1. Two ways of time

A little paradox concerning ›schon‹


(1)   a. [Type 2]  *es ist schon 9 – nicht erst 8*  
       ‘it’s already 9 o’clock – not (still) 8′

   b. [Type 3]  *sie kommt schon um 9 – nicht erst um 10*  
       ‘she’ll come already at 9 – not (only) at 10′

   a’.  *es ist schon 9 – das ist spät*  
       ‘it’s already 9 o’clock – that’s late’

   b’.  *sie kommt schon um 9 – das ist früh*  
       ‘it’s already 9 o’clock – that’s early’

Type 2  In a sentence with imperfective aspect, schon focuses on a time-dependent state specification; the construction says that at the reference time t, this state specification is true, rather than a state specification applying to an earlier time.

Type 3  In a sentence with perfective aspect, schon focuses on a temporal frame adverbial T; the construction says that the event e happened within the time specified by T, rather than within a later time.


Imperfective aspect: IP specifies a state; a reference time t, is specified by tense and context and/or time adverbial; Predication is about t; at t, state P obtains.

Perfective aspect: IP specifies a type of event; a time interval T is specified by tense and context and/or time adverbial. Predication is about e: e occurs, within T. (from Löbner 1989: 196)

Developments: possible correlations of temporally ordered states-of-affairs with time: d' faster, d slower.

Imperfective perspective [left picture] given t, d' is slower/d is faster, in corresponding to a less/more advanced state of affairs.

Perfective perspective [right picture] given e, d is slower/d' is faster, in that e occurs later/earlier

Resolution
In both uses, schon serves to contrast a more advances development with a less advanced one.
2. *early*

2.1 German and English vs. Japanese

| when?            | hayaku okiru früh aufstehen (get up *early*) | osoku okiru spät aufstehen (get up *late*) | haya-i, oso-i  
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>it is [Time]</td>
<td>hayai früh <em>early</em></td>
<td>osoi spät <em>late</em></td>
<td></td>
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<tr>
<td>manner (speed)</td>
<td>hayaku okiru schnell aufstehen (get up <em>quickly</em>)</td>
<td>noroku okiru langsam aufstehen (get up <em>slowly</em>)</td>
<td>haya-i, noro-i</td>
</tr>
<tr>
<td>IN adverbial</td>
<td>hayaku okiru schnell aufstehen (get up <em>quickly</em>)</td>
<td>?</td>
<td>haya-i</td>
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(2) a. *get up quickly / ?*  
    (IN adverbial, = *within short time*)

b. *get up early / late*

2.2 Get up early / late on day d

Working assumption:
*Get up* is taken in the sense of *get up from night sleep*; a person p gets up on a day d exactly one time:
\[ \forall d \forall p \exists ! e \text{ getup}(e, p) \land \tau(e) \in d; \] there is a function Getup: \[ \text{person} \times \text{day} \rightarrow \text{event} \]

Standard analysis:
*early* and *late*, when applied adverbially to a verb that refers to an event e, predicate about the time \( \tau(e) \). The predication is in case of *early / late*: \( \tau(e) \) is [considerably] earlier / later than a standard for the time when an event of the type/kind e is supposed to happen.

(For analyses in this style cf. Bierwisch 1989, Kennedy 1999, Kennedy & McNally 2005 etc.)

(3) \[ \tau(\text{Getup}(p, d)) < \text{standard} \quad (\tau(\text{Getup}(p, d)) \mid \text{condition on } p, \text{condition on } d) \]

The standard depends on the definition of the type of event: getup events as such; getup events of person p; getup events of a person of class P; get-up events as such on days of class D; getup events of person p on days of class D; getup events of persons of class P on days of class D, etc.: Every argument of an event of this type and every condition on every argument may figure in defining a standard. This may also involve implicit arguments.

Remark
While *early* and *late* compare times, *quick(ly)* and *slow(ly)* compare speed values (in a general sense, see below).
3. »quickly«

3.1 Internal speed readings ("manner")

Internal speed readings of quickly / slowly relate to the rate of progress in an ongoing activity; this is speed in a more traditional sense. Verbs eligible for this type of modification denote events with a temporally monotone progress. This use of quickly / slowly goes basically with imperfective aspect as it relates to an event in progress, but can be superimposed with perfective or perfect aspect.

Subclasses of verbs eligible

A telic:
reach a specified result state [results in a reading that is hard to distinguish from / systematically overlaps, or cooccurs, with duration reading]
verbs with an incremental argument;
verbs for complete actions with a result
eat wash_dishes change_clothes cook
> progress in terms of gradually approaching the target state

B1 atelic + durational:
activities or processes consisting of repeated parts
manner of movement: walk gallop rob jog run swin
chew read speak sing play (on an instrument) beat (drum etc.) paddle breathe pant
> progress in terms of accumulating repetitions

B2 less acceptable: punctual verbs, in particular semelfactives
? sneeze brush comb nock
# bark shout cough laugh beat

C verbs of locomotion
go ride drive fly glide
also manner of motion (cf. A) ¹
> progress in terms of path gone

D degree achievements (non-punctual)
grow spread rise recover stabilize improve (specific scale)
change become (unspecific scale)
> progress in terms of specific scale or an implicit dimension of change

E verbs in collective predication
gather
questionable: verbs in distributive macropredication
the refugees quickly crossed the German boarder / left their home country

3.3.2 Modeling internal speed

Basic idea
Construct speed as the first derivation of a progress function (in terms of the respective progress dimension). This approach requires local continuity of the progress function – within τ(e).

