Participles, events and discourse structure in Ancient Greek

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Participles in Ancient Greek

(1) *kai gunê ousa en rusei haimatos dôdeka etê, kai polla pathousa upo pollôn iatrôn kai dapanêsasa ta par’ eautês panta, kai mêden Ôfelêtheisa alla mallon eis to kheiron elthousa, akousasa ta peri tou lêsou, elthousa en tôi okhlôi opisthen êpsato tou himatiou autou.*
And a certain woman, which had an issue of blood twelve years, and had suffered many things of many physicians, and had spent all that she had, and was nothing bettered, but rather grew worse, when she had heard of Jesus, came in the press behind, and touched his garment (Mark 5:25-27)

This is only about participles that are **verbal adjuncts** (predicative participles).
Outline

Corpus study and examples

The linguistic phenomena

Syntax

Syntax-semantics interface

Semantics
The corpus

- The data in this talk all come from the Gospels
- Written in Hellenistic Greek in the first century AD
- 64529 words
- 3041 participles, 1604 of which are predicative (366 of which are from legō ‘say’ and apokrinomai ‘answer’, which will be ignored)
- Morphologically analysed, syntactically parsed and to a large extent marked up for information status in the PROIEL corpus
The hypothesis

- A central claim in this talk is that not all predicative participles are born alike.
- In traditional accounts, it has been noted that they stand in different (adverbial) relations to the verb:
  - manner
  - means
  - condition
  - cause
  - time
  - ...
- We claim that these relations are not only the result of semantic/pragmatic interpretation.
- Participles are introduced by different syntactic rules that impose different constraints on the participle’s interaction with the main verb and with the discourse context.
Where in the clause do participles occur?

- There are numerous ways to think about participles position.
- They will be made precise in a syntactic analysis, but for the moment we will look at position relative to:
  - the initial position of the sentence
  - the matrix verb
  - the (shared) subject of the participle and the matrix
Almost half of the participles occur in sentence initial position.

Another large group are those which occur in second position, after their subject.

Of the remainder, most participles occur to the right of the main verb.

These groups differ according to several parameters.
### Table: Aspect per position

<table>
<thead>
<tr>
<th></th>
<th>Aor</th>
<th>Fut</th>
<th>Pres</th>
<th>Perf</th>
</tr>
</thead>
<tbody>
<tr>
<td>ptcp-(X)</td>
<td>0.875</td>
<td>0.000</td>
<td>0.118</td>
<td>0.007</td>
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<tr>
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<td>0.018</td>
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<tr>
<td>sub-ptcp</td>
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<td>0.000</td>
<td>0.182</td>
<td>0.028</td>
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<tr>
<td>left</td>
<td>0.823</td>
<td>0.000</td>
<td>0.156</td>
<td>0.022</td>
</tr>
<tr>
<td>right</td>
<td>0.122</td>
<td>0.004</td>
<td>0.784</td>
<td>0.090</td>
</tr>
</tbody>
</table>

- Position relative to the verb correlates with aspect usage.
- Informally, postverbal participles give background to the matrix event.
## Verb classes

<table>
<thead>
<tr>
<th>Verb classes</th>
<th>Movement_uni, perception, acquisition, char_speech, transfer</th>
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</thead>
<tbody>
<tr>
<td>ptcp-X</td>
<td>movement_uni, perception, acquisition, char_speech, transfer</td>
</tr>
<tr>
<td>ptcp-sub</td>
<td>movement_uni, perception, acquisition, cognition, transfer</td>
</tr>
<tr>
<td>sub-ptcp</td>
<td>perception, movement_uni, acquisition, transfer, cognition</td>
</tr>
<tr>
<td>left</td>
<td>movement_uni, perception, acquisition, transfer, char_speech</td>
</tr>
<tr>
<td>right</td>
<td>char_speech, compulsive_action, movement_uni, oral_comm, existence_spat</td>
</tr>
</tbody>
</table>

**Table:** Five most frequent verb classes by position

- Participles to the left of the main verb describe movement, perception and acquisition.
- Participles to the right are clearly different: we find characterizing speech (‘call’, ‘teach’, ‘brag’, ‘cry’) and compulsive action (‘tempt’, ‘sadden’, ‘loose’).
Lexical variation

<table>
<thead>
<tr>
<th>% belonging to top 10 lemmata</th>
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</thead>
<tbody>
<tr>
<td>ptcp-X</td>
</tr>
<tr>
<td>ptcp-sub</td>
</tr>
<tr>
<td>sub-ptcp</td>
</tr>
<tr>
<td>left</td>
</tr>
<tr>
<td>right</td>
</tr>
</tbody>
</table>

