1. Introduction

The aim of this paper is to discuss the possible meanings of quickly (and the equivalent Hungarian adverb gyorsan), its relation to sentence aspect, and to provide a semantic analysis for these different meanings. I deal with the so-called clausal and manner readings of the adverb, and conclude that we need to distinguish between its aspectual, rate and manner interpretations.

Section 2 introduces Ernst’s characterisation of the English adverb quickly. In section 3, I discuss Schäfer’s critical remarks on Ernst’s theory and some observations on the interpretation of quickly as well as the syntactic position of the adverb. Section 3 also presents the Hungarian data and gives an informal explanation for some of the distributional phenomena. The concluding section provides a semantic analysis for the emerging three different senses of quickly.

2. Ernst’s theory of adverb interpretation

Thomas Ernst’s theory of adverbial modification accounts for the interpretation of the adverb quickly (in its manner reading, more on this see below) by assigning it to the category of Quality (Predicational) Adverbs, which share the following properties (Ernst (1984):

(A) They are represented semantically by a gradable adjectival predicate (like LOUD, PROBABLE, CLEAR etc.)

(B) They are non-quantificational.

(C) They take entities like events, facts and propositions as arguments.
(D) They are almost always composed of an adjective plus the suffix -ly in English.

Within the category of Predicational Adverbs, we can distinguish the so-called Pure Manner Adverbs (PMA), which share the following semantic characteristics:

(a) PMAs usually involve perceptual qualities: light, sound, taste, physical action and so on.

(b) PMAs modify the perceptible dimensions of an event directly, while the manner readings of other Quality Adverbs only indirectly.

Consider a typical PMA like loudly and compare it to a so-called mental attitude adverb like sadly (Schäfer 2001):

(1)a. John walked loudly off the stage.
   b. John walked sadly off the stage.

Whereas loudly denotes a perceptual quality, sadly does not modify the event but instead expresses a property of the agent’s mental attitude. Thus (1)a. characterizes the walking event, while (1)b. contains a psychological adjective, which is simply a quality adverb.

We can also distinguish between the so-called clausal and manner readings of quality adverbs.

(2)a. Alice has cleverly answered the questions.
   b. Alice cleverly has answered the questions.
   c. Alice has answered the questions cleverly.

(2)a. is ambiguous between the readings (2)b. and (2)c. (2)b. is the subject-oriented clausal reading (‘It was clever of Alice to have answered the questions’), which is compatible with her having given stupid answers, while (2)c. displays the manner reading, which is consistent with the possibility that answering the questions at all was stupid of her.
Ernst mentions two important differences between the manner and the clausal readings. One is that the manner reading requires the manifestation of the quality expressed by the adverb, while the clausal reading is typically either a speaker-oriented or a subject-(agent-) oriented one. Besides agentivity, the clausal reading involves the agent exercising control over the eventuality by choosing or avoiding some action, so in a situation where (2)b. is true, the act of answering warrants positing more cleverness in the agent (as opposed to cleverness exhibited in the content of the answer) than the average norm for answering events.

This leads to the second difference, which concerns the ground of comparison in the two cases and can be accounted for on the supposition that the comparison classes used to interpret the two are different. These comparison classes are sets of actual and possible events that provide the basis for comparing the quality of a particular event with other events of the same type, or alternatively with other unspecified possible events. This means that the comparison class for manner readings consists of so-called Specified Events that receive the same description as the one forming the basis of comparison. In examples (2)a-c., the manner reading requires that Alice’s answer should be compared to other possible answers with respect to the manifested property, whereas the clausal reading requires that her answer should be compared to other possible events, especially to not answering the questions at all.

As I will argue in the paper, the clausal and the manner readings of quickly can be analyzed with the help of scale structures, which accords with the basic assumptions of Ernst’s theory of adverbial modification. However, as there is a third possible temporal interpretation of quickly, which cannot be categorized in terms of the clausal vs. manner dichotomy, we need to make some further distinctions to see how this adverbial interacts with verbs of different aspectual types.

3. The interpretations of the adverb quickly
3.1. Categorization issues
Ernst (2002) only slightly modifies the details of his previous framework and makes a distinction between the pure manner and the aspectual meanings of quickly. However, Schäfer (2001) raises an important critical point about Ernst’s categorization, arguing that quickly cannot be a prototypical (core) pure manner adverb. He gives grounds to his claim pointing out that, although quickly satisfies the semantic criteria for Pure Manner Adverbs on its manner reading, it may receive another, metaphorically extended temporal (aspectual) interpretation as well.

On Ernst’s categorization, this aspectual meaning of quickly is distinct from the pure manner reading. Schäfer does not accept this claim because, as he notes, if we adhered to Ernst’s original criteria, quickly would neither count as a manner adverb under this latter reading (because it has nothing to do with the perceptible qualities of the event), nor a quality (predicational) adverb. Rather, it should be considered a functional adverb of time. However, aspectual quickly would not resemble other quantity adverbs like immediately or soon, because these do not have a pure manner reading as well. This aspectual interpretation of quickly cannot be a clausal reading in the strict sense of the term either, because quickly cannot be paraphrased by predicating the related adjective QUICK of the state of affairs described in the rest of the sentence, as (3)a-c. show:

(3)a. John quickly lifted his arm.
   b. ‘John was quick in lifting his arm.’
   ≠ c. ‘John lifted his arm and that (fact) was quick.’

Schäfer argues that the temporal interpretation of quickly is a metaphorical construction. Contrary to Ernst, who excludes quickly from the class of PMAs on the basis of this temporal meaning, Schäfer concludes that we must distinguish between core PMAs like loudly or tightly and other PMAs like quickly, slowly or quietly whose meanings can be metaphorically extended to obtain another reading.

On the supposition that the temporal meaning of quickly is metaphoric, we may expect that synonyms and antonyms of quickly
do not have the same interpretational possibilities. This prediction is borne out in English: as Schäfer observes, the adverb *fast*, a word which is a close in meaning to *quickly* lacks the temporal (aspectual) reading and cannot occur pre-verbally.

