
German *Gerade* — a Unified Analysis of its Temporal Uses

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1.1 Introduction

The aspectual properties of tenses, and also of verbal periphrasis, have been studied quite extensively. As far as I am aware, the influence of adverbs, or more specifically, focus particles, on the temporal interpretation of sentences, has received much less attention. The present paper tries to shed some light on one of the more intricate — and therefore very interesting — focus particles which interacts with information given by the tense-aspect system, namely German *gerade* (litterally, “straight”). Like other focus particles, it has many non-temporal uses, but my concern here will be the two properly temporal uses, the “progressive” and the “immediate anteriority” readings it triggers. The main claim put forward here is that these two uses (and possibly also a subclass of non-temporal uses) can be dealt with by one single semantic representation for *gerade*.

This paper is structured as follows: in the first section, I will present the two temporal readings, and show their distribution. Special focus will be given to the question whether the “progressive” reading of *gerade* corresponds exactly to a progressive viewpoint aspect, like English *be -ing*, or whether it shows only some related meaning effects. I will show that progressive *gerade* does not always correspond closely to English *be -ing*.

In the second section, I propose a formal analysis of the temporal uses of *gerade*. I argue that *gerade* selects in all cases the highest mem-

ber of some scale, and that such a scalar analysis can explain both temporal readings. In order to do this, the issue of the scalar nature of the temporal features involved has to be addressed. I will show that there exist Horn-scales for the temporal information encoded by the features of unmarked aspect and the perfect, and that “progressive” and “immediate anteriority” correspond to the most informative members of these Horn-scales.

1.2 The Temporal Behaviour of *Gerade*

The adverb *gerade* has been identified by Dahl (1985) as the German expression of the progressive gram type.¹ However, it seems problematic to characterize the meaning of this adverb by the term “progressive” in at least two ways: *gerade* is not only used as what one may call a progressive, but has one other temporal (namely “immediate anteriority”) reading, as has been already noted by Métrich et al. (1995). Furthermore it is used extensively in non-temporal contexts as well. Therefore, the label “progressive” is not able to give a satisfactory description, even if one only considers the temporal readings of *gerade*.

Secondly, one may want to reserve the notion “progressive” for aspectual viewpoints (in the sense of Smith (1991)), and there is strong evidence (which we will see below), that *gerade* is not the expression of such an aspectual viewpoint.

In this section, I will first show the distribution of the two temporal readings. I claim that these readings follow from the position at which *gerade* applies in the functional structure of the sentence: it may apply at the level of the feature PERFECT (if there is one), or at the level of the aspect-phrase. The first configuration causes the immediate anteriority reading, whereas the second will be associated with the progressive reading. Then, I will compare in more detail the meaning effects one obtains in the progressive readings of *gerade*, and compare them with English-style progressive (or imperfective) markers of viewpoint aspect. As we will see, the effects do not always correspond.

1.2.1 Distribution of “Progressive” and “Immediate Anteriority” Readings

It is very plausible to consider *gerade* as the expression of a progressive gram if one looks only at examples like the following, which involve the

¹The notions of *gram* and *gram type* have been developed by the Bybee-Dahl school of linguistic typology (cf., e.g., Bybee and Dahl, 1989). “Gram” is a shortening of “grammatical morpheme”. For cross-linguistic comparisons, the notion of “gram type” is pertinent: a gram type is a cluster of grams (each pertaining to a particular language, e.g. the English *be -ing*), which have very similar properties.

Present Tense and the Simple Past Tense:

- (1) a. Otto isst Schokolade.
 Otto eats chocolate.
 (i) ‘Otto is eating chocolate (now)’.
 (ii) ‘Otto eats chocolate (in general)’.
- b. Otto isst gerade Schokolade.
 Otto eats GERADE chocolate.
 ‘Otto is eating chocolate (now)’.
- c. Als das Feuer ausbrach, setzte Otto seinen Helm auf.
 when the fire outbroke, put Otto his helmet on.
 (i) ‘When the fire started, Otto put on his helmet.’
 (ii) ‘When the fire started, Otto was putting on his helmet.’
- d. Als das Feuer ausbrach, setzte Otto gerade seinen
 when the fire outbroke, put Otto GERADE his
 Helm auf.
 helmet on.
 ‘When the fire started, Otto was putting on his helmet.’

(1a) has two readings: the first corresponds to an English present progressive, and may be interpreted either as ongoing action at the moment of utterance or as a temporary habit. The second reading corresponds to a simple present tense in English, and describes a lasting property of Otto. (1b) lacks the latter reading, and only displays the “progressive” reading. Similarly, (1c) shows an ambiguity between two readings: the action of Otto putting on his helmet may be either a consequence of the outbreak of the fire, and follow it, or it may be ongoing, and include the outbreak of the fire. According to Smith (1991), such an ambiguity is characteristic for tenses with “neuter” viewpoint aspect. In a normal context, the sequential reading of (1c) would be very much favoured, although the progressive reading does exist.² In (1d), the ambiguity disappears, and only the “progressive”, or imperfective-like reading of ongoing action remains.

This progressive-style reading is however not the only reading associated with *gerade*: it can be combined with the Perfekt and expresses

²*Als*-sentences without *gerade* do not always favour the perfective reading; this depends very much on the *Aktionsarten* of the eventuality-predicates appearing in the sentence, and on contextual assumptions. In (2), the imperfective reading is predominant in normal contexts:

- (2) Als das Feuer ausbrach, sang Otto in seiner Badewanne.
 when the fire outbroke, sang Otto in his bath-tub.
 ‘When the fire started, Otto sang | was singing in his bath-tub.’

what one may call “immediate anteriority”:

- (3) a. Anna hat einen Brief geschrieben.
 Anna has a letter written.
 ‘Anna has written a letter.’
- b. Anna hat gerade einen Brief geschrieben.
 Anna has GERADE a letter written.
 ‘Anna has just written a letter.’
- c. Die Polizei stürmte Annas Wohnung, als sie alle
 The police stormed Anna’s flat, when she all
 Beweise beseitigt hatte.
 evidence destroyed had.
 ‘The police stormed Anna’s flat when she had destroyed all
 the evidence.’
- d. Die Polizei stürmte Annas Wohnung, als sie gerade
 The police stormed Anna’s flat, when she GERADE
 alle Beweise beseitigt hatte.
 all evidence destroyed had.
 ‘The police stormed Anna’s flat when she had just destroyed
 all the evidence.’