Table: Lexical variation by position

- There is more lexical variation in the postverbal position.
- Participles occurring in front of their subjects are particularly predictable.
### Length of participle constituents

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std.dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>ptcp-X</td>
<td>3.00</td>
<td>2.29</td>
</tr>
<tr>
<td>ptcp-sub</td>
<td>2.31</td>
<td>2.28</td>
</tr>
<tr>
<td>sub-ptcp</td>
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<td>3.03</td>
<td>2.58</td>
</tr>
<tr>
<td>right</td>
<td>3.81</td>
<td>2.85</td>
</tr>
</tbody>
</table>

- Participle phrases occurring in front of their subjects are shorter than the average.
- Participle phrases to the right of the verb are longer.
The groups we are looking at are not defined by precise syntactic positions and are likely to be heterogeneous, but there are still some clear tendencies:

- **right** tend to be stative, long and lexically varied, suggesting that their main function is to elaborate on the main clause event.
- **ptcp-sub** perfective, short and lexically predictable, which suggests that their main function is to link the sentence to the preceding discourse.
- **other** mostly perfective, but longer and less predictable: we take them to express new information on a par with the matrix verb.
Functions of predicative participles

Elaboration

(2) \( elalei \quad eulogôn \quad ton \quad theon \)
\[ \text{speak.PST.IF.3s \ praising.IF.P.NOM \ the.ACC \ god.ACC} \]
He was speaking praising god.

- In such cases the participle seems to be temporally dependent on the main verb
- Sometimes there is an intuition that the participle describes ‘the same’ event as the main verb
Functions of predicative participles

Independent rhemes

(3) *dramôn de tis kai gemisas spoggon*
run.A.P.NOM but some.NOM and fill.A.P.NOM spunge.ACC
*oxous peritheis kalamôi*
vinegar.GEN put.A.P.NOM reed.DAT
give to drink.PST.IF.3S him.ACC

Someone ran and filled a sponge with sour wine, put it on a reed, and was giving him a drink...

- Independent rhemes express new information which is information structurally on a par with the matrix verb
Functions of predicative participles

Frames

(The devil has tempted Jesus in various ways...)  

(4)  *kai* suuntelesas panta peirasmon ho
and finish.A.P.NOM whole.ACC temptation.ACC the.NOM
*diabolos* apestê ap’ autou
devil.NOM step.away.PST.A.3SG from him.GEN

And when the devil had ended all the temptation he stepped away from him

- This participles typically refer to old or predictable information
- They link the sentence to the previous discourse
Frames make salient old information

(5)  (Alyattes died) . . .

*Teleutêsantos* de *Aluatteô* *exedexato*
die.A.P.GEN PRT Alyattes.GEN receive.PST.A.3SG
tên *basilêiên* *Kroisos*
the.ACC reign.ACC Croesus.NOM

After Alyattes died Croesus received the reign
Functions

Frames under operators

(6)  *Proseukhomenoi* _de mê battalogêsete hôsper hoi_

Praying. **IF.P.NOM** ptc not babble like the _ethnikoi_

gentiles

When you pray, do not babble like the gentiles

- Outscopes both imperative mood and negation (which is here to the right anyway)
- ‘**X-ing, do **Y**!**’ is generally ambiguous in Greek
  - When **X-ing, do **Y**!** (framing)
  - Do **X** and **Y**! (independent rheme)
Issues involved

- Clause linkage
- Temporal anaphora & narrative progression
- The interpretation of aspect
- Interactions between information structure, word order and semantics
- Presuppositions
Clause linkage

Asher & Lascarides (2003)

(7)  a. Max had a great evening yesterday.
    b. He had a great meal.
    c. The waiter served an excellent wine with it.
    d. He then won a dancing competition.

(8)  a. Max had a great evening yesterday.
    b. He had a great meal.
    c. When the waiter served an excellent wine with it, he
       won a dancing competition.
Temporal anaphora & narrative progression

(9) Mary owns a donkey. She likes it.
(10) Mary had a party on Monday. John got drunk.
(11) Mary walked into the room. She sneezed.

Partee (1973, 1984)
(12) Mary came in. John phoned his mother.
(13) Mary came in. John was phoning his mother.