(4) *John fast lifted his arm.*

Based on these observations, Schäfer proposes an underspecified semantic form for the base meaning of *quickly*, so that he can derive the manner and the clausal (aspectual) readings by introducing certain operators into the compositional process. Although I do not relate these different meaning, my analysis in section 4 uses Schäfer’s representation of the aspectual reading of *quickly* as a starting point for developing a semantic analysis.

**3.2. Three senses of *quickly***

Following Travis (1988), Tenny (2000) observes that like some other adverbs, *quickly* is ambiguous between the aspectual and another – rate or manner – reading, depending on its syntactic position.

(5a) *Quickly, John will be arrested by the police.*
(5b) *John quickly will be arrested by the police.*
(5c) *John will quickly be arrested by the police.*
(5d) *John will be arrested by the police quickly.*

In (5a) and (5b) *quickly* modifies the time of the preparation preceding the arrest, so these sentences mean that the arrest is going to happen very soon. In (5c) and (5d), it is the process of arrest that *quickly* modifies, so they mean that the rate or manner of the arrest will be hurried.

Tenny proposes a theory of semantic zones to account for the distribution and the corresponding readings of adverbs. She argues that *quickly* is in fact three-way ambiguous depending on the semantic zone where it modifies events:
Type of modification | Semantic zone
--- | ---
1. pure manner modification: | core event
   (cf. celerative II in Cinque (1999))
2. true rate modification | core event
3. aspectual modification: | middle aspect
   (cf. celerative I in Cinque (1999))

According to Tenny, (6) has two readings, given in (6)a. and (6)b.: 

(6) *Mary moved quickly to the window.*
   a. Mary moved her body in quick motions while progressing to the window, although her traversal of the path to the window may not have been a fast one. (pure manner modification)
   b. Mary’s traversal of the path to the window was fast. (true rate modification)

Compare also (6) with (7) which can only be interpreted as describing the manner Mary moved to the window.

(7) *Mary moved to the window quickly.*

Schäfer’s ‘temporal reading’ corresponds to Tenny’s ‘aspectual modification reading’, which is illustrated in (8):

(8) *Mary quickly moved to the window.*

However, as Thompson (2006) points out, when *quickly* is preposed, it may have a rate reading, too in addition to the aspectual reading. So (5a) (and also (5b)) may mean that the process of the arrest was quick. The only interpretation preposed *quickly* cannot have is the manner reading.
This raises the possibility that *quickly* in its rate reading modifies in the higher, middle aspect zone, like aspectual *quickly*. Thompson (referring to the rate reading for perfective sentences as the “whole event” reading) argues that *quickly* on the rate reading is adjoined to AspP, while on the manner reading it is adjoined to VP (or vP). She further claims that the lower attached *quickly* with a manner reading modifies only atelic events, while *quickly* on its rate reading can modify only telic events.

Thompson’s syntactic analysis is supported by linear order facts as well. When an unambiguous manner adverb like *carefully* precedes *quickly*, it may have both the manner and the rate readings, depending on the context.

(9) John built the house carefully quickly.

However, when *carefully* follows *quickly*, the only reading available is the manner reading:

(10) John built the house quickly carefully.

Following Thompson (2006), we may schematically draw up the following tree structures for the two types of modification.

(11)
As É. Kiss (this volume) shows, the word order with respect to the corresponding Hungarian adverb gyorsan is different, insofar as the occurrence of gyorsan is restricted when ordered with a real degree adverb like félig (half): according to a supposedly universal hierarchy, manner adverbs precede degree adverbs, whereas frequency adverbs precede manner adverbs:

(13)a. János gyorsan félig megcsinálta a házi feladatot.
   John quickly half PRT-did the homework.
   ‘John quickly did half of the homework.’

b. ??János félig gyorsan megcsinálta a házi feladatot.
   John half quickly PRT-did the homework
   ‘John quickly did half of the homework.’

By contrast, the postverbal placement of the so-called predicational adverbs like gyorsan is unrestricted:

(14)a. János megcsinálta gyorsan félig a házi feladatot.
   John PRT-did quickly half the homework
   ‘John did quickly half of the homework’.

b. János megcsinálta félig a házi feladatot gyorsan.
   John PRT-did half the homework quickly.
‘John has done half of the homework quickly.’

Assuming the framework presented by É. Kiss, we can say that manner, frequency and degree adverbs are all called ‘predicate adverbials’, because they are located within a special phrasal projection PredP (for details see this É. Kiss, this volume). However, as I will try to argue in the rest of this paper, adverbial modification interacts with focus and aspect, so the question whether it involves the aspectual projection AspP and the focus projection FP in Hungarian also emerges. The differences in the possible interpretations of gyorsan with respect to focus and some aspectual types like the progressive are more salient in Hungarian due to the presence of the telicizing verbal particles.

3.3 Interaction with aspect

So far we have distinguished three supposedly different meanings of quickly: a manner, a (true) rate and an aspectual one. Actually, the issue is more complex than it would seem at this point. Kearns (2005) argues that certain predicates modified by quickly differ in telicity, depending on the position of the adverb. While preverbal quickly forces a telic reading if it is available, post-verbal quickly allows both a telic and an atelic reading. Kearns calls this latter reading a “manner” interpretation, but in fact this may be either the manner reading or the one which Tenny identified as the true rate meaning of the adverb, depending on the meaning of the verb.

Kearns observes that the postverbal position of quickly is compatible with either a bounded or an unbounded event, so the verb eat in example (15) below may be interpreted either way, and it would seem that quickly may be interpreted either as a manner or as a rate adverbial. Thompson, however, as noted, claims that the only available reading for quickly in atelic sentences is the manner reading. In fact, in my view this is just a terminological issue: if we replace the ‘whole event’ reading which cannot apply to atelic (imperfective) events by definition in favor of the ‘rate reading’
which may be applied to atelic events, too, then the rate reading may also be available with atelic sentences.

