SCOPE OF ASPECTUAL OPERATORS AND ASPECTUAL COMPOSITION IN ADYGHE[1]

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0. Preliminary remarks: layers of aspectual operators

It is commonly assumed by the proponents of the so-called 'bidimensional' theories of aspect (e.g. Smith 1991, Filip 1999, Bertinetto & Delfitto 2000) that it is necessary to distinguish between 'inner aspectuality' (*eventuality type, 'lexical' aspect*) and 'outer aspectuality' (*viewpoint, 'grammatical' aspect*). It is also widely acknowledged that both types of aspectual information are not elementary, and consist of several interconnected components; e.g., inner aspectuality is determined not only by the inherent lexico-semantic features of the verb itself, but also by the referential properties of its arguments (this phenomenon is somewhat clumsily dubbed 'aspectual composition', see *inter alia* Krifka 1989, 1998, Verkuyl 1972, 1989, 1993, Tenny 1994, Filip 1999).

However, to my knowledge, only a few linguists have explicitly addressed the question about the role that is played by temporal adverbials of duration, such as *for two hours* or *in two hours*, in the determination of the overall aspectual semantics of the sentence. Those are Wolfgang Klein (Klein 1994: Ch. 10) and Henriette de Swart (de Swart 1998). Without discussing their valuable contributions in any sufficient detail, I would like to point out that they arrive to similar, but non-identical conclusions about the role of duration adverbials in aspectual composition (hereafter I will use this term in the broad sense):

Klein 1994: duration adverbials 'enrich the lexical content' of the predicate (that is, they belong to the inner layer of aspectual operators);

de Swart 1998: duration adverbials are 'eventuality description modifiers' which take narrow scope with regard to other aspectual/temporal operators (that is, they belong to the inner level of the outer layer of aspectual operators).

In this paper I am going to argue on the basis of data from Adyghe, a North-West Caucasian language, that duration adverbials form a *separate* layer of aspectual operators, intermediate between 'lexical' and 'viewpoint' aspect.

1. Aspect and actionality in Adyghe — a survey

Adyghe is a polysynthetic language with very complex verb morphology. However, its tense-aspect system is relatively simple and consists of a zero-marked Present with a whole range of meanings (from PROGRESSIVE to GENERIC) and two past tense forms, the so called Preterite (suff. -ʁe) and Imperfect (suff. -š'təʁe)[2]. Precisely these two forms will be in the focus of attention in this paper.

The Preterite is perhaps best considered to be the 'unmarked' past tense form: it has the widest range of functions and is the most commonly used form (see Korotkova 2004 for a neat survey). However, it shows a clear tendency toward PERFECTIVE interpretation, especially with those verbs which denote dynamic eventualities; cf. the following examples[3]:

(1) *wəne-m sə-z-je-he-m   č'ale-r pŝaŝe-m deg_wəš'ə ʔa-ʁ*
     ROOM-ERG 1SG.S-REL-OBL-ENTER-ERG BOY-ABS GIRL-ERG TALK.TO-PST
     'When I entered the room, the boy started to talk with the girl'

(2) *wəne-m sə-z-je-he-m   č'ale-r pŝaŝe-m deg_wəš'ə ʔe-š'təʁ*
     ROOM-ERG 1SG.S-REL-OBL-ENTER-ERG BOY-ABS GIRL-ERG TALK.TO-IPF
     'When I entered the room, the boy was talking with the girl'

(3) *sə-qə-z-je-ha-m   č'ale-m pisme-xe-r ə-txə-ʁe-x*
     1SG.S-INV-REL-OBL-ENTER-ERG BOY-ERG LETTER-PL-ASB 3SG.A-WRITE-PST-PL
     'When I entered the room, the boy had written the letters'

(4) *sə-qə-z-je-ha-m   č'ale-m pisme-xe-r ə-txə-s'təʁe-x*
     1SG.S-INV-REL-OBL-ENTER-ERG BOY-ERG LETTER-PL-ASB 3SG.A-WRITE-IPF-PL
     'When I entered the room, the boy was writing the letters'

As it may be seen, the Imperfect in these contexts has a clear progressive meaning (as will be shown later on, it may have also a HABITUAL/ITERATIVE meaning).

