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Nominalizations: The Case of Nominalizations of Modal Predicates

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Abstract

Nominalizations have received considerable interest in linguistics, but some nominalizations have also received interest from philosophers, namely nominalizations that stand for ‘philosophical entities’ (to use Montague’s 1969 term). These include nominalizations describing events, tropes, and facts, which have received considerable interest in the semantic and philosophical literature, present and past. This paper will focus on those nominalization and the ways in which they are able to denote entities. It will then give a case study of nominalizations of modal predicates, which have received little, if any, attention in the literature so far, nominalizations of the sort *need*, *possibility*, *permission*, *obligation*, and *ability*. The paper will argue that nominalizations of modal predicates require recognizing a novel ontological category of modal objects, entities that are closely related to attitudinal objects, the semantic values of nominalizations of attitude verbs (*belief*, *claim*, *decision*, *request*). The paper will give a general characterization of modal objects and discuss three semantic nominalization strategies by which modal objects can be introduced.

Introduction: the challenges of nominalizations, for linguistics and for philosophy

Nominalizations are nouns that are morphologically derived from expressions (base expression) of possibly other syntactic categories. Nominalizations present major challenges for semantics. Nominalizations involve the interface of semantics with morphosyntax and the particular issues for compositional semantics that this goes along with, such as the question of how the argument structure of the nominalization relates to that of the base expression. Moreover, given that nominalizations may denote objects that are not already part of the semantics of the base expression, they pose particular challenges for ontology, raising the question of the objects denoted by the nominalization relate to the meaning of the base expression.

Nominalizations have also played a major role in philosophy, and in fact the linguistic study of nominalizations may shed a light of a range of philosophical debates. Various types of nominalizations appear to stand for to abstract objects or highly derivative or minor objects of some sort, and philosophers have often made use of nominalizations for the purpose of a philosophical argument. Obviously, the study of nominalizations can be illuminating as to the nature of the abstract, derivative, or minor entities that nominalizations are taken to denote, and as regards the ontological operations that serve to introduce such objects.

This paper will focus on particular sorts of nominalizations that have hardly been paid attention to in the linguistic literature, namely nominalizations of modal predicates such as *permission*, *obligation*, *need*, and *possibility*. Entities of the sort of permissions and needs are rather unfamiliar and may appear harder to accept ontologically than events, a fairly well-established ontological category, or tropes, that is, particularized properties, an ontological category traditionally invoked for adjective nominalizations in the philosophical literature. This paper argues that nominalizations of modal predicates such as *obligation*, *permission*, and *need* require recognizing an ontological category of modal objects distinct from events, states, and tropes. Such modal objects arguably play an important role not only for nominalizations, but are also at the heart of the semantics of modals (Moltmann 2018).

In what follows, I will start with a few remarks concerning nominalizations in general and discuss two semantic nominalization strategies that have been invoked for event, trope and fact nominalizations. I then introduce another type of nominalization, namely for attitude verbs, ‘product’ or ‘attitudinal-object’ nominalizations of the sort *judgment*, *claim*, *decision*, *request*, and *promise*. Such nominalizations do not stand for events or acts, but rather for their (nonenduring) products and thus require a third strategy for their introduction. The notion of a product of a cognitive or illocutionary act, or more generally the notion of an attitudinal object, is closely related to that of a modal object, the category of object associated with nominalizations of modal predicates. Modal objects may also be involved in the semantics of certain types of attitude verbs. Modal objects, we will then see, involve all three methods of object introduction, depending on the predicate that is nominalized.

1. What are nominalizations?

Nominalizations are nouns that are morphologically derived from an expression, the base expression, of another category, or another noun. Thus, *driver* is a deverbal nominalization derived from the verb *drive*, *thought* a deverbal nominalization derived from the verb *think*,

and *happiness* a deadjectival nominalization derived from the adjective *happy*, and *motherhood* a nominalization derived from the noun *mother*. Also numerals like *eight* are generally regarded nominalizations of adjectives when appearing in argument position rather than in modifier or quantifier position.¹ There are cases where it is not clear whether the noun is derived from the verb or vice versa, for example *need* (Section 4). Moreover, there is a view, the view of distributive morphology (Harley/Noyer 1999), according to which the lexicon just contains category-less roots and it is both the base expression and the nominalization may be obtained from the same root.

There are also derivative uses of the term ‘nominalization’, especially in the philosophical literature. Philosophers sometimes call expressions ‘nominalizations’ expressions even if they do not involve a morphological process of nominalization, for example *that*-clauses: *that*-clauses, when appearing in argument position are considered nominalizations of sentences: they act as referential terms standing for an object that is or is obtained from the meaning of a sentence (a proposition).² Complex NPs with *that*-clauses such as *the fact that S* are another example. ‘Nominalization’ has also been used as a purely semantic term, in application to expressions (or uses of them) that appear to involve the very same semantic operation as is involved in the semantics of particular types of nominalization. Thus, quantifiers such as *something*, *everything*, and *nothing* have been argued to range over the same things as are semantic values of nominalizations, and in that sense are *nominalizing quantifiers* (Moltmann 2003, 2013b).

1.1. Morphosyntactic issues

A significant part of the semantic literature on nominalization is devoted to the question of how the nominalization relates to the argument structure of the base expression, for example the question which argument position of the base expression nominalizations the nominalization can pick up as its referential (external) position and whether it preserves the other argument position of the base expression. In addition, there is a focus in the linguistic literature on polysemies often displayed by nominalizations, in particular result

¹ There are also views, though, according to which numerals in those context retain their status of quantifiers or adjectival modifiers. This view naturally goes along with the ontological view that numbers are considered quantifiers or plural properties (Hofweber 2007, Moltmann 2013c).

² There are also views, though, according to which *that*-clauses are not referential terms, see Moltmann (2013b, 2014, 2017a) and references therein.

nominalizations such as *destruction* or *building*.³ Alexiadou (2010), Grimshaw (2011), and Lieber (2018) are recent overviews of that literature. The present paper will instead focus on the semantics of nominalizations of what Montague (1969) would call ‘philosophical entities’, such as nominalizations standing for events, facts, and tropes, and against that background present a case study of nominalizations of modal predicates, which have hardly received any attention in the linguistic literature, namely

1.2. Philosophical issues

Nominalizations play a significant role in philosophy and have been used as important tools in philosophical theorizing. Nominalizations can serve to form terms standing for philosophically interesting categories of objects, abstract objects such as properties, relations, and propositions, as well as concrete objects the sort of events and tropes (particularized properties). Thus, nominalizations have played a major role in discussions in metaphysics, in particular in relation to questions about the existence and nature of abstract objects, events, and tropes.