In (3a), the eventuality write_letter(a) is located somewhere before the moment of utterance. This sentence is compatible with a situation where the eventuality is situated immediately before the moment of utterance. (3b), however, is only felicitous if the eventuality is located immediately before the moment of utterance, but not if it is just situated at some interval preceding the moment of utterance. Similarly, in (3c), the destruction of the evidence may have happened at any time before the storming of the flat; (3d) is only compatible with situations where the destruction immediately precedes the storming. This second reading of *gerade* corresponds to the temporal effects caused by English *just*: it transforms a non-specified anteriority (of a perfect tense) into an immediate anteriority.

A first generalization of the pattern we have observed in the examples (1)–(3) is that *gerade* causes a progressive reading when applied to a simple tense, and an immediate anteriority reading with respect to some (con)textually fixed point of reference when combined with a perfect tense. This generalization carries over straightforwardly to what we observe with future tenses:

- (4) a. Jedesmal wenn ein Feuer ausbricht ...
 Each time when a fire outbreaks ...
 ‘Each time a fire breaks out ...

- b. ... wird Otto seinen Helm aufsetzen.
 ... will Otto his helmet onput.
 (i) ‘... Otto will put on his helmet.’
 (ii) ‘... Otto will be putting on his helmet.’
- c. ... wird Otto gerade seinen Helm aufsetzen.
 ... will Otto GERADE his helmet onput.
 ‘... Otto will be putting on his helmet.’

However, if there is no (con)textually available point with respect to which the future tense could be interpreted, one obtains an interpretation with *gerade* as an epistemic present:

- (5) a. Otto wird gerade seinen Helm aufsetzen.
 Otto will GERADE his helmet onput.
 ‘Otto will probably be putting on his helmet (right now).’
- b. Otto wird gerade seinen Helm aufgesetzt haben.
 Otto will GERADE his helmet onput have.
 ‘Otto will probably just have put on his helmet.’

Once again, the corresponding sentences without *gerade* would have this epistemic present reading, too — *gerade* does not add anything to the meaning of the sentence. The importance of an anaphorically available point of reference is equally notable with cases of *gerade* combining with the simple past: if we lack an available anchoring point in the context, a sentence with *gerade* is odd:

- (6) # Otto setzte gerade seinen Helm auf.
 Otto put PAST GERADE his helmet on.
 ‘Otto was putting on his helmet.’

Notice that this is exactly the same kind of infelicity one observes with English past progressive or Romance *imparfait* tenses when they are used “out of the blue”. The necessity of an anaphoric point of reference is therefore not necessarily introduced by *gerade* itself; it may also be a secondary by-product of its aspectual effect.

Up to now, the opposition between “progressive” and “immediate anteriority” uses of *gerade* followed the distinction between simple and perfect tenses. There are, however, systematic exceptions to this generalization: German perfect tenses can have both progressive and immediate anteriority readings.

- (7) Als das Feuer ausgebrochen ist, hat Otto gerade den Helm
 when the fire outbroke is, has Otto GERADE the helmet
 aufgesetzt.
 onput.

‘When the fire broke out, Otto was putting on his helmet.’

The interpretation of (7) is identical to the interpretation of (1d), where the tense was not a present perfect, but a simple past. In (3b), the present perfect had (only) an immediate anteriority reading. Now, some dialects of German — namely the Southern German dialects — are known for the elimination of the simple past tense in favour of the present perfect tense. But note that the Perfekt displays “past progressive” uses far outside the Southern German area.³

The perfect variants of the *Konjunktiv* behave similarly to the present perfect in this respect: in contexts where there is an embedded *when*-clause, one may obtain a progressive reading, whereas in isolation, one obtains an immediate anteriority reading.⁴

- (8) a. Otto sagte mir, als er Herrn Meier angerufen habe,
 Otto said me, when he Mr. Meier called have K,
 habe dieser seinen Artikel gerade gelesen.
 have K this his article GERADE read.
 ‘Otto told me that, when he had called Mr. Meier, Meier had
 been reading his article.’
- b. Otto sagte mir, er habe gerade gegessen und wolle
 Otto said me, he have K GERADE eaten and want K
 nicht mehr mit ins Restaurant.
 NEG more with in the restaurant.
 ‘Otto told me that he had just eaten, and that he didn’t want
 to come to the restaurant anymore.’

We need therefore to account for this behaviour of perfect tenses. It is a quite common assumption that perfects are slightly more complicated than “simple” tenses, and that they encode an additional temporal relation of “relative tense” (cf. Comrie, 1985). A relative tense marks a temporal relation not with respect to the moment of utterance, as an absolute tense would do, but with respect to some contextually given point of reference (which, in the case of a present perfect, may still be identical to the moment of speech).

In the functional hierarchy of a sentence, the perfect feature is generally assumed to be situated above the feature of aspect (cf. Alexiadou et al., 2003, Schaden, 2007), and below the feature of (absolute or deictic) tense, which establishes the link with the moment of utterance.

³One can use sentences like (7) at least as far in the North as Berlin, as was pointed out to me by Christine Dimroth (p.c.).

⁴The examples in (8) illustrate this behaviour for the *Konjunktiv I*. For want of space, I omit the demonstration for the *Konjunktiv II*.

The two readings of *gerade* in combination with a perfect tense may be explained as stemming from two different levels the adverb may interact with: either at the level of relative tense (i.e., the PERFECT feature), or the level of ASPECT:

- (9) a. [Tense [GERADE Perfect [Aspect [*Aktionsart*]]]] = immediate anteriority
 b. [Tense [Perfect [GERADE Aspect [*Aktionsart*]]]] = progressive

The basic idea is that, if *gerade* interacts with an unmarked or “neuter” aspect in the sense of Smith (1991), it will produce the progressive reading. Whenever *gerade* interacts with the PERFECT feature, we will get the immediate anteriority reading. This predicts that non-perfects may only have a progressive reading, but that perfect tenses may produce immediate anteriority readings as well as progressive readings. This prediction is indeed borne out: (6) may not be interpreted as indicating an immediate anteriority of the eventuality with respect to the time of utterance.⁵ Whenever a sentence has two possible readings (thus a sentence containing a perfect tense), (con)textual parameters will sort out which one is to be retained.