Adyghe verbs (or, to be more precise, predicates) fall into several *actional classes* (I follow Tatevosov 2002 in determining the actional class of a given verb by the range of interpretations its TA-forms, viz. (PROGRESSIVE) Present and Preterite, have), see Table 1.

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[2] There are also two 'future' suffixes, whose range of meaning points to their categorization as irrealis forms. See Korotkova 2004 for details.

[3] All the examples cited in this paper have been collected during RSUH field-trip to village Hakurinohabl, Republic Adygeya, July 2004. For a more detailed survey of actionality in Adyghe see Arkadiev 2004.

Table 1. Actional classes of predicates in Adyghe

Class	Example	Meaning of Present	Meaning of Preterite
Stative	*mewəzə* 'to ache'	State	State
Inchoative-Stative	*jeλeʁ_wə* 'to see'	State	Entry-into-a-State
Atelic	*meǯeg_wə* 'to play'	Process	Process
Ingressive-Atelic	*mače* 'to run'	Process	Entry-into-a-Process
Multiplicative	*mapske* 'to cough'	Multiplicative	Entry-into-a-State
Punctual	*xewəq_we* 'to make a mistake'	—	Entry-into-a-State
Telic	*jebzə* 'to cut'	Process	Entry-into-a-State

Here I am going to focus only on two important actional classes: Atelic and Telic, since their behaviour with respect to various aspectual operators is crucial. Punctual verbs will be briefly discussed, too.

2. Durational adverbials in Adyghe

Let us now look at the two types of Adyghe durational adverbials, with which I am going to be concerned hereafter. To the first type belong 'simple' adverbials, which are formally identical with caseless forms of nouns denoting temporal intervals (e.g. *səhat* 'hour' or *taqjəq* 'minute') with numeral suffixes (e.g. *ṭ_we* 'two', *pṣ̂e* 'ten' etc.)[4]. These 'simple' adverbials are rough translational equivalents of the English *for*-adverbials, thus *səhat-nəqwe* 'for half an hour', *taqjəq-jə-ṭ_we* 'for two minutes'. The adverbials of the second type are formed on the basis of the 'simple' adverbials by means of the highly polyfunctional suffix *-č̣'e* (the 'Instrumental' case; see Kuznetsova & Serdobol'skaja 2004 for a comprehensive survey of its meanings) and more or less accurately correspond to the English *in*-adverbials: *səhatnəq_we-č̣'e* 'in half an hour', *taqjəq-jə-ṭ_we-č̣'e* 'in two minutes'. These adverbials will be hereafter called *-č̣'e*-adverbials.

The difference in meaning between 'simple' and *-č̣'e*-adverbials (and, mutatis mutandis, between *for*-adverbials and *in*-adverbials) can be informally captured with reference to the *part* of the event they may take scope over (cf. Klein 1994: Ch. 10): *for*-adverbials denote a homogenous eventuality (a process or a state) which lasts for the whole specified period of

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[4] An 'empty' conjoining morpheme -jə- is inserted between the noun and the numeral: səhat-jə-ṭ_we 'two hours'.

time, and thus they obligatorily *exclude* transitions; *in*-adverbials, on the contrary, obligatorily *require* a transition to be located at the final point of the specified period of time. Thus, *in*-adverbials are usually restricted to telic eventualities and *for*-adverbials to atelic ones. What these two types of adverbials have crucially in common is the fact that the output of both of them is a *quantized* or *bounded* predicate (in the sense of e. g. Depraetere 1991 or Krifka 1998). Thus, while *to sleep* as a *cumulative* (*unbounded*) predicate, *to sleep for two hours* is definitely not. This observation will be important for the following discussion.

3. The problem: Aspectual composition and temporal adverbials in Adyghe

Let us now examine the combinatorial possibilities of Adyghe actional classes, temporal adverbials and aspectual operators. First let us focus on the behaviour of the two types of durational adverbials when they are combined with the (unmarked) Preterite form of Telic and Atelic predicates. Given the telicity-sensitive nature of 'simple' and -*č'e*-adverbials, it is reasonable to expect that their distribution over the two actional classes in question will be as presented in Table 2.