Nominalizations have played a major role in the debate as to whether there are universals or properties. A common view is that adjective nominalizations such as *wisdom* stand for properties. This raises the question whether properties are ontologically real or derivative introduced by the use of the expression itself. But the view that adjective nominalizations stand for properties has itself been challenged. When occurring in NPs of the sort *Socrates wisdom*, they have generally been considered standing for tropes or particularized properties, rather than properties acting as universals, a view that can be traced to Aristotle and has been taken for granted throughout most of medieval and modern philosophy. Even when occurring as bare nouns (as in *wisdom is rare*), their function of referring to properties has been questioned. On a par with are nouns such as *giraffes* and *water*, bare adjective nominalizations act like kind terms in the sense of Carlson (1977), displaying different properties from explicit property-referring terms (Moltmann 2004). Kinds as semantic values of bare mass nouns or plurals in turn may be viewed as plurality of concrete entities, rather than as single abstract objects (Moltmann 2013). The philosophical literature not generally

³ I will come back to the issue of polysemies of nominalizations in Section 4.

does not address the question of how the meaning of the nominalization relates to the adjective.⁴⁴

Event nominalizations, as opposed to deadjectival trope nominalizations, have been discussed only much more recently in philosophy, in particular in connection with Davidson's view of events as primitive entities that also serve as implicit arguments of eventive verbs. According to that view, the verb *walk* takes an event of walking as an implicit argument and the nominalization *walk* serves to make reference to an event in an NP like *John's walk*. The Davidsonian view of events has had an enormous influence in linguistic semantics, and almost every linguistic account of deverbal nominalizations takes it for granted.

1.3. Strategies for introducing objects with nominalizations

Given the view on which nominalizations are derived from base expressions, there will be three ways in which the nominalization could obtain its semantic value:

- [1] by picking up an argument of the base expression
- [2] by introducing an object by abstraction from the meaning or use of the base expression
- [3] by mapping an argument of the base expression to a closely related object.

We will see that all three strategies are involved in actual types of nominalizations. Strategy 1 is involved in the semantics of event and trope nominalizations; Strategy 2 is involved in fact nominalizations and certain nominalizations of modal predicates; Strategy 3 is involved in nominalizations of (non-stative) attitude verbs.

1.3.1. Picking up an argument of the base expression: Davidsonian event semantics

Nominalizations are nouns that are derived from an expression (the base expression) of a possibly different category, such as a verb or an adjective. Thus the nominalization *laughter* is derived from the verb *laugh* and can serve to form the referential term *John's laughter*, referring to an event. The nominalization *happiness* is derived from the adjective *happy*, and can serve to form the referential term *John's happiness*, referring to a trope or particularized property, that is, the manifestation of happiness in John. In a derivative sense, also nominal

⁴⁴ An exception is approaches that take properties derivative upon the use of the adjectives, such as the pleonastic view of Schiffer (2003).

constructions obtained from sentences are called nominalizations, such as *the fact that John is happy*, which is in a way derived from the sentence *John is happy*.

Nominalizations obviously have a semantics that is related to that of the base expressions and so should have a meaning that is obtainable from -- or at least systematically related to -- that of the base expression. For some nominalizations this is straightforward; for example agent nominalizations such as *driver* stand for entities that are arguments of the base expression. But for nominalizations that are event and trope nominalizations the relation to the meaning of the base expression is less obvious. Such nominalizations appear to introduce ‘new’ entities into the semantic structure of sentences, entities that would not be part of the semantic structure of sentences without the nominalization and whose ontological status may appear problematic.

There are different accounts as to how to derive the meaning of a nominalization from that of the base expression. For event nominalizations derived from verbs such as *laughter*, *walk*, or *scream* as well as adjective nominalizations such as *wisdom* or *happiness* there are two strategies in particular that could achieve that. On one account, the nominalization picks up an implicit argument of the base expression. In the case of event nominalizations, this would be the implicit Davidsonian event argument of the verb. Similarly, in the case of adjective nominalizations, this would be an implicit trope argument of the adjective (a manifestation of wisdom in the case of the nominalization *wisdom*). The Davidsonian account of event nominalizations is due to Higginbotham’s (1985, 2000) development of Davidson’s (1967) semantics of adverbials.⁵ According to Davidsonian event semantics, events act as implicit arguments of verbs, and adverbials are predicates of the implicit event argument of the verb. A sentence like (1a) on that account has the logical form in (1b), with existential quantification over events that are to occupy an additional, ‘implicit’ argument position of the verb:

(1) a. John walked slowly.

b. $\exists e(\text{slowly}(e) \ \& \ \text{walk}(e, \text{John}))$

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 (1a) to (1c):

⁵ For further developments of the Davidsonian event semantics, see also Parsons, (1990) and Landmann (2000).

(1) c. John walked.

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). This means that different properties can be used to describe one and the same event and thus events are not conceived as entities strictly dependent on the content of a (canonical) description, say composed of the meaning of the verb and its arguments.

Given Davidsonian event semantics, NPs with a deverbal nominalization as head such as *John's walk* can be given a straightforward semantics on which they pick up the implicit event argument of the verb as their referent (cf. Higginbotham 1985, 2000):

(2) [*John's walk*] = $\iota e[\text{walk}(e, \text{John})]$

The implicit event argument of the verb will be the very same event as is described by the event nominalization.⁶

Given, the Davidsonian account, it is clear why the same expressions that act as adverbials generally are able to act as predicates or adjectival modifiers of the event nominalization of the verb. This is illustrated with *slow(ly)* below:

- (3) a. John walked slowly.
 b. John's walk was slow.
 c. John's slow walk.

Slow(ly) in all three syntactic roles will be predicated of the very same events.

The Davidsonian account of event nominalizations allows a rather straightforward extension to the semantics of nominalizations of adjectives. This, though, requires an enrichment of the ontology associated with natural language so as to include tropes besides events. While this view was more recently defended in Moltmann (2007, 2009, 2013b), it was in fact also the standard view about adjective nominalizations throughout the

⁶ Nominalizing verbs as event nominalizations, however, 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.

philosophical literature on tropes. It is a view in fact that goes back to Aristotle and was common throughout the Aristotelian tradition in medieval and early modern philosophy (Ockham, Aquinas, Locke, to name just a few). Also in contemporary metaphysics, philosophers generally use adjectival nominalizations when giving examples of tropes (Williams (1953), Campbell (1990, Lowe (2006)). Tropes (or accidents or modes, to use the Aristotelian terms) are ‘particularized properties’, that is, concrete manifestations of properties in objects. They are not properties as universals, but rather properties as particulars, dependent on particular objects as their bearers.

Adjectives, to an extent, exhibit the very same alternation of expressions acting both as modifiers of the adjective and as predicates (or adjectival modifiers) of the adjective nominalization. Thus, the modifiers of *happy* in (4a) and *pale* in (4b) act as predicates of what the nominalizations *happiness* in (5a) and *paleness* in (5b) stand for:

- (4) a. Mary is visibly / profoundly happy.
- b. Mary is extremely / frighteningly / shockingly pale.
- (5) a. Mary’s happiness is visible / profound.
- b. Mary’s paleness is extreme / frightening / shocking.

Mary’s happiness stands for the particular way happiness manifest itself in Mary, which is also an implicit argument of *happy*, and *Mary’s paleness* stands for the particular manifestation of paleness in Mary, which is also an implicit argument of *pale*.