An analysis along the lines of (9) assumes also that *gerade* is not directly and in itself an expression of “progressive” (viewpoint) aspect in the sense of Smith (1991) or Klein (1994), but that this focus particle modifies neuter viewpoint aspect in a way which makes it look like an imperfective or “progressive” aspect. In the next section, I will try to show that progressive *gerade*, even if it shows many meaning effects standardly associated with a progressive, does not behave like the prototypical progressive that is English *be -ing*.

1.2.2 Discursive Effects of “Progressive” *Gerade*

We have seen some examples in which *gerade* produced the effects typically associated with a progressive marker, or with a tense with imperfective aspect. Among those, I had stressed mainly one: the impossibility of obtaining a sequential reading when *gerade* appears in a sentence containing a *when*-clause. We will check some criteria which are often associated with progressive markers: they are used in one of

⁵There are some isolated exceptions to this, but they are instances of an “Ersatzperfekt”, that is, a simple past tense which is used instead of a present perfect, and with the semantics of a present perfect. However, there are only a handful of verbs in German allowing for such a use of the simple past tense: *haben* (“to have”), *sein* (“to be”), and some modal auxiliary verbs. With plain lexical verbs, it is impossible to obtain a perfect-reading in the simple past tense. The effect one obtains with a plain, lexical verb in the past tense with *gerade* is the one we have observed in (6): it behaves like an English past progressive or a Romance imperfective.

the standard tests to distinguish stative eventualities from non-stative eventualities (cf. Dowty, 1979).

A meaning effect often associated with progressives is the coercion of permanent states into transitory states, and sometimes, the addition of some volitional component of sense:

- (10) a. ?John is being intelligent.
 b. ?John is being ill.

Both of (10) are acceptable if they are interpreted as denoting a temporary state, maybe involving some control by the subject. Whereas the control condition is not necessarily salient in all English examples for the progressive (cf. (11)), for the acceptability of *gerade* with an eventuality in German, “control” or “agentivity” do not seem to play a role at all.

- (11) The socks are lying under the bed.⁶

- (12) a. Otto ist gerade krank.
 Otto is GERADE ill.
 ‘Otto is ill (for the moment).’
 b. Die Socken liegen gerade unter dem Bett.
 The socks ly GERADE under the bed.
 ‘The socks are lying under the bed.’

However, *gerade* is extremely infelicitous with eternal truths, generic states, or resultant states which are not supposed to change:

- (13) a. ?? 3 ist gerade eine Primzahl.
 3 is GERADE a prime number
 ‘3 is a prime number (for the moment).’
 b. ?? Pinguine haben gerade zwei Flügel.
 penguins have GERADE two wings.
 ‘Penguins have two wings (for the moment).’
 c. ?? Bruno Kreisky ist gerade tot.
 Bruno Kreisky is GERADE dead.⁷
 ‘Bruno Kreisky is dead (for the moment).’
 d. ?? Der Apfel ist gerade gegessen.
 The apple is GERADE eaten.
 ‘The apple is eaten (for the moment).’

⁶Example taken from Dowty (1979), p. 173.

⁷One of the anonymous reviewers brought up the question why sentences like (13c) are infelicitous, whereas sentences like (14a) are acceptable:

- (14) a. Bruno Kreisky ist gerade gestorben.
 B. K. is GERADE died.

The sentences in (13) are not ungrammatical: they are only pragmatically odd, because they do not correspond to what our world knowledge considers to be a normal state of affairs. If for instance Bruno Kreisky rose periodically from death, (13c) would be perfectly normal. This means that as long as the states are able to change, *gerade* can be applied to them, which comes very close to the behaviour of the English progressive:

- (15) a. New Orleans lies at the mouth of the Mississippi River.⁸
 b. ?? New Orleans is lying at the mouth of the Mississippi River.

But there is one point where progressive and imperfective aspect markers differ quite strongly from *gerade*: it has been argued that such an aspect marks an eventuality as belonging to the background of a narration, whereas the main events, which form the core-narration in a strict sense, appear in a perfective tense (cf. Asher and Lascarides (2003), Weinrich (1986)).

- (16) a. It was raining. A man was standing on the steps. He was wearing a grey hat. He began to speak quietly.
 b. When the man began to speak, it was raining.
 c. When the man began to speak, he was standing on the steps.
 d. When the man began to speak, he was wearing a grey hat.

With a progressive like in English, the fragment of discourse (16a), and its reformulations in (16b-d) are just two different ways of referring to the same situation. The progressive “backgrounds” the eventualities it is applied to in either context; it does not add any additional meaning effects.

This is not the case for German *gerade*. Whereas the translations of (16b-d) are perfectly normal, the translation of (16a) clearly is not:

- (17) a. ??Es regnete gerade. Ein Mann stand gerade auf der
 It rained GERADE. A man stood GERADE on the
 Treppe. Er trug gerade einen grauen Hut. Er begann
 steps. He wore GERADE a grey hat. He started

‘Bruno Kreisky has just died.’

b. Der Apfel ist gerade gegessen worden.
 The apple is GERADE eaten become.
 ‘The apple has just been eaten.’

Sentences like (14a) are eventive (present perfect) sentences, which concern an event in the past. Their main assertion is not about a non-reversible resultant state *to be dead* or *to be eaten*, which would be the same as in (13cd).

⁸Examples in (15) from Dowty (1979), p. 174.

- ruhig zu sprechen.
 quiet to talk.
 ‘It happened to rain. A man happened to be standing on the steps. He happened to wear a grey hat. He began to speak quietly.’
- b. Als der Mann zu sprechen begann, regnete es gerade.
 When the man to speak started, rained it GERADE.
 ‘When the man started to speak, it was raining.’
- c. Als der Mann zu sprechen begann, stand er gerade auf der Treppe.
 When the man to speak started, stood he GERADE on the steps.
 ‘When the man started to speak, he stood on the steps.’
- d. Als der Mann zu sprechen begann, trug er gerade einen grauen Hut.
 a grey hat.
 ‘When the man started to speak, he was wearing a grey hat.’