Kamp & Rohrer (1983)
Information structure, word order and semantics

(14) He was deeply asleep when the bomb exploded.
(15) When the bomb exploded, he was deeply asleep.
Presuppositions

(16) John knows that it is raining.
The ingredients of the framework

- LFG - suitable treatment of free word order
- CDRT - adequate treatment of cross-sentential temporal anaphora while allowing for a more deterministic, compositional account of sentence-internal relations
- Glue semantics to combine syntax and semantics
- Three-valued logic for a compositional treatment of presuppositions
Challenge

What is it what we would like to account for?

- Explain how the temporal relations between the participles and the finite verb arise, using a theory which
  - has a consistent semantics of aspect
  - can deal with multiple occurrences of independent rhemes
  - is compositional
Greek word order

- Very free: all six permutations of SVO occur with more than 5% frequency in the NT
- Does not signal grammatical relations, but pragmatic roles
- Although word order is free inside clauses, it is very restricted between clauses
- A ‘flat’ phrase structure
A simple Greek main clause

- One distinguished position with IS-related effects
- A ‘flat’ unordered sentence domain
They found the man sitting clothed at Jesus’ feet.
Participle in the specifier of IP...  

(18) *idôn* autên *ho kurios* esplangkhnistê ep’ autên

seeing her the lord felt compassion for her

When he saw her, the lord felt compassion for her.
... or adjoined to I’?

(19) *idôn autên ho kurios esplangkhnistê ep’ autên*
seeing her the lord felt compassion for her
‘When he saw her, the lord felt compassion for her.’
Both

(20) genomenês de hêmeras exelthôn eporeuthê
becoming day going out he went

eis erêmon topon
to a deserted place

‘When it became day, hew went out and travelled to a
deserted place
Relations between syntax and information structure

- Three basic positions: inside I’, adjoined to I’ and in the specifier of IP

- We’ll argue that they correlate with information structure in the following way:
  - Part of IP: elaboration on the rheme expressed by the I
  - Adjoined to the IP: expressing a rheme independent of that of the I
  - Spec, IP - topic/frame setter
Some complications

- Adjunction can be to the left or to the right, but the first is more common (especially with multiple participles)
- Participles inside the IP can appear to the left and the right of the main verb, but the latter is more common
- There is a systematic ambiguity between the Spec,IP position and left adjunction to I’ (the left-most adjunction in case of several participles)
Aside: backward control

(21) \( \text{labôn ho lêsous arton kai} \)
\( \text{take.A.P.NOM the.NOM Jesus.NOM bread.ACC and} \)
\( \text{eulogêsas eklasen} \)
\( \text{bless.A.P.NOM break.PST.A.3SG} \)

‘Jesus took the bread, blessed it and broke it.’
Semantics for f-structures

- f-structures are intuitively ‘closer’ to semantics than phrase structure trees
- But binary trees have a natural connection to meaning composition by functional application
- We need a categorial logic to guide the composition

\[ f \]

\[ h \]

\[ g \]

\[ \exists E_g \text{ denotes a semantic resource of the type of individuals associated with the f-structure} \]

\[ \exists E_g \rightarrow C_f \text{ is a function from such resources to a clause type resource (truth value) belonging to } f \]
Intransitives

\[
j : E_g \quad \lambda x.\text{speak}(x) : E(g) \rightarrow C_f
\]

speak(j) : C_f

- A type e (individual) resource associated with g
- From a type e resource belonging f’s subject I can create a clause type resource for f
- The glue language operations map straightforwardly to lambda calculus
Where do meaning constructors come from

- From lexical items and their morphology
- From constructions flagged by lexical items, by phrase structure rules or by subcategorization templates
  - The recipient in *bake someone a cake* adds a (intended) transfer meaning
  - In the same way, the different phrase structure rules that introduce participles are associated with different meaning constructors
(22) I didn’t turn off the stove Partee (1973)

- \( \neg \exists t P(t) \)
- \( \exists t \neg P(t) \)

But there is a specific time about which the speaker claims that he did not turn off the stove at that time: the topic time.
### Semantics of tense

<table>
<thead>
<tr>
<th>present</th>
<th>past</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>utterance time</td>
</tr>
<tr>
<td>-</td>
<td>topic time</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Semantics of aspect

- **aorist**
  - topic time
  - eventuality time
  - ‘completed’

- **imperfective**
  -
  - ‘going on’
Combining tense and aspect: imperfective aspect

(23)  *eikhon de tote desmion episêmon legomenon* had.
\text{PST}.\text{IF}.\text{3PL} \text{PTC} then prisoner notable called
*Barabban.*
Barabbas
They had a notable prisoner called Barabbas.