Problem
The topology of time to be applied may be discontinuous, not allowing for the infinitesimal definition of df/dt. For example: ‘breathe quickly’

¹ Open question: Verbs of manner of motion involving locomotion with recurring movements (walk, gallop) seem to only yield the space-related speed reading, not the repetition-related one. (However: run quickly on the treadmill; this is possible because change of location is excluded.)
Events of locomotion
Define the trajectory of a motion in space:
\[ \text{traj}(e) = \{ \langle \text{LOC}(\text{AGENS}(e), t), t \rangle : t \in \tau(e) \} \]
The times underlying the trajectory need not form a contiguous stretch in time. It may be sufficient to assume that there is a finite set of times in linear temporal order within \( \tau(e) \), something like:

A time line/chronology for an event \( e \) is a set \( \{ t_0, \ldots , t_n \} \) with \( t_0 = \text{begin}(\tau(e)) \), \( t_n = \text{end}(\tau(e)) \); \( t_0 < \ldots < t_n \) and \( n \geq \) some sensible minimum.

Remark: If \( e \) is punctual, there is no time line for \( e \) because \( \text{begin}(\tau(e)) = \text{end}(\tau(e)) \).

Attempt to define the (internal) speed of locomotion for an event \( e \):
\[ v(e, t) = \text{LOC}(\text{AGENS}(e), t) / \text{dt} \] bzw. \( \text{LOC}'(\text{AGENS}(e), t) \)

Remark:
We need to define \( \text{LOC}(\text{AGENS}(e), t) / \text{dt} \) on the basis of a time line for \( e \). One possibility:
restrict the definition to times within the time line, i.e. \( t \) with \( \text{begin}(\tau(e)) < t < \text{end}(\tau(e)) \);
define for time line \( \{ t_0, \ldots , t_n \} \) and \( 0 < i < n \in \)
\[ \text{LOC}(\text{AGENS}(e), t_i) / \text{dt} = 1/2 \left( \text{LOC}(\text{AGENS}(e), t_{i+1}) - \text{LOC}(\text{AGENS}(e), t_i) \right) / (t_{i+1} - t_i) + \]
\[ \left( \text{LOC}(\text{AGENS}(e), t_i) - \text{LOC}(\text{AGENS}(e), t_{i-1}) \right) / (t_i - t_{i-1}) \]

3.2 External speed readings
All these cases are preferably used with perfective aspect: they relate to the event as a whole. However, imperfective aspect is not excluded: \textit{Was machst du denn hier? Ich rauch gerade nur mal schnell ne Zigarette.}
In all these cases, \textit{quickly} represents an “In-adverbial”.

3.1.2 Sub-readings
S1 Onset speed reading
How much time does it take until \( e \) happens (or begins)?
- special class: verbs of reaction
  \textit{react} reply answer
- special class: classical achievements
- more generally: verbs of simple change

S2 Completion reading
How much time does it take until \( e \) is completed?
Remark For punctual verbs, the first two readings coincide.
- accomplishment verbs

S3 Done reading
How much time does it take until \( e \) is completed and the initial state is restored?
(4) \textit{Ich zieh mich schnell um.}
‘I’ll quickly change my clothes’

S4 Duration reading
How much time does \( e \) take?
- non-punctual verbs
Definition 1 Speed function for punctual events
Let e be a punctual event, t’ be a contextually given time, < \tau(e). The function speed measures the speed of e occurring after t’.

speed: EVENT × TIME \rightarrow TIME^−₁ such that for all t > t’, all e with \tau(e) > t': speed(e, t') = \frac{1}{\tau(e)−t’}

Remarks
The value of speed is a generalized speed: a quotient of some (arbitrary) measure and a duration.

- speed locates e in a two-dimensional space of SPEED × TIME.
- The two dimensions are inversely related as shown in the figure below.
  If e happens early after t’, then e is quick;
  if e happens quickly, then e is early after t’.
- The speed function returns a degree for the standard ADJ analysis.
- As an IN-adverbial, the predication is in need of a lower speed bound, and therefore an upper time bound: a within TIME modification is pointless if TIME does not provide an upper bound.
  Therefore, no antonym of quickly can serve in this function: it would specify an upper speed bound, correlation with a lower time bound, but no upper time bound.

Onset speed reading: apply speed(begin(e), t')
Completion speed reading: apply speed(end(e), t')
Duration reading: apply speed(end(e), \tau(begin(e)))
4. Conclusions

- Temporal ›already‹ and ›quickly‹ / ›slowly‹ deal with the relation between temporally ordered states of affairs (history, as it were) and time as such.

- Both operators have polarity contrasts in terms of more, or less, advanced developments.

- Given that time as such is established by temporally ordered states of affairs (e.g. by events that define, and count, time units), ›early‹ / ›late‹, too, are closely related to the two dimensions of time; ›early‹ and ›late‹ are degree concepts about times.

- There are basically two types of use of ›quick(ly)‹:
  1. “External speed” uses rate the time interval between some contextually given time and an event-related time, or between the beginning and the end of an event.
     There seems to be no correspondent use of ›slow(ly)‹.
  2. “Internal speed”, or manner, use: measures the speed of ongoing event, provided the event concept provides for a monotone progress (where mere temporal progressing is not sufficient).

     In both types of use, ›quick(ly)‹ can be given an essentially uniform analysis as expressing high speed, if the notion of speed is generalized accordingly (contra Rawlins 2013)

- ›quick(ly)‹ / ›slow(ly)‹ are degree concepts about speed in all adverbial uses.

- First derivations of functions may be useful in formal semantics in certain cases.

References

Acknowledgments
The research underlying this presentation was supported by the DFG grant CRC 991 “The structure of representations in language, cognition, and science”. I am indebted to Katja Gabrovská, Willi Geuder, and Curt Anderson for extended discussions of the matter.