A question that needs to be answered in this connection concerns the aspectual status of telic verbs of movement with an endpoint. Caudal and Nicolas (2005) argue that these verbs (like X drove to X, for example) cannot be gradual – they should be represented as atomic change-of-state events, because they cannot be modified by completely or finish. Thus we have conflicting evidence that pull us in different directions: on the one hand, we should be able to account for the possibility of modification with quickly, where the rate meaning of the adverb clearly requires a development portion of the event, but we have to do justice to the data of modification with completely and the like. I cannot resolve this tension in this paper, so I will continue with the assumption that these verbs are non-atomic.

To round off the discussion of aspectual differences, let us consider the two possible interpretations of (15), an example borrowed from Kearns (2005). (15a), the temporal interpretation of the verb eat is unbounded, as the completion of the event can be denied without contradiction. By contrast, once quickly is attached in a preverbal position as in (15b), the denial of completion of the event would be contradictory.

(15) John ate the apple quickly.

(15)a. John ate the apple quickly, but Mary snatched it away before he finished it. – Unbounded (imperfective), manner or rate reading

b. ??John quickly ate the apple, but Mary snatched it away before he finished it. – Bounded (perfective), aspectual reading

Used with quickly, the change-of-state verb dry also alternates between process and accomplishment senses depending on the position of the adverb (see Kearns 2005 for details):

(16)a. The clothes dried quickly, but were still quite damp when I checked them.
b. The clothes quickly dried, but were still quite damp when I checked them.

The following table gives an overview of the different interpretations of the adverb *quickly* depending on its possible positions.

<table>
<thead>
<tr>
<th>Preverbal (incl. Preposed) AspP-adjoined</th>
<th>Postverbal, VP (PredP)-joined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspectual reading</td>
<td>Manner reading</td>
</tr>
<tr>
<td>Rate reading</td>
<td>Rate reading</td>
</tr>
<tr>
<td>Manner reading</td>
<td></td>
</tr>
</tbody>
</table>

The next section surveys the Hungarian data bearing on the various interpretations of *gyorsan* and the different interpretations of the adverb, showing how they depend on its co-occurrence with verbs belonging to different aspectual classes and focus.

### 3.4 The Hungarian data

This section will introduce the relevant data concerning the interaction of the adverb with the different aspectual verb classes, and compare the distribution of *gyorsan* in sentences containing activities, accomplishments, achievements and so-called punctuals. Of course, a number of other factors besides verbal meaning may also affect the resulting aspectual interpretation, but here I will largely ignore these to keep things simple.

The adverb *gyorsan* is incompatible with states, so I will not consider this aspectual class, neither will I discuss certain (mainly post-verbal) placements of the adverb which are generally regarded as marginally acceptable. I will use the labels M, R and A as short for manner, rate and aspectual readings respectively.

First, consider how *gyorsan* is interpreted when it modifies an intransitive verb of motion:
(17) János [FocP gyorsan [PredP futott (három órán át)]]. M, R
John quickly ran three hours for
‘John ran quickly (for three hours).’

Gyorsan in (17) is in focus position, where it can be interpreted as specifying the manner or the rate of John’s motion. We may explain the absence of the aspectual reading on the supposition that the preceding or preparatory time needed for the aspectual interpretation is absent in activities. This view about imperfective atelic sentences is supported by the substitution of the aspectual adverbs rögtön (‘at once’) or azonnal (‘immediately’) for gyorsan. These expressions can only modify the preparatory time.

(18)a. *János rögtön futott három órán át.
John at.once ran three hours for
‘John at once ran for three hours’.

(18)b. *János azonnal futott három órán át.
John immediately ran three hours for.
‘John immediately ran for three hours.’

At this point we may also discern an interesting parallel between the aspectual reading of gyorsan and these aspectual adverbs. Kiefer (1994) observes that rögtön or azonnal can disambiguate certain sentences that are ambiguous between an imperfective and a perfective interpretation.

(19) Amikor csengettek, János (éppen) telefonált.
when bell-rang John (just) phoned
‘When the bell rang, János was speaking on the phone.’

(20) Amikor csengettek, János rögtön /azonnal telefonált.
when bell-rang John at.once/immediately phoned
‘When the bell rang, János made a call immediately.’
The main clause in (19) has progressive aspect, as attested by the modifier *éppen* (‘just’), and the event time of the activity described in the main clause includes that of the subordinated time clause. By contrast, the aspect of the main clause in (20) is perfective and the events described in the main clause and the subordinated time clause are understood as consecutive. It seems that the function of *rögtön* (‘immediately’) in (20) is to relate the event time of a perfective clause it is contained in to a certain time immediately preceding it, which may be explicitly expressed or implicitly inferred from the context. When interpreted aspectually, the function of *gyorsan* looks very similar:

(21) *Amikor csengettek, János gyorsan telefonált a rendőrségére.* A when bell-rang John quickly phoned the police-to ‘When the bell rang, John quickly called the police.’

Let us now return to atelic verbs. Consider the transitive change-of-state verb like *szárít* (‘dry’) in (22):

(22) *A szél [FocP gyorsan [PredP szárította (a kiterített ruhákat)]].* R the wind quickly dried the hung-up clothes. ‘The wind quickly dried the clothes on the line.’

It would be impossible to interpret this sentence on the manner reading of *gyorsan*, because the wind is a non-human natural force instead of an agent, so the manner of drying events by the wind cannot be modified. In fact, it cannot possibly have the aspectual reading either for reasons explained above. Of course, the so-called change-of state verbs that denote non-agentive intransitive processes like *érik* (‘ripe’) or *szárad* (‘dry’) also lack the manner meaning:

(23)a. *A paradicsom gyorsan érett.* R the tomato quickly ripened ‘The tomato ripened quickly.’

b. *A ruha gyorsan száradt.* R
the clothes quickly dried
‘The clothes dried quickly.’

By contrast, *gyorsan* modifying an accomplishment with an incremental theme and an agent may receive the rate and the aspectual readings.

(24) János gyorsan felépítette a házat. R, A
John quickly PRT-built the house
‘John built the house quickly.’

