Nominals and Event Structure

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1. Events, verbs, and deverbal nominalizations

Events have come to play an important role in natural language semantics. While events have been taken to be involved in a wide range of constructions, they most obviously play a role as referents of nominalizations of verbs. It is generally taken for granted that the very same events that verbs describe may act as the referents of NPs with a corresponding deverbal nominalization as head. Thus the very same events described by the sentences in (1a), (2a), and (3a) appear to be what the nominalizations in (1b), (2b) and (3b) stand for:

(1) a. John laughed.
   b. John's laughter.
(2) a. John jumped.
   b. John's jump
(3) a. John walked.
   b. John's walk

That the same event is described by the sentence and referred to by the nominalization appears to be supported by the semantic behavior of predicates. In general, it appears, the same predicates can act as adverbials modifying the verb and as predicates predicated of what the nominalization stands for as well as as adjectival modifiers of the nominalization:

(4) a. John laughed intensely.
   b. John's laughter was intense.
   c. John's intense laughter
(5) a. John jumped quickly.

b. John's jump was quick.

c. John's quick jump

(6) a. John walked slowly.

b. John's walk was slow.

c. John's slow walk

The semantics of nominalizations is closely related to the semantics of adverbial modification, and that needs to be accounted for by any semantic analysis of nominalization based on the semantics of the corresponding verb or sentence.

The main question concerning nominalizations and events then is, how does the semantics of deverbal nominalizations relate to the semantics of the verb or the corresponding sentence? That is, how do deverbal nominalizations obtain their referent, given the semantics of the verb, its complements, and its modifiers? I will discuss three approaches to the semantics of event nominalizations (and the related issue of the semantics of adverbials):

[1] the Davidsonian account,

[2] the Kimian (or pleonastic) account

[3] the truthmaker account.

I will conclude that a combination of the three accounts may be required for the semantics of the full range of event and state nominalizations. In addition, I will present data regarding a distinction between two sorts of event nominalizations for psychological and illocutionary verbs that challenge the received view of the identity of the events described by verbs and by (non-gerundive) deverbal nominalizations, namely a distinction between 'actions' and 'products' introduced by the Polish philosopher Twardowski (1911).

2. The Davidsonian account of event nominalizations

Clearly the most influential semantic account of events described by verbs and their nominalizations is Davidson's (1967) account, further developed by Higginbotham (1985, 2000).[1] According to the Davidsonian account, events act as implicit arguments of verbs and adverbials are predicates of the implicit event argument of the verb. A sentence like (7a) then

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[1] Fr further developments of the Davidsonian event semantics, see Parsons (1990), Moltmann (1997), Landmann (2000).

has the logical form in (7b), with existential quantification over events that are to occupy what can be called the implicit *Davidsonian argument position*:

(7) a. John walked slowly.

b. ∃e(slowly(e) & walk(e, John))

The main argument Davidson gives for events acting as implicit arguments of verbs and adverbials as predicates of such events is the possibility of adverb-dropping, that is, the validity of an inference from (7a) to (7c):

(7) c. John walked.

Landman (2000) adds another argument for the Davidsonian view and that is the possibility of permuting adverbial modifiers, as in the valid inference below:

(8) <u>John walked slowly with a stick.</u>

John walked with a stick slowly.

The semantic status of events as implicit arguments of verbs goes along with a particular view about the ontology of events, on which events are primitive entities not to be defined in terms of objects, properties and times (cf. Davidson 1968). Thus, for Davidson, different properties can be used to describe one and the same event. One and the same event can be described as the rotation of the wheel or as the wheel getting hot, just as one and the same events can be described in both physicalist and psychological terms. Given this view, events could not be conceived as entities strictly dependent on a description, say the content associated with a verb and its arguments. However, conversely, if events are conceived as strictly dependent on objects, properties and times or the content of the verb and its arguments this is still compatible with a Davidsonian view of events as implicit arguments of verbs. In fact, this is Maienborn's (2007) view of 'Kimian' or abstract states, which she considers implicit arguments of stative verbs (Section 6).

Given the Davidsonian event semantics, NPs with deverbal nominalizations such as *John's walk* will simply pick up the implicit event argument of the verb as the referent (cf. Higginbotham 1985, 2000):

(9) [*John's walk*] = ιe[walk(e, John)]

On this account, the implicit event argument of the verb is the very same as the event described by the event nominalization. The formation of the event nominalization thus goes along with a shift in argument structure: the Davidsonian event argument of the verb will become the external argument position of the nominalization, that is, the argument position that will provide a referent for the entire NP of which the nominalization is the head.

   The Davidsonian account immediately explains why the same expressions that act as adverbials generally appear to be able to act predicates or adjectival modifiers of a nominalization of the verb. In all three cases, on the Davidsonian account, the expression is predicated of the very same events.

    The Davidsonian account furthermore benefits from a generality of application, allowing a rather straightforward extension to adjectives. Adjectives, to an extent, exhibit the very same alternation of expressions acting as modifiers of the adjective as well as predicates (or adjectival modifiers) of the adjective nominalization. Thus the modifiers of *happy* in (10a) and *pale* in (10b) act as predicates of what the nominalizations *happiness* in (11a) and *paleness* in (11b) stand for:

(10) a. Mary is visibly / profound happy.

     b. Mary is extremely / frighteningly / shockingly pale.
(11) a. Mary's happiness is visible / profound.

     b. Mary's paleness is extreme / frightening / shocking.

In the case of adjectives, the implicit arguments will be tropes or particularized properties, rather than events (Moltmann 2009, 2013a).[2]

    Thus formally, (10a) will have the logical form in (12a), with existential quantification over tropes filling in the 'Davidsonian' argument position of *happy*, and (10b) will have the logical form in (12b), where *Mary's happiness* is taken to stand for the maximal tropes of happiness of Mary.:

(12) a. ∃e(happy(e, Mary), & visibly(e))

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[2] For the notion of a trope in contemporary metaphysics see, for example, Williams (1973), Campbell (1990), Lowe (2006), as well as Moltmann (2013a, Chap. 2).

b. visible(max e[happiness(e, Mary)])

Why should the implicit argument of adjectives be a trope, rather than an event, or perhaps more specifically a state? That is because a state, as the sort of entity a gerund would stand for, would not have the right properties. For example, 'Mary's being happy' cannot not be profound and 'Mary's being pale' cannot be extreme (Moltmann 2015).