(17a) sounds very odd. This oddness is due to the presence of *gerade* in all three backgrounded sentences. If there were only one, the sequence would be perfectly normal.⁹ (17a) ostensibly underlines the fact that the backgrounded eventualities are unrelated with respect to each other, which I have tried to render in the translation with “happened to”. In insisting heavily on the accidental character of the coming about of the eventuality, (17a) conveys the meaning that it is not an accident that those eventualities occurred at the same time. However, if such a meaning component of ‘chance event’ does exist at all in (17b-d), it is not salient.

Such a massive occurrence of *gerade* does, however, not have the same effects in all kinds of discourse. In non-narrative fragments of discourse, sentences like the second in (18) are perfectly normal:

- (18) Kunigunde betrachtete das Foto mit Staunen. Da sah Kunigunde watched the photo with awe. There saw man einen Ritter, der gerade vom Pferd fiel, ein one a knight, who GERADE from the horse fell, a Einhorn, das gerade Blätter fraß, und einen Basilisken, der unicorn, which GERADE leaves ate, and a basilisk, who

⁹As one of the anonymous reviewers pointed out, if the only *gerade* in (17a) appeared in the sentence “He wore a grey hat”, this would not be perfectly normal. It seems that in this case, we need some additional information that the man in question wore another hat at some other time.

sich gerade im Spiegel betrachtete.
 himself GERADE in the mirror watched.

‘Kunigunde looked at the photo with awe. One could see on it a knight who was falling from his horse, a unicorn who was eating leaves, and a basilisk who was looking at himself in a mirror.’

The main difference between (17a) and (18) is that in (18), there is no point of reference which would “move along” with the narration. The anchoring point of *gerade* in (18) is the moment when the spectator sees what is in the photo. One does not expect any ordering relation (temporal or causal) in the description of a photo; in a narration, one does expect it. Therefore, the introduction of a “contingency effect” by *gerade* does not have the same consequences in the two types of contexts.

König (1991, p. 131ff.) insists on this meaning component of *gerade*, which he describes as introducing a meaning effect that the fact under consideration is “contrary to expectations”. This is often very salient in non-temporal uses of *gerade*:

- (19) Es war ja gerade der Triumph der Araber, der ihnen
 It was yes GERADE the triumph of the Arabs, that them
 ihre heutige Lage so unerträglich macht.¹⁰
 their present situation so unbearable makes.

‘It was precisely the triumph of the Arabs which makes their present situation so unbearable for them.’

According to König, this meaning component is an implicature which is becoming conventional. However, as we have seen, there are many circumstances in which it is not very salient, if it does exist at all. It might be possible that there are some circumstances in which the implicature has not yet emerged, or which block this additional inference. Among these contexts would be the “normal” temporal uses of the adverb, unless there are massive repetitions of the occurrence of *gerade*, like in the example (17a). In any case, if König is right in calling it an implicature, this meaning-component should not be hardwired into the semantics of *gerade*. Therefore, and because it does not seem to play a role for the basic temporal and aspectual interpretation of a sentence with *gerade*, I will ignore it in the rest of the paper.

So far, we have thus identified two temporal readings of *gerade*: the progressive and the immediate anteriority reading. With simple tenses, *gerade* eliminates the perfective reading of a sentence, leaving only the imperfective reading; with perfect tenses, the anteriority component is

¹⁰Example from *Die Zeit* 23/2006: Interview with Hans Magnus Enzensberger.

either narrowed down to an immediate anteriority, or we may obtain imperfective readings with such a tense. In any case, it seems that the meaning of a clause containing *gerade* is a subset of the meaning of the same sentence lacking the adverb.

Finally, we have seen that the so-called progressive use of *gerade* does not always correspond to a canonical progressive like English *be -ing*, but departs in some important ways from it.

1.3 The Formal Analysis

In the present section, I will provide a unified account of German *gerade*'s temporal uses. At first, I will discuss possible ways of adapting König's analysis to the temporal core-uses. More specifically, I will argue against an analysis which supposes that the temporal interpretation of *gerade* can be derived from its anaphoric behavior by applying König's idea of "emphatic assertion of identity". Finally, I will develop in detail the account of the temporal uses of the adverb, based on the idea that *gerade* interacts with the underlying scalar properties of the ASPECT- and PERFECT-features.

I will not have much to say about the non-temporal uses of *gerade*. However, I suppose that my analysis can be adapted to at least a subclass of the non-temporal uses, namely cases where *gerade* modifies a second adverbial (e.g., *enough*), as I will briefly discuss for example (23), on page 16.

1.3.1 Extending König's Analysis to the Temporal Uses?

According to König (1991), the essential contribution of *gerade* is to provide an "*emphatic assertion of identity*" (cf. König, 1991, p. 125ff.). This is a very appealing solution for the non-temporal uses. Furthermore, as well as any other elements denoted by (parts of) sentences, temporal arguments (that is, intervals, instants and events) might also be emphatically asserted to be identical with other intervals, instants and events. Indeed, König himself presented such an idea.¹¹

Such an analysis seems to work reasonably well for a subclass of temporal readings: sentences where *gerade* is located clause-initially, immediately modifying a *als*-clause. These are probably the uses that König had in mind when speaking about the temporal uses of *gerade*. How-

¹¹Cf. König et al. (1990, p. 116–17): *der Zeitpunkt eines Ereignisses oder Zustandes wird mit einem zeitlichen Bezugspunkt (Sprechzeitpunkt oder kontextuell gegebener Punkt) oder der unmittelbaren Umgebung dieses Bezugspunktes identifiziert.* Translation: *the moment of an event or state is identified with a temporal reference point (point of speech or another contextually given point), or with the immediate surroundings of this point of reference.*

ever, this does not fall into the core-part of what is investigated here, namely the temporal effects of *gerade* in clause-internal position. In sentences like (20b), *gerade* scopes over a temporal subordinate clause, just like it could also scope over a subordinate clause introduced by *because*. I will show in what follows that the temporal effects of sentence initial *gerade* scoping over a temporal subordinate clause are not always identical to sentence internal *gerade*, and that the second should therefore not be derived from the first.

In a sentence like (20b), *gerade* could convey emphatically, following the idea by König, that the “event-times” of the two sentences would be identical, which excludes a sequential and a causal construal.