Table 2. The expected distribution of temporal adverbials and actional classes in Adyghe

	'simple' adverbial	-*č'e*-adverbial
Telic	*	+
Atelic	+	*

Cf. the following often-cited examples from English:

(5)   *John slept for two hours / *in two hours* (Atelic)

(6)   *John wrote a letter in two hours / *for two hours* (Telic)

However, this prediction is actually not borne out: both types of adverbials may co-occur with both Telic and Atelic predicates; the combination of a Telic verb and a 'simple' adverbial is especially common, cf. the following examples:

(7)   *č'ale-r minut-jə-tfe qe-ŝ_wa-ʁ*
        BOY-ABS MINUTE-&-5   INV-DANCE-PST
        'The boy danced for five minutes' (Atelic + simple)

(8)   *ž'_waḳ_we-m   g_wəbʁ_we-r səhat-jə-š'e ə-ž'_wa-ʁ*
        PLOUGHMAN-ERG FIELD-ABS   HOUR-&-3   3SG.A-PLOUGH-PST
        'The ploughman was engaged in ploughing the field for three hours' (Telic + simple)

(9)   *ž'_waḳ_we-m   g_wəbʁ_we-r səhat-jə-š'e-č'e ə-ž'_wa-ʁ*
        PLOUGHMAN-ERG FIELD-ABS   HOUR-&-3-INS   3SG.A-PLOUGH-PST
        'The ploughman ploughed the (whole) field in three hours' (Telic + -*č'e*-)

Combinations of Atelic verbs with -*č'e*-adverbials are usually infelicitous in isolation, but in appropriate contexts (for instance, in the presence of temporal clauses denoting points in time) they become perfectly acceptable, cf.:

(10) *sə-qə-z-je-ha-m   pŝaŝe-r səhat-nəqᵂe-č'e televizorə-m je-pλə-ʁ*
1SG.S-INV-REL-OBL-ENTER-ERG GIRL-ABS HOUR-HALF-INS TV-ERG   OBL.3SG.S-WATCH-PST
'After I came into the room, the girl began to watch TV in half an hour'

Thus, here we are dealing with clear instance of 'coercion' (in de Swart 1998's sense): when the actional class of the predicate and the semantic restrictions imposed by the adverbial are incompatible, the predicate 'shifts' to another class (here Ingressive-Atelic) which is appropriate for the adverbial. However, contrary to de Swart, I am reluctant to consider (8) as an instance of coercion on a par with (10); in the next section I will discuss how (8) can be uncontroversially accounted for. Here I want simply to note that combinations of 'simple' adverbials with Telic verbs are quite natural in Adyghe, and that it is intuitively clear that (8) requires much less effort to interpret and find appropriate context for than (10).

The actual distribution of durational adverbials and actional classes in Adyghe is presented in Table 3.

Table 2. The actual distribution of temporal adverbials and actional classes in Adyghe

	'simple' adverbial	-*č'e*-adverbial
Telic	Process	Entry-into-a-State
Atelic	Process	Entry-into-a-Process

Let us now consider a more problematic case, viz. what happens when temporal adverbials co-occur with the Imperfect form of the verb. As has been already noted earlier, the Adyghe Imperfect has two major meanings: PAST PROGRESSIVE and PAST HABITUAL. These meanings may be present in simple sentences, cf. the following:

(11) *bzəwe-r bəbə-š'təʁe*
BIRD-ABS   FLY-IPF
a. 'The bird was flying (at the moment)'

b. 'The bird used to fly (usually)'

(12) *jane   č'etə-r   ə-ʁa-ẑᵂe-š'təʁ*
MOTHER CHICKEN-ABS 3SG.A-CAUS-BOIL-IPF
a. 'The mother was cooking the chicken (at the moment)'

b. 'The mother used to boil the chicken (usually)'

However, when there is a durational adverbial of any type, only HABITUAL meaning of the Imperfect is possible:

(13) *č'ale-m maše-r səhat-nəq_we-č'e ə-ṭə-š'təʁ*
BOY-ERG PIT-ABS HOUR-HALF-INS 3SG.A-DIG-IPF
'The boy used to dig a pit in half an hour'

(14) *č'ale-m maše-r səhat-nəq_we ə-ṭə-š'təʁ*
BOY-ERG PIT-ABS HOUR-HALP 3SG.A-DIG-IPF
a. 'The boy used to be engaged in the digging of a pit for half an hour'

b. *'The boy was engaged in the digging of the pit for half an hour'

(15) *č'ale-r səhat-jə-ble čəje-š'təʁe*
BOY-ABS HOUR-&-7 SLEEP-IPF
a. 'The boy used to sleep for seven hours'

b. *'The boy was asleep for seven hours'

It is clear from these examples that Imperfect takes scope over the adverbials, and not vice versa; were it otherwise, -*č'e*-adverbials could not have been compatible with the Imperfect (which cannot denote transition in any of its meanings).

The impossibility of the PROGRESSIVE interpretation of (13) is rather straightforward, since the -*č'e*-adverbial does not allow to exclude the transition component of meaning; however, it is necessary to account for the impossibility of PROGRESSIVE meaning in (14) an (15): why do 'simple' adverbials not allow, so to say, to 'look into' the event they modify?

Thus, Adyghe data posits two main problems:

☞ how to account for the fact that 'simple' adverbials may co-occur with Telic verbs?

☞ how to account for the fact that 'simple' adverbial prohibit the PROGRESSIVE interpretation of the Imperfect?

In the next section I will present a tentative solution to these problems. I will not deal with the third possible problem, viz. the behaviour of -*č'e*-adverbials with Atelic verbs; I believe that this fact may be accounted for with the mechanism of coercion.

4. A tentative solution

As is obvious, both problems stated in the end of the last section are concerned with the 'simple' adverbials. First of all, let us consider the first question, viz. the compatibility of these adverbials with both Atelic and Telic verbs. As I have noted earlier, I believe that it is possible to deal with this problem without recourse to the notion of 'coercion', which, in de Swart's terms (1998: 360 ff.), is an invisible aspectual operator, and I would like to avoid such problematic entities. The solution, I believe, lies in the adoption of a richer semantic representation of event-structure.

First let us consider the following difference between Adyghe Telic and Punctual verbs: only the former allow co-occurrence with 'simple' adverbials, while the latter do not, cf. the following:

(16)   *p̂aŝe-m ʔ$_w$ənč̂əbze-r səhat-nəq$_w$e qə-ʁ$_w$etə-ʁe
          GIRL-ERG   KEYS-ABS   HOUR-HALF   INV-FIND-PST
          '*The girl found the keys for half an hour'

It is intuitively obvious why (16) is ill-formed: the verb 'to find' does not denote any durable process, but only a transition. On the contrary, Telic verbs denote both a transition, and a process leading to it. This fact is neatly captured by the formal representation assumed by Levin & Rappaport Hovav (1998) and going back to Dowty (1979):

(17)   *to find* x = BECOME [*FOUND* (x)]

(18)   *to build* x = [ACT] CAUSE [BECOME [*BUILT* (x)]]

However, the representation in (17) and (18) is not sufficient for the purposes of an aspectual analysis. So, I propose to capture the contrast between Punctual and Telic verbs explicitly using a richer ontology of atomic eventuality types (cf. Pustejovsky 1991):

(19) $s_1,s_2,...s_i,...$ — states   (+homogenous, –dynamic)

        $p_1,p_2,...p_i,...$ — processes   (+homogenous, +dynamic)

        $t_1,t_2,...t_i,...$ — transitions   (–homogenous, +dynamic)

The difference between Punctual (=achievements) and Telic (=accomplishments) verbs may be captured as follows:

(20)   [[find]] = $\lambda t \lambda x \lambda y$ **find'** (x, y, t)

(21)   [[build]] = $\lambda p \lambda t \lambda x \lambda y$ (**build'** (x, y, p)) CAUSE (**build'** (x, y, t))

Under these assumptions it is possible to say that 'simple' adverbials in Adyghe take as their input predicates which denote eventualities with *homogenous subevents* (processes or states), not just homogenous eventualities. Punctual verbs do not allow 'simple' adverbials, because they denote only transitions; Telic verbs, on the contrary, denote processes with subsequent transitions, and therefore they freely combine with 'simple' adverbials.

