHL Flexline unit is part of the investment programme to accompany the groups' growth. [...] Christopher Stewart, group managing director sees this delivery as a keeping of a promise.
 (<http://iwjs.dns-systems.net/2012/01/22/hello-world/>, accessed on 10/11/2013)
 b. #... sees the keeping of a promise as a delivery.

¹⁶The envisaged duality also clearly differs from coercion phenomena, which involve weaker relations (see, for instance, the classic example *enjoy a cigarette*, where an event of smoking mediates between *cigarette* and *enjoy*).

¹⁷This does not say that *by/indem* and *as* are grammatically identical. Note, in particular, that *as* takes as its first argument the more abstract event. In a sense, *by/indem* and *as* are mirror images of each other.

Lack of closure and intensionality *By/Indem*-constructions are not closed if weakened, as in (39) (= (5b)).

- (39) a. Ben kept a promise by dancing in public.
 b. \rightarrow Ben kept a promise by dancing.
- (40) a. $\exists e:\text{KEEP-PROMISE}\exists e':\text{DANCE-IN-PUBLIC} \bullet \text{KEEP-PROMISE.dance}'(e', \text{Ben})$
 $\wedge \text{in-public}'(e') \wedge \text{o-elab}'(e, e') \wedge \text{keep-a-promise}'(e, \text{Ben})$
 b. $\exists e:\text{KEEP-PROMISE}\exists e':\text{DANCE} \bullet \text{KEEP-PROMISE.dance}'(e', \text{Ben})$
 $\wedge \text{o-elab}'(e, e') \wedge \text{keep-a-promise}'(e, \text{Ben})$

The corresponding logical forms in (40) predict this behavior in the following way. ‘o-elab’ relates an aspect, that is, an object under a certain conceptualization, to an object of a suitable complex type. I therefore assume that ‘o-elab’ is an intensional relation: whether it holds or not not only depends on the involved entities simpliciter, but also on their specific typing. Since the complex types in (40a) and (40b) are intensionally distinct, (39a) does not entail (39b), no matter whether one is the subtype of the other. This argument can be strengthened: Asher (2011:208–209) discusses that, normally, an object of some subtype inherits the properties of the supertype, but not vice versa. He illustrates his point with the housecat Tasha: typically, Tasha inherits properties of the supertype HOUSECAT, while one would not say that the properties associated with Tasha (her specific weight, color of fur, etc.) are passed on to its supertype. Correspondingly, the characteristics of DANCE-IN-PUBLIC \bullet KEEP-PROMISE are not normally passed on to objects of type DANCE \bullet KEEP-PROMISE; as far as I can see, this substantiates the claim that the more specific typing information of (40a) bars a closure upon weakening.¹⁸

The Anscombe Thesis In light of the counterevidence, the Anscombe Thesis, if taken literally as a thesis about full event identity, seems to be clearly wrong; according to Schnieder (2009), this is meanwhile also the predominant opinion in the philosophical literature. In the present account, the departure from the thesis is most obviously reflected in the use of different event variables for embedded and matrix events and their crucial role in capturing the construction’s characteristics. Nevertheless, the original intuition is not absurd, but still rather appealing. Why? The proposed \bullet type approach offers an explanation. Crucially, aspects, despite involving separate terms, do not exist independently of the particular object they are aspects of (see section 3.1). That is, if one speaks of a keeping of a promise by dancing, this keeping of a promise is neither an independent object nor a part of the dancing: the dancing is *wholly* a keeping of a promise under the relevant aspect. I therefore give the following revised formulation of the Anscombe Thesis: there are different events; however, since the matrix event is an aspect of the embedded one and, thus, dependent on it in a particular ontological way, the illusive intuition arises that there is only one event. The following short digression on \bullet types and individuation makes the underlying reasoning more transparent.

With regard to the individuation conditions of \bullet types, Asher distinguishes two variants. If a \bullet type object involves aspects with different individuation conditions, so-called quantificational puzzles may arise. For instance, counting books is sensitive to predication, as in (41).

