

# How verbs are conceived and born: three theories

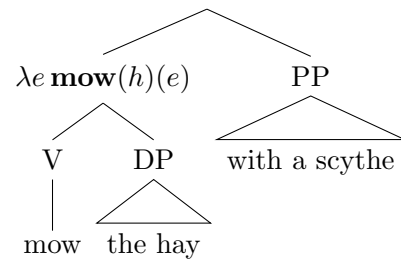
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## 1 The first theory: simple sets of eventualities

According to the first theory, once something is a verb, it basically denotes a (function to a) set of events, or more generally eventualities.

- (1) mow the hay with a scythe

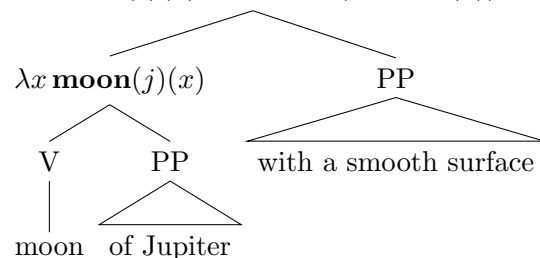
$\lambda e \text{mow}(h)(e) \wedge \text{scythe}(\text{instrument}(e))$



This simple and standard theory mirrors the simple and standard theory where a **noun** basically denotes a (function to a) set of **individuals**:

- (2) moon of Jupiter with a smooth surface

$\lambda x \text{moon}(j)(x) \wedge \text{smooth}(\text{surface}(x))$



## 2 The second theory: kinds of eventualities

[N]atural language ontology includes both kinds . . . and tokens. Crucially, this distinction is relevant across the subsorts of the entity domain: in addition to being able to refer to kinds of objects alongside token objects, we can refer in an analogous way to kinds of events alongside token events . . . . (Grimm and McNally 2015: 86f.)

- (3) . . . the category of Eric Clapton playing the guitar

“will include many tokens that have occurred in many places at many times”.

Now if what a verb denotes is a kind of events, for most purposes it must be type-shifted to denoting a set of token events, those that **realize** the kind. For we rarely need to refer to a kind of event as an atomic entity; candidate contexts are perception verbs or predications over verbal nominalizations:<sup>1</sup>

- (4) Have you ever seen it snow?<sup>2</sup>  
 (5) Briefmarken sammeln ist out.  
 stamps collect.INF is out

The shift can be accomplished by the event analogue to the ‘predicativizing’ ‘up’ functor (Chierchia 1989),  $\mathcal{R}$  is the realization relation (Carlson 1980):

- (6)  $\llbracket \cup \text{row} \rrbracket^w = \lambda e \mathcal{R}_w(\mathbf{row}_w)(e)$

That a verb denotes a kind of events is the event analogue to the proposal by Zamparelli (2000) that a noun denotes a kind of objects and comes to denote a set of objects through a type-shift licensed by, e.g., number morphology. For verbs, a corresponding type-shift could be licensed by Aspect.

Alongside the functor KO ( $\approx \cup$ ), Zamparelli assumes an alternative functor KSK that can convert kinds to sets of sub-kinds, relevant for cases like (7). A counterpart in the domain of events would be relevant for cases like (8).

- (7) Woods had been prescribed two drugs, Ambien and Vicodin.  
 (8) But as soon as the desire left them, the two erstwhile angels became aware that on their first night on earth they had sinned twofold – in murder and fornication.

<sup>1</sup>According to Alexiadou, Iordăchioaia and Schäfer (2011), German ‘verbal infinitives’ refer only to generic events.

<sup>2</sup>Grimm and McNally (2015) cite Barwise and Perry (1983) on ‘situation types’.

### 3 The third theory: sets of kinds of eventualities

Since Dayal (2004), it has become more and more customary to assume that a noun basically denotes a set of kinds of objects or, if it is an event noun, a set of kinds of events (see, e.g., McNally and Boleda 2004, Espinal 2010, Aguilar-Guevara and Zwarts 2010, Gehrke and McNally 2015).

More recently still, some scholars, like Gehrke (2015) and Mueller-Reichau (2015), have argued that a verb basically denotes a set of kinds of events.

... the stronger claim that VPs and NPs are predicates of kinds, which get instantiated only when additional functional structure is added (Asp or Num) ... (Gehrke 2015: 919)

... the hypothesis that verbal predicates are predicates of event kinds which get instantiated only when verbal structure is directly embedded under Tense/Aspect, ... (Alexiadou, Gehrke and Schäfer 2014: 193)

Arguments come from various sources, but in particular, from

- (i) adjectival passives in German and
- (ii) factual imperfectives in Russian.

