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Class presentation of the paper:
"The aspectual makeup of Perfect participles and the interpretation of Perfect"
by **Roumyana Pancheva**

1. The central problem

The Present Perfect can have the following 3 interpretations:

(1) Since 2002, Alex has lived in LA UNIVERSAL
(2) Alex has been in LA before EXPERIENTAL
(3) Alex has just arrived in LA RESULTATIVE

All sentences in (1)-(3) have perfect aspect, but they all make different claims about the temporal location of the underlying eventuality with respect to the reference time (time of utterance in this case).

UNIVERSAL: the eventuality holds throughout an interval of time from 2002 till the present moment.

EXPERIENTAL: the eventuality holds sometime in the past (the eventuality holds at a proper subset of an interval extending back from the utterance time).

RESULTATIVE: the eventuality holds sometime in the past, but the result holds at the utterance time.

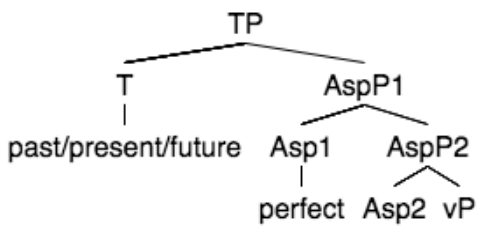
EXPERIENTAL and RESULTATIVE together are called the EXISTENTIAL perfect (as opposed to the UNIVERSAL perfect)

2. The outline of the paper

The paper argues that:

- The Perfect makes a uniform contribution into the semantics of each of the sentences in (1)-(3).
- The distinction between 3 types of the Perfect is grammatically based, the structures below the perfect aspect are responsible for those differences.
- The Perfect in this system acts like the second aspect (as shown in (4)).

(4)



- Aspect below the Perfect can be one of the following 4 options: bounded (=perfective), unbounded (=imperfective), neutral (a new one) and resultative (a new one).

3. The semantics of the Perfect

The semantics of the Perfect suggested in the paper is a modification of the "extended now" theory of the Perfect (McCoard 1978, Dowty 1979).
The basic idea is the following: the Perfect introduces an interval called the Perfect Time Span and temporally relates it to the reference time. Perfect acts like an embedded tense, it relates two evaluation intervals.

3.1 What is the Perfect Time Span?

The Perfect Time Span is an interval of time, such that its **final** subinterval is the reference time. Its **initial** subinterval can be introduced by adverbials like "since 2002" in (5).

(5) Since 2002, I have lived in LA.

PTS introduced by the Perfect in (5) is the interval starting in 2002 and ending at the utterance time (with is the reference time in this case, because of the present tense).

PTS in (5): |_____|
2002 now

3.2 Some motivation for the idea of the PTS:

The semantics for the Perfect we gave in class was the following (6).

(6) $[[\textbf{Perf}]]^{w,t,g} = [\lambda P_{<\varepsilon,t>} [\lambda t'_i \exists e.\ T(e) < t' \ \& P(e)=T\ ]\ ]$

This semantics makes the Perfect essentially the past tense (the eventuality holds in the past with respect to a reference time).
However, the sentence given in (5) not only means that I lived in LA in the past (since 2002), but also entails that I live in LA now. Therefore the semantics in (6) makes the wrong prediction about (5).
We need to have an access to the entire period of time in (5) and relate the event to this period. The idea that the Perfect introduces the Perfect Time Span does exactly this.

3.3 The semantics of the Perfect:

(7) $[[\textbf{Perf}]]^{w,t,g} = [\lambda P_{<i,t>} [\lambda t'_i \exists t.\ PTS(t,t') \ \& P(t)=T]$

PTS(t,t') iff t' is a final subinterval of t

The Perfect takes a predicate of tense and asserts that this predicate is true throughout the PTS (t).
The tense will determine the final subinterval (t') of the Perfect Time Span by relating it to the utterance time.

4. The contribution of the lower aspects

4.1 The Imperfective and the perfective

Pancheva argues that are 4 types of aspects that can be found below the Perfect that may or may not have a special morphological realization (two different aspects can have the same realization) (8).