¹⁸It might be puzzling why the reversed implication between (39a) and (39b) does not work either. However: first, the inheritance of properties by a subtype is only a default (Tasha, for instance, could have only three legs instead of four, although housecats usually have four legs). Second, at the level of logical form and independently of the specific typing information, (40a) is clearly stronger than (40b), given the additional predicate ‘in public’; this renders an implication from (39b) to (39a) extensionally invalid.

- (41) a. The student mastered every math book in the library.
 b. The student carried off every math book in the library. (see Asher's (5.18))

The verb *master* relates to informational objects; therefore, (41a) is true iff the student masters every math book in the library that is individuated informationally. If the library has two informationally distinct math books, but three copies of each, (41a) requires that the student master two books, but not six. For (41b), the opposite holds: since *carry off* relates to the physical aspect of books, (41b) is true in the same scenario iff the student carries off six books. However, while books may be counted via the informational or the physical aspect, they cannot be counted by using both; this crucial point is illustrated by (42) from Asher 2011:144. In the given scenario, the physical and informational objects form 10 different pairs and, if added up, 12 different entities. But if one asks for the number of books here, both counts are out.

- (42) There are on a shelf 3 copies of the Bible, 1 copy of a collection of 7 novels by Jane Austen. How many books are we dealing with?
 a. 4 physical objects / 8 informational objects
 b. # 10 <physical, informational> objects / #12 physical plus informational objects

This clearly indicates that • types are not interpreted in terms of pairs or sums; see Asher 2011:ch. 5.2.3, ch. 5.3 for details. Notably, the counting options show that one must decide whether one counts by one aspect or the other. This behavior directly reflects the idea that, for instance, a book is *wholly* a book under one conceptualization, no matter whether it may be individuated and counted differently under another one.

The second variant comprises cases where the aspects of a • type do not give rise to distinct individuation criteria. According to Asher (2011:159–160, fn. 25), *as*-phrases such as *John as a judge* exemplify this configuration. These involve a functional relation between the • type object and its aspects, for instance, between John and his JUDGE-aspect and vice versa; accordingly, no quantificational dissociation comes up.

It is not crucial whether *by/indeem*-constructions involve a functional or a non-functional relation. I will only argue that both positions may explain the Anscombe intuition. See (43).

- (43) Ben kept a promise by dancing twice.

On the one hand, one may argue that the two dancing events are parts of one bigger dancing event; from this perspective, (43) involves a functional relation between the big dancing event and the keeping of a promise. Clearly, there is no dissociation option in terms of counting and, correspondingly, no potential problem for the • type treatment of the Anscombe Thesis.

On the other hand, one may decouple the counting of dancing events from the counting of the keeping-of-a-promise events. However, such a non-functional relation does not pose a threat to the • type perspective on the intuition either: the Anscombe Thesis (in its modified interpretation) does not dwell on the question of whether both involved event descriptions give rise to distinct counting criteria. It merely bars – as envisaged by the • type hypothesis – an independence of the respective objects. More concretely, we could speak of dealing with one keeping-of-a-promise event or two dancing events in (43). Nevertheless, it would be awkward to count the involved events by using both event descriptions simultaneously, as in (44):

- (44) # Ben kept a promise by dancing twice. That is, there were three events, one keeping-of-a-promise event and two dancing events.

This suffices to explain why the core intuition underlying the Anscombe Thesis comes about.

4 Refinements: *indem* in German

The proposed analysis covers the key characteristics of the canonical event-elaborating use of *by/indem*. However, this is clearly not the full story, neither with regard to details of the event-elaborating use nor with regard to other potential interpretations of the connectives. This section will not address the full range of empirical questions, but primarily aims at showing that the general set-up of the present proposal is inspiring for, or, at least, compatible with necessary refinements. The proposal is flexible for mainly two reasons: first, it is lexically driven. That is, while Sæbø's account hinges on unification as a particular mode of composition, the alternative builds on the lexical entry of *by/indem* and its potentially fine-grained presuppositional and preferred contents. This leaves a lot of room for adjusting application conditions; it is also compatible with lexical ambiguities. Second, the approach is compositional in spirit. Therefore, the compositionally identified target of the *by/indem*-modifier may have crucial effects on the interpretation. German *indem* will now serve as a test case for the suggested flexibility.

