
On German *seit* – since

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ABSTRACT. In this paper, a single semantics for German *seit* ('since') will be sketched, and it will be shown that there are two basic readings of sentences containing *seit*: the homogeneous and the existential reading. It will be argued that it is the predicate of the main clause and its properties that decide which reading is retained. It will be proposed that it is the presence of an extended measure function that triggers existential readings.

1 Introduction

Like its English counterpart *since*, German *seit* can be used with localising temporal expressions (e.g., *yesterday*, *2001*, *etc.*):

- (1) a. My car's been broken since Monday.
b. Mein Auto ist seit Montag kaputt.¹
My car is since Monday broken.

Contrary to *since*, however, *seit* is also compatible with durational temporal expressions (e.g., *three weeks*, *two years*, *etc.*), where in English one would have to use *for*:

- (2) a. *John has been to Boston since two weeks.
b. John has been to Boston for two weeks.
c. Hans ist seit zwei Wochen in Boston.
H. is since two weeks in Boston.

Note that (2b) is ambiguous in a way that (2c) isn't: (2b) can be understood in a way that there was a 2-week-period at some time in the past where John has been to Boston; this interpretation is often referred to as an "existential" interpretation. The German sentence (2c), with a simple present, does not display this existential interpretation; the only reading possible is that there is a two-week-period immediately preceding and including the moment of utterance in which the predicate *be-in-Boston(j)* is true. For (2b), this reading is referred to as the "universal" reading.

¹Note that *kaputt* ('broken') is an adjective, and not a participle.

To the best of my knowledge, scholars dealing with *seit*² were not principally concerned about the lexical semantics of this adverbial, but rather with the fact that in English sentences like (1a) and (2b), one must use the Present Perfect, whereas in the German sentences (1b) and (2c), the simple Present Tense is used.

I presuppose that the general architecture of a (German) sentence is like follows:

- (3) [Tense [Perfect [Aspect [*Aktionsart*]]]]

I suppose that *Tense* and *Aspect* are obligatory functional categories, which are present once and only once per sentence. *Perfect* is an optional category, that may or may not be present in a sentence; crucially, Present Perfects will trigger it.

Seit denotes an interval. The right boundary of the *seit*-interval is given by the interval introduced by *Tense*. This is, in the simplest of all cases, the moment of utterance, when the sentence is in Present Tense. The left boundary of the *seit*-interval is given by the interval denoted by a localizing temporal expression, like *Monday*. If the complement of *seit* is a durative temporal expression, I suppose there to be a sort of covert “*ago*”-operator which turns the durative temporal expression into a localizing temporal expression. In order to see this, let’s look at the following:

- (4) Charles coughed an hour ago.

The idea is that *ago* takes the durative *an hour* and gives us a localizing temporal expression. *An hour ago* now denotes the left endpoint of an interval whose duration is one hour and whose right boundary is the moment of speech.³ *Seit* will then be able to take as argument this newly formed constituent “*ago* + durative complement”. In this way, we get one single semantic representation for *seit*, instead of three, as it is the case in von Stechow (2002).

Syntactically, I suppose that *seit* is outscoped by *Tense*, and outscopes *Aspect*. This means that in case of a Perfect operator, there may be two possible positions of *seit*: it may outscope, or be outscoped by, the Perfect operator. In case of *seit* being above *Perfect*, the *seit*-interval will coincide temporally with the resultant state of the base eventuality. Traditionally, this is what is called *resultative* Perfect. In case of *seit* being below *Perfect*, the *seit*-interval will contain inner stages of the base eventuality, once the stages have been “filtered” by aspect. This second configuration might in principle give rise to *universal* or *existential* Perfects.

Having sketched my base assumptions,⁴ I will try to show that these assumptions do not suffice to explain the data, and I will propose that one should distinguish two types of readings relevant with *seit*, an issue that is in part orthogonal to considerations on tense.

²See, for instance, von Stechow (2002), Rathert (2003), Musan (2003) or Musan (2002).

³The motivation for this move comes from Spanish, where we have an overt “*since ago*” (sp.: *desde hace*) in those constructions.

⁴A full and formal exposition of the semantics of *seit* and the tense-aspect system involved is impossible, given the space restrictions. I hope that my sketch of the semantics of *seit* is sufficiently clear to enable readers familiar with a framework like Pancheva (2003) to guess the general picture.