Despite these apparent advantages, the Davidsonian account has also been subject to criticism. A general uneasiness with the account concerns the intuition that events generally should play a role as objects in the semantic structure of sentences only in the presence of nominalizations: as derived objects introduced by nominalizations.[3] Positing entities as implicit arguments of all verbs constitutes, on that view, an unnecessary proliferation of entities in the semantic structure of sentences. There are in fact two accounts of event nominalizations that would give justice to that intuition: the Kimian account and the truthmaker account. Let us therefore explore those approaches for the semantics of event nominalizations as well as the related issue of the semantics of adverbials. We will see that the truthmaker account meets further challenges for the Davidsonian account, namely regarding more complex adverbial constructions.

3. The Kimian account of event nominalizations

The Kimian account of event nominalizations is based on the view that events introduced into the semantic structure of a sentence generally only by the means of nominalizations. This goes along with Kim's (1976) conception of events, according to which events strictly depend on an individual, a property, and a time, and are introduced as entities by a form of Fregean abstraction. This conception is closely related to the notion of a pleonastic entity of Schiffer (1996, 2003) (which Schiffer (2003) also means to apply to events). Kim's (1976) original account is a rather simply elaboration of the view, and it has subsequently been adopted and further developed by Bennett (1988), Lombard (1986), and others.[4]

Kim's (1976) conception of events consists in the following statement of existence and identity conditions for an event dependent on an object, property, and time, where [d, P, t] is the event dependent on an object d, a property P, and a time t:

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[3] Of course setting aside underived event nouns such as *fire, war, act*, and *event.*

[4] The view of events as derived objects has been more popular among philosophers than linguists, with the exception of Chierchia (1984). Linguistics generally adhere to the Davidsonian account.

(13) For individuals d, d', properties P, P', and times t, t',

    [1] [d, P, t] exists iff P holds of d at t.

    [2] [d, P, t] = [d', P', t'] iff d = d', P = P', t = t'.

The semantics of event nominalizations then appears straightforward, as below, where the denotation of *walk*, [*walk*], is taken to be the one-place property of walking:

(14) [*John's walk*] = ιe[e = [John, [*walk*], t]]

    Events need not strictly be constituted by the entire content of the event description. Kim 1976) in fact draws a distinction between *event-characterizing* and *event-constitutive* properties. Event-characterizing properties are merely properties holding of an event constituted on the basis of another, event-constitutive property. If *slow* is event-characterizing, (15a) has the analysis in (15b); but if *slow* is event-constitutive, (15a) has the analysis in (15c):

(15) a. John's slow walk

    b. ιe[e = [John, [*walk*], t]] & slow([John, [*walk*], t])]

    c. [John, [*slowly walk*], t]]

The availability of event-characterizing properties conveyed by an event description distinguishes descriptions of events from explicit fact descriptions of the sort *the fact that* S. Whereas adjective modifiers of event nominalizations may just be event-characterizing, all of the content of S in a fact description of the sort *the fact that* S must be fact-constitutive. This manifests itself in the contrast between (16a), which can be true, and (16b), which can't:

(16) a. John's slow walk was John's walk.

    b. The fact that John walked slowly is the fact that John walked.

Events are relatively independent of the description used to refer to them. Facts, by contrast, are entirely reflected in the meaning of explicit fact-referring terms of the sort *the fact that* S.[5]

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[5] For further linguistic support for that view and a semantics for *the fact that* S, see Moltmann (2013a, Chapt 6). This is the notion of a non-worldy fact, defended by Strawson (1950), as opposed to the notion of a worldly fact, defended by Austin (1979).

Kim's account does not explicitly define events in terms of a property, an object, and a time. Rather it gives an implicit definition of events, stating their existence and identity conditions in terms of an object, a property, and a time. In particular, events are not taken to be composed in some way of properties, objects, and times. Kim's account in fact introduces events by a form of Fregean abstraction (Frege 1884, Dummett 1973, Hale 1987, Wright 1983). Frege's abstraction principle, given below, just gives identity conditions for objects obtained by the abstraction function g from entities o and o' that stand in some equivalence relation:

(17) For an equivalence relation R, $g(o) = g(o') \leftrightarrow R(o, o')$.

Thus, Frege introduces directions as entities by abstraction from parallel lines, and natural numbers as entities from concepts whose extensions stand in a one-to-one correspondence. (17) can naturally be generalized to n-place abstraction functions applying to *n* objects that stand in respective equivalence relations to each other. Kim's account of events then introduces events by a three-place abstraction function applying to objects, properties, and times on the basis of the equivalence relation of identity.

An object introduced by Fregean abstraction has just those properties specified by the method of introduction. Thus, given (13), events have identity conditions and existence conditions relative to a time, but they won't have other intrinsic properties. They may, though, act as objects of mental attitudes. This means in particular that events won't have a part structure, won't have a spatial location, won't enter causal relations, won't act as objects of perception, and won't have properties of intensity or other measurable properties. This of course is highly counterintuitive. It is certainly part of our notion of an event for an event to have those properties. By contrast, it is part of our notion of a (non-worldly) fact to lack those properties. This difference between events and facts is also linguistically reflected, in the applicability and inapplicability of the relevant predicates:[6]

(18) a. Mary noticed part of the event.

   b. ??? Mary noticed part of the fact.

(19) a. The meeting was in the room.

   b. ??? The fact that they met was in the room.

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[6] See Vendler (1967), Peterson (1997), and Asher (1993) for similar observations.

(20) a. John's jump caused the table to break.

    b. ??? The fact that John jumped caused the table to break.

(21) a. John saw Bill's jump.

    b. ??? John saw the fact that Bill jumped.

(22) a. John's jump was high.

    b. ??? The fact that John jumped was high.

(23) a. John's laughter was intense.

    b. ??? The fact that John laughed was intense.

    Another interesting difference between facts and events is that facts unlike events do not allow predicates of description:

(24) a. Mary described John laughter / John's jump.

    b. ?? John described the fact that John laughed / the fact that John jumped.

The reason for this particular difference appears to be that facts are tied to explicit fact-descriptions, of the sort *the fact that* S, whereas events are not tied to explicit event descriptions, but rather generally come with incomplete descriptions which won't provide all of the event-constitutive properties. Predicates of description in general require that the term used for the object described won't specify precisely the properties mentioned in the describing, as indicated by the contrast below:

(25) a. John described the object: he said it was a book.

    b. ??? John described the book: he said it was a book.

The difference in description (that facts are tied to complete constitutive descriptions, but events generally come with incomplete descriptions) may explain the applicability of verbs of description. But it cannot be considered *the* feature distinguishing facts and events, as Bennett (1988) did. The difference in description won't account of the other differences in properties between events and facts. The difference between events and facts is clearly an ontological one, not one residing in their description.