4.1 Refining Event Elaboration

So far, the combinatorics of *indem* is assumed to be constrained as follows: it relates two event predicates, their highest thematic arguments are co-referential, and the matrix event elaborates on the embedded event in a conceptually plausible way. Behrens and Fabricius-Hansen (2002), however, suggest that event-elaborating *indem* is restricted to activities and accomplishments controlled by an agent. While the authors do not flesh out their argument, the examples in (45) support the assumption. Statives (in the sense of Maienborn 2005) such as *gefallen* 'please', *wiegen* 'weigh', *ähneln* 'resemble', *auffallen* 'stand out' and constructions with the copula *be* are deviant with *indem*. The examples would be fine if *indem* were replaced by the connectives *weil* 'because' or *dadurch dass* (lit. 'therethrough that').¹⁹

- (45) a. ?? Paula gefiel allen, indem sie Marilyn Monroe ähnelte.
Paula pleased everyone in that she Marilyn Monroe resembled
- b. ?? Der Sportler war zu schwer, indem er 70kg wog.
the athlete was too heavy in that he 70kg weighed
- c. ?? Paula ähnelte Marilyn Monroe, indem sie blond war.
Paula resembled Marilyn Monroe in that she blond was
- d. ?? Ben fiel auf, indem er der einzige unverheiratete Vater war.
Ben stood out in that he the only unmarried father was

The picture becomes more intricate if one distinguishes both arguments of *indem*. With regard to the internal argument, intuitions are as expected. While both examples in (46) convey similar information, only the agentive variant is fully grammatical.

- (46) a. ?? Er erregte Aufsehen, indem er ein Gentleman war.
he caused a sensation in that he a gentleman was

¹⁹I do not know whether English *by* and German *indem* pattern alike. Schnieder (2009:655–656) considers an English example analogous to (45d) grammatical; he concludes that *by* is not constrained to actions proper. (In fact, building on a narrow conception of events that excludes stat(ive)s, he suggests an analysis based on propositions or facts.) Moreover, it might be telling that *by* is sometimes translated by German *dadurch dass* instead of *indem*; see Behrens and Fabricius-Hansen 2002 for a more detailed look at *indem* vs. *by*. However, Sæbø (2008:139) briefly argues in favor of restricting *by* to agentive events. Be that as it may, fine-grained contrasts are not per se a problem for the present analysis. The lexico-syntactic traits of *by* might well differ in the details from those of *indem*.

- b. Er erregte Aufsehen, indem er sich wie ein Gentleman verhielt.
 he caused a sensation in that he as a gentleman behaved

The negated examples in (47) are in line with these observations. Commonly, only statives, and not actions, are considered closed with respect to negation (Maienborn 2005). Therefore, a ban on statives within the internal argument correctly predicts that (47a) is odd. (47b) is grammatical, but it presupposes that Ben's not coming to the party amounts to a controlled action (similarly to examples such as *Ben gladly did not go to the party*, where, following Maienborn and Schäfer 2011:1398, the mental attitude adverbial relates to the controlled omission of an action). Accordingly, the relation to the matrix predicate is not one of mere state or fact.²⁰

- (47) a. ?? Ben verletzte sie, indem er die Sicherheitsvorkehrungen nicht beachtete.
 Ben injured her in that he the safety regulations not observed
 b. Ben verärgerte sie, indem er nicht zur Party kam.
 Ben upset her in that he not to the party came

The external argument of *indem* seems to be more flexible. The examples in (48) indicate that the combination of a stative external argument with a non-stative internal one is felicitous; compare the contrast to (45a) and (45d). The same holds for (49); its English counterpart is discussed by Fabricius-Hansen (2006:52). Finally, recall (24) (one of Sæbø's examples) with a non-agentive achievement in matrix position. This is fine in German as well, as in (50).