2 The two interpretations of *seit*

I will try to shed light on the behaviour of *seit* by characterizing the eventualities it applies to with the notional apparatus taken from Krifka (1992) and Krifka (1998), as *Aktionsart* seems to play the determining role in the general picture.⁵

I will try to establish 2 *prima facie* different readings of *seit*, namely the *homogeneous* and the *existential* reading. This distinction will be based on the following three criteria: First, only homogeneous readings allow for a durative temporal expression (e.g. *two hours*) as complement of *seit*; second, only homogeneous readings allow for the Simple Present Tense for the main verb of the sentence; and third, only the existential reading allows for focalizing on inner stages of the eventuality with a Present Perfect.

For reasons of space, I will take it for granted, rather than show, that any combination whatsoever with *seit* and a localizing temporal expression (e.g., *yesterday*) is felicitous.

2.1 Homogeneous readings

An observation that has been made several times in the literature is that *seit* with Simple Present Tense on the main verb is limited to eventualities with homogeneous reference (that is, activities and states), and other eventualities that can be somehow coerced into being homogeneous:

- (5) a. Anna schläft seit fünf Minuten.
A. sleeps since five minutes.
Anna has been sleeping for (the last) five minutes.
- b. ?Otto schläft seit fünf Minuten ein.
O. sleeps since five minutes in.
Otto has been falling asleep for (the last) five minutes.
- c. ??Isidor gähnt seit gestern drei Mal.
I. yawns since yesterday three times.
Isidor has been yawning three times since yesterday.

The homogeneous (5a) is just fine. The telic (and thus non-homogeneous) eventuality (5b) is acceptable to the extent that one can coerce **fall-asleep(o)** into its preparatory phase and predict its final outcome; for (5c) – a semelfactif, and thus non-homogeneous in principle –, the only way to interpret the sentence seems to be some generic interpretation: Whenever Isidor yawns, he does it three times (but before, he habitually yawned only twice). Generics are usually considered to be state-like, and thus homogeneous, too.

In the examples in (5), we had the (homogeneous part of the) inner stage of the eventuality fitting into the *seit*-interval. This is the only possibility with a simple present tense. In case of a Present Perfect, we also may get a homogeneous readings, namely if it's the

⁵The role of *Aktionsart* is not really surprising: in German, aspect is a covert category, so that one would expect *Aktionsart* to have an important impact on aspectual patterns.

resultant state that fits into the *seit*-interval, like in (6). This means that syntactically, *seit* outscopes *Perfect* in the following examples:

- (6) a. Anna ist seit fünf Minuten eingeschlafen.⁶
 A. is since five minutes in-slept.
 Anna has fallen asleep (has been sleeping) for five minutes.
- b. Wolfgang hat Diano seit Freitag verlassen.
 W. has Diano since Friday left.
 Wolfgang has left Diano (has been out of) Diano since Friday.

In (6), as expected, the eventuality *fall-asleep(a)* or *leave(w,d)* is properly anterior to the *seit*-interval.

Notice, that there is no reading for the examples in (6) corresponding to their Present Perfect Progressive equivalents in English, that is: the preparatory stage of *fall-asleep(a)* or the inner stage of *leave(w,d)* may not be included in, or last throughout, the *seit*-interval.

Notice also that there is no problem with *seit* and a durational temporal expression, as (6a) shows.

2.2 Existential readings

I dub the second group of readings with *seit* the “existential” ones, because they only occur with an (existential) Perfect. *Seit* seems to restrict the period for which the predicate is asserted; its syntactic position is below *Perfect*.

- (7) a. Isidor ist drei Mal in Boston gewesen.
 I. is three times in B. been.
 Isidor has been in Boston three times.
- b. Isidor ist seit 2001 drei Mal in Boston gewesen.
 I. is since 2001 three times in B. been.
 Since 2001, Isidor has been in Boston three times.

(7a) is an assertion over the whole life-span of Isidor – unless the interval of evaluation is contextually restricted; in (7b), *be-in-boston(i)* is only evaluated with respect to the *seit*-interval.

The crucial difference to (6) is the following: in (7b) there is no reading where Isidor has been to Boston three times *before* 2001, and in which the *seit*-interval marks the post-time of his three-times-being-in-boston.