Why should the implicit argument of an adjective be a trope, rather than an event, or perhaps more specifically a state? This raises the question, what are states, in the context of natural language ontology? That is, how are our intuitions about states reflected in natural language? States are certainly the sorts of things we refer to with terms like *the state of Mary’s being happy* as well as simply the gerund *Mary’s being happy*. States in that sense have different properties from the entities that terms with adjective nominalizations stand for, such as *Mary’s happiness*. For example, ‘Mary’s being happy’ cannot be profound and ‘Mary’s being pale’ cannot be extreme (Moltmann 2009, 2013a, 2015). By contrast, these are among the properties that ‘Mary’s happiness’ and ‘Mary’s paleness’ can have. Tropes involve a particular manifestation of the property in question whereas states just consist in an

individual having that property.⁷ For reasons such as these, nominalizations of adjectives cannot stand for states, but rather stand for tropes.

Formally, (6a) will then have the logical form in (6b), with existential quantification over tropes filling in the ‘Davidsonian’ argument position of *happy*:

(6) a. Mary is visibly happy.

b. $\exists t(\text{happy}(t, \text{Mary}), \& \text{visibly}(t))$

(7a) will have the logical form in (7b):

(7) a. Mary’s happiness is visible.

b. $\text{visible}(\max t[\text{happiness}(t, \text{Mary})])$

Here *max* is a suitable maximality operator. Since there may be various tropes of happiness of Mary at a period of time, the definite NP *Mary’s happiness* is taken to stand for the maximal trope of happiness of Mary at that time, to ensure uniqueness.

Davidsonian event semantics has been enormously influential in linguistic semantics, and, going along with it, the Davidsonian account of event nominalizations. However, there is an alternative approach to the semantics of event nominalizations, based on Kim’s (1976) conception of events. What has sometimes been objected to the Davidsonian semantics of events is that it fails to account for the intuition that only a sentence with an explicit event-referring term such as (3b) is about an event; a sentence containing just a verb describing an event such as (3a) is only about an agent, John, and not *about* an event. The Kimean account of event nominalizations appears to be able to capture this intuition, since on that account sentences such as (3a) do not involve events as part of their semantics, but only John and the property of walking slowly.

1.2. Introducing a referent by abstraction: Kimean event semantics

On the second strategy, a nominalization introduces a new entity on the basis of the meaning of the base expression, in addition to perhaps further expressions or entities. This can be

⁷ States are then in a sense abstract. See Maienborn (2007) and Moltmann (2013a, 2015) for a discussion of the relevant notion of a state.

called the ‘Kimian account’ of nominalizations, since it goes along naturally with the way Kim (1976) conceived of events, as entities obtained from a property, an object, and a time. While the Kimian account, as we will see, appears unsuitable for event nominalizations, it will have an application to one kind of nominalization of a modal predicate, namely *possibility* (Section 6).

The Kimian account of event nominalizations goes along with the view that events are introduced into the semantic structure of a sentence generally only by means of nominalizations (underived event noun such as *fire*, *war*, or *noise* would be exceptions). Events are conceived as entities that strictly depend on an individual, a property, and a time. Kim’s account of events then consists in the following statement of existence and identity conditions for events:

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

[1] $f(d, P, t)$ exists iff P holds of d at t .

[2] $f(d, P, t) = f(d', P', t')$ iff $d = d', P = P', t = t'$.

Here $f(d, P, t)$ is the event dependent on an object d , a property P , and a time t .

This account introduces events simply by way of specifying their properties. In (8), these are the conditions under which events exist (in time) and when events are identical to other entities obtained in the same way.⁸

Kim’s account of events does not explicitly define events in terms of a property, an object, and a time. Rather the account consists in an implicit definition of events, stating their existence and identity conditions in terms of an object, a property, and a time. Kim’s account in fact introduces events by a form of Fregean abstraction (Frege 1884, Hale 1983) (Moltmann 2019b).⁹

Given Kim’s ontological account of events, the semantics of event nominalizations appears straightforward, as below, where the denotation of *walk*, $[walk]$, is taken to be the one-place property of walking:

⁸ Kim’s (1976) original account, which targets events of a rather simple sort, has subsequently been adopted and further developed by Bennett (1988), Lombard (1986), and others

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

⁹ The notion of an entity introduced by abstraction is closely related to the notion of a pleonastic entity of Schiffer (1996, 2003), which is in fact also meant apply to events.

(9) [*John's walk*] = $\iota e[e = [\text{John}, [\text{walk}], t]]$

There is one refinement of this semantics of event nominalizations that Kim himself introduces. Kim (1976), admitting that events need not strictly be constituted by the entire content of the event description, draws a distinction between *event-characterizing* and *event-constitutive* properties. If *slow* is event-characterizing, (10a) has the analysis in (10b); but if *slow* is event-constitutive, (10a) has the analysis in (10c):

(10) a. John's slow walk

b. $\iota e[e = f(\text{John}, [\text{walk}], t) \ \& \ \text{slow}(e)]$

c. $f(\text{John}, [\text{slowly walk}], t)$

The availability of event-characterizing properties conveyed by an event description would distinguish 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 a sentence S in a fact description of the sort *the fact that S* must be fact-constitutive. This difference appears to manifest itself in the contrast between (11a), which can be true, and (11b), which can't:

(11) 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*, or at least fact as 'non-worldly facts' in the sense of Strawson (1950).^{10,11}

The difference in description, however, won't account for various differences in properties between events and facts. An object introduced by Fregean abstraction has just those properties specified by the method of introduction. Thus, given (8), 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

¹⁰ Facts in the sense of non-worldly facts differ from the notion of a worldly fact defended by Austin (1979).

¹¹ For further linguistic support for the view that facts are introduced by canonical fact descriptions and for a semantics for *the fact that S*, see Moltmann (2013b, Chap. 6).

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, though, it is part of our notion of a (non-worldly) fact to lack those properties.

These differences between events and facts are linguistically well-reflected, namely in the applicability of part-related constructions such as partitive *part of* as well as predicates of concreteness of various sorts, as seen below:¹²

- (12) a. Mary noticed part of the event.
b. ??? Mary noticed part of the fact.
- (13) a. The meeting was in the room.
b. ??? The fact that they met was in the room.
- (14) a. John saw Bill's jump.
b. ??? John saw the fact that Bill jumped.
- (15) a. John's jump was high.
b. ??? The fact that John jumped was high.
- (16) a. John's laughter was intense.
b. ??? The fact that John laughed was intense.

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

- (17) a. Mary described John laughter / John's jump.
b. ?? John described the fact that John laughed / the fact that John jumped.

Predicates of description appear to resist entities whose nature is fully displayed by the description used, such as facts with their canonical fact descriptions.