- (48) a. Paula gefiel allen, indem sie sich wie Marilyn Monroe verhielt.
 Paula pleased everyone in that she as Marilyn Monroe behaved
 b. Ben fiel auf, indem er sich wie ein Gentleman verhielt.
 Ben stood out in that he as a gentleman behaved
 (49) Wir ehren ihn, indem wir uns von seiner Arbeit faszinieren lassen.
 we honor him in that we by his work fascinate let
 (50) Er hat die Medaille gewonnen, indem er betrogen hat.
 he has the medal won in that he cheated has

In order to capture these facts, one may either ease the restrictions on the external argument or adhere to the agentive constraint, but allow for type coercion. As mentioned in section 2.3, Sæbø suggests the second route; similarly, Fabricius-Hansen argues with regard to the English counterpart of (49) that the *by*-phrase licenses a shift from an emotional attitude with an experiencer to an activity controlled by an agent. Recall, however, that Sæbø's analysis involves a global change, which is at variance with locality effects. Fabricius-Hansen does not spell out her analysis, but the same problem arises. The locality effects can be replicated in German. For instance, if *indem* projected its internal argument to the matrix VP, *indem*-modifiers with a prototypical activity should considerably enhance direct perception reports, contrary to fact, as in

²⁰Schnieder (2009:655) mentions an English example analogous to (47b); he considers it further evidence against event-based approaches to English *by*; see footnote 19. I doubt that the English case exemplifies a propositional or factive reading. At least, sentences involving a clear reference to facts are rather odd in both English and German:

- (i) a. ?? He upset her by the fact that he did not come to the party.
 b. * Er verärgerte sie, indem es der Fall war, dass er nicht zur Party kam.
 he upset her in that it the case was that he not to the party came

(51a). Similarly, (51b) is out because the activity-sensitive durative adverbial does not match the achievement at the matrix level.²¹

- (51) a. ?? Wir hörten sie den Komponisten ehren, indem sie seine berühmtesten
we heard them the composer honor in that they his most famous
Kompositionen spielten.
compositions played
- b. * Er hat zwei Stunden lang die Medaille gewonnen, indem er betrogen hat.
he has two hours long the medal won in that he cheated has

The type-logical approach to *indem* is well equipped for both an underspecification and a coercion analysis. According to the first option, the first argument of *indem* requires an event controlled by an agent while the second argument is underspecified allowing for all aspectual classes. This information can be directly encoded within a refined lexical entry for *indem*, which yields a well-formed representation only if *P* conveys a subtype of NON-STATIC AGENTIVE EV:

$$(52) \llbracket \text{indem} \rrbracket = \lambda P \lambda Q \lambda x \lambda e : \text{TY}^+(Q) \exists e' : \text{TY}^+(P) \sqsubseteq \text{NON-STATIC AGENTIVE EV} \bullet \text{TY}^+(Q). \\ P(e') \wedge \text{hth. arg.}'(e') = \text{hth. arg.}'(e) \wedge \text{o-elab}'(e, e') \wedge Q(x)(e)$$

The underspecification approach has key advantages: it is fairly simple; in particular, the locality effects follow automatically. Furthermore, the presuppositional asymmetry directly reflects the fact that the construction calls for some form of conceptual abstraction by the matrix events. This allows these matrix events not to be actions proper. In turn, the respective subjects are flexible in terms of agents and experiencers or holders as well.

If, however, one wants to stick to the stricter agentive constraint and capture deviating cases by reinterpretation, the type-logical approach also has much to offer. In fact, coercion phenomena are at the heart of Asher 2011. They are modeled in terms of polymorphic types that license the interpolation of terms that bear the adequate type. Following this view, the type presuppositions of *indem*'s second argument could be augmented by a polymorphic type that makes accessible an adequate activity component via the compositionally given non-agentive type. Notably, Asher extensively discusses problems of local accommodation (as opposed to global effects). For instance, *quick cigarette* denotes a set of physical objects, notwithstanding that *quick* enforces the interpolation of an event (Asher 2011:233–234). One would have to motivate a similar adaptation for *indem* in order to capture the locality effects. Spelling out such an analysis is beyond the scope of the present paper. Compared to the underspecification approach, it is computationally costly; what is more, I am unsure whether the interpolation of an additional activity besides the one given by the internal argument is in fact intuitively plausible. I therefore cautiously conclude that it is more promising to assume asymmetric selectional restrictions.