Both phenomena provide evidence that events “remain in the kind domain”.

#### 3.1 Arguments from adjectival passives

In a series of articles culminating in (2015), Berit Gehrke has argued that the characteristics of German adjectival passives can best be accounted for if adjectivization is taken to operate on a participle phrase which denotes a relation  $P$  between an object  $x$ , a state  $s$  and an event kind  $e_k$ .

$$(9) \quad \llbracket A^0 \rrbracket = \lambda P \lambda x \lambda s \exists e_k P(y)(s)(e_k)$$

In this way, adjectivization literally closes off the event variable so that the event kinds never get instantiated but are trapped at the level of kinds.

If the verb is *mäh*- ‘mow’, the participle has a meaning as defined in (10) and the homophonous adjective has a meaning as defined in (11).

$$(10) \quad \llbracket \underset{\text{Prtp}}{\text{gemäht}} \rrbracket = \lambda x \lambda s \lambda e_k \exists y \mathbf{mäh}(e_k) \wedge \mathbf{gemäht}(s) \wedge \text{BECOME}(s)(e_k) \wedge \text{THEME}(s)(x) \wedge \text{AGENT}(e_k)(y)$$

$$(11) \quad \llbracket \underset{A}{\text{gemäht}} \rrbracket = \lambda x \lambda s \exists e_k \exists y \mathbf{mäh}(e_k) \wedge \mathbf{gemäht}(s) \wedge \text{BECOME}(s)(e_k) \wedge \text{THEME}(s)(x) \wedge \text{AGENT}(e_k)(y)$$

Why is it desirable to do it this way? Because there are severe restrictions on event modification in adjectival passives, and these restrictions are accounted for if there are no event tokens, only event types, or kinds, to be modified.

For one thing, “the underlying event ... cannot be modified by temporal or spatial modifiers” (Gehrke 2015: 901).

- (12) Das Boot sei erst kurz vor der Fahrt am Strand  
 the boat is.SUBJ only shortly before the voyage on.DEF beach  
 aufgepumpt #(worden).  
 inflated #(become)  
 ‘The boat had been inflated on the beach right before departure.’

Secondly, it can only be modified by **some** modifiers that specify manner, instrument, or agent: they have to provide well-established event sub-kinds. So arguably, any modifier that does not modify the states must modify the event kinds. Here are some examples of *by* phrases:

- (13) Dieses Buch ist von einer Frau geschrieben.  
 this book is by a woman written  
 ‘This book is written by a woman.’<sup>3</sup>  
 a. ?Dieses Buch ist von einer jungen Frau geschrieben.  
 this book is by a young woman written  
 b. #Dieses Buch ist von einer blonden Frau geschrieben.  
 this book is by a blonde woman written

Noteworthiness can contribute to well-establishedness:

- (14) Dieser Satz hätte von Goethe geschrieben sein können.  
 this sentence had.SUBJ by Goethe written be can.INF  
 ‘This sentence could have been written by noone lesser than Goethe.’

Instrument modifiers typically involve bare nouns or weak definites.

- (15) Die Adresse war mit Füllfeder geschrieben.  
 the address was with fountain-pen written  
 ‘The address was written with a fountain pen.’

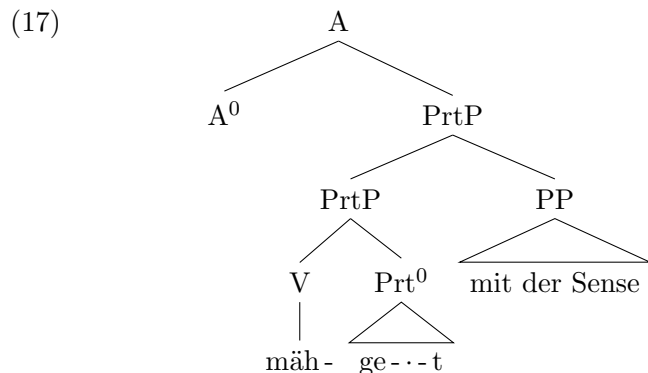
This is suggestive of pseudo-incorporation, and in fact, Gehrke (2015: 924) claims that event-related modifiers pseudo-incorporate into the participle.

<sup>3</sup>Robert Musil: *Der Mann ohne Eigenschaften*

Let us look more closely at a case with a weak definite:

- (16) mit der Sense gemäht  
with the scythe mown  
'mown with a scythe'

The syntactic structure is more or less as in (17).