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

¹² See also Vendler (1967), Peterson (1997), and Asher (1993).

account, individuate an event (together with an individual and a time). But this is characteristic of (non-worldly) facts, not events. Non-specific properties, negation, disjunction, and quantification can be fact-constitutive, but generally not event-constitutive. Events as concrete objects must be maximally specific or at least grounded in specific properties (Moltmann 2007, 2013a, b, 2019b).¹³

One might try to account for the groundedness of events by imposing the restriction that events can be constituted only by fully determinate properties or rather property changes. However, if events are introduced by abstraction, even if based on such specific property changes, they will still lack the typical event properties. That is because the only properties they can have are those that come with the strategy of their introduction.

Moreover, if events are 'introduced' into the semantic structure of sentences only by nominalizations, then the descriptive content of a nominalization would have to be fully event-constitutive, but this is generally not the case.

However Kim's account is suited as an account of fact nominalizations, that is, nominalizations of the sort *the fact that S*, for a true sentence *S*. These are nominalizations standing for facts as non-worldly facts, that is, facts that correspond to true propositions and are tied to the content of the fact description itself. More precisely, (8) gives a semantic account of a simple fact description of the sort *the fact that Mary is happy today*, introducing a fact on the basis of an individual (Mary), a property (happiness) and a time (the time of today).¹⁴

1.3.3. Mapping an argument of the base expression to a closely related object: Product nominalizations and attitudinal-object nominalizations

The Davidsonian account of event nominalizations appears to apply well to verbs describing physical events. However, it does not apply well to nominalizations derived from attitude verbs such as *think*, *decide*, *claim*, and *request*. Such verbs display a distinction between two sorts of deverbal nominalizations that display sharp semantic differences: nominalizations of the sort *thought*, *decision*, *claim*, and *request* on the one hand and gerunds such as *thinking*,

¹³ 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'.

¹⁴ Kim's account is also suited for the semantics of nominalizations that stand for abstract states rather than events. See Maienborn (2007) and Moltmann (2013a) for the distinction between Davidsonian or concrete states and Kimian or abstract states.

deciding, claiming, and requesting on the other hand, and not just in English.¹⁵ This is a distinction that the Polish early analytic philosopher Twardowski (1911) introduced as the distinction between actions and what he called ‘products’. According to that distinction, nominalizations such as *thought, decision, claim, and request* describe non-enduring ‘products’ of actions of thinking, judging, claiming, and requesting, the actions described by the base verbs. By contrast, gerunds such as *thinking, judging, deciding, claiming, requesting, and promising* describe actions, the very same entities described by the base verbs. The non-enduring products of actions are as concrete and particular as the actions and in fact spatio-temporally coincident with them. The notion of a product is closely related to that of a modal object, and so it is appropriate to elaborate on the action-product distinction as introduced by Twardowski and further elaborated in Moltmann (2013b, Chap. 4, 2014, 2017a).

Actions and products differ fundamentally in their properties. Most importantly, as Twardowski emphasizes, only products and not actions may bear truth conditions or, more generally, satisfaction conditions. This is reflected the applicability of the predicates *true* (or correct) and *false* (or wrong) to products of the sorts of judgments and claims and their inapplicability to the corresponding acts of judging and claiming actions:

- (18) a. John’s judgment that that S is true / false.
- b. ?? John’s judging / John’s claiming that S is true / false.
- (19) a. John’s claim is correct.
- b. ?? John’s (act of) claiming / John’s speech act is true.

Moreover, it is reflected in the applicability of predicates of satisfaction to products like requests, decisions, and promises and their inapplicability to acts of requesting, deciding, and promising:

- (20) a. John’s request that people leave the building was fulfilled / satisfied.
- b. ?? John’s act of requesting / John’s speech act was fulfilled / satisfied.
- (21) a. John’s decision to postpone the meeting was implemented / executed.
- b. ?? John’s action of deciding was implemented / executed.
- (22) a. John kept / broke his promise.
- b. ??? John kept / broke his act of promising / his speech act.

¹⁵ For a crosslinguistic study of that distinction see Gerner (2017).

Note that the applicability of predicates of satisfaction makes clear that products cannot be identified with propositions, since propositions cannot be fulfilled, implemented, executed, kept, or broken. Rather products are entities *sui generis*, sharing some similarities with both propositions and with events, but are not to be identified with either of them (Ulrich 1979).

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 possibly physical manifestation. This is reflected in the applicability of *is the same as*, a predicate in fact expressing exact similarity not numerical identity in English:

- (23) a. John's thought is the same as Mary's.
- b. John's thinking is the same as Mary's.
- (24) a. John's promise is the same as Mary's.
- b. John's speech act is the same as Mary's.

Whereas the truth of (23a) and (24a) just requires sharing of content, (23b) and (24b) appear to require more, say sharing of the particular way of performing the act.¹⁶

While the ability of product to have truth or satisfaction conditions and to enter similarity relations based on a shared content can be attributed to Twardowski, there is another important difference between actions and products not noted by Twardowski and that concerns part-whole relations. The part structure of products is strictly based on partial content, not the temporal parts (subevents) an act would have. A part of a thought, a belief, or a decision is a partial content. By contrast, the part structure of actions is that of events, consisting of temporal parts. Parts of products generally are distinct from the parts of the actions. Part of John's decision cannot be part of the action of deciding. Part of John's claim cannot be part of the speech act. Part of John's promise cannot be part of John's act of promising.

There are further properties distinguishing actions and products. Only products not actions can enter causal relations on the basis of content, that is, only products can have causal effects in virtue of their content. John's claim may cause astonishment or puzzlement in virtue of its

¹⁶ Note that the *is* of identity expresses numerical identity not exact similarity, making (27c) false or true only under special circumstances (say a situation of coordinated acts of thinking or promising):

- (23) c. John's thought is Mary's thought.
- (24) c. ?? John's promise is Mary's promise.

content, but not so for John's act of claiming. John's remark may trigger a lot of comments in virtue of its content, but not so for John's making a remark. John's promise may have made Mary happy in virtue of its content, but not so for John's act of promising. Acts, of course enter causal relations, but not that of content-based causation

Actions and products also differ in properties relating to the understanding of their associated content. Understanding a claim or request means something quite different from understanding an act of claiming or requesting. Only the former relates to the content of the product, not the latter.

Related to properties of content-based causation and understanding are properties of content-based evaluation. Attitudinal objects are evaluated with respect to both their content and force, but not so for actions. A thought being interesting is something quite different from the act of thinking being interesting. It is also something different from an abstract proposition being interesting. Similarly, John's thought process may be unusual, without his thought or the corresponding abstract proposition being unusual.

Thus, an ontological distinction must be made between cognitive or illocutionary acts and their non-enduring products. 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 (25a), product nominalizations will involve a more complex semantics, as in (25b), with *att-obj* being a function mapping an event onto its non-enduring product:

- (25) a. $[claiming] = \{ \langle e, x \rangle \mid \langle e, x \rangle \in [claim] \}$
 b. $[claim_N] = \{ \langle e', x \rangle \mid \exists e (\langle e, x \rangle \in [claim_V] \ \& \ e' = att-obj(e)) \}$

The action-product distinction does not apply to stative attitude verbs such as *believe*, *intend*, *fear*, and *hope*. Mental states do not, at least not generally, come with products. Yet the entities that the nominalizations of stative attitude verbs describe, *belief*, *intention*, *fear*, *hope* etc., display the very same characteristic features as cognitive or illocutionary products. In particular, they have truth or satisfaction conditions:

- (26) a. John's belief is true.
 b. John's hope was fulfilled.

c. John's realized his intention.