Atelic sentences containing so-called route verbs with an associated path of the motion (for details see Tenny (1994)) are ambiguous between a manner and a rate meaning of *gyorsan*, as (25) illustrates:

(25) János gyorsan mászott a létrán. M, R
John quickly climbed the ladder-on
‘John climbed the ladder quickly.’

The adverb *gyorsan* has the following interpretations in sentences containing a particleless verb with a telicising directional NP:

(26)a. János [FocP gyorsan [PredP mant (az ablakhoz)]. M, R
John quickly moved the window-to
‘John quickly moved to the window.’

b. János [AspP gyorsan [AspP az ablakhoz [PredP mant]]]. M, R, A
John quickly the window-to moved
‘John quickly moved to the window.’

We may account for the availability of the aspectual reading in (26)b. by assuming that *gyorsan* sits in Spec, FocP in (26)a., whereas in (26) b. it is attached to AspP, and the DP *az ablakban* (‘in the window’) is in the specifier position of PredP, a projection below AspP.
Compare the positions of non-focussed gyorsan in sentences containing an accomplishment with a telicising verbal particle and a Goal-denoting NP.

(27)a. János gyorsan felment az emeletre. M, R, A
   John quickly up-went the first.floor-to
   ‘John went upstairs quickly.’

   b. János felment gyorsan az emeletre. M, R, A
   John up-went quickly the first.floor-to
   ‘John went upstairs quickly.’

By contrast, the aspectual meaning is not available when the adverb is in focus.

(28) János [FocP gyorsan [PredP ment fel az emeletre]]. M, R
    John quickly went up the first.floor-to
    ‘John went upstairs quickly.’

The following sentences illustrate that gyorsan in progressive sentences containing accomplishments with a directional NP has the manner and the rate readings.

(29) János (éppen) gyorsan ‘ment fel a lépcsőn az emeletre...
    John (just) quickly went up the stairs-on the first.floor-to
    (prog) M, R
    ‘John was going upstairs quickly when...’

(29) has progressive aspect, which in Hungarian requires the explicit expression of a reference time in the past with a subordinate clause to count as a complete utterance. Being the object of the verb megv (go) the stairs provide a measure for the climbing event, and the adverb, besides qualifying John’s motion as quick (manner), may also mean that the rate of the climbing the stairs was quick compared to other climbing events.
gyorsan with change-of-state accomplishments has the following readings:

(30)a. Péter gyorsan megfőzte a csirkét. R, A
   Peter quickly PRT-cooked the chicken
   ‘Peter cooked the chicken quickly.’

   b. A csirke gyorsan megfőtt. R, A
   the chicken quickly PRT-cooked
   ‘The chicken cooked quickly.’

   c. Péter gyorsan főzte meg a csirkét. R
   Peter quickly cooked PRT the chicken
   ‘Peter cooked the chicken quickly.’

Also consider two sentences with achievements, to be discussed below:

(31)a. János [AspP gyorsan [AspP [Prep felért (az emeletre)]]]. A
   John quickly PRT-reached the first.floor-to
   ‘John reached upstairs quickly.’

   b. János [FocP gyorsan [Prep ért fel (az emeletre)]]. A
   John quickly reached PRT the first.floor-to
   ‘John quickly reached upstairs.’

Finally, the case of punctuals (achievement-like verbs without a preparatory phase) reveals an interesting property of gyorsan:

(32)a. #János gyorsan megbotlott.
   John quickly PRT-stumbled
   ‘John quickly stumbled.’

   b. #János gyorsan tüsszentett.
   John quickly sneezed.
‘John quickly sneezed.’

A bomba gyorsan felrobbant. A
the bomb quickly PRT-exploded
‘The bomb exploded quickly.’

(32)a. and (32)b. are unacceptable because when aspectual gyorsan is used with agentive verbs, it requires that the agent have control over the event to some extent, a precondition which is not met in (32)a. and (32)b., as these sentences describe typical involuntary actions. Perhaps an appropriate context for interpreting (32)c. would be a situation where a bomb disposal expert has control over detonating the bomb. In this scenario, gyorsan can only have the aspectual reading.

Note also that gyorsan can be used with non-agentive intransitive accomplishment verbs, too. Consider (33a-c):

(33)a. A paradicsom gyorsan megérett. R, A
the tomato quickly PRT-ripened
‘The tomato ripened quickly’.

b. A ruha gyorsan megszáradt. R, A
the clothes quickly PRT-dried
‘The clothes quickly dried.’

These sentences may express that either the rate or the termination of the accomplishment was quick. Gyorsan may also occur with their transitive causative counterparts, with natural forces conceptualized as causes of these events:

(34)a. A sok napfény gyorsan megéreltte a gyümölcsöt. R, A
the much sunshine quickly PRT-ripened the fruit
‘A lot of sunshine quickly ripened the fruit.’

b. A szél gyorsan megszáríttotta a ruhát. R, A
the wind quickly PRT-dried the clothes
‘The wind quickly dried the clothes.’

3.5 Summary of the distributional facts
Having surveyed the available readings of the adverb gyorsan, we may formulate the following generalizations:

(35) Generalizations about gyorsan

a) (focussed) gyorsan has manner and rate readings in sentences containing activity verbs.

b) gyorsan has manner and rate readings in progressive sentences containing an associated path of motion.

c) focussed gyorsan has rate and manner readings in perfective sentences containing accomplishment verbs of motion.

d) non-focussed gyorsan has rate, manner and aspectual readings in perfective sentences containing accomplishment verbs of motion.

e) a sentence containing an accomplishment which is a change-of-state verb may receive the aspectual and the rate but not the manner readings with non-focussed gyorsan.

f) gyorsan has only the aspectual reading in perfective sentences containing achievements.

h) gyorsan has only the aspectual reading with punctuals expressing controllable events.

Based on these observations, the following table shows summarizes the interpretational possibilities of the adverb gyorsan.