Though it is not fully clear how it is built formally, the meaning of the whole is something like (18).

- (18)  $\llbracket (16) \rrbracket = \lambda x \lambda s \exists e_k \exists y_k \mathbf{mow}(e_k) \wedge \mathbf{mown}(s)(x) \wedge \mathbf{BECOME}(s)(e_k) \wedge \mathbf{scythe}(\mathbf{INSTRUMENT}(e_k)) \wedge \mathbf{AGENT}(e_k)(y_k)$

Questions remain, in particular, what does it mean for a scythe as an object (kind) to be an instrument, or for an object kind to be an agent, of an event kind; or for a state kind to come about as a result of an event kind.

It is also a question whether adjectival passive sentences like those in (19a) should not entail the corresponding perfect verbal passive sentences, (19b).

- (19) a. Sie ist gerichtet! – Ist gerettet! (Goethe: *Faust*)  
she is doomed – is saved  
b. Sie ist gerichtet worden! – Ist gerettet worden!  
she is doomed become – is saved become

“From a pragmatic point of view, we most likely infer that such events have taken place, but from a strictly semantic point of view it is not asserted”. By the same token, (13) does not according to the theory as it stands entail the existence of an actual writing event by an actual woman. – Anyway:

The argument is that event kind modification means pseudo-incorporation – and conversely, though less explicitly, that pseudo-incorporation generally concerns kinds. Regarding the general restriction to stereotypical activities,

Even if it is less clear how to make this restriction more precise, this holds for all other cases that have been analysed as pseudo-incorporation. (Gehrke 2015: 933)

Hallmarks of pseudo-incorporation are thus seen as evidence of event kinds. Broadly the same reasoning underlies the arguments from Russian aspect.

### 3.2 Arguments from factual imperfectives

A factual imperfective, as opposed to a progressive or habitual imperfective, is when you use the imperfective to situate an event within a time interval, so the existence of an event of the described type is entailed or presupposed – much as you would do with the perfective.<sup>4</sup> – Still, there are pronounced differences between the perfective and the factual imperfective(s).

One is that

bare singular NPs . . . show the typical properties of pseudo-incorporated constituents (Mueller-Reichau 2015):

- narrow scope only
- reduced discourse transparency
- bad support for pronominal anaphora
- establishedness effects

For example, the discourse in (20) can only have a progressive reading:

- (20) Ja našel jedno strausinoe jajco i dva kokosovych orecha.  
I found.PF one ostrich egg and two coco nut  
'I found one ostrich egg and two coconuts.'  
Ja el strausinoe jajco.  
I ate.IPF ostrich egg  
'I ? have eaten / was eating the ostrich egg.'

The same is true of the discourse in (21):

<sup>4</sup> A key source is Grønn (2004), who introduced a distinction between existential and presuppositional factual imperfective. In fact, the differences in focus in the following only concern the former kind of factual imperfective.

- (21) Ja el        strausinoe jajco.  
 I ate.IPF ostrich egg  
 ‘I have eaten / was eating an ostrich egg.’  
 Ono bylo     podarkom Ivana.  
 it was.IPF gift Ivan  
 ‘It was a present from Ivan.’

As for establishedness effects, consider the contrast in (22), and (23):

- (22) a. Ja el        strausinoe jajco.  
 I ate.IPF ostrich egg  
 ‘I have eaten / was eating an ostrich egg.’  
 b. Ja el        černoje jajco.  
 I ate.IPF black egg  
 ‘I ? have eaten / was eating a black egg.’
- (23) V Amerike est’ kuricy, kotorye nesut čeranye jajca.  
 in America exist chicken which lay black eggs  
 Ja el        černoje jajco.  
 I ate.IPF black egg  
 ‘I have eaten / was eating (such) a black egg.’

According to Mueller-Reichau (2015), these constraints follow if we assume that the arguments compose with the verb at kind level, and this, in turn, follows from the analysis: the existential-factual imperfective aspect phrase, AspP-ipf<sup>3</sup>, is partitioned into presupposition and at-issue content:<sup>5</sup>

- (24)  $\lambda t [e \mid \mathcal{R}(e_k)(e), e \subseteq t] [x_k, e_k \mid P(x_k), Q(e_k), \mathbf{theme}(e_k)(x_k)]$

The at-issue content is that there is a realization of a presupposed event kind  $e_k$  within a time interval  $t$  – cf. Padučeva (2006): focus on the realization. Now if the  $P$  argument were a token object argument to a  $Q$  token event  $e$ ,  $e$  would occur free in the presupposition and it would not be interpretable, for a discourse referent occurring in the at-issue content can be introduced in the presupposition but not the other way around (Kamp and Reyle 1993: 111). Consequently, only kind level events or objects can come from the VP.