    The main objection to Kim's account of events has been that it assimilates events to facts. Note that any property, however unspecific or logically complex, can, for Kim, be event-constitutive. Any predicate expressing a non-natural or indeterminate property, any explicitly

or implicitly quantified predicate, and any negated or disjunctive predicate can, on Kim's account, individuate an event (together with an individual and a time). But this is characteristic of facts, not events. Non-specific properties, negation, disjunction, and quantification can be fact-constitutive, but generally not event-constitutive. That is because events as concrete objects must be maximally specific or at least grounded in specific properties. This is the *groundedness* of events (Moltmann 2007).[7] Moreover, events unlike facts need to involve particular participants; a quantifier or disjunction does not suffice for their individuation. This is clearly part of our notions of event and fact. Take the property of making several mistakes (separately) and the property of eating an apple or a pear:

(26) a. John made several mistakes.

    b. John ate an apple or a pear.

Then (26a) describes several events, all the events involving a particular mistake, but only one fact, the fact that John made several mistakes. (26b) describe an event that involves either an apple or a pear, but it will describe a fact not involving one particular fruit, but constituted by a disjunction, namely the fact that John at an apple or a pear

    Given the Kimian conception of events, one might try to account for the groundedness of events by imposing the restriction that events can be constituted only by fully determinate properties. More adequately, since events generally involve change, events might be conceived as transitions from an object having one determinate property at a time t to the object's having a contrary determinate property at a subsequent time t' (Lombard 1986). More complex events may then be built from such transitions, either as collections of transitions or as a transitions viewed with a particular, possibly complex property as its gloss, as would be the case with events for which a totality condition is constitutive (Section 3). But if events are introduced by abstraction, even if based on such specific property changes, they will still lack the typical event properties, since the only properties they can have are those stipulated by the strategy of their introduction. Making events be dependent on specific properties will make no difference to the properties events have if events are still introduced by abstraction.

    Moreover, such a more complex conception of events poses a problem for the Kimian account of event nominalizations. Most verbs in English do not describe the kinds of

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[7] The notion of a specific property that I am using is closely related to Armstrong's (1978) notion of a 'natural property' and Lewis (1983) notion of a 'non-redundant- property.

transitions that could constitute or ground events. In fact, it is hard to find any reasonably simple predicates at all that do. Even such predicates as *become soft* or *turn red*, which express a simple property change still involve a non-specific property. Given the range of verbs that can describe events, there are at least five major classes of verbs whose content merely characterizes an event, but would not be fully constitutive of it:

[1] verbs involving quantification over kinds of properties: *change*

[2] verbs expressing quantification over spatial positions: *move towards, walk*

[3] verbs expressing quantification over types of actions having a particular of causal effect: *disturb, kill*

[4] verbs expressing quantification over types of actions and expressing just a mode of action, such as *hurry, obey,* and *continue*

If events are 'introduced' into the semantic structure of sentences only by nominalizations, then the descriptive content of a nominalization of any of the verbs just mentioned would not be event-constitutive. It would underspecify the event that is to be introduced. For example, *John's change* has a descriptive content that underspecifies the particular event of change that is being referred to. The same holds for *the object's becoming red* (leaving open the particular shade of red the object arrives at), *John's walk toward the house* (which leaves open what changes in spatial positions exactly took place), *John's disturbance of Mary* (which leaves open what exactly John did to cause Mary's state of irritation), and *John's hurry* (which leaves out what exactly John did that was done in a hurried way). Deverbal nominalizations cannot generally introduce an event by providing its constitutive properties. They can at best give a partial characterization of an event, leading to a description that would merely serve to pick out one event rather than another. This is why the Kimian conception of events cannot provide a semantics of event nominalizations.

The Kimian account must go along with a different analysis of adverbials since adverbial modifiers can no longer be considered predicates of the implicit event argument of the verb. Temporal and spatial adverbials in particular could be treated as operators whose semantics will involve quantification over spaces or times acting as indices of evaluation (cf. Cresswell 1985), as in (27b) for (27a), where *then* is represented by a suitable operator THEN:

 (27) a. John was happy then.

    b. THEN(happy(John))

Adverbials could also be treated as predicate modifiers (cf. Reichenbach 1947), as below:

(28) a. John walked slowly

    b. (slowly(walk))(John)

The validity of adverb-dropping could then be ensured by imposing general conditions on at least certain kinds of predicate modifiers. One issue for this account is that it would not assign the same meaning to expressions when they act as adverbials and as adjectives (*slowly – slow*). The account could only assign related meanings to the two uses of *slow(ly)* roughly as follows. *Slow* holds of an event e if the changes constitutive of e have a more than average distance from each other, and *slowly* P holds of an entity d iff the changes P attributes to d have a more than average distance from each other. More difficult to handle on this account, though, would be the possibility of modifier permutation (as pointed out by Landman 2000).

  We can conclude that the Kimian account fails for event nominalization, first because it is based on an untenable ontological view of events (blurring the distinction between facts and events) and second because it would be inapplicable to actual event nominalizations in natural language. In addition, it requires a more complicated semantics of expressions that can function both as adverbials and as event predicates.

4. The truthmaker account of event nominalizations

Another way for nominalizations to introduce events as 'new objects' into the semantic structure of a sentence is as truthmakers, an approach pursued in Moltmann (2007). In what follows, I will outline a truthmaker account of nominalizations as well as of adverbial constructions and mention some critical issues for the approach.

  A truthmaker is an entity in virtue of which a sentence is true. The truthmaking idea, that sentences are true in virtue of some entity in the world, though not uncontroversial, has been pursued by a number of philosophers, including Armstrong (1997, 2004, Rodriguez-Pereira 2005, Restall 1996, Mulligan/Simons/Smith 1984, Fine 2012, 2014, to appear).[8] The standard motivation for the truthmaking idea is the view that the truth of a sentence must be grounded, and that it must be grounded in an entity in the world. The more recent approach to truthmaking, Fine's (2012, 2014, to appear) Truthmaker Semantics, has a somewhat different

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[8] See also the contributions in Beebee/Dodd (eds.) (2005).

motivation. Rather than being concerned with the grounding of truth, it is simple based on the view that for each sentence S there is a set of (possible or actual) entities that are wholly relevant for the truth of S (exact truthmakers) -- as well as a set of entities that make S false. The truth-making relation ⊩ is a relation between an entity e and a sentence S. Thus 'e ⊩ S' means 'S is true in virtue of e'. While truthmaking is at the center of many contemporary metaphysical discussions, it is generally not used for the semantic analysis of natural language, except in the recent version of Fine (2012, 2014, to appear) and, earlier, in the exploration of truth-making for the semantics of nominalizations in Moltmann (2007).