- \( n \)

\text{TT}: ‘then, that time’

\( \tau(e) \): the time of them having Barabbas
Combining tense and aspect: aoristic aspect

(24) *ekhthes hôran ebdommên afêken auton ho puretos*
    yesterday hour ninth left him the fever
    Yesterday at the seventh hour the fever left him

- $n$

___________ $t_{TT}$: the seventh hour of the day before $n$

__________ $\tau(e)$: the fever leaving
CDRT: The best of two worlds

Montague semantics

- clear compositional treatment

\[
PAST\left(\text{IPFV}(\lambda e[\text{have}_b(e)])\right)
\equiv \lambda Q[t_{TT} < n \land Q(t_{TT})(\lambda P \lambda t \exists e[\tau(e) \supseteq t \land P(e)](\lambda e[\text{have}_b]))
\equiv \exists e[\tau(e) \supseteq t_{TT} \land \text{have}_b(e) \land t_{TT} < n]
\]

Discourse Representation Theory

- Dynamics for intersentential anaphora

<table>
<thead>
<tr>
<th></th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>\tau(e) \supseteq t_{TT}</td>
<td></td>
</tr>
<tr>
<td>have_b(e)</td>
<td></td>
</tr>
<tr>
<td>\partial</td>
<td>t_{TT}</td>
</tr>
<tr>
<td></td>
<td>t_{TT} &lt; n</td>
</tr>
</tbody>
</table>
CDRT: The best of two worlds

Compositional DRT (Muskens (1996))

- clear compositional dynamic theory

\[ \lambda \mathcal{Q}[t_{TT} \preceq n] \oplus \mathcal{Q}(t_{TT})](\lambda \mathcal{P} \lambda t[\tau(e) \supseteq t] \oplus \mathcal{P}(e)](\lambda e[\text{have}_b(e)]) \]

\[ \equiv \]

\[ \tau(e) \supseteq t_{TT} \]
\[ \text{have}_b(e) \]
\[ t_{TT} \preceq n \]

- formalism: classical type logic
- DRSs are abbreviations of expressions in this language
CDRT and Glue semantics

- The language of CDRT and of the meaning representations in Glue semantics is type logic.
- So these two can be combined (van Genabith & Crouch 1997): glue semantics with CDRSs.
The semantic building blocks

AOR  \[ \lambda P \lambda t. \exists e. P(e) \land \tau(e) \subset t \]
     \[(EV_m \rightarrow C_m)\]

IPFV  \[ \lambda P \lambda t. \exists e. P(e) \land \tau(e) \supseteq t \]
      \[(EV_m \rightarrow C_m)\]

PAST  \[ \lambda P \lambda t. P(t) \land t \preceq n \]
      \[(T_m \rightarrow C_m) \rightarrow (T_m \rightarrow C_m)\]

ELAB  \[ \lambda P \lambda Q \lambda e_m. P(\tau(e_m)) \land Q(e_m) \]
      \[(T_p \rightarrow C_p) \rightarrow [(EV_m \rightarrow C_m) \rightarrow (EV_m \rightarrow C_m)]\]

FRAME  \[ \lambda P. \partial P \]
       \[(T_p \rightarrow C_p) \rightarrow (T_p \rightarrow C_p)\]

NARR-PROG  \[ \lambda P \lambda Q \lambda t_p. \exists t_m. P(t_p) \land Q(t_m) \land t_p \supseteq t_m \]
          \[(T_p \rightarrow C_p) \rightarrow [(T_m \rightarrow C_m) \rightarrow (T_p \rightarrow C_m)]\]

PICKUP  \[ \lambda P \lambda Q \lambda t_p. Q(t_p) \land P(t_p) \]
        \[(T_p \rightarrow C_p) \rightarrow [(T_m \rightarrow C_m) \rightarrow (T_p \rightarrow C_m)]\]

SENTENCE \[ \lambda P. P(a) \]
   \[ \forall \alpha (TT_\alpha \rightarrow C_f) \rightarrow C_f \]
Where the building blocks come from