They enter similarity relations based on being the same in content:

- (27) a. John's belief is the same as Mary's -- they both belief that Sue is guilty;
 b. John's intention was the same as Mary's, to help Sue.

And they display a part structure based on partial content, rather than the temporal part structure that states are generally taken to have:

- (28) a. Part of John's belief is that he will get nominated.
 b. Part of John's intention is to help Sue.

Nominalizations of stative attitude verbs stand for entities that share the characteristic properties with cognitive and illocutionary products, but are not themselves products of acts. This motivates the broader notion of what I call an *attitudinal object*, which comprises both cognitive and illocutionary objects and state-like entities such as beliefs and intentions (Moltmann 2013b, 2017). Attitudinal objects thus form an ontological category of concrete particulars that have content-related properties (having satisfaction conditions, entering similarity relations based on sameness of content, and having a part structure based on partial content). The term *attitudinal-object nominalization* should hence replace the more narrow term *product nominalization*, for nominalizations of attitude verbs.

Thus, nominalizations of verbs and adjectives in English consist in event nominalizations, trope nominalizations, as well as attitudinal-object nominalizations and involve an ontology of events, tropes, and attitudinal objects. They manifest two ways for nominalizations to obtain its referent, by picking up an implicit argument of the base expression and by mapping such an argument to a closely related object.

2. Complex predicates and nominalizations

Verbs often alternate with complex-constructions containing a nominalization, of the sort light verb – nominalization, as below:

- (29) a. walk – take a walk

- b. rest - have a rest

But there are also complex predicates with a nominal that is not a deverbal nominalization, for example *take a nap*.

There are also adjectives that alternate with complex predicates of the sort light verb-adjective nominalization:

- (30) a. be wise – have wisdom
b. be intelligent -- have intelligence

Again, there are complex predicates with a nominal from which the adjective is derived, rather than the other way around:

- (31) a. have insight – insightful
b. have talent -- talented

With attitude verbs, it is generally the attitudinal-object nominalization that occurs in the complex- predicate construction:

- (32) a. think – have a thought / have the thought that S
b. decide – make a decision / make the decision that S
(33) a. claim – make a claim / make the claim that S
b. advise – give advice / give the advice that S

The gerund in fact never figures in complex predicates with the same sorts of light verbs, as Twardowski (2011) already observed (**have a thinking, *make a deciding, *give advising*). There are also complex predicates with nominals not derived from verbs such *have the impression that S* or German *die Absicht haben, daß S* ‘have the intention that S’ or French *avoir peur que S* ‘have fear that S’.

The alternation of the simple verb or adjective with the complex-predicate construction bears on the question of ontological priority. Is the fact that simple verbs or adjectives may alternate with complex predicates formed with nominalizations indicative that nominalizations stand for ontologically derived entities? If so, this would go along with the view that nominalizations introduce ‘new’ entities that are not as such already involved in the

simple predicates. That is, the nouns *walk*, *rest*, *wisdom*, *intelligence*, *thought*, *decision*, *claim*, and *advice* would stand for derivative entities, not already involved in the semantics of the simple predicates *walk*, *rest*, *wise*, *intelligent*, *think*, *decide*, *claim*, and *advise*. However, there is also reason to take the answer to the above question to be negative, because of the existence of underived nominals in complex predicates that stand for the very same sorts of entities as the relevant sorts of nominalizations, nouns like *impression*, German *Absicht*, and French *peur*. Those entities could not be introduced on the basis of linguistic constructions, let's say in the way facts are introduced by canonical fact descriptions.

The existence of complex-predicate constructions that do not alternate with a simple verb might even give suggestive support for the view that the semantics of the simple predicate is in fact more complex, involving already implicit reference to the entities in question. In Moltmann (2014, 2017 a), the semantics of attitude reports with a simple attitude verb as in (34a) is in fact assimilated to that of the semantics of attitude reports with a complex predicate as in (34b), involving explicit reference to an attitudinal object (or kind of attitudinal object):

(34) a. John claimed that S.

b. John made the claim that S.

On that analysis, the attitude verb is considered expressing a relation between acts or states and agents and the clausal complement acts semantically as a predicate of the attitudinal object, as in (34c):

(34) c. $\exists e(\text{claim}(\text{John}, e) \ \& \ [S](\text{att-obj}(e)))$

In (34c), *att-obj* is a (partial) function mapping an act onto its product (if it has one) or else, in the case of stative attitude verbs, an attitudinal object onto itself.

Given this semantics of attitude reports, the complex-predicate construction simply makes explicit the ontology and semantic structure already involved in the simple construction. This sort of semantics, as we will see, carries over naturally to modal sentences with their alternations of the sort *need* – *have a need*.

The distinction between actions and products brings up other issues of ontological priority than that of whether an entity is introduced by means of linguistic construction. Clearly, the product depends for its existence on the act, and so it depends on it ontologically. However, the the identity of intentional act in a way depends on the intended product. While the

intentional act may be performed by performing physical acts, the identity of the intentional act depends on what is intended, the product. The act in fact may also inherit certain properties from the product. This is reflected in part linguistically, in the applicability of certain adverbial modifiers. *John painted beautifully* means that John produces beautiful paintings, not that the activity of painting as such is beautiful. *John writes well* implies that the product, the written work, is good, not the act of writing as such.¹⁷

4. Nominalizations derived from modal predicates

We can now turn to the main topic of this article, the semantics of nominalizations of modal predicates. Nominalizations of modal predicates denote what I call ‘modal objects’.

This requires a few linguistic remarks about nominalizations of modal predicates in general. Modal predicates in English and related languages may come in the form of modal auxiliaries, such as *may must, can*, which generally lack nominalizations. Modal adjectives in English, however, do come with nominalizations: *permitted – permission, obliged – obligation, possible – possibility, necessary – necessity, impossible – impossibility*. English also has modal adjectives describing physical possibility that come with nominalizations: *able – ability, capable – capability*. Furthermore, English has full verbs that are modal verbs, such as *need*, which comes with the nominal *need* (as in *have a need*). Thus *John’s need, the permission for John to stay* and *the obligation for John to leave* stand for modal objects

In general, nominalizations of modal predicates enter complex-predicate constructions that alternate with simple predicates formed with the base expressions:

- (35) a. need – have a / the need
 b. be able to / have the ability to
 c. be capable to / have the capability to

In fact, the verb *need* in many European languages is expressed as ‘have (a) need’, with the light verb *have* and the product nominalization *need* (e.g. French *avoir besoin*, Italian *avere bisogno*). According to Harves / Kayne (2012), even the English verb *need* is itself derived syntactically from an underlying complex predicate *have need*.