Again, questions remain, such as what it means for a kind of ostrich egg to be a theme of a kind of eating. But then again, the major focus is on how signs of pseudo-incorporation can be used as evidence for event kinds.

<sup>5</sup>DRT notation where the presupposition DRS is subscripted.

## 4 Evidence from event nominals

There may in fact be more direct evidence to be found, evidence that event kinds exist if not that they are what verbs basically denote.

There are **words** that can only denote sets of event kinds, but there do not seem to be verbs that can only denote sets of event kinds.

Nouns, however, there are (section 4.2), and NPs with frequency adjectives (section 4.1).

### 4.1 Event nominals and distributional modifiers

Gehrke and McNally (2015) develop an analysis of temporal-distributional adjectives like *daily* or *sporadic* as modifiers of singular nominals.<sup>6</sup>

The nominal has to, and the NP will, denote a set of event kinds.

- (25) The patients continue treatment at a rehabilitation facility . . .  
 plus one daily exercise at home (5 min).  
 (26) Not every daily task is glamorous, but it is a task for a reason.

Nouns that may seem not to denote sets of event kinds are easy to coerce:

- (27) Calvin and Hobbes is a daily comic strip by American cartoonist Bill Watterson that was syndicated from 1985 to 1995.  
 (28) World’s oldest person Jeanne Calment enjoys her daily cigarette and glass of wine on the occasion of her 117th birthday.

Simplifying somewhat, the analysis of one reading of *one daily exercise* is:

- (29)
- 
- ```

graph TD
  DP --> D[one]
  DP --> NumP
  NumP --> NP
  NumP --> Num[∅]
  NP --> A[daily]
  NP --> N[exercise]
  
```

<sup>6</sup>Note that this is just one of several uses of frequency adjectives analyzed by them.

- (30)  $\llbracket \text{exercise} \rrbracket^i = \lambda e_k \mathbf{exercise}_i(e_k)$
- (31)  $\llbracket \text{daily} \rrbracket^i = \lambda e_k \mathbf{distribution}(\{e \mid \mathcal{R}(e_k)(e) \text{ at } i\}) = \mathbf{daily}$
- (32)  $\llbracket \text{one} \rrbracket^i = \lambda P \lambda Q \mid P \cap Q \mid = 1$
- (33)  $\llbracket (29) \rrbracket^i = \lambda Q$   
 $\mid \lambda e_k \mathbf{exercise}_i(e_k) \wedge \mathbf{distribution}(\{e \mid \mathcal{R}(e_k)(e) \text{ at } i\}) = \mathbf{daily} \cap Q \mid$   
 $= 1$

Summing up: for frequency adjectives to make sense together with singular nouns, the nouns must be interpreted as denoting sets of kinds of events.

## 4.2 Event kind level nominals

There are an array of event nouns that can only denote sets of event kinds, or preferably so anyway, without anyone much noticing. Among these are:

- *art, craft, duty, hobby, sin, pastime, sport, vice, virtue*

How do we know that they do not denote event kinds or sets of event tokens? First, note that they can evidently be predicated of event kinds:

- (34) Protecting the environment is a Christian duty not just reserved for ‘green’ activists, Pope Francis said today.

Second, it can be problematic to predicate them of event tokens:

- (35) a. ? What he did was a moral duty. (B. von Stauffenberg)  
 b. ? There are three sports going on.  
 c. # One particular sin only took a minute.  
 d. # Every theatre art lasts more than thirty minutes.

Now if, as assumed by Gehrke and McNally (2015), event nominals generally basically denote sets of event kinds and there is a freely available mapping from sets of event kinds to sets of realizations located in Num Sg, cf. (36),

- (36)  $\llbracket \text{Num } \emptyset \rrbracket = \lambda P \lambda e \exists e_k P(e_k) \wedge \mathcal{R}(e_k)(e)$

then it is predicted, contrary to evidence it would seem, that any expression denoting a set of kinds of events can covertly be converted to an expression denoting a set of tokens of events, those that realize one of the event kinds.

Summing up, there is indirect and there is more direct evidence that event kinds are real – but whether the comparatively novel assumption that verbs or event nouns are generally born that way is correct is too early to judge.

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