<table>
<thead>
<tr>
<th>Non-progressive atelic/imper</th>
<th>Non-progressive telic</th>
<th>Progressive atelic/telic</th>
<th>Achievement</th>
<th>Punctual (controllable)</th>
</tr>
</thead>
</table>
3.6 Two kinds of aspectual reading?
According to (35d), non-focussed gyorsan has both the rate and the aspectual readings in perfective sentences containing accomplishments. The aspectual reading of gyorsan in telic sentences often carries the implication that the path of the movement was traversed quickly. At this point, by choosing appropriate contexts it may be shown that the two readings are independent of each other. Suppose that John ate a small apple at a leisurely pace. In this scenario, (36) may be truthfully asserted:

(36) János lassan ette az almát, mégis gyorsan megette.
    John slowly ate the apple still quickly
    Lassan: R, gyorsan: A
    ‘John ate the apple slowly, still he ate it up quickly.’

Here the slow rate of the eating event, expressed by the adverb lassan (‘slowly’) is contrasted with the quick finishing of eating up the apple indicated by gyorsan, which shows that gyorsan here has the aspectual sense.

This might suggest that we ought to distinguish between the terminative and the inceptive aspectual senses of gyorsan. The clear cases for the inceptive aspectual meaning seem to be those where gyorsan is used with certain inchoative verbs in Hungarian or with the inchoative construction elkezd V-ni ‘start to V’ (A-I here indicates the inceptive aspectual reading):

(37)a. János gyorsan elindult haza. A-I
    John quickly PRT-left home
    ‘John left for home quickly.’
b. Péter gyorsan feldühödött. A-I
   Peter quickly PRT-got-angry
   ‘Peter got angry quickly.’

(38) Péter gyorsan elkezdett futni /vacsorázni/olvasni. A-I
   Peter quickly PRT-started run-INF/dine-INF /read-INF
   ‘Peter started to run/eat his dinner/read quickly.’

In (38), gyorsan modifies the VP elkezd V-ni, but it may also be
inserted between the verb elkezd and the infinitive, in which case it
modifies the rate or the manner of the event expressed by the
infinitive.

(39) Péter elkezdett gyorsan futni. M, R
   Peter PRT-started quickly run-INF
   ‘Peter started to run fast.’

Nevertheless, when used with verbs of motion and change of state
which function as telic predicates, the inceptive meaning of gyorsan
cannot be separated from the terminative sense clearly, because telic
predicates expressing a bounded change of state or a bounded
change of location involve complex events consisting of a (durative
or momentary) process and a resultant state/resultant location. The
process is denoted by a verbal predicate in Hungarian, while the
resultant state or location is signaled by the presence of resultative or
terminative verbal particles (É. Kiss 2006a). In these cases, gyorsan
modifies the whole telic predicate, and the sentence locates the
whole complex event with its result state relative to a reference time.
Besides sentences containing achievement verbs, the terminative
reading of gyorsan is also salient in the construction befejez + NP
‘finish + NP’, where the NP is a nominalized form of a verb
denoting an activity, or a quantized object. The latter is a
metonymical construction where the missing verb may be inferred
from the context:
Notwithstanding some phenomena that seem to support the distinctness of these two aspectual meanings, I will consider the aspectual use of *gyorsan* uniform, because in most cases it involves a relation between a preceding reference time and a culmination point or alternatively, the start of the event. As for those sentences where it does not seem to function this way, like in examples (40)-(41), it can be understood as qualifying the length of an interval spanning a period extending from a certain reference time to the end of a preparatory period of the event.

### 3.7 The possible readings of *gyorsan*

I will assume that *gyorsan* (or *quickly*) in sentences containing achievements behaves only as an aspectual modifier. Consider (42):

(42) Mary quickly PRT-reached the top
    ‘Mary quickly reached the top.’

It is obvious that in (42) *quickly* (or *gyorsan*) cannot modify the manner of reaching the top, because taken in itself, a momentary act of reaching cannot be said to be slow or quick. I suppose it cannot modify the rate of Mary’s climbing prior to her reaching the top either, because this activity is not strictly part of the meaning of the verb. Instead, here *gyorsan* refers to a presupposed preparatory phase of the event of Mary’s reaching the top. The sentence asserts that the time that elapsed between Mary’s having started climbing the hill, or between the start of the final phase of her climbing and the result
state of her being at the top is short – that is, the preparatory phase of Mary’s reaching the top was quick. In addition, it may pragmatically imply that the rate at which Mary performed the preparatory phase (consisting in her climbing the hill) was quick as compared to other possible climbing events.

We may suppose some kind of pragmatic reasoning like this going on here: the speaker asserted that a short time elapsed between the start of the climbing (or alternatively, the start of some final phase of climbing) and the result of being at the top, so Mary must have been climbing quickly, because she could not have reached the top otherwise in a time shorter than the average for climbing events.

Note that thus we have to distinguish two kinds of preparation: a preparatory time which does not form part of the event structure and is not presupposed in general, and a preparatory phase whose existence is presupposed by achievements in general.

3.8 *gyorsan* in progressive sentences

Property (35b) fits several event-based semantic analyses of the progressive, e.g. Landman (1992). Landman gives the truth conditions of progressive sentences within a possible-world framework, claiming that they denote unfinished, partially completed eventualities, so-called stages of possibly complete events. On this interpretation we can see why progressives do not allow the aspectual reading. This reading involves the notion of a preparatory phase or a period preceding the event – as we have seen, according to Schäfer (2001) this is what the adverbial *quickly* modifies in its aspectual use. However, progressives denote a partial, ongoing eventuality with possible outcomes whose preparatory phases (if there are any) are not available for modification. So we may conclude that the aspectual reading of *gyorsan* is acceptable only in clauses describing complete events, i.e. with non-progressive accomplishments, achievements and punctuals.