¹⁷ For more discussion on the relation between an attitudinal object and that act that may have produced it see Moltmann (2019).

Modal predicates with subject clauses generally alternate with *there*-sentences involving quantification over modal objects:

- (36) a. It is possible that it will rain.
 b. There is a possibility that it will rain.

Modal objects, at least of the deontic sort, share important properties with attitudinal objects. Most importantly, deontic modal objects generally have satisfaction conditions, enter similarity relations based on shared content, and have a part structure based on partial content. Let us look at those properties more closely.

Modal objects of the sort of obligation allow for satisfaction or violation, expressed by various sorts of predicates, for example those in the sentences below:

- (37) a. John's need was satisfied
 b. John fulfilled his obligation to help Bill.
 c. John ignored his obligation to help Bill.
 d. John kept his promise to help Bill.

Like the satisfaction of a cognitive or illocutionary product, the satisfaction of a modal object may consist in performing a suitable action, describable by a *by*-phrase:

- (38) e. John fulfilled his obligation to help Bill by offering him financial support.

Modal objects of the sort of permissions, invitations, and offers go along with different predicates of satisfaction, just like the corresponding illocutionary products:

- (39) a. John took up the permission to leave the room.
 b. John accepted the invitation / offer to use the house.

Modal objects of this sort do not come with violation condition: there is nothing incorrect about not taking up a permission or accepting an invitation or offer.

Modal objects share with cognitive and illocutionary product also the property of entering similarity relations just on the basis of a shared content, illustrated below:¹⁸

- (40) a. John's and Mary's needs are the same – they both need a good computer.
 b. John's offer is the same as Mary's, they both offered Sue a thousand dollar for the painting.

The same as in natural language, as we have seen, expresses exact or close similarity, rather than identity. Note also that the plural *needs* is used in (40a), which means that reference is made to modal objects particular to John and to Mary, not a single modal object they share.

Furthermore, modal objects have a part structure based on partial content. Partial content is what the *part of*-construction picks out when applied to modal objects:

- (41) a. Part of John's need is for good computer.
 b. Part of the offer was that Sue could use the house.

Intuitions are very clear that *part of* in (41a, b) could not pick out a temporal part of a state, and so needs and offers could not be viewed as states with a temporal part structure.

The notion of a partial content of a modal object goes along with the notion of partial satisfaction (Moltmann 2017a, 2018a):

- (42) a. Part of John's need was satisfied.
 b. John's need was partly satisfied.
 (43) a. Part of the offer was taken up.
 b. The offer was partly taken up.

Modals objects also show properties of concreteness. In particular, they may enter causal relations. John's need may have pushed him to act in certain ways and his medical condition

¹⁸ By contrast, (ia, b), with the *is* of identity, sound false or require very special circumstances, let's say in which the satisfaction of John's need goes along with that of Mary in (ia) or else in which they put in a joint offer in (ib):

(i) a. ??? John's need is Mary's need.
 b. John's offer is Mary's offer.

may have been the cause of his need for a certain medicine. Moreover, the evaluation of modal objects is generally content-based: John's offer can be strange only because *what* John offered, not because of the *way* the offering was done etc.

Modal objects thus share a range of properties with attitudinal objects, in particular their focus on content while being particular and concrete. Yet modal objects differ in one significant respect from attitudinal objects. Unlike the latter, they may endure past the time of the act that established them. Various sorts of illocutionary acts may produce not only illocutionary products, but also modal products that are able to endure for a longer time. An act of commanding may not just produce a command, but may, under the right circumstances, also produce a lasting obligation on the part of the addressee. An act of promising generally produces not only an illocutionary product that is a promise, but also an enduring commitment on the part of the speaker. Also an act of permitting may set up an enduring modal product, namely the permission that the addressee may have for a longer period of time. Similarly, an act of offering creates an enduring product, the offer that may obtain for a period of time beyond the duration of the act.

Sometimes nouns for illocutionary products may also be used to make reference to the corresponding modal object, giving rise to apparent polysemies. Obvious examples are *permission* and *offer*, which can be used to refer both to an illocutionary product and a modal product. In general, the modal product produced by an illocutionary act *e* shares the very same satisfaction conditions with the illocutionary product produced by *e*. Thus, the command and the obligation that have been produced by the same speech act will be satisfied by the very same actions, and so for the promise and the commitment that has been produced along with it. But unlike illocutionary products, enduring modal products do not require subsequent sustaining actions ensuring their persistence, but only the initial act establishing them.

The lifespan of modal products is reflected in the applicability of particular existence predicates that go along with them. In English, such existence predicates are, besides *exist*, *obtain*, *hold* and *be valid*. An obligation that results from an act of demanding may 'hold' or 'obtain', that is, 'exist', for a period of time after the act. Similarly, an offer may 'hold' or 'be valid' for a time past the act of making it, and a permission may 'hold' for a time past the act of giving it.

It is not clear that nouns for illocutionary products that also appear to be usable for modal products are truly polysemous, standing for distinct things at different occasions. They may

rather be viewed as standing for a complex objects, or objects with different facets.¹⁹ Also assertions appear to have a modal component, constituting a state of commitment on the part of the speaker. It is then not obvious that there are illocutionary products without modal component.

If there were, then the difference between illocutionary and modal products should be reflected in the choice of tense in specificational sentences. This is what we see with cognitive product such as thoughts, as opposed to modal products. Thus past tense is required in (44a) if John's thinking was in the past, but in (44b) present tense may be used if the modal product, the obligation, was produced in the past:

- (44) a. John's thought was / ??? is that the problem is unsolvable.
 b. John's obligation is to solve the problem.

With illocutionary products produced in the past both tenses appear to be possible, indicating the presence of a modal component in the illocutionary product:²⁰

- (45) a. John's promise was / is to solve the problem.
 d. John's claim is / was that he problem is solvable.

Not only modal products described by nominalizations such as obligations and permissions may be produced by illocutionary acts, also laws and regulations may be produced that way.²¹ A law that is established by an act of declaring or passing it will generally endure beyond the act itself. A law exhibits the same characteristics of modal products. It has satisfaction and violation conditions, it enters similarity relations based on shared content, and it has a part structure based on partial content. It also has properties of concreteness, having a generally limited life span and being potentially causally efficacious. Finally, it shares the particular existence predicates specific to modal products. Like an obligation, a law may 'hold' or 'be valid' past the act of establishing it.

¹⁹ See Arapinis/Vieu (2015) for a recent approach to apparent polysemies of that kind.

²⁰ In Moltmann (2016) I argued that promises can only be viewed as illocutionary products and that assertions do not have a modal component, mistakenly so, I now think. Promises and assertion do carry a modal component.

²¹ These entities, just like illocutionary and cognitive products, would classify as 'abstract artifacts' in the sense of Thomasson (1999), that is, as artifacts that lack a material realization.

The fact that modal products share satisfaction conditions with the illocutionary product produced by the same illocutionary acts accounts for certain semantic connections between modal sentences and sentences describing illocutionary acts. In particular, deontic modals may anaphorically relate to the illocutionary product introduced by an illocutionary or attitudinal verb as in the inferences from the a-sentences to the b-sentences below (under suitable conditions)

(46) a. John asked Bill to leave the room.

b. Bill must leave the room.