- AOR, IPFV and PAST come from the morphology
- NARR-PROG, ELAB, FRAME, PICKUP come from the phrase structure rules

\[
I' \rightarrow \text{VP} \quad I'
\]

\[
\text{NARR-PROG} \lor \text{PICKUP}
\]

\[
I' \rightarrow \text{VP} , I , \text{XP*}
\]

\[
\text{ELAB}
\]

\[
\text{IP} \rightarrow \text{VP} \quad I'
\]

\[
\text{FRAME}
\]

\[
\text{NARR-PROG} \lor \text{PICKUP}
\]
Interaction with the context

- Composing a meaning for a sentence will typically leave a lambda bound time variable.
- ‘John left’ denotes the set of times which includes a leaving of John.
- However, in the final interpretation this should be bound to a specific time in the narrative context.
The sentence construction

\[ \lambda P.P(a) : \forall \alpha \left( TT_\alpha \rightarrow C_f \right) \rightarrow C_f \]

- The (declarative) sentence construction comes with a semantic resource which ‘frees’ a lambda bound time variable
- If you need a time resource to produce a sentence meaning, you can get it in the form of a free variable
- The free variable is interpreted as an anaphor in CDRT
- The meaning constructor can be generalised to other cases where we need to combine intersentential, compositional constraints with intrasentential binding
He was speaking praising the lord

- Notice that only the main clause verb needs to find a topic time in the context
- The participle temporally interacts only with the main verb
- If the meaning of aspect should remain constant it is impossible to have a direct relation between the two events
- But we also believe there shouldn’t be one in the semantics
(25)  *peritheis kalamôi epotizen*

Someone ran and filled a sponge with sour wine, *put it on a reed, and was giving him a drink*, saying...
Independent rhemes

PTCP+AOR:  
$$\lambda t_p. \exists e_p. put(e_p) \land (t_p \supset \tau(e_p)) \subset t_p : T_p \rightarrow C_p$$

NARR-PROG:  
$$\lambda P. \lambda Q. \lambda t_p. \exists t_m. P(t_p) \land Q(t_m) \land (t_p \supset \tau(t_m)) : (T_p \rightarrow C_p) \rightarrow ((T_m \rightarrow C_m) \rightarrow (T_p \rightarrow C_m))$$

MAIN+IMPF:  
$$\lambda t_m. \exists e_m. makedrink(e_m) \land (t_m \supset \tau(e_m)) \supset t_m : T_m \rightarrow C_m$$

Again we start with a set of times which serves as input to NARR-PROG

NARR-PROG turns the participle into something which looks for a dependency on main clause times . . .

. . . and returns a dependency of participle times

This is done by relating \( t_m \) and \( t_p \) so that \( t_p \) abuts on \( t_m \) and existentially quantifying over \( t_m \)
Recursive application

- Since we can have several independent rheme participles, it is important that this process can be applied several times.
- We need to see how the $m$ and $p$-variables arise in the glue side: $(T_p \circ C_p) \circ [(T_m \circ C_m) \circ (T_p \circ C_m)]$
- The participle applies to the verb to its right to produce a sentence meaning, but in this case the verb to the right is the main verb.
Independent rhemes

Instantiating NARR-PROG

\[(T \uparrow \rightarrow C \uparrow) \rightarrow [(T \rightarrow \rightarrow C_{ADJ\in \downarrow}) \rightarrow (T \uparrow \rightarrow C_{ADJ\in \downarrow})]\]

\[(T_p \rightarrow \rightarrow C_p) \rightarrow [(T_m \rightarrow \rightarrow C_m) \rightarrow (T_p \rightarrow \rightarrow C_m)]\]

- \(\uparrow\) refers to the f-structure of the participle
- \(ADJ\in \downarrow\) refers to the f-structure of the main clause
- \(\rightarrow\) refers to the f-structure of the following independent rheme (various implementations are possible)
Putting the sponge on a reed, he was making him drink

- Again, the sentence is dependent on one time which must be provided by the context, but this time it is the time of the participle.
- The time of the participle and the time of the matrix event are related through a relation of abutment.
This time, the context has to provide not only a suitable time for the participle event, but a suitable event.

Putting the sponge on a reed, he was making him drink.
Summing up

- in sentences without framing/independent rheme participles, the topic time is provided by the context
- in sentences with framing/independent rheme participles, the topic time is provided by the participle clause, which is in its turn related to the context (in different ways)

- elaboration participles have a different function:
- they do not locate the event in time, but provide additional information about the event
Conclusion

- Corpus data clearly show that participles behave differently in different sentence positions.
- A precise account of these differences requires the combination of several frameworks.
- Combining LFG and CDRT using Glue semantics we can account for:
  - the different functions of Ancient Greek adjunct participle
  - how these functions are coded in the word order
  - their temporal relations to each other, the main verb, and the context.
Slides available at
http://www.hf.uio.no/ifikk/proiel

Data from the PROIEL corpus
http://foni.uio.no:3000