- (20) a. Als ich kam, ging Paul.¹²
 when I came, went Paul.
 ‘When I arrived, Paul left | was leaving.’
- b. Gerade als ich kam, ging Paul.
 GERADE when I came, went Paul.
 ‘When I arrived, Paul was leaving.’
- c. Als ich kam, ging Paul gerade.
 when I came, went Paul GERADE.
 ‘When I arrived, Paul was leaving.’

The temporal interpretation of (20b) is identical to (20c): the perfective reading — which was available in (20a) — is eliminated. However, this pattern of clause-initial *gerade* is restricted to a subclass of temporal conjunctions.

It seems to be true that in any case of *gerade* heading a *als*-clause, there is no way of obtaining a sequential reading. However, German has a second temporal conjunction, where the effect of *gerade* is quite different: with *wenn*-clauses, perfective readings remain available:¹³

- (21) a. Gerade wenn Onkel Theo gekommen ist, sind wir ins
 GERADE when uncle Theo came is, are we into the
 Schwimmbad gegangen.
 swimming-bath gone.
 ‘It was precisely on occasions when uncle Theo arrived that
 we went | were going to the swimming pool.’
- b. Wenn Onkel Theo gekommen ist, sind wir (immer) gerade
 when uncle Theo came is, are we (always) GERADE

¹²Examples (20a-b) taken from König (1991, p. 128).

¹³In German, *als* is restricted to episodic temporal clauses in the past, whereas *wenn* combines with any future referring temporal clauses, as well as with iterative past-referring temporal clauses.

ins Schwimmbad gegangen.¹⁴
 into the swimming-bath gone.

‘Whenever uncle Theo arrived, we were always going to the swimming pool’

It is perfectly natural to get a sequential, causal reading for (21a), however, the sequential reading is completely impossible in (21b). This is a strong indication that modifying a clause initially with *gerade* is not (at least not always) the same thing as having a clause-internal temporal *gerade*, and that cases like (20) and (21) do not belong to the core-examples of temporal *gerade* I have studied in the first section of this paper, where *gerade* seems to interact directly with temporal parameters provided by the aspect- and the perfect-features.

Concerning the clause-internal examples of temporal *gerade* — which I take to be the temporal core-uses —, it is not obvious how to apply König’s analysis to a neo-reichenbachian framework like the one assumed here, because this notional apparatus has been developed only after König (1991), and the analysis by König is not sufficiently precise in order to give clear indications how it should be understood in the light of a formal framework of the tense-aspect system.¹⁵

One could however suggest that *gerade* focalizes an instant or interval and emphatically asserts its identity with an anaphorically available point of reference. In that way, it would not directly relate two intervals provided by the tense-aspect projection in *gerade*’s host-clause. This would account for the need of sentences with *gerade* to have an anaphorically accessible point of reference, and their infelicity otherwise.

I do not think, however, that this can be the correct answer to the problem. First of all, one should assume that in such a case, *gerade* could have as a denotation an interval (if such an interval is contextually available), and that therefore, it should be able to be the answer to a

¹⁴Without the explicit *immer* (‘always’), it is difficult to get an iteration for (21c) (which is necessary, given the *wenn*). This is probably caused by the anaphoric effect of *gerade*, which tries to ‘anchor’ itself at an established reference point.

¹⁵One could try and apply König’s idea of “emphatic assertion of identity” directly to the temporal relation in the ASPECT- and PERFECT-features. However, this isn’t a move in the spirit of König, and moreover, it would predict false readings: if we apply emphatic identity to a temporal relation expressed in the aspect-phrase (i.e., T-Ast = $\tau(e)$), we would obtain a perfective point of view, and not an imperfective or progressive view-point. As the reader may check for herself, there is no way of obtaining an immediate anteriority reading by applying emphatic anteriority to any proposed denotation of the PERFECT-feature, either: with anteriority theories of the perfect, the intervals cannot be identified (this would lead to a contradiction), and with an Extended Now perfect, the anteriority itself would be eliminated.

question like (22):

- (22) a. A: When did that happen?
 b. B: #*Gerade*.
 c. B: *Gerade eben*.
 GERADE then.
 ‘Just a moment ago.’

However, as (22b) shows, *gerade* alone is inadequate in such a context. However, if it is “strengthened” with *eben* (lit: ‘flat’), another enigmatic focus particle, it can be the answer to a *when*-question.¹⁶ What is more, in this context, *gerade* can no longer anaphorically refer to any interval whatsoever, just as long as it is somehow salient in the discourse context: it must denote an interval immediately anterior to the moment of utterance.

Furthermore, the anaphoric properties of *gerade* might be a secondary effect, rather than the original contribution. It is well-known that progressive tenses and imperfective tenses rely on the existence of a contextually established moment of reference in order to be felicitously interpreted. The same is true for pluperfects or future perfects: if the addressee cannot know which moment to calculate the anteriority with respect to, there will be a problem. Thus, one could derive the anaphoric properties of sentences containing *gerade* from the aspectual properties of a progressive and the temporal properties of perfect tenses.

However, it is not clear to me how one could derive the impossibility of perfective interpretations of such sentences from the anaphoric properties of *gerade*. Similarly, it is unclear to me how to derive the immediate anteriority reading from the anaphoricity of *gerade*.

Therefore, I suggest that the anaphoricity of *gerade* is a secondary effect to be derived from the influence the focus particle has on the temporal projection it combines with. I will now implement this interaction of *gerade* with the aspect- and the perfect-feature in a formal way.

1.3.2 *Gerade* and Scales

In order to account for the semantic effects of *gerade* in its temporal uses, I assume that it combines either with the ASPECT- or the PERFECT-feature and that it induces a scalar interpretation of the feature. More precisely, I assume that *gerade* discards all possible readings but a small group of readings containing the most informative one.

¹⁶Note that *eben* on its own is as inadequate as answer to the question in (22a) as was (22b).

I will illustrate the basic idea with an example of a non-temporal use of *gerade*. *Gerade* can modify *enough*, and intuitively, seems to sharpen its truth conditions there, by discarding most possible interpretations of *enough*.