On the standard truthmaking view, truthmakers are actual entities as part of the actual world. The recent approach to truthmaking by Fine (2012, 2014, to appear) allows them to be merely possible entities. Some philosophers such as Russell and Armstrong take truthmakers to be states of affairs, while Fine calls them 'states'. Others such as Mulligan / Simons / Smith (1984), take truthmakers to be events as well as tropes and perhaps individuals. Yet others stay neutral as regards the nature of truthmakers (Rodriguez-Pereyra 2005).

If events are truthmakers of sentences, then the semantics of nominalizations may make use of the truthmaking relation to establish as their referent an event that would not have been part of the semantic structure of the sentence without the nominalization. Thus, the semantics of *John's walk*, in first approximation, would be as below:

(29) [*John's walk*] = ιe[e ⊩ *John walks*]

That is, *John's walk* refers to the unique event that makes the sentence *John walks* true.

The truthmaking relation then should not only be involved in the semantics of nominalizations, but also that of adverbials. Adverbials on the truthmaker account will be considered constructions triggering the introduction of truthmakers (Moltmann 2007). For that purpose, the truthmaking relation needs to be viewed not only a relation between entities and sentences, but also as a relation applying to entities and pairs consisting of a property and an object (or more generally an n-place relation and n objects, or perhaps even more generally a structured propositions). Thus, the truthmaking conditions of (30a) will involve the truthmaking relation applying to an event e and a pair consisting of the property expressed by *slow* and another event e' (an event of walking):

(30) a. John walked slowly

b. e ╟ *John walked slowly* iff there is an event e', e' ╟ *John walked* & e ╟ <[*slow*], e'>

(30a) involves two truthmakers: an event e making the unmodified sentence true and another entity e' making the predication of the adverbial of e true. e in some way includes e', since a truthmaker generally includes the entities that the sentence or proposition is about that it makes true. Hence this need not be made explicit in the semantics of adverbially modified sentences.

Crucially, on this analysis, the simple sentences *John walks* won't involve events in its semantic structure, and thus the truthmaker account allows events not to be implicit arguments of verbs yet takes them to be what adverbials are predicated of. Using truthmaking for the semantics of adverbials has further advantages over the Davidsonian account regarding stacked adverbials and the interaction of adverbials with quantifiers, as we will see.

There are two different views about how 'big' the truth maker for a sentence may be. While many assume truth making to satisfy Monotonicity (if e < e' and e ╟ S, then e' ╟ S), others hold the view that a truthmaker should strictly consist only of features in virtue of which a sentence is true Rodriguez-Pereyra (2000), Moltmann (2007), Fine (2012, 2014, to appear). Thus, for example, the sentence *John walks* is made true by a walking event of John, but not by an event that is a walking and yawning of John or an event that is a walking of John and Mary. This notion of a truth maker is obviously what is needed for the semantics of nominalizations as well as adverbial modification.

The truthmaker approach would be equally applicable to adjective nominalizations and modifiers of adjectives. Thus, *John's happiness* would have the analysis in (31a), and (31b), with an adjective modifier, that in (31c) -- in first approximation:[9]

(31) a. [*John's happiness*] = ιe[e ╟ *John is happy*]

(32) a. John is profoundly happy.

   b. ∃t(t ╟ *John is happy* & profound(t))

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[9] Note, though, that modifiers of adjectives do not systematically alternate with adjectival modifiers of the corresponding nominalization (consider *John is highly talented -- # John's talent is high, John's talent is great – # John is greatly talented*). That tropes act as implicit arguments of adjectives is problematic also in that trope nominalizations can alternatively refer to *kinds* of tropes of a sort, as in *John had the wisdom of Socrates*, where *the wisdom of Socrates* refers to a sort of wisdom, the one that Socrates had. This poses the same problem as nominalizations referring to event types.

The truthmaker that makes the sentence *John is happy* true is a trope that instantiates happiness in John. Such a trope is what *profoundly* applies to and *John's happiness* refers to.

   The view that event and trope nominalizations stand for the truthmakers of the sentences that correspond to them requires some further elaboration. First, the analysis in (29) is not compositional: it makes the semantics of a noun dependent on the syntactic context in which the noun occurs (that is, dependent on which complements it takes). In addition, the analysis would be inapplicable to quantificational nominalizations as below:

(33) a. every walk John took

   b. every walk anyone every took

The truthmaker semantics of nominalizations thus should better assign an extension to the nominalizations on the basis of an argument of the verb, as below:

(34) $[walk_N] = \{<e, d> \mid e \Vdash <[walk_V], d>\}$

   The semantics of event nominalizations in (29) cannot be right also because there are many events that would be exact truthmakers of *John walked*: a maximally continuous walk as well as smaller parts of it. *John's walk* can refer only to the maximally continuous walk. This temporal maximality condition is not tied to the definiteness of *John's walk* because it also is associated with quantificational NPs as in (34). But the condition is not associated with the gerund *John's walking*: *John's*, which does not necessarily refer to the temporally maximal event (as one can say 'John's walking from 9 to 10 am was the reason that he missed the meeting -- in fact John walked from 10 to 11'). This means that it could not be a condition on the individuation of events in general or a condition on reference to truthmakers. What appears to be at stake rather is the mass-count distinction. *Walking* is a mass noun (*too much walking*, not *too many walkings),* whereas *walk* is a count noun (*many walks*). Count nouns generally describe countable events, events that have some form of integrity. Achievements and accomplishments such as John's jump and the destruction of the palace are inherently countable. But with activity and stative verbs, the events referred to are not inherently delimited, which is why the nominalization, if it is a count noun, will impose the condition that the event be a maximal temporally continuous event.[39] The semantics of activity

nominalizations should thus be as in (35) (with $<_t$ being the temporal part relation among events):[10]

(35) $[walk] = \{<e, d> \mid e = max_{<_t}(\{e' \mid e' \Vdash <[walk], d>\}))\}$

The truthmaker approach appears particularly suited for the analysis of adverbial modification, and it is applicable to a range of cases for which the Davidsonian approach has difficulties.

One potential issue for the Davidsonian account is adverbials that do not act as predicates of the Davidsonian event argument, but rather of what would be a more complex event, an event somehow incorporating the contribution of another adverbial:

(36) a. The ball suddenly rolled quickly.
    b. John spoke very slowly with patience.
    c. Mary danced slowly very elegantly.

What is sudden according to (36a) is the quick rolling event, not the rolling event. What was done with patience in (36b) is John's speaking slowly, not just John's speaking and what was done elegantly according to (36c) was Mary's dancing slowly, not just Mary's dancing. Examples such as in (36a-c) also do not allow for modifier permutation.