(8) Bounded (=perfective)
Unbounded (=imperfective)
Neutral
Resultative

Two familiar aspects are given in (9) and (10).

(9) (**imperfective** =) [[**unbounded**]] ^{w,t,g} = [$\lambda P_{<\varepsilon,t>}$ [$\lambda t'_i$ $\exists e.\ t' \subseteq T(e)$ & $P(e)=T$]]

the time t' is contained within the 'temporal trace' of an event of P

(10) (**perfective** =) [[**bounded**]] ^{w,t,g} = [$\lambda P_{<\varepsilon t>}$[$\lambda t'_i$ $\exists e.\ T(e) \subset t'$ & $P(e)=T$]]

the time t' is contains the 'temporal trace' of an event of P

Perfect + unbounded (imperfective)=universal

The result of applying the perfect to a lower structure with the imperfective aspect is exemplified by (11).

(11) Since 1 am, Alex has been dancing.

In (11) the Perfect combines with unbounded aspect and yields the following meaning (12).

(12) [[[$_{\mathbf{AspP1}}$ **Perfect** [$_{\mathbf{AspP2}}$ **unbounded** [$_{\mathbf{vP}}$ **Alex dance]]]**]] ^{w,t,g} =
$\lambda P_{<i,t>}\lambda t''_i\ \exists t.\ PTS(t,t'')$ &$P(t)=T$
($\lambda Q_{<\varepsilon,t>}\lambda t'_i$ $\exists e.\ t' \subseteq T(e)$ & $Q(e)=T$ ($\lambda e.\ dance(e,w)$&$Ag(e,w)=Alex$))=

$\lambda t''_i\ \exists t.\ PTS(t,t'')$ &$\exists e.\ t \subseteq T(e)$ & $dance(e,w)$ & $Ag(e,w)=Alex$

(the dancing is happening throughout the entire PTS (from 1 am till the present moment in this particular case))

Since the sentence is in the present tense, the schematic representation of the resulting meaning of the entire sentence is given in (13). This semantics seems to capture the truth-conditions of the sentence:

(13)

(where | marks the beginning and the ending point of the PTS and ____ represents the event of dancing).

The resulting meaning is the Universal reading of the Perfect.

Perfect + Bounded (perfective)=Experiential

If the Perfect is applied to a lower structure with the perfective aspect, we get the Experiential reading. One example is given in (14).

(14) Alex has danced before.

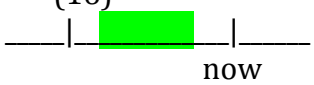
In (14) the Perfect combines with the bounded aspect and yields the following meaning (15).

(15) $[[\ [_{\text{AspP1}}\ \textbf{Perfect}\ [_{\text{AspP2}}\ \textbf{bounded}\ [_{\text{vP}}\ \textbf{Alex dance}]]]\ ]]^{w,t,g} =$
$\lambda P_{<i,t>}\lambda t''_i\ \exists t.\ PTS(t,t'')\ \&P(t)=T$
$(\lambda Q_{<\varepsilon,t>}\lambda t'_i\ \exists e.\ T(e) \subset t'\ \&\ Q(e)=T\ (\lambda e.\ dance(e,w)\&Ag(e,w)=Alex)\ )=$

$\lambda t''_i\ \exists t.\ PTS(t,t'')\ \&\exists e.T(e) \subset t\ \&\ dance(e,w)\ \&\ Ag(e,w)=Alex$

The time of the event is contained in the PTS.
The result of combining this with the present tense gets us the following picture (16). This semantics seems to capture the truth-conditions of the sentence in (14).

(16)

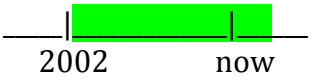


(where | marks the beginning and the ending point of the PTS and ____ represents the event of dancing).

How does this account for the fact that (5) (repeated as (17)) entails that I live in LA now? Stative predicates like "be sick" in English do not show morphological differences between the bounded and unbounded aspect when they appear under the Perfect. In (17) the lower aspect is **unbounded**. The predicted reading is shown in (18), which seems to be what we need.

(17) Since 2002, I have lived in LA.

(18)



In (19) the lower aspect is **bounded**:

(19) I have lived in LA before.