- (23) a. Wir haben genug Geld, um ein Eis zu kaufen.
 We have enough money, to an ice-cream to buy.
 ‘We have enough money to buy an ice-cream.’
- b. Wir haben gerade genug Geld, um ein Eis zu kaufen.
 We have **GERADE** enough money, to an ice-cream to buy.
 ‘We have just enough money to buy an ice-cream.’

Suppose that an ice-cream costs \$2. Therefore, any amount higher than \$2 will qualify as “enough money to buy an ice-cream”. So, if I had \$100, I could felicitously utter (23a). However, in the same context, (23b) would be out, because I have much more money than just the minimum amount I would need in order to purchase the ice-cream. Note that in uttering (23b), I do not commit myself to having *exactly* \$2: if I had an insubstantial amount¹⁷ more than \$2 (say, \$2 and 3 cents), that sentence will still be felicitous, provided that I cannot buy something more desirable than an ice-cream with the money I have.

Therefore, for at least some of the non-temporal uses of the adverb, it is quite easy to see how *gerade* interacts with an underlying scalar domain, and selects for the most specific, or most informative reading. However, for the temporal uses of *gerade*, it seems to be intuitively more difficult to grasp how the immediate anteriority and the progressive reading could be the result of the interaction of *gerade* with underlying scales in the temporal domain.

This problem will be addressed now. I will argue that *gerade* interacts in the temporal domain with Horn-scales — that is, scales based on asymmetric entailment relations —, and that the immediate anteriority and the progressive readings correspond to the most informative readings of the perfect feature and neuter viewpoint aspect, respectively.

In order to show the exact entailment scales, I will present in the following section a formal semantics for a part of the tense-aspect system of natural languages, namely for the perfect and for “neuter” viewpoint aspect. These are, as I have already underlined before, the two ingre-

¹⁷What exactly counts as an insubstantial amount will remain vague with respect to contextual parameters. Possibly, Paris Hilton would be able to utter (23b) felicitously, even if she had got \$100, because for her, it is an unsubstantial amount of money more than \$2.

dients I assume that *gerade* interacts with.

1.3.3 Semantics of the Tense-Aspect System

The architecture of the tense-aspect system I assume is in a neo-Reichenbachian spirit, based mainly on the work of Smith (1991), Klein (1994), Pancheva (2003), Kamp and Reyle (1993), and Reyle et al. (2005).

(24) [Tense [Perfect [Aspect [*Aktionsart*]]]]

I thus suppose — like Comrie (1985) and von Stechow (1999) — the perfect to be a relative tense. The perfect feature is located between absolute tense and aspect. I assume the following semantics for the perfect and “neuter” aspect:

- (25) a. $\llbracket \text{perfect} \rrbracket = \lambda p. \lambda i \exists i' [i' \prec i \wedge p(i')]$ ¹⁸
 i' properly precedes i
- b. $\llbracket \text{neuter} \rrbracket = \text{imperfective} \vee \text{perfective}$
 neuter view-point aspect is underspecified between imperfective and perfective viewpoint aspect.
- c. $\llbracket \text{imperfective} \rrbracket = \lambda P. \lambda i \exists e [i \subseteq \tau(e) \wedge P(e)]$
- d. $\llbracket \text{perfective} \rrbracket = \lambda P. \lambda i \exists e [\tau(e) \subseteq i \wedge P(e)]$

The perfect is characterized by a relation of proper anteriority, and not by an Extended Now. Furthermore, I assume that what Smith (1991) calls “neuter” viewpoint aspect is an unmarked aspect, which is underspecified between imperfective and perfective aspect (following Reyle et al. (2005)), and not an aspectual viewpoint on its own.¹⁹

1.3.4 Scalar relations in the temporal domain

Let us now look at the scales associated with the perfect and unmarked aspect. I assume that the temporal relations themselves are scalar, in a way that will be explained immediately. I argue that the scales at hand are Horn-scales, that is, scales of asymmetrical entailment, which hold

¹⁸The formalisations given in (25) are incomplete. I do not think that the representation of the perfect given in (25a) is satisfactory as it stands, and I am aware of the need to have a modal semantics for imperfective aspect. However, a more complete representation would add unnecessary complications, which would not change the point I will be making here.

¹⁹This assumption is based on the fact that the relation between T-Ast and $\tau(e)$ of an aspectually unmarked tense may display cases of strict inclusion of T-Ast in $\tau(e)$ — that is, properly imperfective view-points —, as well as cases of strict inclusion of $\tau(e)$ in T-Ast — and therefore properly perfective view-points (cf. the discussion in Schaden, 2007, 152–161). This particular aspectual configuration cannot be captured in a sufficiently restricted way by postulating a single type of view-point aspect.

at the level of the temporal feature which *gerade* interacts with. There is one important point, however: as we will see, the entailment relation at the feature-level does not obligatorily carry over to the sentence as a whole. This will be crucial for explaining the progressive uses of *gerade*.

First, for the immediate anteriority readings, there clearly is a Horn-scale: a sentence with *gerade* in the immediate anteriority reading asymmetrically entails the same sentence lacking this adverb:

- (26) a. Otto hat gerade gehustet.
 Otto has GERADE coughed.
 ‘Otto has just coughed.’
 b. Otto hat gehustet.
 Otto has coughed.

Such a Horn-scale holds in all cases. We can therefore write:

- (27) perfect < immediate anteriority
 where $x < y$ iff y entails, but is not entailed by, x

One might think that the reason for this particular entailment relation is merely the greater specificity of (26a) with respect to (26b): any specified anteriority relation will entail an unspecified anteriority relation. For instance, (28) — where the anteriority relation provided by the Perfect is further narrowed down by the localizing temporal adverbial *yesterday* — does also asymmetrically entail (26b).

- (28) Otto hat gestern um sieben gehustet.
 Otto has yesterday at seven coughed.
 ‘Otto coughed yesterday at seven o’clock.’

But by proceeding by specificity, one fails to explain why there is systematically an immediate anteriority reading, rather than, say, a ‘the day before at 7 p.m.’ reading.²⁰ However, there is a natural scale for the perfect, namely the distance of i' with respect to i . The question is why the highest member of the scale — which is what *gerade* selects for, according to my proposal — should be “immediate anteriority”, rather than “furthest precedence”.