A Davidsonian has to assume that *suddenly* in (36a) acts as a predicate of the event argument of the verb. But the event here is not an event of the ball's rolling but of the ball's rolling quickly, and such an event could only be an event argument of *quickly*, not of *roll*. Thus the Davidsonian needs to postulate additional event argument places for adverbs as well. As a matter of fact, this is precisely what Peterson (1997) proposes, with the following analysis of (36a):

(37) $\exists e'\exists e(suddenly(e') \ \& \ quickly(e', e) \ \& \ roll(e, the \ ball))$

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[10] The maximality condition is also associated with nominalizations of tropes: *John's happiness* refers to the trope that is maximal with respect to occupying a continuous stretch of time. Here, because *happiness* is a mass, not a count noun, the condition is associated with the definiteness of a mass NP (cf. Sharvy 1980).

Thus, *quickly* expresses a two-place relation between events. The second arguments would be the familiar Davidsonian events, events that are said to be quick -- in (36a) a simple event of the ball's rolling. The first arguments of *quickly*, however, would be events of the 'quickness' of events acting as the second arguments -- in (36a) the quickness of a rolling. The first arguments of *quickly* are in fact better viewed not as events, but as tropes: they are particular manifestations of properties, such as quickness, in events. (37) then states that there is an event e that is a rolling of the ball and is quick and moreover that there is a trope that is e's quickness and is sudden.[11]

The Davidsonian account of stacked adverbials needs to posit the very same argument structure for adverbials as it would for the corresponding deadjectival nominalizations, making use of tropes as implicit arguments of adverbials. Stacked adverbials thus are not a serious challenge for the Davidsonian, except that they already require the same ontology and argument structure as de-adjectival nominalizations do.

But stacked adverbials also receive a straightforward analysis within the truthmaker account, permitting a simpler argument structure of verbs as well adverbial modifiers. On that analysis, an adverbial will act as a predicate of the truthmaker of a sentence modified by another adverbial. Thus (36a) will have the truthmaking conditions below:

(38) e $\Vdash$ *The ball suddenly rolled quickly* iff ∃e' ∃e''(e $\Vdash$ <[*suddenly*], e'> &
    e' $\Vdash$ <[*quickly*], e''> & e'' $\Vdash$ <[*roll*], the ball>

According to (38) *suddenly* in (36a) will be predicated of a trope of an event, namely the quickness of the ball's rolling, whereas *quickly*, as before, is predicated of the event of the ball's rolling. (36a) in fact involves three truth makers: the event of the ball's rolling (the truthmaker of the proposition that the ball rolled), the trope of the quickness of the ball's rolling (the truth maker of the proposition that the ball rolled quickly), and the trope of the suddenness of the quickness of the ball's rolling (which is the truthmaker for the entire sentence).

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[11] *Suddenly* should actually express a two-place relation as well, taking in (36a) a trope of suddenness and a trope that is sudden as arguments, as below:

(37') ∃e''∃e'∃e(suddenly(e'', e') & quickly(e', e) & roll(e, the ball))

Again the truthmaker-based analysis of stacked adverbials reflects the argument structure and ontology of nominalizations on the truthmaker account. Given the truthmaker account, verbs lack a Davidsonian argument position for events, just as event nominalizations do not come with an external argument position for events. Moreover, adjectives/adverbials will have just one argument position, lacking an additional, 'Davidsonian' argument position for tropes, just like deadjectival nominalizations will lack an external argument position for tropes.

Stacked adverbials do not present a serious challenge for the Davidsonian account, since their semantics goes along with a trope-based Davidsonian semantics of de-adjectival nominalizations. However, adverbial modifiers with certain logically complex sentences do, as do corresponding nominalizations. Let us then first address the truthmaking of logically complex sentences as such.

The truthmaking conditions of disjunctions and existentially quantified sentences are fairly uncontroversial as below (formulated with substitutional quantification):

(39) a. e $\Vdash$ A v B iff e $\Vdash$ A or e $\Vdash$ B

b. e $\Vdash$ ∃x S iff for some substitution instances of S with respect to 'x', e $\Vdash$ S'

Also the truthmaking condition on conjunctions is straightforward. Adverbial modifiers may apply to conjunctions of verbs or VPs (*John quickly came and left*). Therefore conjunctions should have as truthmakers the sum of truthmakers of the conjuncts:

(40) e $\Vdash$ S & S' iff there are entities e, e', and e'' such that e = sum({e', e''}), and

e' $\Vdash$ S and e'' $\Vdash$ S'.

More controversial are the truthmaking conditions of universally quantified and negative sentences. As Russell (1918/19), more recently Armstrong (1997, 2004) and Fine (to appear) have argued, universal quantification involves an irreducibly general state for its truth-making, involving the condition that a set be exhaustively included in another. Let us call this the totality condition. A truthmaker of a universally quantified sentences thus cannot be identified with the sum of truthmakers of corresponding atomic sentences. Rather, as Armstrong (1997, 2004), and, similarly, Fine (to appear) propose, it should be an aggregate of the sum of truthmakers of corresponding atomic sentences with the relevant totality condition (to the effect that the entities involved in the 'singular' truthmakers exhaust the actual domain or a relevant quantifier restriction).

Given the present interest, it is easy to see that truthmakers that includes a totality condition are needed for the truthmaker semantics of adverbial modification of universally quantified sentences. Examples are (41a, b), contrasting with (42b, c):

(41) a. John carefully eliminated every mistake.

    b. John intentionally mentioned every participant.

(42) a. John eliminated every mistake carefully.

    b. John mentioned every participant intentionally.

In (41b), what is said to be careful is John's doing away with the entirety of the mistakes, and in (41b) what is said to be intentional is John's mentioning the entirety of the participants. (41a) and (41b) differ from (42a) and (42b), where *carefully* and *intentionally* apply to the individual events instead.

Even nominalizations, it appears, may involve a totality condition as part of their referent, as below on the relevant reading:

(43) a. John's careful elimination of every mistake

    b. John's intentional mentioning of every participant

Armstrong (1997, 2004) proposes that the truthmaker for the statement 'All P are Q' is the aggregate consisting of the sum (or aggregate) of the 'singular' states of affairs of the sort 'd's being P and Q' and the states of affairs that consists in the aggregate of those singular truth makers constituting all states of affairs involving P. Reformulating this condition for events, this means that the following condition would hold for the truth-making of universally quantified sentences, where ALL is the condition that holds between a sum and another sum if the first exhausts the second::

(44) $e \Vdash$ *Every* A *is* B iff there are events e' and e'' such that $e = sum(\{e', e''\})$ and for

    any substitution instance S of *every* A *is* B, there is an event $e''' < e''$ and $e''' \Vdash S$

    and $e' = ALL(e'', sum(\{e \mid e \Vdash S$, for some substitution instance S of *every* A *is* B$\}))$.