3.9 *gyorsan* in focus position

According to (35c) and (35e), one difference between the focussed and non-focussed sentences is the absence of the aspectual reading in
the case of focussed *gyorsan*. This means that the preceding time interval is not available for modification when the adverb is focussed in perfective sentences containing telic accomplishments. Although I have no ultimate explanation for the fact that this reading is not allowed in the focus position, I think it may be helpful to compare the behaviour of *gyorsan* with its antonym *lassan* (‘slowly’), which must be in focus in Hungarian to receive a manner reading, sharing a common characteristic of other expressions (like *ritkán* (‘rarely’), *rosszul* (‘wrongly’), *kevesen* (‘few’) etc.) with a ‘negative meaning’ component. Unlike most of these negative expressions, it may also occur unaccented pre-verbally, preceding the particle-verb complex (see example (44)), and in this case it has only the aspectual modification meaning

(43) *János* [FocP *lassan* [PredP ment (oda (az ablakhoz))]] R, M
    John slowly went PRT the window-to
‘John moved to the window slowly.’ (with slow motion)

(44) *János lassan odament* az ablakhoz. A
    John slowly PRT-went the window-to
‘John slowly moved to the window’. (The event of John’s going to the window took a long time to begin.)

In order to distinguish the presupposed part from the asserted content in sentences containing the focussed adverb, let us consider (45):

(45) *Nem igaz, hogy János* [FocP *gyorsan* [PredP ment (fel (az emeletre))]]
    not true that John quickly went up the first.floor-to
‘It is not true that John went upstairs quickly.’

The presupposed part, which can be formulated roughly as ‘John went upstairs in some manner or at some rate’ is preserved under negation. What is asserted in a sentence containing the focussed adverb is that this manner or rate was quick as compared to some
other possible goings upstairs: following Rooth (1996), we may suppose that these possible events form the alternative set of focus. When focussed, the adverb *lassan*, the antonym of *gyorsan* does not have the aspectual reading either – it can modify the time preceding the beginning of an event only in a non-focussed position. That is, we cannot use *gyorsan* in its aspecual reading contrastively because the appropriate contrast with *lassan* is not available in focus. Of course, the question of why neither of these adverbs can occur in focus still needs to be explained.

The possibility of the aspecual reading with *gyorsan* (both as focussed and as non-focussed) in sentences containing achievements like *felér* needs some elucidation. As I have already explained, we can distinguish two kinds of intervals which precede the event times. The first kind of interval is attached only contingently to the event, which means that it may or may not be involved in the interpretation of certain aspecual verb classes, depending on its relevance. This interval is typically either inferred from the context or from the reference time specified in an appropriate time clause.

The second kind of interval, which is a preparatory phase, is presupposed by achievements in general, as they describe the reaching of a result state or culmination that is preceded by this phase. Used with achievements, *gyorsan* qualifies this preparatory time, rather than simply a contingent interval that precedes the event. Thus when it occurs with achievements, the aspecually interpreted *gyorsan* does have an aspecual antonym *lassan* with which it may be contrasted in focus:

(46)a. János gyorsan ért fel a lépcsőn. A John quickly reached PRT the stairs
    ‘John reached up stairs quickly’.

b. János lassan ért fel a lépcsőn. A
    John slowly reached PRT the stairs
    ‘John reached upstairs slowly.’
4. A scalar semantics for *quickly*

I will use the semantic framework of Kennedy and McNally (1999) to give a detailed analysis of the meaning of *quickly*. The general idea behind an analysis of this sort resembles Ernst’s theory where adverbs are interpreted as expressions with a semantic representation containing a corresponding adjective and an appropriate comparison class, whether consisting of specified or other, non-specified events. However, as I will argue, the different meanings of *gyorsan* require basically different kinds of comparison classes and ways of comparison with different scale structures, so the adjective *QUICK* involved in the semantic representation of the sentences containing *quickly* is really a shorthand for a complex relation, to be formulated in terms of scales and these comparison classes. This means that we need to flesh out the relevant scale structures in more detail to give a suitable meaning representation for all three attested meanings of *quickly*.

The basic idea behind the scalar analysis of so-called gradable adjectives (like *dry, tall, warm* etc.) may be summarized as follows. Adjectives of this type map their arguments onto abstract representations of measurement, which can be conceived as degrees. These degrees in turn may be formalized as points or intervals totally ordered along some dimension. (e.g., dryness, height, temperature etc.). Each set of degrees ordered in this way corresponds to a scale. We can then interpret the propositions containing the gradable adjectives like relations between degrees on a scale. If we use a domain with a structure like this, we may interpret these adjectives as relations between individuals and degrees.

The first question to be discussed concerns the type of scale by which the senses of *quickly* are to be interpreted. Although Kennedy and McNally do not discuss the adjective *quick*, they mention its synonym *fast* explicitly while making several interesting
observations about some similar adjectives, which also apply to
quick.
The adjective quick is a relative gradable adjective like tall or deep.
‘Gradable’, understood here in a narrow sense, means that the
standards used by quick do not involve any minimal and maximal
degrees. This feature contrasts it with absolute adjectives like awake
(minimum standard) or full (maximum standard). Thus quick
incorporates an open scale with no minimal or maximal elements.
Although as an adjective, quick is an NP modifier appearing in
several metonymic constructions, I think it is plausible to claim that
its characterizing properties transfer to the related gradable relative
adverb quickly. As Kennedy and McNally convincingly show, the
behavior with the maximizing modifier absolutely, along with the
fact that fast (and also quick) allows for PPs that introduce the
comparison class provide evidence for the relative nature of quick:

(47)a. ??John is absolutely quick.
b. ??John is absolutely slow.

(48) This baby is quick (for a two-year old).

Of course, these properties must be taken into account in specifying
the scale structures.
The following gives the details of a scalar analysis of quickly,
complemented with some definitions from the event semantic
framework of Krifka (1992), where events and times form complete
semi-lattices with the two-place operation □ on the domain U of
events.

(49)a. □, the sum operation is a function from U×U to U that is
idempotent, commutative and associative.
b. The temporal trace function τ maps events to their run-times.

∀e,e’[τ(e) □ τ(e’) = τ(e □ e’)]
c. The structure of time intervals has atomic reference, the atoms are the time points (Ta).