²⁰The immediate anteriority reading is provided by the interaction of a perfect and an adverbial in several other European languages, amongst which English (e.g., *has just arrived*). Furthermore, in Romance languages like French or Spanish, where there is a periphrasis indicating immediate anteriority of an event with respect to a point of reference, the temporal proximity can be further narrowed down by adding an adverbial which derives from Latin *iustum*: e.g. French *vient tout juste d’arriver*, litt. ‘comes all just to arrive’. Therefore, one should expect that the specific temporal contribution of the adverbial does not just arise as an idiosyncratic behavior of some Germanic languages, but has to be explained as the interaction of the perfect feature with a certain type of adverbial modification.

The reason for this seems to be the following: we don't expect there to be a limit in how far away an interval in the past can be.²¹ Therefore, the scale towards the past is open, and does not have any highest point — just like the scale associated with *enough* is open at one side and closed at the other. So, “furthest precedence” is out as a possible scale for *gerade* to interact with, because there is no single highest value with respect to temporal distance. Proximity with respect to *i*, however, is a closed scale, where there is a single, temporal interval which is closest to *i*, provided that our model of time is discrete — that is, where time can not be infinitely divided.²² Therefore, *gerade* has to select “immediate anteriority”.

Summing up, we get the right interpretation for the interaction of *gerade* with the perfect if we assume that the adverb retains only the highest possible member of the scalar temporal relation provided by the PERFECT, and that it discards all other possible readings.

Let us now move on to the relation between perfective and imperfective viewpoint aspect. Assuming that a progressive is a variety of imperfective viewpoint aspect, we need the following Horn-scale in order to get the right result:

(30) perfective < imperfective

However, this seems difficult to maintain from an empirical point of view: not only is there no systematic entailment from imperfective sentences to perfective sentences; there seems to be on the contrary a

²¹I do not see any reason why the “Big Bang” should be reflected in a language-based temporal ontology. However, as one of the anonymous reviewers pointed out, one might suppose something like a “mythical past” at the very beginning of time, such that the lower end of the scale would be closed as well. But I think that this would be part of someone's cultural knowledge, rather than their linguistic knowledge.

²²The idea of making an analysis depend on a particular type of representation of time may seem worrying to many people. Let me explain why I have to assume that particular ontology: in a dense model of time, there could always be constructed another instant *i''*, which would be even closer to *i* than a previously chosen instant *i'*, because one can always insert another point in time between two points (this was pointed out by one of the two anonymous reviewers). Therefore, one needs the possibility of “sticking” the two points together, without there being any space in between.

The open- or closedness of scales and the need for a discrete domain is not specific to the temporal domain. It has also been argued that the markedness of the closed scale influences markedness in other areas of linguistics: *near* is a closed scale with respect to a discrete domain, whereas *far* is an open scale. As is well known, neutral questions in languages like English prefer the open-ended scale:

- (29) a. How far is it?
b. ?How near is it?

systematic entailment from perfective to imperfective sentences:

- (31) a. Otto drew a circle.
 b. Otto was drawing a circle.

(31a) asymmetrically entails (31b). But we don't have to rethink the whole idea of basing the analysis on a Horn-scale, nor suppose a scale reversal. In the case of the immediate anteriority reading, the scalar relation was located at the level of the perfect feature, but happened to carry over to the sentence as a whole. I will argue that — in the case of *gerade* applying to an unmarked aspect — we still get a Horn-scale at the very abstract level of relations between the interval of assertion and the temporal trace of the situation, but that this entailment scale carries over to the sentence as a whole only under very specific circumstances.

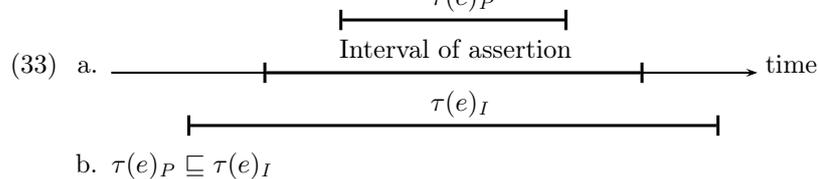
Such a very specific circumstance is the one displayed in the following example, as has been observed by Mittwoch (1988): :

- (32) a. Otto has been singing since 6 o'clock.
 b. Otto has sung since 6 o'clock.

Indeed, the universal reading of a perfect in a sentence like (32a), where the *since*-phrase fixes the interval of assertion, asymmetrically entails the existential reading in (32b).

The crucial difference between (32) and the sentences in (31) is that in the former case, the interval of assertion is exhaustively fixed by the expression *since 6 o'clock*, whereas this is not the case in (31). And as aspect is the relation between the interval of assertion and the temporal trace of the eventuality, it is crucial that the interval of assertion is stabilized across the sentences in order to observe the entailment relation depending on aspect proper.

The basic idea to explain why the inference from imperfective to perfective goes through in (32), but not in (31) is the following: if one considers imperfective aspect with Smith (1991) to be the (proper or non-proper) inclusion of the interval of assertion in the temporal trace of the eventuality, and perfective aspect to be the (proper or large) inclusion of the temporal trace in the interval of assertion, the temporal trace of an eventuality under imperfective viewpoint (written $\tau(e)_I$) will always include the temporal trace of an eventuality under perfective aspect (written $\tau(e)_P$), as illustrated under (33):



As can be seen, everything else being equal, the temporal trace of the eventuality under imperfective aspect is longer than the temporal trace of the eventuality under perfective aspect. If one does not consider any other information except the temporal relation encoded in the Asp-P, the use of imperfective aspect amounts to asserting something for a longer interval than one would have done using perfective aspect. Therefore, imperfective aspect is *per se* more informative than perfective aspect.²³ Let us now consider why in so many cases, this scalar relation between imperfective and perfective aspect does not carry over to the sentence as a whole. First of all, in most sentences, the position of the interval of assertion is not fixed at all, or not fixed precisely enough. If we do fix it exhaustively (that is, by precisely stating its initial and end points), for instance with a temporal adverbial of type *since X*, a first condition of comparability will be fulfilled. Secondly, in order to be able to observe an entailment, the eventuality needs to be of a certain type: it needs to have the subinterval property, because otherwise, we will not be able to infer from the occurrence of $P(e)$ during $\tau(e)_I$ that the same predicate holds during a subinterval of $\tau(e)_I$. If these two conditions are fulfilled, a sentence displaying imperfective aspect does entail its correspondent with perfective aspect. Now, this is precisely what happens for pairs like (32a-b). Where one or the two conditions are violated — (as in (31)) —, the entailment relation of the aspect does not carry over to the sentence as a whole.