Note that since totality events are composed of ordinary events and a totality condition, they are distinct from facts as described by *the fact that every* A *is* B, that is, non-worldly facts introduced by an explicit fact description.

Given (44), the truthmaking condition of (41a) will then be as follows:

(45) e ⊩ *John carefully eliminated every mistake* iff there is an event e',

    e ⊩ <[*carefully*], e'> & e' ⊩ *John eliminated every mistake*

Again, it is assumed that in addition to sentences, structured propositions consisting of a property and an object may have truthmakers, i.e. <[*carefully*], e'>.

Adverbial modification of universally quantified sentences as well as nominalizations in which universal quantification plays an event-constitutive role pose a serious issue for the Davidsonian account of adverbs and nominalizations. In order to treat *carefully* and *intentionally* in (41a, b) as predicates of events, the Davidsonian would require additional event argument places for quantifiers like *every*. The exhaustion of a set of entities in certain types of events would be partly constitutive of the event that *carefully* in (41a) and *intentionally* in (41b) are predicated of (e.g. in (41a) John was careful in that the mistakes he eliminated constitute all the mistakes). If an event were to be made an additional argument of *every*, then *every* would express a three-place relation between events, sets, and sets. (41a) would then have the logical form below:

(46) ∃e'(carefully(e') & every(e', [*mistake*], {x | ∃e(eliminate(e, John, x)}))

It would be part of the lexical meaning of *every* to specify how the event e' relates to the event argument of *eliminate*: e' must be an event of John's exhausting the mistakes in his eliminations. Of course, it would be highly peculiar if that should be part of the meaning of *every*. Note that a sentence like *every student eliminated every mistake* would have to be about two additional events, one being constituted by the exhaustion of the students in acts of elimination and another by the exhaustion of the mistakes in acts of elimination. Furthermore, *every teacher showed every student every mistake* would be about three events constituted by an exhaustion of a set.

Another serious problem for the Davidsonian account are adverbial modifiers modifying negated VPs as in the examples below:

(47) a. John intentionally did not get up before 8am.

b. John frequently does not get up before 8 am.

As in the case of the universal quantification, the Davidsonian account would have to posit an implicit argument position for events, or rather states of not happening, as part of the meaning of negation *not*. This again is highly implausible, especially since negation is generally treated as syncategorematic lacking arguments entirely.

It is not entirely straightforward, though, to treat adverbial modification of negated VPs on the truthmaker account. Negation has been considered a problematic issue for the truthmaker idea as such. It is controversial whether negative sentences should have truthmakers in the first place and what their truthmakers should be. For present purposes, clearly negative sentences indeed have truthmakers since they permit adverbial modifiers taking scope over the negation. Given the truthmaker account, *intentionally* in (47a) is predicated of the truthmaker of a negated sentence *John did not get up before 8 am*, and *frequently* in (47b) acts as a quantifier ranging over truthmakers of the same negated sentence. Thus we need a truthmaker theory that assigns truthmakers to negative sentences.

The most straightforward account of the truthmaking of negative sentences has been given recently by Fine (2012, 2014, to appear). Fine, crucially, makes use not only of the notion of truthmaking ⊩, but also of falsemaking ⫤. An entity e makes a sentence *not* S true just in case it makes S false:

(48) e ⊩ *not* S iff e ⫤ S

This condition makes truthmakers of negative sentences available without requiring that they meet particular conditions on individuation. Yet as truhmakers they are fully specific and part of the world, unlike non-worldly facts or Kimian events.

The question whether there are 'negative events' as referents of nominalizations has received a significant amount of attention in the literature. There obviously are formal constraints on forming negative nominalization requiring *non* as a morpheme instead of the particle *not* (as in the often-cited *the nonarrival of the boat*). This is clearly not part of a productive formation of nominalizations for negative events though. *The non-thought, the non-jump, the non-meeting* etc are impossible. A more productive way of forming terms for negative events involves the nominalizations of *fail* and *lack*, as in *John's failure to act* and *John's lack of understanding*. But those terms are associated with particular restrictions on

individuating the corresponding negative states or events. There does not seem to be systematic way in English for forming nominalizations standing for the truthmakers of negative sentences. This means that Fine's truthmaking conditions on negative sentences should yield the truthmakers to which adverbials modifying negated VPs apply. But they can be at best only part of the conditions involved in the semantics of negative nominalizations.

The use of adverbials with quantifiers and negation indicates that there is in principle no limit as to the 'generation' of 'higher-order events', and this poses a serious problem for the Davidsonian account. At the same time, nominalizations involving quantification or negation appear to be subject to more restrictions, requiring not just truthmaking but further conditions for them to have a referent.

The Davidsonian view of events as implicit arguments of verbs provides an immediate account of event nominalizations. With its straightforward extension to trope nominalizations, the Davidsonian account gives a plausible account of stacked adverbials. The semantics of adverbials involves the very same ontology that the extended Davidsonian view would posit for the semantics of adjectives and their nominalizations anyway.

The alternative, truthmaker account would do away with the Davidsonian argument position of verbs, adjectives, as well as adverbials. While this gives justice to an intuition that the semantics of those expressions is simpler than the Davisonian would have it, there are reasons to in fact not pursue the truthmaker account in that way. Give the relation of exact truthmaking, events seem, like any other fully individuated entities (including tropes), unsuited for the exact truthmaking relation (Moltmann 2013, Chap. 1). Events generally have more properties than are needed for the exact truthmaking of sentences. Take the sentence *John is walking*. A concrete event of John's walking has a location, a manner, an intensity, possibly a company, and other features not relevant for the truth of *John is walking*. That is, events, like tropes and enduring objects, are too thick to serve as exact truthmakers.

There are, arguably, entities we refer to in natural language that serve the exact truthmaker role, namely 'cases', entities we refer to as *the case in which John might be walking*, *the case in which John does not get up before 8*, *the case in which John eliminates every mistake etc,*(Moltmann, to appear b, ms). But 'cases' have very different properties from events, in fact they have a lot fewer properties than events, lacking, generally, a location, a temporal part structure and causal roles (Moltmann, to appear, ms). Given this, it would be a mistake to apply truthmaker semantics to the semantics of nominalizations and simpler adverbial constructions (including stacked adverbials as in (36).

Yet, the truthmaker semantic account appears the only option and in fact entirely appropriate for adverbial modification of quantified and negated sentences. This indicates that the Davidsonian account of event (and trope) nominalizations as well as simpler adverbial constructions should best be combined with a truthmaker account of more complex constructions involving adverbials and complex nominalizations.