4.2 Neutral aspect

The formal definition of the neutral aspect is given in (20).

(20) $[[\textbf{neutral}]]^{w,g,t} = [\lambda P_{<\varepsilon,t>} [\lambda t_i \exists e.\ t\ \ NEU\ \ T(e) \& P(e)\ ]\ ]$

$t\ \ NEU\ \ t'$ iff $t \cap t' \neq \varnothing \ \&\ \exists t_1.\ t_1 \in t\ \&\ t_1 \notin t'\ \&\ \forall t_2.\ t_2 \in t' \rightarrow t_1 < t_2$

This formal definition can be unpacked in the following way: the event time and the reference time overlap, but there is a point during the reference time interval when the eventuality has not started yet.
(There is a time belonging to the reference time such that the event does not hold at that time and all the moments of the event are in the **future** with respect to this time.)

This is an aspect that allows reference to the beginning of an eventuality and some of its internal time, but not its ending point. The question of when the eventuality ends is left open.

Perfect + Neutral=Experiential

Some relevant examples of the Perfect + Neutral are given in (21)-(23).

(21) Alex have been working very hard these days.
(22) Alex have been losing my glasses recently.
(23) Alex have been sick lately.

The result of combining the Perfect with the Neutral aspect for example (21) is given in (24).

(24) [[**[$_{AspP1}$ Perfect [$_{AspP2}$ neutral [$_{vP}$ Alex work very hard]]]**]]^{w,t,g} = $\lambda P_{<i,t>}\lambda t''_i$ ∃t. PTS(t, t'') &P(t)=T

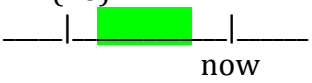
($\lambda Q_{<\varepsilon,t>}\lambda t'_i$ ∃e. t' NEU T(e) & Q(e)=T (λe. work very hard (e,w)&Ag(e,w)= Alex))=

$\lambda t''_i$ ∃t. PTS(t,t'') &∃e. t NEU T(e) & work very hard (e,w) & Ag(e,w)=Alex

The result of applying the Perfect to the neutral can be represented by either (25) or by (26).

(25)

(26)

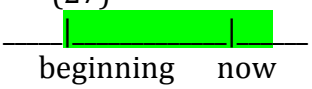


Both options are possible because the semantics in (24) is agnostic about when the event ended.

What is the motivation for introducing the Neutral aspect?

We see in (21) and (22) the progressive morphology on verbs that we normally associate with the imperfective. However the semantics we gave for the imperfective (= unbounded) (schematically represented in (27)) will not work for those cases.

(27)



All sentences in (21)-(23) do not require that the eventuality holds at the current moment. As an answer to this problem, one could say that the progressive morphology in English is ambiguous between the neutral and the imperfective aspect when it appears under the Perfect.

The schematic representation given in (26) seems to be right for the sentences (21)-(23).

What is the evidence for the existence of the neutral aspect?

Pancheva argues that Bulgarian overtly distinguishes between the neutral and imperfective aspect, as the example in (28) shows.

(28)

a. *Az* *stroix* *pjasâčna* *kula.*
I build-NEUT.1SG.PAST sand castle
'I was engaged in building a sandcastle.'

b. *Az* *strojax* *pjasâčna* *kula.*
I build-IMPERF.1SG.PAST sand castle
'I was building a sandcastle.'

c. *Az* *postroix* *pjasâčna* *kula.*
I build-PERF.1SG.PAST sand castle
'I built a sandcastle.'

28(a) and 28(b) do not entail the achievement of the goal, unlike 28(c).

28(a) is similar to 28(b) (the imperfective): both allow durative adverbials ("for two hours"), and do not allow completive adverbials ("in two hours").

However, like the perfective in (28(c)) and unlike the imperfective in (28(b)), the neutral (28(a)) allows such adverbials as "between 10 and 11".

This point about the overt distinction of neutral and imperfective in Bulgarian was not entirely clear to me.

First, it is not obvious that the fact that imperfective is incompatible with adverbials like "between 10 and 11" follows from the semantics of the imperfective.

Second, later the author argues that in Bulgarian neutral morphology is in fact ambiguous between the Neutral and Imperfective readings (see table (29)).