Some further definitions specify the part, the proper part relations and the notion of a P-atom. This is the set of atomic events of larger events under a description P. x is a P-atom with respect to predicate P if and only if it has property P but has no proper parts with property P.

\[
\forall x, y [x \sqsubseteq y \leftrightarrow x \sqcup y = y] \text{ (part relation (partial order))}
\]

\[
\forall x, y [x \sqsubset y \leftrightarrow x \subseteq y \land \neg x = y] \text{ (proper part (strict partial order))}
\]

\[
\forall x, P[\text{ATOM}(x, P) \leftrightarrow P(x) \land \neg \exists y [y \sqsubset x \land P(y)]] \text{ (x is a P-atom)}
\]

**4.1. The manner and the rate readings**

I will start with discussing the manner reading of *gyorsan*, which is available with activities and accomplishment verbs of motion. At first we might suppose that an analysis would be adequate which uses a scale structure with degrees ordered along the dimension of speed for the minimal parts (which may be considered as separate bodily motions). However, this would result in an incorrect prediction, considering that the minimal parts make up the whole event, so that their speed values add up and determine the rate of the event, which means that on this supposition the rate reading would depend asymmetrically on the manner reading. Obviously, we have to make sure that this does not happen. One possible solution would be to suppose that the manner-type modification involves the agent of the event, whose bodily motion is at issue, while under the rate reading the adverb relates the whole event to a contextual standard specified by other events of the same type.
To spell out this idea, let us introduce a new notion, the Agent-Atom of an event. Agent-Atoms are atomic parts which stand in a specific relation to the Agents of activities or accomplishments. Thus we may conceive the agent as composed of atomic parts corresponding to the minimal events, and in doing so we can attribute the intensity of the particular bodily motions to these minimal agent-parts. The definition given below assumes an ordering defined over the consecutive temporal parts of the agent, where there is a morphism from sub-events to agent parts:

\[
(53) \text{AG-ATOM}(x', e, P) = \text{def} [(\text{AG}(e, x, P) \land x' \subset x \land \exists!e' \\
\text{ATOM}(e, e', P) \land \text{AG}(x, e', P)]
\]

So in this analysis the manner reading of *quickly* is represented with reference to the atomic agent of the sub-event and a contextually determined comparison class consisting of atomic agents of other events characterised under the same description like the one at issue. The adverb *quickly* on its manner reading takes an event and a degree argument, yields the minimal (atomic) agents of the event under a description, and compares the degree of these minimal agent parts’ intensity of bodily motion to minimal agent parts of other events of motion, so that the sentence asserts that all these minimal agents possess a higher degree of bodily motion than the average for minimal parts in general.

Of course, in a more precise analysis we should allow for a certain degree of vagueness as the exact number of the ‘sub-agents’ that have to move with a degree above average cannot be exactly specified, but for the sake of simplicity here I will use universal quantification over them.

As I have already noted, when the modification with *quickly* results in a manner reading, the adverb takes a verbal predicate as its argument together with its implicit degree argument characterizing the intensity of bodily movement. This argument is bound by default as having an unspecified value when the sentence does not contain any adverb to modify it. When an adverb is inserted, it does not only relate this argument to a contextually given average value. The
following gives an overview of the semantic composition of the sentence radical ‘John run quickly.’

(54) [quicklyM] → \( \lambda x \lambda d_1 \lambda d_2 \lambda e \Phi(x)(d_2)(d_1)(e) \land \forall x'[\text{AG-ATOM} (e, x', F) \rightarrow d(x') > C(d)] \)

(55)a. [[move] V]→ \( \lambda x \lambda d_1 \lambda d_2 \lambda e [\text{move}(e)(x) \land \text{AG-ATOM}(x)(d_1) \land \text{rate}(e)(d_2)] \)

b. [John] → j

c. [run] (\([\text{John}]VP\) → \( \lambda d_1 \lambda d_2 \lambda e [\text{move}(j)(e) \land \text{AG-ATOM}(j)(d_1) \land \text{rate}(e)(d_2)] \))

d. [quicklyM] (\([\text{move} (\text{John})VP\]) → \( \lambda d_1 \lambda d_2 \lambda e [\text{move}(x)(d_2)(d_1)(e) \land \text{AG-ATOM}(j)(d_1) \land \text{rate}(e)(d_2) \land d_1 > C(d)] \))

I will assume that another difference between the manner and the rate readings of *quickly* lies in the types of their corresponding scales. Caudal and Nicolas (2005) argue that verbs may have two different types of scales associated with them, such as a) Intensity (*dry, widen*) or alternatively b) Quantity (*eat*). My analysis differs from theirs insofar as I suppose that verbs of motion incorporate both of these scale types, but they associate them with different arguments, i.e. Intensity goes with the atomic agents of sub-events while Quantity with the event as a whole. Thus the manner reading of *quickly* uses a scale of Intensity, whereas the rate reading uses a scale of Quantity. This also means that we cannot derive either reading from the other.

Below I provide the interpretation for the rate reading. Here we have to provide an appropriate comparison class for the rate reading in order to make sure that the events to be compared are of the proper kind. There are two options: either the meaning of the verb incorporates either an open scale, or a closed scale (quantity). In the first case, there are only sub-events to be compared with respect to
their quantity, so to specify the average run-time of these events we should define an equivalence relation on the set of sub-events that yields the equivalence class containing events with the same length of path as sub-events of the original event. In this case, the degree argument for the rate reading (d2) serves to compare the run-times of the atomic sub-events, so the resulting proposition asserts that the run-times of these sub-events are less than the average value. When *quickly* is used with a verb of motion with an associated path or other types of ‘measuring-out’ expressions (see Tenny (1994) for details), the corresponding scale is closed and the resulting interpretation should differ accordingly. Of course, in both cases the comparison is made with events of the same type as the original, that is, specified events. (56) gives the interpretation of *quickly* for the rate reading with atelic events of motion. This formulation is intended to replace the “rate” relation shown in the preceding formulas.

(56) \[\text{quicklyR} \rightarrow \lambda \Phi \lambda x \lambda d1 \lambda d2 \lambda e \left[\left(\Phi(x)(d2)(d1)(e) \land \forall e'[\left(\text{ATOM, } e', \Phi\right) \rightarrow (d2,e') \Phi C(d) \right]\right] \]

4.2 The aspectual interpretation of *quickly*

Schäfer provides an analysis for the aspectual reading of *quickly*, which serves as my starting point in this section. Consider (57a) and (58a) and their paraphrases (57b) and (58b).