5. The action-product distinction and the mass-count distinction among verbs and event nominalizations

There is another challenge for both the Davidsonian and the truthmaker account of event nominalizations and that concerns a distinction between two sorts of event-like mental or illocutionary entities. This is Twardowski's (1911) distinction between actions and products, a distinction that concerns particularly nominalizations of psychological and illocutionary verbs.[12] According to that distinction, nominalizations such as *thought, judgment, decision, claim, request,* and *promise* describe non-enduring 'products' of the event described by the verb. By contrast, gerunds such as *thinking, judging, deciding, claiming, requesting,* and *promising* describe actions, the very same things described by the corresponding verbs. The non-enduring products of actions are as concrete as the actions and in fact spatio-temporally coincident with them.

Actions and products differ fundamentally in their properties. Most importantly only products may bear truth or satisfaction conditions, but not actions. This is reflected not only in the applicability of *true* and *false* to products but not actions, but also of predicates expressing satisfaction conditions of various sorts, such as *satisfy, fulfill, implement, execute* etc:

(49) a. John's claim / judgment that that S is true / false.

   b. ?? John's claiming / judging that S is true / false.

   c.?? John's action (of claiming / judging) is true.

 (50) a. John's request to be promoted was fulfilled.

   b. ?? John's requesting / act of requesting was fulfilled.

   c. John's decision was implemented.

   d. ?? John's act of deciding was implemented.

   e. John's command that people leave the building was executed.

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[12] See Moltmann (2013a, Chap. 4, 2014, to appear) for a recent discussion and further development of Twardowski's distinction.

f. ?? John's commanding / act (of commanding) was fulfilled.

This means that products, but not actions will be able to enter logical relations, in virtue of their truth or satisfaction conditions. It also means that products, not actions could play the role that propositions play on standard views of attitude reports and sentence meaning (Moltmann 2013a, Chap. 4, 2014, to appear). Note, though, that the applicability of predicates of satisfaction makes clear that products cannot be identified with propositions (propositions cannot be fulfilled, implemented, or executed). Rather products are entities sui generis, sharing similarities with bot propositions and events, but are not to be identified with either of them.

Products differ from actions furthermore in entering relations of exact similarity just on the basis of being the same in content, provided they involve the same force and mode of physical manifestation. This is reflected in the applicability of *is the same as*, a predicate expressing exact similarity in English:

(51) a. John's thought is the same as Mary's.

b. John's thinking is the same as Mary's.

(52) ??? John's thought is the same as Mary's remark.

Whereas the truth of (51a) just requires sharing of content, (51b) appears to require more, say sharing of the particular way of thinking. (52), which states exact similarity among different sorts of products, could just not be true at all.

There are further properties that distinguish actions and products. For example, only products not actions have a part structure based on partial content and only products not actions can enter causal relations and evaluations on the basis of content (Moltmann, 2013a, Chap. 4, Moltmann 2014, to appear).

It is clear then that an ontological distinction must be made between certain types of events and their non-enduring products. These types of events consist of (certain) mental acts as well as illocutionary acts. For the semantics of nominalizations this means that non-gerundive nominalizations of psychological and illocutionary verbs do not just pick up the implicit event argument of the verb. Rather their semantics will be more complex involving a function mapping an implicit event argument onto its non-enduring product. Thus, whereas gerunds have the simple semantics in (53a), product nominalizations will involve a more complex

semantics, as in (53b), with prod being a function mapping an event onto its non-enduring product:

(53) a. [*claiming*]= {<e, x> | <e, x> ∈ [*claim*]}

    b. [*claim$_N$*] = {<e', x> | ∃e (<e, x> ∈ [*claim$_V$*] & e' = prod(e))}

All non-gerundive nominalizations of psychological and illocutionary verbs appear to be product nominalizations thus requiring the more complex semantics, given the Davidsonian view. This raises the question of how general is the distinction between actions and products is. Twardowski's (1911) own view was that the action-product distinction includes the distinction between physical actions and their products, for example that between an action of walking and a walk, an act of jumping and a jump, and an act of screaming and a scream. Clearly, an action of walking and a walk and an act of jumping and a jump do not differ in properties in the way an act of judging and a judgment and an act of claiming and a claim do, since a walk and a jump do not have satisfaction conditions or other representation-related properties. The same holds for a scream as a byproduct of a state of agitation, as opposed to an act of screaming. Linguistically, though, the same sorts of nominalizations are used for physical products as for cognitive and illocutionary products: *jump, scream*, and *walk* are morphologically on a par with *belief, claim*, and *hope*.

All nominalizations of the sort of *walk, jump, scream, belief, claim,* and *hope* differ from gerunds in one common respect, though and that is that they are count nouns rather than mass nouns. Count nouns typically apply to entities viewed as integrated wholes, whereas mass nouns apply to entities not viewed as integrated wholes (Moltmann 1997). The count character of *walk, jump*, and *scream* manifests itself in that such nouns describe events that are viewed as wholes, which is not the case for gerunds. This difference is reflected in the way evaluative properties apply. If Mary's dance was unusual, it may be so just because of the very beginning and the very end. But if Mary's dancing was unusual, then unusualness must pertain to Mary's dancing throughout the time it lasts. Similarly, *amazing* when applying to John's scream naturally evaluates John's scream as a whole, whereas when it evaluates John's screaming, it evaluates an activity throughout the time it goes on. Cognitive and illocutionary products are generally described by count nouns (which means they are generally viewed as integrated wholes, say in view of the unity of their representational content), whereas the corresponding actions or states are described by mass nouns when using

gerunds. Thus suggests that it is the mass-count distinction that may have mislead Twardowski to posit a distinction between physical actions and physical products as well.

The mass-count distinction of course needs to be taken into account for the semantics of nominalizations. If gerunds and other nominalizations differ with respect to the mass-count distinction, this raises the question of the mass-count distinction among verbs. It appears, given a range of criteria, that verbs always classify as mass rather than count – despite the differences in mereological properties among verb extensions (some verbs have an atomic extension, others don't). Thus conjoined verbs do not support plural anaphora, and number-related adverbial modifiers require a classifier (*times* in *two times*) (Moltmann 1997). If this is right, then the mass-count distinction among nominalizations requires an account that does not draw on an ontological distinction among events or a distinction in mereological properties of extensions.

The action-product distinction raises a difficulty for the truthmaker account to event nominalizations. The difficulty is that actions and their products qualify equally, it seems, for the truthmaking of the very same sentences. But since they have such different properties, they should not both qualify as exact truthmakers of the same sentences. This is in fact part of the more general difficulty with considering events as truthmakers already mentioned (Section 4).