Now let us observe how the Imperfect behaves with Telic and Punctual verbs; there is a contrast quite similar to that found with 'simple' adverbials, viz. Punctual verbs allow only HABITUAL interpretation of the Imperfect (while Telic ones allow both HABITUAL and PROGRESSIVE meanings):

(22)   p̂aŝe-m ʔ$_w$ənč̂'əbzə-r qə-ʁ$_w$etə-š'təʁ
          GIRL-ERG   KEYS-ABS   INV- FOUND-IPF
          a. 'The girl used to find the keys'

          b. *'The girl was finding the keys'

The difference between Telic and Punctual verbs with respect to the interpretation of the Imperfect follows straight from the representations in (20) and (21) and the following assumptions about the nature of PAST PROGRESSIVE and PAST HABITUAL meanings (cf. Filip 1999: 172 for (23))

(23) $[[\text{PAST PROGRESSIVE}]] = \lambda P \lambda e' \exists e; (P(e) \ \& \ e' < e \ \& \ \tau(e') < m_0)$

(24) $[[\text{PAST HABITUAL}]] = \lambda P \lambda E \ \#E > 1 \ \& \ \forall e \in E; (P(e) \ \& \ \tau(e) < m_0)$

As follows from (23), PROGRESSIVE is a partitive operator over events, which applies only to homogenous eventualities, whereas HABITUAL is a 'pluractional' operator which takes event as a whole an thus is not restricted to any particular eventuality type. Although Telic verbs denote non-homogenous eventualities, their event structure contains a homogenous subevent (viz. the process) which is precisely *the* subevent falling in the scope of PROGRESSIVE. Punctual verbs do not have a homogenous subevent in their event structure and therefore cannot allow the PROGRESSIVE reading of the Imperfect.

Moreover, under these assumptions about the nature of event structure (viz., the existence of a homogenous subevent in the event structure of Telic verbs), it is possible to modify the semantic representation of the PROGRESSIVE in the following way:

(25) $[[\text{PAST PROGRESSIVE}]] = \lambda P \lambda e' \exists e; (P(e) \ \& \ P(e') \ \& \ e' < e \ \& \ \tau(e') < m_0)$

The representation in (25) crucially differs from that in (24) in that it requires that the predicate embedded under PROGRESSIVE be true not only of the vent itself, but also of at least some of its proper parts. Such a modification becomes possible precisely when we assume that Telic eventualities, such as *to build a house* or *to walk to school* have a complex event structure consisting of a homogenous process and of a non-homogenous transition.

Now we are able to account for the behaviour of 'simple' adverbials in the scope of Imperfect in Adyghe. Let us see how the meaning of the sentences with both 'simple' adverbials and Imperfect tense are computed. Consider example (15), repeated here as (26):

(26)   *č'ale-r səhat-jə-ble čəje-š'təʁe*
BOY-ABS HOUR-&-7   SLEEP-IPF

    a. 'The boy used to sleep for seven hours'

    b. *'The boy was asleep for seven hours'

We must remember here that temporal adverbials yield *quantized* eventualities even if their output was cumulative, as in this example. Among two components of the property of being quantized, viz. antidivisibility and non-additivity (Filip 1999: 41 ff.), it is the former which is crucial here: the inability of a quantized event to have proper parts:

(27) **sleep_for_7_hours'** (e) $\rightarrow$ $\forall$e'; e' < e $\rightarrow$ ¬ **sleep_for_7_hours'** (e')

So, even though (26) denotes a homogenous process, the latter is quantized (bounded), and therefore it does not have any proper parts; thus it cannot be embedded under the PROGRESSIVE operator as represented in (25), cf. the computation in (28):