²¹In (51a), the verb *spielen* (instead of *faszinieren lassen*) contributes the embedded event because it is an indisputable candidate for direct perception. I will also add one further piece of evidence against a global change. Traditionally, activities and states are distinguished by the subinterval property. If a global change were at work, the subinterval property should fail to hold for indefinitely small subintervals of events that are denoted by *ehren*-VPs with *indem* while it should hold in cases where *ehren* is not accompanied by an *indem*-sentence. According to my intuition, however, the subinterval property of *ehren* is fairly independent of the fact that embedded events (for instance, *eine Komposition spielen*) may unfold in terms of discernable subintervals.

4.2 Compositionality: On the Interaction between Attachment Site and Interpretation²²

Behrens and Fabricius-Hansen (2002) and Fabricius-Hansen (2011) adduce examples with *indem* that differ from the typical event-elaborating use discussed so far because the respective matrix and subordinate clauses are related via the so-called “Accompanying Circumstance” relation:²³

- (53) a. Ist der Erpel geneigt, diesen Antrag anzunehmen, so hebt er das Kinn und sagt, indem er den Kopf etwas von der Ente wegwendet, sehr schnell “räbräb, räbräb!” (KOL1)
 ‘If the drake is inclined to accept the proposal, he lifts his chin and says, INDEM he turns his head slightly away from the duck, very quickly [“rabrab, rabrab!”].’
- b. Meine Tochter ist schon gegangen! brachte er endlich mühsam hervor, indem er seinen Blick nach den Dächern der Stadt hinüberraichtete. (DWDS)
 ‘My daughter is already gone! he finally ground out, INDEM he turned his gaze toward the roofs of the city.’

(see Behrens and Fabricius-Hansen 2002:(5); Fabricius-Hansen 2011:(16b))

In order to capture this variance, one may resort to lexical ambiguity. In view of the lexicalist framework pursued here, such idiosyncracies are perfectly possible. More principled explanations are nevertheless desirable. In the following, I will sketch a corresponding attempt.

The basic assumptions are as follows: first, the *indem*-modifiers in (53) do not target the event denotation of the matrix VP, but some term of the extended verbal projection; in other words, they have a compositionally different anchor than in the event-elaborating use. Notably, research on modifiers widely agrees that their interpretation is sensitive to attachment sites.²⁴ Second, plausible candidates are times, worlds, or situations. Let it be situations – understood as parts of worlds – that provide a topical component against which a sentence’s predication is evaluated; see Kratzer 2010 for a corresponding introduction to (a version of) situation semantics. Notably, these topical situations are not events, but rather broader multi-dimensional

²²This section only touches upon one compositional aspect of *indem*. There are more. Behrens and Fabricius-Hansen (2002), for instance, suggest that English *by* and German *indem* behave differently with regard to matrix negation scope. I am not fully convinced by their judgments; however, the issue deserves a detailed discussion that is beyond the scope of the present paper. Another important question that relates very directly to compositionality results from the fact that, from a syntactic perspective, *indem* selects an inflectionally fully specified verbal projection as its internal complement. This is not trivially compatible with the assumption that *indem* takes an event property as its first argument, as in the lexical entry above. However, the readings I focus on in this paper (event elaboration, “Accompanying Circumstance”) build on subject and tense identity. Plausibly, this indicates that the full syntactic specification of the embedded clause does not matter for semantics; in other words, we are not forced to take the *indem*-sentence as an autonomous proposition. I admit, though, that the technical challenges that result from an adequate projection of the corresponding features are not dealt with properly here.

²³For reasons of space and readability, I do not provide glosses here, but translations. The authors also mention archaic temporal or causal uses of *indem*, which I will not discuss here.