6. Events and states

So far, this paper has set aside state nominalizations. That is because states, it has been argued, are not to be on a par ontologically with events. This relates to the observation that the states described by most stative verbs accept only a very restricted set of adverbial modifiers; they resist location modifiers, manner adverbials, instrumentals, and comitatives, and they cannot act as bare infinitival complements of perception verbs. Those stative verbs include *own, know, resemble, weigh, measure*, as well as copula *be.* Some researchers have taken this 'Stative Adverb Gap', as it is called, to mean that stative verbs lack a Davidsonian event argument position (Katz 2003); others have taken it to mean that states (at least as described by the relevant class of verbs) are ontologically rather different from events (Maienborn 2007). On Maienborn's view, states (described by verbs exhibiting the Stative Adverb Gap) are 'Kimian states' or 'abstract states' as I call them (Moltmann 2013b, to appear). That is, they are entities introduced by abstraction (Section 3). States so introduce are abstract in the sense that they will carry only properties specified for them by the method of introduction.

Thus, on the Kimian account of states as below, states will have identity conditions and a temporal duration, but no other intrinsic properties:

(54) <u>A Kimian account of states</u>

    a. For a property P, an object o, the state s(o, P) obtains at a time t iff P holds of o at t.

    b. For properties P and P' and objects o and o', s(o, P) = s(o', P) iff P = P' and o = o'.

The Kimian account of states in (54) still leaves two options open for the semantic analysis of state nominalizations. Based on (54), states could be introduced as referents of nominalizations of stative verbs either in terms of the Davidsonian account by picking up states as the implicit arguments of stative verbs (albeit ontologically different from events) or in terms of the Kimian account on the basis of the nominalization itself. While in the former case the semantics of state nominalization would be the same as event nominalizations, in the latter case the semantics of state nominalizations would be as below, where N_V is the nominalization of the verb V:

(55) $[N_V] = \{e \mid \exists o \, (e = s(o, [V]))\}$

    The truthmaker account is not applicable to abstract state nominalizations. Abstract states cannot act as truthmakers since they are not entities in the world, but rather are on a par with non-worldly facts. They are not concrete in the sense of being fully specific and in space and time. Abstract states have a temporal duration only due to the method of their introduction.

    Given the other two theoretical options, the Davidsonian and the Kimian account, it is then worth taking a closer look at actual nominalizations of stative verbs. First, stative verbs always have gerundive nominalizations, and those certainly stand for abstract states, as the resistance to relevant predicates, on the relevant reading, illustrates:

(56) a. ??? John's resembling Bill is striking / unusual.

    b. ??? John knowing French is profound / superficial.

Furthermore, though, stative verbs may have other nominalizations, and those do not quite pattern the same. Thus there are differences in semantic behavior between *resembling* and *resemblance* as well as *knowing* and *knowledge*, as seen in the contrasts to (56a, b) belo:

(57) a. John's resemblance to Bill is striking / unusual.

  b. John knowledge of French is profound / superficial.

Note that the same predicates in (56) and (57) can form adverbial modifiers of the verbs *resemble* and *know*, which means that those verbs should not take as Davidsonian arguments the very same abstract states as are described by their gerundive nominalizations:

(58) a. John resembles Bill in an unusual / striking way.

  b. John knows French in a profound / superficial way.

Yet *resemble* and *know* do not permit spatial adverbials (??? *John resembles Mary in France*, ??? *John knows Mary in the house*). This indicates that *resemblance* and *knowledge* describe tropes or trope-like entities. Tropes allow predicates that concern the ways the property in question is manifested (manner predicates), which abstract states do not. Yet tropes by nature generally do not allow for spatial modifiers (Moltmann 2013b):

(59) a. ??? John's wisdom / nervousness / happiness was in France.

  b. ??? the cake's deliciousness on the table

   Abstract states and tropes also differ with respect to their part structure and their measurability: abstract states, like facts, cannot have parts nor can they be measured, but tropes can, as is reflected in the data below:

(60) a. ??? part of John's being wise / nervous / intelligent

  b. part of John's wisdom / nervousness / intelligence

(61) a. ??? There is more being wise in this book.

  b. There is more wisdom in this book.

The same pattern can be observed for the two nominalizations of stative verbs of the relevant sort:

(62) a. Part of John and Bill's resemblance is due to their genes.

  b. ??? Part of John and Bill's resembling each other is due to their genes.

(63) a. Part of John's knowledge of French is due to his year as an exchange student.

b. ??? Part of John's knowing French is due to his year as an exchange student.

(64) a. There is more resemblance to Bill than resemblance to Mary.

b. ??? There is more resembling Bill than resembling Mary.

The semantic behavior of the two sorts of nominalizations, gerunds vs *resemblance* and *knowledge*, suggests that at least certain stative verbs that do not permit spatial adverbials have two distinct nominalizations, first gerundive nominalizations for abstract states and second non-gerundive nominalizations for entities that are tropes (relational tropes of resemblance) or closely related to tropes (knowledge). This means that a gerund may refer to an abstract state even if the implicit Davidsonian argument of the verb is not an abstract state but rather a trope or trope-like entity.[13] In such a case, then, a Kimian semantics of gerundive nominalization will be the only option, that is, a semantics according to which the gerund introduces an abstract state, by abstraction from the content of the verb.

7. Conclusion

We have seen that despite its initial plausibility the Davidsonian account of event nominalisations and adverbial constructions faces serious challenges, most importantly from the possibility of stacked adverbials and interactions of adverbials and quantifiers and the corresponding nominal constructions. Those constructions do not involve entities already acting as implicit arguments but, it seems, introduce them themselves. There is a view according to which this holds even for simple event nominalizations and adverbial constructions, namely the view that events come play a role in the semantic structure of sentences only in virtue of those constructions and are not already present as implicit arguments of all verbs.

However, the most well-known alternative to the Davidsonian account, the Kimean account of event nominalizations is affected with serious difficulties regarding the ontology of events and its applicability to actual nominalizations in natural language. Yet that account appears to have one application, namely to gerundive nominalizations of certain stative verbs such as *resemble* and *know*.

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[13] Maienborn (this volume) furthermore argues that gerunds (infintival nominalizations in German) furthermore may refer to concrete states as entities distinct from tropes, namely when derived from verbs like *sleep, sit,* and *glow*.

The third alternative, the truthmaking account, fares much better with respect to complex adverbial constructions and corresponding nominalizations. But it has to meet its own challenges regarding abstract state verbs as well as the notion of exact truthmaking in general. Nominalizations moreover require a more complex semantics in view of the action-product distinction among psychological and illocutionary verbs.

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