(29)

Semantics	Morphology
unbounded	neutral/imperfective
neutral	neutral/imperfective

In the light of this fact, it is not clear why (28(b)) does not allow "between 10 and 11" on the neutral reading of the imperfective morphology.

One possible answer is that the neutral/imperfective morphology is ambiguous between the unbounded and the neutral only when it appears under perfect.

Pancheva also argues that in English the neutral aspect is possible without the Perfect in (30).

(30) We read the Bible this morning.

However, again it is not quite clear why the aspect in (30) must be neutral. The sentence is compatible with the situation where not the entire Bible was read, however it is not clear if it has anything to do with when the event of reading the Bible ended.

4.3 The Resultative aspect

There is still one reading of the Perfect that we do not predict with the ingredients we have seen so far. It is the resultative reading in (3) (repeated here as (31)).

(31) Alex has just arrived in LA RESULTATIVE

The paper argues that this reading occurs as the result of applying a special aspect below the Perfect that is called the Resultative aspect.

The semantics for the Resultative aspect is given in (32)

(32) $[[\textbf{resultative}]]^{w,g,t} = [\lambda P_{<\varepsilon<\varepsilon,t>>} [\lambda t_i \exists e \exists s.\ t \text{ RES } T(s) \ \& \ P(s,e)\ ]\ ]$

$t \text{ RES } t' \text{ iff } t \cap t' \neq \varnothing \ \& \ \exists t_1 \exists t_2.\ t_1 \in t \ \& \ t_1 \notin t' \ \& \ t_2 \in t' \ \& \ t_2 \notin t \ \& \ t_1 < t_2$

This can be unpacked in the following way:

1) The Resultative aspect takes only telic predicates, the first argument it takes must be a relation between a state and an event. "lose my glasses" for example has a relevant semantics: λsλe [e causes s in w & my-glasses-are-lost (s)]

2) The reference time interval and the state time interval overlap, but the state time interval continues after the reference time interval ends.

____ represents the reference time interval
____ represents the state time interval
____ represents the time when they overlapped

The result of applying the Perfect to a structure with the resultative aspect is given in (33).

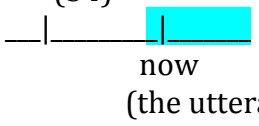
(33) $[[\ [\textbf{AspP1 Perfect } [\textbf{AspP2 resultative } [\textbf{vP Alex arrive in LA}]]]\ ]]^{w,t,g} =$

$\lambda P_{<i,t>} \lambda t''_i \exists t.\ PTS(t, t'') \ \& P(t)=T \ \ (\lambda Q_{<\varepsilon,t>} \lambda t'_i \ \exists e \exists s.\ t' \text{ RES } T(s) \ \& \ Q(e)=T \ (\lambda s \lambda e \text{ [e cause s in w } \& \ Ag(e,w)= \text{Alex } \& \text{ arrive in LA } (e,w) \ \& \text{ Alex is in LA } (s,w)]\ )=$

$\lambda t''_i \exists t.\ PTS(t,t'') \ \& \exists e \exists s.\ t \text{ RES } T(s) \ \& \ \text{ e cause s in w } \& \ Ag(e,w)=\text{Alex } \& \text{ arrive in LA } (e,w) \ \& \text{ Alex is in LA } (s,w)]$

The schematic representation of the resulting truth-conditions of (31) is given in (34).

(34)



where |___| shows the boarders of the PTS,
____ represents the state of Alex being in LA

This gives us the right reading for (31).