²⁴See more generally Maienborn and Schäfer 2011. Fabricius-Hansen (2011:21–22) also suggests that the different readings of *indem*-modifiers depend on their semantic targets. However, her brief remarks do not include anything explicit for the case “Accompanying Circumstance.” I will not make precise here how *indem*-sentences are syntactically projected; again, clear answers require a more involved discussion. There are at least two questions: first, how do *indem*-sentences behave in terms of \pm syntactic integration within the matrix configuration. See Reich and Reis 2013 for an overview. Second, it might be true that both elaborating and accompanying *indem*-sentences are equally licensed in the German so-called Nachfeld. However, it would not necessarily follow that their semantic targets are also identical. In fact, in Bücking 2012, I have argued that modifiers at the right edge of nominal projections may have distinct semantic targets despite their being integrated within the same extraposed domain.

frames the events are parts of. Under these premises, one can conjecture that accompanying *indem*-modifiers accommodate a complex type with a topical situation as one of its constituent types. That is, the second argument of *indem* is not filled by the matrix event but by the matrix topical situation. Clearly, one must adjust *indem*'s presuppositions in order to license this option. This can be assured by explicitly allowing application to the type SITUATION; notably, the different uses are still based on the same lexical entry. Taken together, the example (53b) receives the rough logical form in (54), where \leq relates situations to their parts.

- (54) $\exists s:\text{SITUATION}\exists e:\text{GRIND-OUT}\exists e':\text{TURN-GAZE-TO} \bullet \text{SITUATION}.$
 turn-gaze-to'(e', y, ir[city roofs(r)]) \wedge o-elab'(s, e') \wedge e \leq s \wedge grind-out'(e, y, "My ...")

(54) says that the embedded event involves as one aspect the topical component of the whole sentence; in turn, this topical aspect elaborates on the embedded event. Therefore, the turning of the gaze is not conceived of as a grinding out (which would amount to the nonsensical event-elaborating interpretation), but the conceptualization relates to the sentence's topic situation. This makes sense: intuitively, the *indem*-modifiers in (53) add additional information to the broader situation the matrix event is part of. That is, the embedded event "accompanies" the topic situation by specifying one of its (temporal, causal, ...) dimensions. Moreover, using *indem* seems to convey that this additional information is not integrated by mere intersection, but by some form of inherent connectivity. The \bullet type analysis tracks exactly this kind of copresence. In short: I hypothesize that event-elaborating *indem* yields complex events with event aspects, while accompanying *indem* accommodates a complex type that directly builds in the situational context the sentence is about.²⁵

I admit that this analysis is far from full-fledged; semantic, ontological, and syntactic aspects call for specification. In particular, one would like to know more about 'o-elab' in those cases where it relates (dimensions of) situations and events. The proposal may, however, stimulate further research on pinning down the specific contribution of accompanying *indem* without resorting to a separate lexical entry.

5 Conclusion

This paper has been concerned with the compositional semantics of event-elaborating *by* in English and its German counterpart *indem*. Based on a critical evaluation of Sæbø's (2008) unification-based approach, I have argued in favor of treating *by/indem* as means of turning embedded events into complex events on which the matrix description elaborates. That is, *keep a promise by dancing* involves a dancing that is conceived of as a keeping of a promise.

The implementation of this core idea builds upon Asher's (2011) type composition logic. More specifically, *by/indem* dynamically accommodate dual aspect objects; their constituent types are contributed by the matrix and embedded event. The \bullet type conception underlying dual aspect objects renders the embedded and the matrix event dependent on each other. However, the assignment of respectively separate terms paves the way for tracking their compositionally distinct roles. The approach thereby captures putatively conflicting key characteristics of *by/indem*: the locality of the embedded event, the locution's conceptual constraints, its asymmetry and intensional behavior, and the Anscombe intuition that it is about just one event. Finally,

²⁵Notably, the accommodation of the complex type remains local, analogously to the event-elaborating use. This predicts that the add-on brought in by the *indem*-modifier does not change the topic situation. This matches the intuition: the *indem*-sentence does not set the frame, but rather joins the topic parasitically.

I have suggested that the proposal's core is readily amenable to refinements where necessary; German *indem*, its constraints and its options beyond the elaborating use have served as a case in point.

While Asher focuses on complex types for ordinary individuals, the present analysis argues that the approach can be applied fruitfully to events and their often elusive interrelations.

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