(28) [[Progressive (**sleep_for_7_hours'**)]] (e)   =

=   [λPλe' $\exists$e; (P(e) & P(e') & e' < e)] (**sleep_for_7_hours'**) (e)   =

=   [λe' $\exists$e; (**sleep_for_7_hours'** (e) & **sleep_for_7_hours'** (e') & e' < e)] (e)

The formula in (28) is not computable due to the fact stated in (27), and this accounts for the impossibility of the PROGRESSIVE interpretation of (26). On the contrary, the HABITUAL reading of (26) is unproblematic:

(29) [[Habitual (**sleep_for_7_hours'**)]] (E)   =

=   [λPλE #E > 1 & $\forall$e $\in$ E; P(e)] (**sleep_for_7_hours'**) (E) =

= λE #E > 1 & $\forall$e $\in$ E; **sleep_for_7_hours'** (e)] (E)

It is possible to compute the meaning of a combination of a Telic verb with a 'simple' adverbial, like in (30) [= (14)] in a similar fashion (I omit the formulas).

(30) *č'ale-m maše-r səhat-nəq$_w$e ə-ţə-š'təʁ*
      BOY-ERG PIT-ABS   HOUR-HALP   3SG.A-DIG-IPF
      a. 'The boy used to be engaged in the digging of a pit for half an hour'

      b. *'The boy was engaged in the digging of the pit for half an hour'

5. Conclusions

So, the range of combinatorial and semantic properties of Adyghe Telic and Atelic (and also Punctual) verbs, 'simple' and -*č'e*-adverbials, and Preterite and Imperfect TA-forms can be uncontroversially accounted for under the following assumptions about the nature of these three levels of aspectual operators and their interaction:

(1)   the event structure of Telic verbs is complex and includes both a non-homogenous transition event argument (t) and a homogenous process event argument (p); on the contrary, Atelic and Punctual verbs have a simplex event structure, with only a process or transition event argument, respectively;

(2)   'simple' adverbials require a homogenous eventuality (state or process) as their input, while -*č'e*-adverbials take scope only over transitions; therefore, 'simple' adverbials may combine both with Atelic and Telic verbs, but not with punctual verbs, and -*č'e*-adverbials require specific context in order to combine with an Atelic verb;

(3)   the Imperfect suffix has two meanings: PROGRESSIVE (a modified partitive operator requiring divisible eventualities as its input) and HABITUAL (an indefinite pluralizer over any types of eventualities);

(4)   the computation of aspectual meanings in Adyghe proceeds in the following steps: first the meaning of the verb[5] is modified by the adverbial, which preserves all the necessary aspectual information (such as the ontological type of the eventuality denoted by the verb, viz. state, process or transition) but may modify it in a certain way (e.g., 'simple' adverbials make processes and states bound without turning them into non-homogenous transitions; so, Adyghe data bears important evidence for Depraetere (1991)'s claim that *telicity* and *boundedness* must be distinguished from each other); then the whole complex is embedded under the TA-operator which imposes on it its particular viewpoint interpretation.

I believe that Adyghe data I have presented in this paper clearly indicates that it is necessary to postulate temporal adverbials (at least those of duration) as a separate level of aspectual operators, intermediate between 'lexical' aspect proper and 'viewpoint' aspect. Durational adverbials are not merely 'eventuality description modifiers' on a par with TA-forms, since they (at least 'simple' adverbials) neither actually *change* the eventuality type of the predicate, nor impose a special viewpoint on it. What they do is indicate the duration of the event denoted by the predicate and thus make it bounded.

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[5] For the sake of simplicity I do not consider here complex interactions between verbs and their arguments, viz. the aspectual composition *sensu stricto*.

Abbreviations

A	—	Agent	OBL	—	Oblique
ABS	—	Absolutive	PL	—	Plural
CAUS	—	Causative	PST	—	Preterite
ERG	—	Ergative	REL	—	Relativizer
INS	—	Instrumental	S	—	Subject (of 1-place predicate)
INV	—	Inverse	&	—	empty conjoining suffix
IPF	—	Imperfect			

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