(57)a. John lifted his arm quickly.
   b. ‘John lifted his arm in a quick way.’

(58)a. John quickly lifted his arm.
   b. ‘John was quick in lifting his arm.’

Whereas *quickly* in (57a) specifies the manner of the lifting action, in (58a) it qualifies the time span after which the activity occurred. This reading involves a contextually given reference time, and locates the event with respect to it. So (57a) may be given a more detailed paraphrase: ‘The time that elapsed from a contextually given point in
time to the onset of the action/event which consists in John’s lifting his arm was short.’

Schäfer assigns the semantic representation (59) to the temporal reading of quickly and (60) to the whole sentence (58a).

\[(59) \lambda P \exists \tau [P(e) \land [\tau = [\text{tr}, \text{BEG}(e)] \land \text{SHORT}(\tau)]\]

\[(60) \exists y [\text{ARM}(\text{John}, y) \land \text{LIFT}(\text{John}, y, e) \land [\tau = [\text{tr}, \text{BEG}(e)] \land \text{SHORT}(\tau)]\]

Here tr represents the contextually given reference time (an instant) and \(\tau\) is a time span, so the second conjunct of (60) says that the time span leading up from the reference time to the beginning of the event is short. The speaker may specify the reference time by using a time clause, like in (61).

(61) When the bell rang, John quickly lifted his arm.

In what follows I would like to develop Schäfer’s analysis for the aspectual reading of quickly by spelling out the meaning of SHORT (that is, the aspectual equivalent of QUICK) in the above formula. Let us start with an observation of Partee (1973), who pointed out that the interpretation of immediately (an aspectual adverb) interacts with tense in a sentence like (62).

(62) If Susan comes in, John will leave immediately.

The immediate future is measured from the time of Susan’s coming in. In (62) the present tense is interpreted as a bound variable which is anaphorically connected to the present tense of the if-clause. The occurrence of present tense in the if-clause is not deictic, it has no specific reference.

Similarly to immediately, the reference time for aspectually interpreted gyorsan may be contextually specified:

(63) János gyorsan elkezdett olvasni.
‘John quickly started reading.’

Or else the reference time may be anchored to an antecedent time given in a time-clause:

(64) Amikor Mari elmosogatott, János gyorsan elkezdett takarítani.
   ‘When Mary had done the washing up, John quickly started to clean the room.’

As Schäfer notes, using quickly in its aspectual reading, the speaker asserts that the time interval between the reference time and the beginning of the event is a short one in comparison with the time intervals of similar events that form the comparison class. I will build on this intuition in giving a more detailed interpretation for this kind of reading. To achieve this, let me introduce the definitions of right and left boundaries as in (65)a. and b.

(65)a. LB(i,i’) iff i ⋂ i’ ≠ ∅ ∧ ¬∃i’’: i’’ < (i ⋂ i’) ∧ i’’ ⊆ i’
     b. RB(i, i’) iff i ⋂ i’ ≠ ∅ ∧ ¬∃i’’: i’’ > (i ⋂ i’) ∧ i’’ ⊆ i’

Under the aspectual reading of quickly, the relevant intervals are compared with respect to the closeness of their right boundary (RB) to a left boundary (LB) of a given event. Instead of a two-place relation, I will use two functions (LB, RB), which map the respective boundaries to an interval as their value. The reference interval may be given by a time-clause or it may become salient in the context.

(66) [quickly] → λΦxλd1λd2λe [Φ(x)(d2)(d1)(e) ∧ (DIFF(LB(τ(e)), RB(i))) < C)]

The relevant comparison class consists of events of the same type like the one to be compared, and the comparison class for specifying the contextually given average value may be defined like this:

(67) {RBτ(e) – LB(i’): e ∈ U}
Here \( i \) and \( i' \) are free variables. The variable \( i \) is either bound by a reference interval which is made available by a time clause or its value is given by the relevant context of the utterance. The variable \( i' \) is needed to characterize the earliness of the events in the comparison class and therefore it is different in each case.

Under this analysis, verbs of achievement would require special treatment, because being instantaneous and therefore practically identical with their culmination, the right and left boundaries of their run-time collapse into an instant. In addition, the relevant reference intervals in their case must always be the corresponding preparatory periods preceding their culmination. The analysis given here should therefore be modified accordingly to accommodate this aspectual type.

5 Conclusion
I have shown in outline how the interpretations for the different senses of quickly can be given, based on Ernst’s theory of adverbial modification supplemented by specific scale structures in a scalar semantic framework. The overall result is an interpretation where two different senses of quickly are given distinct scales, while the third, aspectual sense uses a comparison class containing the run-time values of intervals. The nature of the respective scales are different, just like the required types of comparison classes. In this approach, the aspectual interpretation is not derived from a basic meaning representation but represents a distinct sense for quickly. The interaction with aspect and focus in Hungarian offers a direction for further research.

Notes
1 I would like to thank Huba Bartos, Anikó Csirmaz, Katalin É. Kiss, Christopher Piñón, Balázs Surányi, and Anne Tamm for their helpful comments on the earlier version of this paper.
2 The adverb lassan (‘slowly’) has a pragmatic function in Hungarian, which seems unrelated to its central meanings. Used this way, it can be paraphrased by the ideje, hogy... („it is time to V”) collocation, or another adverb lassanként (‘before long’) and implies that the speaker is of the opinion that the action or
process which it modifies is about to take place. In this use, it may also occur in modal constructions with a special word order. Consider (a) and (b):

(a) Lassan (már) el kellene mennem.
   slowly (already) PRT should go-INF
   'It is time for me to leave'.

(b) Lassan elmegyek.
   slowly PRT-go-1SG
   'I am going to leave.'

(a) or (b) cannot be interpreted as specifying the manner or rate of my leaving. This pragmatic function somewhat resembles the aspectual interpretation, but is different from the standard aspectual sense. The speaker may utter (a) or (b) only when (s)he is actually about to take his leave.