As already shown by (5c), eventualities that display this kind of readings are either not acceptable at all with the Simple Present Tense, or are coerced into a homogeneous reading.

⁶Examples (6) minimally changed from von Stechow (2002), p. 395.

Lastly, although (7b) was fine with a localizing temporal expression, it is no longer acceptable if we have a durational temporal expression as complement of *seit*:⁷

- (8) *Seit 4 Jahren ist Isidor drei Mal in Boston gewesen.
 Since 4 years is I. three times in B. been.

Now, the reader may not be convinced that the distinction between homogeneous readings and existential readings follows from the properties of the eventuality. Wouldn't it be possible that the existential reading was an effect caused by the cardinalizing time adverbial *x times*, as supposed by von Stechow (2002)?

Indeed, it definitely is strange to have a telic predicate without any such cardinality expression in it:

- (9) ??Kunigunde ist seit 2001 nach Venedig gefahren.
 K. is since 2001 to Venice driven.
 Kunigunde has driven to Venice since 2001.

The reading that there is one occurrence of **drive-to-Venice(k)** in the period from 2001 up to now is very unnatural and difficult to get;⁸ in order to convey this reading, any native speaker would add something like *einmal* ('one time'). This is an argument for the assumption that existential readings are caused by *x time(s)*.

However, there are other expressions than this one noted by von Stechow (2002) that favour existential readings; *x time(s)* cannot be the only responsible:

- (10) a. Kunigunde hat seit heute Morgen vier Äpfel gegessen.
 K. has since today morning four apples eaten.
 Kundigunde has eaten four apples since this morning.
 b. ??Kunigunde hat seit einer Stunde vier Äpfel gegessen.
 K. has since one hour four apples eaten.
 Kunigunde has eaten four apples since an hour ago.
 c. ??Kunigunde isst seit einer Stunde vier Äpfel.
 K. eats since one hour four apples.
 Kunigunde has been eating four apples since an hour ago.
 d. Kunigunde hat die vier Äpfel seit heute Morgen gegessen.
 K. has the four apples since today morning eaten.
 Kunigunde has eaten the four apples (they are eaten) since this morning.

⁷The fact that one may not have a durational temporal expression for a *seit*-type adverbial in combination with such eventualities isn't a lexical idiosyncrasy of German; Spanish *desde hace* and French *depuis* aren't very good with such a complement either.

⁸This holds for a sentence pronounced with a normal stress-pattern. There is however one context in which an existential reading is easy to get: if (9) is pronounced with prominent stress on the auxiliary *ist*, which causes an effect that is called *verum-focus*, the existential reading is the only one to be obtained. *Verum-focus* is something very special: it presupposes that the negation of (9) is in the common ground of the conversation, so that it looks like a special instance of metalinguistic negation.

In configuration (10a), the existential reading is predominant; although one may have a (rather marginal) resultant state reading; in (10d), the homogeneous resultant state reading is preferred. There is nevertheless no reading of (10a) or (10d) that could be characterized as “perfect progressive reading”.⁹ (10b) is marginally acceptable under a resultant state homogeneous reading; (10c) is marginally acceptable under a reading “*K. has been eating from 4 apples for an hour now*”, which is a progressive homogeneous reading.

Though some sentences may be ambiguous, they all can be characterized as being either homogeneous or existential. And there is an obvious descriptive generalization to the pattern observed in (10): we get a homogeneous reading if and only if we read *four apples* as a group (in the sense of Landman (2000)), that is, a collective individual, consisting of several individual parts. Going back to the example **eat-four-apples**, the group reading is the one where we have got one single event of eating, and the theme is a group of four apples, that is, one single individual (the group) consisting of four apples.

The group formation on *four apples* has as consequence that we are confronted with one single event, and not a plurality of (possibly temporally disjoint sub-) events. Thus it seems that the homogeneous readings are linked to single events, whereas the existential readings are in some connection with event-plurality.

But before we continue, let’s briefly summarize what we have seen so far:

		HOMOGENEOUS	EXISTENTIAL
(11)	Present Tense	OK	*
	Perfect	OK (iff <i>Perfect</i> < <i>seit</i>)	OK (iff <i>seit</i> < <i>Perfect</i>)
	<i>Seit</i> + durational	OK	*
	<i>Seit</i> + localizing	OK	OK

Combinatorial properties of the two readings of *seit*

In (11), I deliberately did not include any information about the *Aktionsart* properties of the eventualities. Homogeneous eventualities do favour homogeneous readings, but non-homogeneous eventualities do not always lead to existential readings, as (9) shows us.