Therefore I conclude that there is, at a quite abstract level, a Horn-scale between perfective and imperfective aspect, where the imperfective aspect is the strong member of the opposition. The “progressive” reading of *gerade* can thus be explained by the semantics of *gerade*, which selects for the more informative, imperfective reading, and discards the less informative, perfective reading.

Summing up, the analysis of the temporal uses of *gerade* proposed here assumes that *gerade* is a focus particle, and that focus particles interact with scales. It does not contain any element (e.g., reference to intervals) which would be specific to the temporal readings, and offers a viable basis which can be applied also to at least a subset of the non-temporal uses of *gerade*. At the same time, the scalar analysis led

²³The formal implementation of this idea uses partial orders on intervals. Imperfective aspect can be restated as follows: the temporal trace of the eventuality is an element of the filter generated by T-Ast. Similarly, perfective aspect amounts to the following: $\tau(e)$ is an element of the ideal generated by T-Ast. In such a framework, (33b) can be easily proved (cf. Schaden, 2007, p. 175ff.): any element of the ideal generated by an element x will be included in any element of the filter generated by x . Notice that this scale, unlike the immediate anteriority scale, does not depend on specific assumptions (dense vs. discrete) on the temporal ontology.

to the discovery of underlying scalar relations in the temporal domain, amongst which the fact that perfective and imperfective aspect form a Horn-scale.

1.4 Conclusion

In this paper, I have shown the distribution of German *gerade*'s two two temporal readings, namely a “progressive” and an “immediate anteriority” reading: with a simple tense, one obtains only progressive readings, whereas perfect tenses display progressive as well as immediate-anteriority readings. I have argued that those two readings are due to a difference in the merging site of the adverb: if *gerade* interacts with the perfect feature, this will trigger an immediate anteriority reading; if *gerade* interacts with an underspecified aspect, this will trigger the progressive reading.

Furthermore, I have proposed that these two temporal readings are to be derived from the same semantics for *gerade*, and that this semantics can account for at least a subset of the non-temporal uses of this adverb. According to my proposal, *gerade* selects the highest member of a scale, which is a Horn-scale in the case of the temporal readings.

Further investigations will have to determine to what degree the proposed semantics has to be modified in order to account for the non-temporal uses, and to what degree it is realistic to pursue the goal of finding a unique semantics for all temporal and non-temporal uses of *gerade*.

Acknowledgements

My work on *gerade* has benefitted from the comments of many linguists. I would like to thank specifically Daniel Buring, Patricia Cabredo Hofherr, Patrick Caudal, Bridget Copley, Christine Dimroth, Alice ter Meulen, Clive Perdue, Laurent Roussarie, Benjamin Spector and Lucia Tovina, for their enlightening discussions. Andrew Woodard helped me with my English. Special thanks to my thesis supervisor, Brenda Laca, Christopher Piñon, and the two anonymous reviewers of the paper, for their extensive and constructive criticism of the first draft of this paper, and their suggestions for improvements. None of the above should be assumed to endorse my positions, and any remaining errors and omissions are mine.

References

- Alexiadou, Artemis, Monika Rathert, and Arnim von Stechow, eds. 2003. *Perfect Explorations*, Berlin. Mouton de Gruyter.

- Asher, Nicholas and Alex Lascarides. 2003. *Logics of Conversation*. Cambridge: Cambridge University Press.
- Bybee, Joan and Östen Dahl. 1989. The creation of tense and aspect systems in the languages of the world. *Studies in Language* 13(1):51–103.
- Comrie, Bernard. 1985. *Tense*. Cambridge: Cambridge University Press.
- Dahl, Östen. 1985. *Tense and Aspect Systems*. Blackwell.
- Dowty, David R. 1979. *Word Meaning and Montague Grammar. The Semantics of Verbs and Times in Generative Semantics and Montague's PTQ*. Dordrecht: Reidel.
- Kamp, Hans and Uwe Reyle. 1993. *From Discourse to Logic. Introduction to Modeltheoretic Semantics of Natural Language, Formal Logic and Discourse Representation Theory*. Dordrecht: Kluwer.
- Klein, Wolfgang. 1994. *Time in Language*. London: Routledge.
- König, Ekkehard. 1991. *The Meaning of Focus Particles. A Comparative Perspective*. London: Routledge.
- König, Ekkehard, Detlef Stark, and Susanne Requardt. 1990. *Adverbien und Partikeln. Ein deutsch-englisches Wörterbuch*. Heidelberg: Julius Groos.
- Métrich, René, Eugène Faucher, Gilbert Courdier, and Michaela Heinz. 1995. *Les invariables difficiles: dictionnaire allemand-français des particules, connecteurs, interjections et autres mots de la communication*, vol. 2, *Bald – geradezu*. Nancy: Association des Nouveaux cahiers d'allemand, 2nd edn.
- Mittwoch, Anita. 1988. Aspects of english aspect: On the interaction of perfect, progressive and durational phrases. *Linguistics and Philosophy* 11(2):203–254.
- Pancheva, Roumyana. 2003. The aspectual makeup of Perfect participles and the interpretations of the Perfect. In Alexiadou et al. (2003), pages 277–306.
- Reyle, Uwe, Antje Rossdeutscher, and Hans Kamp. 2005. Ups and downs in the theory of temporal reference. (Ms.), Universität Stuttgart, submitted to *Linguistics and Philosophy*.
- Schaden, Gerhard. 2007. *La sémantique du Parfait. Étude des “temps composés” dans un choix de langues germaniques et romanes*. Ph.D. thesis, Université Paris 8.
- Smith, Carlota S. 1991. *The Parameter of Aspect*. Dordrecht: Kluwer.
- von Stechow, Arnim. 1999. Eine erweiterte Extended Now-Theorie für Perfekt und Futur. *Zeitschrift für Literaturwissenschaft und Linguistik* 113:86–118.
- Weinrich, Harald. 1986. *Grammaire textuelle du français*. Paris: Alliance Française.

January 2, 2008