(47) a. John promised to come.

b. John must come.

(48) a. John allowed Bill to leave.

b. Bill may leave.

(46a, 47a, 48a) involve illocutionary products, and (46b, 47b, 48b) the associated enduring modal products, the obligation or permission.

Deontic modals of course need not involve modal products produced by a particular directive act described in the context. They may also involve modal products of the sort of laws, rules, or conditions of various sorts whose origin may not be specified in the discourse.

Enduring normative products are clearly part of our social ontology in general, and they are well-reflected in natural language, in the semantic behavior of nominalizations of the sort *commitment*, *obligation*, *permission*, and *offer*. Modal products share relevant properties with cognitive and illocutionary products, most importantly satisfaction conditions, similarity based on shared content, and a part structure based on partial content, as well as particularity and concreteness (coming into existence and going out of existence at a particular time, causal efficaciousness), but they do not display the action-related aspects of the latter.

5. The role of modal objects in the semantics of modal sentences

Do modal objects play a role for the semantics of modal predicates and not just for the semantics of nominalizations? I will just make a few remarks on the possible role of modal objects for the semantics of modal predicates.

First, modal objects are good candidates for being Davidsonian implicit arguments of modal predicates. Indications for that are the adverbials that can apply to modal predicates:

temporal adverbials as well as, for at least certain modal predicates, degree adverbials such as *quite* and *very (much)* (*John is quite obliged to help out, John very much need to study*).

As implicit arguments of modal predicates, modal objects may play an even more important role than being the target of the application of adverbials. In Moltmann (2017, 2018), I developed a semantics of modal sentences according to which modal objects are considered the central entities in a novel semantics of modals. According to that semantics, which I call *object-based truthmaker semantics*, modals do not represent quantifiers ranging over possible worlds but rather predicates of modal objects. Also the clausal complement, subject clause, or prejacent of the modal, *the sentential unit* associated with the modal, acts semantically as a predicate of the modal object, specifying its satisfaction conditions. This is given for (49a) in (49b), where (setting syntactic details aside) the syntactic unit *Bill to leave* serves to specify the satisfaction conditions of the modal object *d*, a need:

(49) a. Bill needs to leave.

b. $\exists d(\text{need}(d, \text{Bill}) \ \& \ [\text{Bill to leave}](d))$

(50a), with a deontic modal of permission, will have the very same logical form, as in (50b):

(50) a. Bill is allowed to leave.

b. $\exists d(\text{is allowed to}(d, \text{Bill}) \ \& \ [\text{Bill to leave}](d))$

In (50b), the sentential unit *Bill to leave* specifies the satisfaction conditions of the modal object *d*, a permission.

How does the sentential unit associated with the modal specify the satisfaction conditions of the modal object? It does so by characterizing its satisfiers and possibly violators. Satisfiers of a modal object are actions or situations that satisfy (fulfill/comply with) the modal object, which are considered exact truthmakers in the sense of Fine's (2017) Truthmaker Semantics.

Within object-based truthmaker semantics, the difference between modal objects of necessity (e.g. obligations) and modal object of possibility (e.g. permissions) resides in that the latter have only satisfiers, but the former have satisfiers and violators, actions or situations that violate or contravene the modal object. Thus, permissions allow certain actions, those they permit. Obligations not only allow for certain actions, those that comply with them; they also exclude certain actions, those violating them. The permission for Bill to leave allows for actions of Bill leaving, but does not exclude any other actions. By contrast, the obligation for

Bill to leave allows for actions of Bill's leaving and excludes actions of Bill's staying. That is, permissions have only satisfiers, whereas obligations have both satisfiers and violators. Also illocutionary products can be distinguished in terms of having or not having violators. An offer has only satisfiers, but no violators; a request has both satisfiers and violators. Modals of necessity and modals of possibility thus lead to exactly the same logical form, but involve different kinds of modal objects with different satisfaction and violation conditions. The result is an account of the semantics of modal sentences that differs radically from the standard one based on quantification over possible worlds.

6. Modal objects other than deontic modal objects

Modal objects are particularly well-motivated as semantic values of nominalizations of deontic modals and implicit arguments of deontic modal verbs. We have rather robust intuitions about things like obligations and permissions, which are well reflected not only in the nominalizations we use to refer to them, but also in abstract artifacts such as laws, which are of the same nature.

For other modal predicates the correlation with a corresponding nominalization is less obvious. The ability modals *able* or *capable* in English come with the nominalizations *ability* or *capability*. Abilities share a range of properties with deontic modal objects. Abilities do not have satisfaction conditions, but they have what one may call 'manifestations conditions', which play the same sort of role. Abilities then are on a par with modal objects of permission (rather than obligations), having what corresponds to satisfiers, the manifestations of the ability, but no violators. Abilities appear to enter similarity relations based on the similarity of their manifestations and thus shared content. Moreover, abilities have a part structure based on partial content rather than temporal parts: *part of John's ability* cannot refer to a temporal part, but only to part of what the ability consists in or how it manifests itself. Abilities also display properties of concreteness, in that they come about and cease to exist at a certain time. Moreover, they can be compared in strength: John's ability may be greater than Bill's etc. However, abilities are not generally suited as the modal objects associated with the predicate *be able*. *John was able to speak* does not entail *John had the ability to speak*. *Ability* stands for dispositions, but *able* may just involve an episodic state. This does not mean that *be able* does not involve a modal object; it only means that that modal object would not be denoted by the nominalization of *able*.

Possibility is a nominalization of a modal predicate that can go along with various modal flavors, including epistemic ones. But it does not actually stand for an object that shares the characteristic properties of modal objects (and attitudinal objects). Possibilities not come with satisfaction conditions and a part structure based on partial content. The latter is illustrated by the fact that that (51) is hard to make sense of:

(51) ??? Part of the possibility we are considering is that John might return today.

Instead, possibilities appear to be on a par with non-worldly facts; that is, they would be merely possible non-worldly facts. This means *possibility* would involve Strategy 2 for introducing an object, that is, the introduction of an object by abstraction, along the lines of the Kimean account of events.

Modal auxiliaries such as *may*, *might*, *must*, *should*, *can*, and *could* do not come with nominalizations, and thus overtly expressed modal objects. This means in particular that there are no nominalizations in English for epistemic modal objects. The absence of suitable nominalizations of modals of the non-deontic sort does not mean, though, that such modals should not have the same semantics of was given for deontic modals. It just means that there is less overt linguistic support for it than in the case of deontic modals.

Conclusion

Nominalizations of the sort this paper has discussed, nominalizations of ‘philosophical entities’, have been at the center of philosophical discussions for a long time. The paper has argued that a new ontological category needs to be acknowledged for nominalizations of modal predicates, the category of modal objects, which is close to that of attitudinal objects, a category of objects distinct from that of events and states reflected in nominalizations of attitude verbs. This paper has distinguished three different strategies with which nominalizations introduce objects and argued that they are all involved in the introduction of modal objects.