5. The morphological realization of different aspects

English:

(35)

Perfect Type	**Viewpoint Aspect**		**Aktionsart**
	Semantics	**Morphology**	
Universal	[UNBOUNDED]	non-progressive progressive	state activity, telic
Experiential	[NEUTRAL]	non-progressive progressive	state activity, telic
	[BOUNDED]	non-progressive	any
Resultative	[RESULTATIVE]	non-progressive	telic

Bulgarian:

(36)

Perfect Type	**Viewpoint Aspect**		**Aktionsart**
	Semantics	**Morphology**	
Universal	[UNBOUNDED]	neutral/ imperfective	any
Experiential	[NEUTRAL]	neutral/ imperfective	any
Resultative	[RESULTATIVE]	perfective	telic

Some important observations:

- The **Resultative** has the same realization as the **Bounded** in English
- There is no Bounded aspect in Bulgarian
- The **Neutral** and the **Imperfective** are realized in English and Bulgarian with the same morphology

6. Is the Resultative a separate aspect?

The paper argues that the resultative is a separate aspect.
The paper mainly focuses on distinguishing the Resultative and Experiential reading, arguing that the differences between those two readings result from two different grammatical structures.

6.1 Arguments from the tense shifting properties

The Resultative and the Experiential (resulting from the bounded aspect) readings are morphologically expressed in the same way in English, however only the Experiential is compatible with the simultaneous reading.

(37) Resultative: John has convinced his coach that he was too weak to play (back-**shifted** only)

(38) Experiential: John has convinced his coach once before that he was too weak to play (**simultaneous**, back-**shifted**)

(39) Universal: Since Friday John has been convincing his coach that he was too weak to play (back-**shifted** only)

It is not quite clear from the paper if the suggested semantics (for each aspect) captures this fact.

A similar phenomenon is observed in Bulgarian in the future under the Perfect configurations.
Bulgarian Perfect is analytic, it is formed with a be-auxiliary and a specialized participle. The perfect participle can express grammatical aspect.

The claim is that the Resultative behaves in a different way than the Experiential in Bulgarian.
(In Bulgarian, however, the Resultative and the Experiential have different morphological realization: perfective morphology for the Resultative and imperfective morphology for the Experiential. The paper argues that in Bulgarian there is no bounded aspect at all).

(40) Resultative (**no shifted reading**): Ivan will leave 2 days after the utterance time

Ivan	*me*	*e*	*ubedil*		*sega*	
Ivan	me	is	convince-PERF.M.SG		now	
če	*šte*	*trâgva*		*sled*	*dva*	*dena.*
that	will	leave-IMPERF.PRES.3SG		after	two	days

'Ivan has convinced me now that he will leave in two days.'

(41) Experiential (**shifted reading is possible**): Ivan will leave 2 days after the utterance time (now) or Ivan will leave 2 days after the time when he convinced me

Ivan	*me*	*e*	*ubeždaval*	*i*	*predi*
Ivan	me	is	convince-IMPERF	and	before

če	*šte*	*trâgva*	*sled*	*dva*	*dena.*
that	will	leave-IMPERF.PRES.3SG	after	two	days

'Ivan has convinced me before that he would leave in two days.'

(42) Universal (**no shifted reading**):

Ivan	*cjal*	*den*	*me*	*e*	*ubeždaval*
Ivan	all	day	me	is	convince-IMPERF.M.SG

če	*šte*	*trâgva*	*sled*	*dva*	*dena.*
that	will	leave-IMPERF.PRES.3SG	after	two	days

'Ivan has been convincing me all day that he will leave in two days.'

6.2 Arguments from ellipsis

(43) John has lost his glasses and Mary has too.
(44) *John has just now lost his glasses and Mary has too, several times before.

The assumption here is that "just now" forces the resultative reading.
However, it is not quite clear from the paper if this fact is predicted by the suggested analysis.

6.3 Arguments from restrictions on the use of adverbials

Adverbials can disambiguate between different readings. Some adverbials are only compatible with some specific interpretation.

(45)

Adverb	**The reading it is compatible with**
all morning	the Universal reading
many times, before	the Experiential reading
now	the Resultative reading

The neutral morphology is incompatible with "now" as (46d) shows. The culmination of the underlying telic event is not asserted in (46e), this is why the reference to the castle is infelicitous.