3 Towards a formal characterization

We have seen so far that the two sorts of eventualities distinguished in the homogenous vs. existential readings do not follow exactly the familiar telic or atelic distinction; in fact, as far as I am aware of, they do not pattern with any natural classes distinguished in the *Aktionsarten*-literature. Crucially, being telic doesn’t seem to be enough to allow for an existential reading.

Traditionnally, atelic eventualities are viewed as being homogeneous, whereas telic eventualities are said to be non-homogeneous.

⁹A Perfect Progressive reading is when the homogeneous part of the inner stages of the eventuality fit into the *seit*-interval.

In order to be explicit, I will assume that being homogeneous corresponds to being at once cumulative and divisive, without being diverse, as defined in Kiparsky (1998, p. 284):

- (12) a. P is DIVISIVE iff $\forall x[P(x) \wedge \neg atom(x) \rightarrow \exists y[y \sqsubset x \wedge P(y)]]$
 b. P is CUMULATIVE iff $\forall x[P(x) \wedge \neg sup(x, P) \rightarrow \exists y[x \sqsubset y \wedge P(y)]]$
 c. P is DIVERSE iff $\forall x \forall y[P(x) \wedge P(y) \wedge x \neq y \rightarrow \neg x \sqsubset y \wedge \neg y \sqsubset x]$

(12a) says that a predicate P has divisive reference¹⁰ if for any non-atomic element x for that P holds, there will be another element y such that y is a proper subpart of x and P holds of y . The condition on x to be non-atomic assures that we don't run into the minimal parts problem: if we had some x that is a molecule of water, there would not be any y such that it is water and a proper subpart of x . However, we still would like to be able to say that **water** is a predicate with divisive reference.

(12b) says that a predicate P has cumulative reference if for any non-maximal element x that is P , there will be another element y such that x is a proper subpart of y and P holds of y . The condition on x to be non-maximal with respect to P ensures that we don't run into some sort of maximal parts problem: if we had an x such that x is all the water in our model/world, we still would like to say that **water** is cumulative, even though there is no entity y that is water and of which x would be a proper subpart.

(12c) makes sure that predicates that have only atomic elements (and which satisfy thus trivially (12a-b)) will not count as homogeneous.

For now we have defined some mereological properties of event predicates. As the readings described above depend crucially on aspect, that is, the relation between the running time of the eventuality and the interval for which one makes an assertion, we will need some mean to link the mereological properties of the event to the interval for which the event predicate will hold. Dowty (1986, p. 42) provides us with the definition of "truth with respect to an interval", that can serve as base:

- (13) a. A sentence ϕ is stative iff it follows from the truth of ϕ at an interval I that ϕ is true at all subintervalls of I [...]
 b. A sentence ϕ is an activity [...] iff it follows from the truth of ϕ at an interval I that ϕ is true of all subintervals of I down to a certain limit in size [...]
 c. A sentence ϕ is an accomplishment/achievement [...] iff it follows from the truth of ϕ at an interval I that ϕ is false at all subintervals of I [...]

Taken together with the temporal trace function $\tau(e)$, which maps an event to its running time, the property of divisivity explains the subinterval property as formulated in (13a-b).

Let's come back to the data: for some reason, there is a class of telic eventualities (e.g., **drive-to-Venice**) that patterns with atelic eventualities rather than with some other class of telic eventualities (e.g., **eat-four-apples**). Thus, we need to state precisely

¹⁰The notions of "divisiveness", "cumulativity", etc. apply to the reference or denotation of a predicate. However, in what follows, I will sometimes speak loosely of "divisive predicates" and the like.

the relevant difference between **drive-to-Venice** and **eat-four-apples**. Both predicates fail to be homogeneous, though in different ways. Assuming the truth conditions of **four** to be “of cardinality four or higher”, **eat-four-apples** is cumulative, but not divisive; **drive-to-Venice** is divisive, but not cumulative. However, predicates that share the properties of divisivity and non-cumulativity, e.g. **eat-at-most-four-apples**, pattern with **eat-four-apples** in their existential interpretation:

- (14) Seit heute morgen hat Isidor höchstens vier Äpfel gegessen.
 Since today morning has I. at most four apples eaten.
 Since this morning, Isidor has eaten at most 4 apples.