References

Alexiadou, A. (2010): ‘Nominalizations: a probe into the architecture of grammar. Part II: the aspectual properties of nominalizations, and the lexicon vs. syntax debate.’ *Language and*

- Linguistics Compass* 4, 512-523.
- Alexandra A. / L. Vieu (2015): 'A Plea for Complex Categories in Ontologies'. *Applied Ontology*, IOS Press, 2015, vol. 10 (n° 3-4), pp. 285-296.
- Asher, N. (1993): *Reference to Abstract Objects in Discourse*. Kluwer, Dordrecht
- Austin, J. L. (1979): 'Unfair to Facts'. *Philosophical Papers*. Oxford University Press, New York.
- Chierchia, G. (1984): *Topics in the Syntax and Semantics of Infinitives and Gerunds*. Ph.D. Thesis, University of Massachusetts, Amherst.
- Campbell, K. (1990): *Abstract Particulars*. Blackwell, Oxford.
- Davidson, D. (1967): 'The Logical Form of Action Sentences'. In N. Rescher (ed.): *The Logic of Decision and Action*. Pittsburgh UP, Pittsburgh, 81–95.
- Fara Graff, D. (2013): 'Specifying Desires'. *Noûs* 47(2), 250-272.
- Fine, K. (2017): 'Truthmaker Semantics'. In Bob Hale / Crispin Wright / Alex Miller (eds.): *A Companion to the Philosophy of Language*, John Wiley & Sons, Ltd, Chichester, UK (online).
- Frege, G. (1884): *Die Grundlagen der Arithmetik* („Foundations of Arithmetic')
- Gerner, M. (2017): 'Actions and Products across Languages'. In Textor / Moltmann (eds.) (2017).
- Grimshaw, J. (2011): 'Deverbal Nominalization.' *Semantics: An International Handbook of Natural Language Meaning*, Vol. 2, ed. by Klaus Von Heusinger, Claudia Maienborn, and Paul Portner. Walter de Gruyter.
- Hale, B. (1987): *Abstract Objects*, Basil Blackwell, Oxford.
- Harley, H. / Noyer, R. (1999): 'State-of-the-Article: Distributed Morphology', *GLOT International*, 4 (4): 3–9.
- Harves, S. / R. Kayne (2012): 'Having 'need' and 'needing' have'. *Linguistic Inquiry* 43. 120–132.
- Higginbotham, J. (1985): 'On semantics'. *Linguistic Inquiry* 16, 547—595.
- (2000): 'On events in linguistic semantics'. In Higginbotham, J. / F. Pianesi / A. Varzi (eds.), *Speaking of Events*. Oxford University Press.
- Hofweber, T. (2007): 'Innocent Statements and their Metaphysically Loaded Counterparts'. *The Philosophers' Imprint*, Vol. 7 no. 1, 1–33.
- Kim, J. (1976): 'Events as Property Exemplifications'. In M. Brand / D. Walton (eds.): *Action Theory*. Reidel, Dordrecht, 310-326.
- Lowe, J. (2006): *The Four-Category Ontology. A Metaphysics Foundation for Natural*

Science. Oxford UP.

- Maienborn, C. (2007): 'On Davidsonian and Kimian States'. In I. Comorovski / K. von Heusinger (eds.): *Existence: Semantics and Syntax*. Springer, 107-130.
- Moltmann, F. (2003): 'Nominalizing Quantifiers'. *Journal of Philosophical Logic*.35.5., pp. 445-481.
- (2007): 'Events, Tropes and Truthmaking'. *Philosophical Studies* 134, 2007, 363-403.
- (2009): 'Degree Structure as Trope Structure'. *Linguistics and Philosophy* 32.1., 51-94.
- (2013a): 'On the Distinction between Abstract States, Concrete States, and Tropes'. A. Mari / C. Beyssade / F. Del Prete (eds.): *Genericity*, Oxford UP, Oxford, 2013, pp. 292-311
- (2013b): *Abstract Objects and the Semantics of Natural Language*. Oxford UP, Oxford.
- (2013c): 'Reference to Numbers in Natural Language'. *Philosophical Studies* 162.3., pp. 499-534.
- (2014): 'Propositions, Attitudinal Objects, and the Distinction between Actions and Products'. *Canadian Journal of Philosophy*, supplementary volume on propositions, edited by G. Rattan and D. Hunter, 43.5-6, pp. 679-701.
- (2015): 'States vs Tropes. Commentary on Marcyn Morzicki: 'Degrees as Kinds of States''. *Natural Language and Linguistic Theory* 33.3., special issue edited by B. Gehrke and E. Castroviejo Miró, pp. 829-841.
- (2017a): 'Cognitive Products and the Semantics and Attitude Verbs and Deontic Modals'. In F. Moltmann / M. Textor (eds.).
- (2017b): 'Partial Content and Expressions of Part and Whole. Discussion of Stephen Yablo: *Aboutness*'. *Philosophical Studies* 174.3., 797-808.
- (2018): 'An Object-Based Truthmaker Theory for Modals'. *Philosophical Issues* 28.1., 'Philosophy of Logic and Inferential Reasoning', edited by C.F. Juhl and J. Schechter, pp. 255-288.
- (2019): '*Attitudinal Objects. Their Importance for Philosophy and Language Semantics*'. In B. Ball and C. Schuringa (eds.): *The Act and Object of Judgment*. Routledge Studies in Contemporary Philosophy, Routledge, 180-201.
- Moltmann, F. / M. Textor (eds.) (2017): *Act-Based Conceptions of Propositions: Contemporary and Historical Contributions*. Oxford UP, Oxford.

- Montague, R. (1969): 'On the Nature of Certain Philosophical Entities'. *The Monist* 53. 2, *Logic, Ontology, and Linguistics*, pp. 159-194
- Schiffer, S. (1996): 'Language-Created and Language-Independent Entities'. *Philosophical Topics* 24.1., 149-167.
- (2003): *The Things we Mean*. Oxford UP, Oxford.
- Strawson, P. (1950): 'Truth', *Proceedings of the Aristotelian Society*, reprinted in Strawson 1971, *Logico-Linguistic Papers*, Methuen, London, 1971.
- Twardowski, K. (1911): 'Actions and Products. Some Remarks on the Borderline of Psychology, Grammar, and Logic'. In J. Brandl/J. Wolenski (eds.): *Kazimierz Twardowski. On Actions, Products, and Other Topics in the Philosophy*. Rodopi, Amsterdam and Atlanta, 1999, 103-132. Reprinted in Moltmann / Textor (to appear).
- Ulrich, W. (1976): 'An Alleged Ambiguity in the Nominalizations of Illocutionary Verbs'. *Philosophica* 18, 113-127.
- Williams, D. C. (1953): 'On the Elements of Being'. *Review of Metaphysics* 7, 3-18.
- Woltersdorff, N. (1970): *On Universals*. Chicago UP, Chicago.