(46)

a. *Ivan cjala sutrin e stroil pjasâčna kula.*
Ivan all morning is build-NEUT sand castle
'Ivan has been building a sandcastle all morning.'

b. *Ivan e stroil pjasâčna kula mnogo pâti.*
Ivan is build-NEUT sand castle many times
'Ivan has built a sandcastle many times.'

c. *Ivan e stroil pjasâčna kula i predi.*
Ivan is build-NEUT sand castle and before
'Ivan has built a sandcastle before as well.'

d. * *Ivan e stroil pjasâčna kula sega.*
Ivan is build-NEUT sand castle now
'Ivan has built a sandcastle now.'

e. # *Ivan e stroil pjasâčna kula*
Ivan is build-NEUT sand castle

no šte ja razvali.
but will it destroy

'Ivan has built a sandcastle but will destroy it now.'

"Now" is also incompatible with the imperfective morphology (47(c)). Since it is not asserted that the state of Maria being here holds, (47d) is not felicitous.

(47)

a. *Maria vinagi e pristigala v polunošt.*
Maria always is arrive-IMPERF in midnight
'Maria has always arrived at midnight.'

b. *Maria e pristigala v polunošt i predi.*
Maria is arrive-IMPERF in midnight and before
'Maria has arrived at midnight before as well.'

c. * *Maria e pristigala sega.*
Maria is arrive-IMPERF now
'Maria has now arrived.'

d. # *Maria e pristigala i šte sedi do*
Maria is arrive-IMPERF and will stay to

utre.
tomorrow

'Maria has arrived and will stay until tomorrow.'

The sentences in (48) show that the perfective morphology (that expresses only the resultative reading in Bulgarian) is not compatible with the adverbials triggering the Universal reading or the Experiential reading. Since the resultative reading asserts that the state of Maria being here holds at the reference time, the continuation in (48d) is fine.

(48)

a. * *Maria vinagi e pristignala v polunošt.*
Maria always is arrive-PERF in midnight
'Maria has always arrived at midnight.'

b. * *Maria e pristignala v polunošt i predi.*
Maria is arrive-PERF in midnight and before
'Maria has arrived at midnight before as well.'

c. *Maria e pristignala sega.*
Maria is arrive-PERF now
'Maria has arrived now.'

d. *Maria e pristignala i šte sedi do utre.*
Maria is arrive-PERF and will stay till tomorrow
'Maria has arrived and will stay until tomorrow.'

6.4 No bounded aspect in Bulgarian

The paper argues that there is no bounded aspect in Bulgarian and the perfective morphology always realizes the Resultative aspect. The argument goes as follows: if an atelic predicate X appears with the perfective morphology, the only possible reading is "started to X". Perfective morphology requires shifting the meaning of atelic predicate into a predicate expressing a telic eventuality. Two examples are given in (49) and (50).

(49)

a. *Ivan obikna Maria.*
Ivan love-PERF.PAST Maria
'Ivan fell in love with Maria.'

b. *Ivan običaše Maria.*
Ivan love-IMPERF.PAST Maria
'Ivan loved Maria.'

(50)

a. *Ivan pisna (*dva časa).*
Ivan scream-PERF.PAST two hours
'Ivan started screaming (*for two hours).'

b. *Ivan pištja (dva časa).*
Ivan scream-NEUT.PAST two hours
'Ivan screamed (for two hours).'

c. *Ivan pišteše.*
Ivan scream-IMPERF.PAST
'Ivan was screaming.'

Conclusion

- Perfect always introduces the PTS and related the eventuality to this time interval
- The distinction between 3 types of perfect (Universal, Existential and Resultative) is grammatically based, the structures below the Perfect aspect are responsible for those differences.
- Aspect below the Perfect can be one of the following 4 options: bounded (=perfective), unbounded (=imperfective), neutral and resultative.
- In English different aspects have the following morphological realization:

Perfect Type	**Viewpoint Aspect**		**Aktionsart**
	Semantics	**Morphology**	
Universal	[UNBOUNDED]	non-progressive progressive	state activity, telic
Experiential	[NEUTRAL]	non-progressive progressive	state activity, telic
	[BOUNDED]	non-progressive	any
Resultative	[RESULTATIVE]	non-progressive	telic

- In Bulgarian different aspects have the following morphological realization:

Perfect Type	**Viewpoint Aspect**		**Aktionsart**
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Universal	[UNBOUNDED]	neutral/ imperfective	any
Experiential	[NEUTRAL]	neutral/ imperfective	any
Resultative	[RESULTATIVE]	perfective	telic