Another important point can be seen if we take something like **having-been-three-times-in-Boston** in (7a) and compare it with the two predicates that precede. Here, there is a “natural” order on those events, given by progression of (physical) time. The base eventuality is a (temporary) state, and thus homogeneous. However, there is an event measure, *three times*. In order to count these three times, we need maximal and disjoint events of **be-in-Boston**. Maximal, because otherwise, if Isidor stays in Boston without interruption for 24 hours, we could reconstruct this otherwise as two disjoint events of 12 hour-stays. Disjoint, because otherwise there would not be any criteria for what to count as “being in Boston”. There have thus to be in some sort “maximal subevents”, or some kind of indivisible “units” that we are able to count.

It seems that all existential-reading triggering eventualities contain some sort of extensive measure function, in the sense of Krifka (1998). Such a measure function may be vague, but, what is important, is that it needs access to individual entities (maybe contextually identified) in order to cardinalize them.

In German (as in the other languages I am familiar with), there is no morphological plural marking available for the verbal domain – contrary to the nominal domain – which makes it difficult to decide whether a given eventuality is an atomic eventuality or a sum of several eventualities. The presence of an extensive measure function (like “*once*”) gives us a clue that we are in presence of atomic entities. We may not be sure about what they really are, and what the atoms are exactly: for the case of **eat-four-apples**, there are several combinations, for instance, this might be a concatenation of 2 events of eating two apples, or four of eating one apple, etc. What we know, however, by the definition of an extensive measure function, is that there are some units to be cardinalized, whatever they may be, and that these units are not overlapping.

One important property of extended measure functions is *additivity*, as defined in Krifka (1998). Explained informally, this amounts to the following: **having-eaten-four-apples** may be true although there has never been any (single) event of eating four apples; it may be true if there have been four separate eatings of one apple or two separate eatings of two apples, etc., that add up to **having-eaten-four-apples**. In an eventuality without extended measure function, for instance, **having-driven-to-Venice** will not be true if all there was were four separate events of driving from Naples to Rome, even if the total mileage corresponds to the distance Naples – Venice. The ordering of subparts of the

event to the whole event is very different in case of the eating of the apples and in case of the driving to Venice; it has no importance at all in which order you eat which apple, as long as they are four. However, you can't just add, as you like, pieces of movements to obtain a driving to Venice. **Driving-to-Venice** is characterized by a path, whereas **eating-four-apples** isn't.

What remains to be explained is the difference in behaviour between **drive-to-Venice** and **drive-once-to-Venice**. One major difference seems to be that the latter doesn't allow for inner stages to be accessed, and for the initial and final stages to be "cut off". Imperfective aspect would have such an effect, and would cause thus a homogeneous reading. The CARDINALITY PRINCIPLE of Rothstein (2004, p. 172) states that the cardinality of an event is the same as the cardinality of its BECOME events (i.e., its telic transitions). Thus an event may only have cardinality 1 if the transition from inner to resultant stages it contains is not eliminated by a homogenizing aspectual view-point, like imperfective or resultative aspect (where it is the resultant state that is focalized, crucially without the transition from the inner to the resultant stage). Therefore, if we haven't got an explicit cardinality marker like *once*, which fixes the cardinality, a covert homogenizing aspectual operator may always interfere and prevent the assignation of cardinality 1 to an eventuality like **drive-to-Venice**. And this intervention will prevent an existential reading.

4 Conclusion

In this paper, I have tried to sketch an account for the readings with *seit* based on the assumption that there is one single lexical entry for this preposition. I have shown that there are two readings of sentences with *seit*, namely the "homogeneous" and the "existential" reading. The readings distinguished depend crucially on *Aktionsart*-properties of the underlying eventuality, and more precisely, the presence of an extended measure function that applies to the event predicate.

As a next step, I think that one should try to integrate focus-semantics into the picture. Some specific focus-pattern, as *verum-focus*, make acceptable any eventuality for an existential reading with the Perfect. An enumeration of eventualities which – taken in isolation – do not allow for an existential reading, also induce an existential interpretation. These patterns might be explainable by exhaustivity-effects linked to information structure.

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