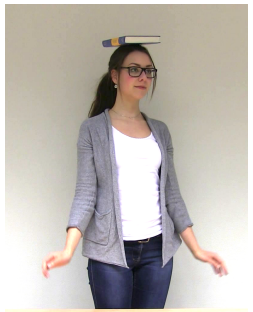
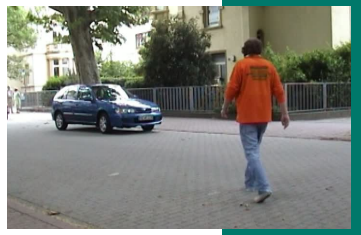
MAX PLANCK INSTITUTE
FOR PSYCHOLINGUISTICS

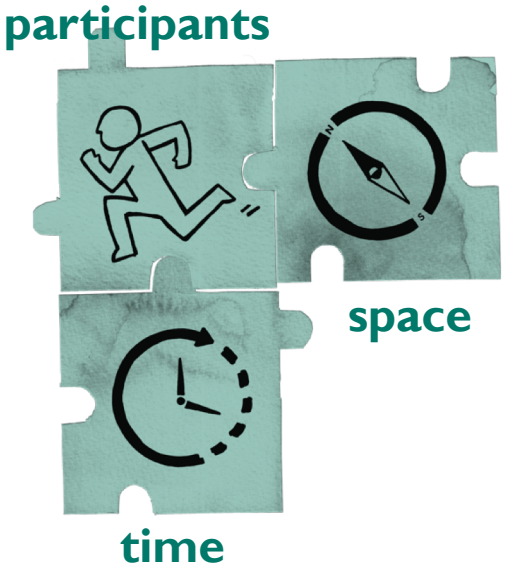
On the role of aspect in event comprehension

MONIQUE FLECKEN

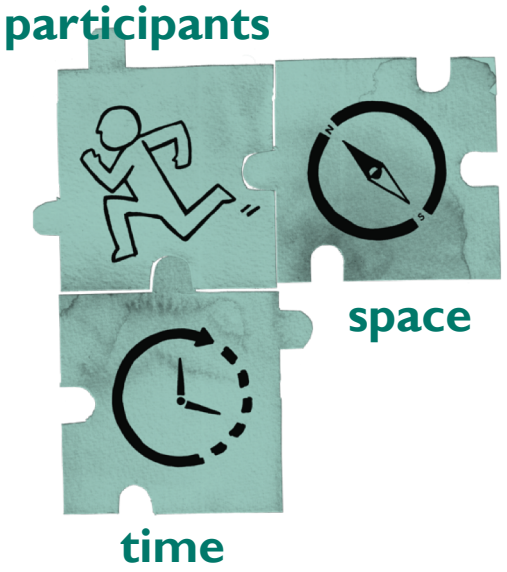




Events



Events in language



Time in language

time

Aspect and event cognition

How does temporal viewpoint expression through grammatical aspect guide event understanding and construal?

- Speakers of languages with different aspectual systems may perceive events differently
  → phasal (English, Russian, Arabic) vs holistic (German, Dutch) viewpoint as reflected in eye movement patterns in relation to spatial goals in motion events
  (Flecken et al., 2014; 2015; v. Stutterheim et al., 2012)

- During event comprehension, aspect influences our mental representations of events
  (e.g., Magliano & Schleich, 2000; Madden & Zwaan, 2003; Madden-Lombardi et al., 2019)
  - Event duration
  - Object-state change (e.g., orange in a peeling event)

- During event construal (language production), temporal viewpoint information is interrelated with information on event participants and roles

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Event duration

short → **long**

to boil pasta

to open a door

to watch a film

Estimating event duration

How does the specific way in which an event is described in a sentence affect how we perceive its duration?

1. World knowledge based on prior experiences with events
   'Inherent' event duration: 'to open a door', 'to repair a bicycle'

2. Linguistic context (e.g., temporal viewpoint expressed through grammatical aspect)
   'Finite' event duration: 'Max was opening the door' - ' Max opened the door'

e.g., Coll-Florit & Gennari, 2011; Ferretti, Kutas & McRae, 2007; Gennari, 2004

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Progressive aspect in Dutch

a) Oscar eet pasta	'Oscar eats pasta'
b) Oscar is pasta aan het eten	'Oscar is pasta at the eat'
	Oscar is eating pasta
? Paul is naar het station aan het rijden	'Paul is to the station at the drive'
	Paul is driving to the station
* Paul is op een stoel aan het zitten	'Paul is on a chair at the sit'
	Paul is sitting on a chair

Given a) or b), how long will Oscar be engaged in the activity of pasta – eating?

Flecken (2011), Behrens, Flecken & Carroll (2013)

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Design

- Experiment 1:

Establishing 'inherent' duration of different types of everyday events (e.g., 'to eat pasta')

- Experiment 2:

Estimating 'finite' event duration (present progressive and present simple sentences in Dutch)

Flecken & Gerwien, 2013

Experiment 1

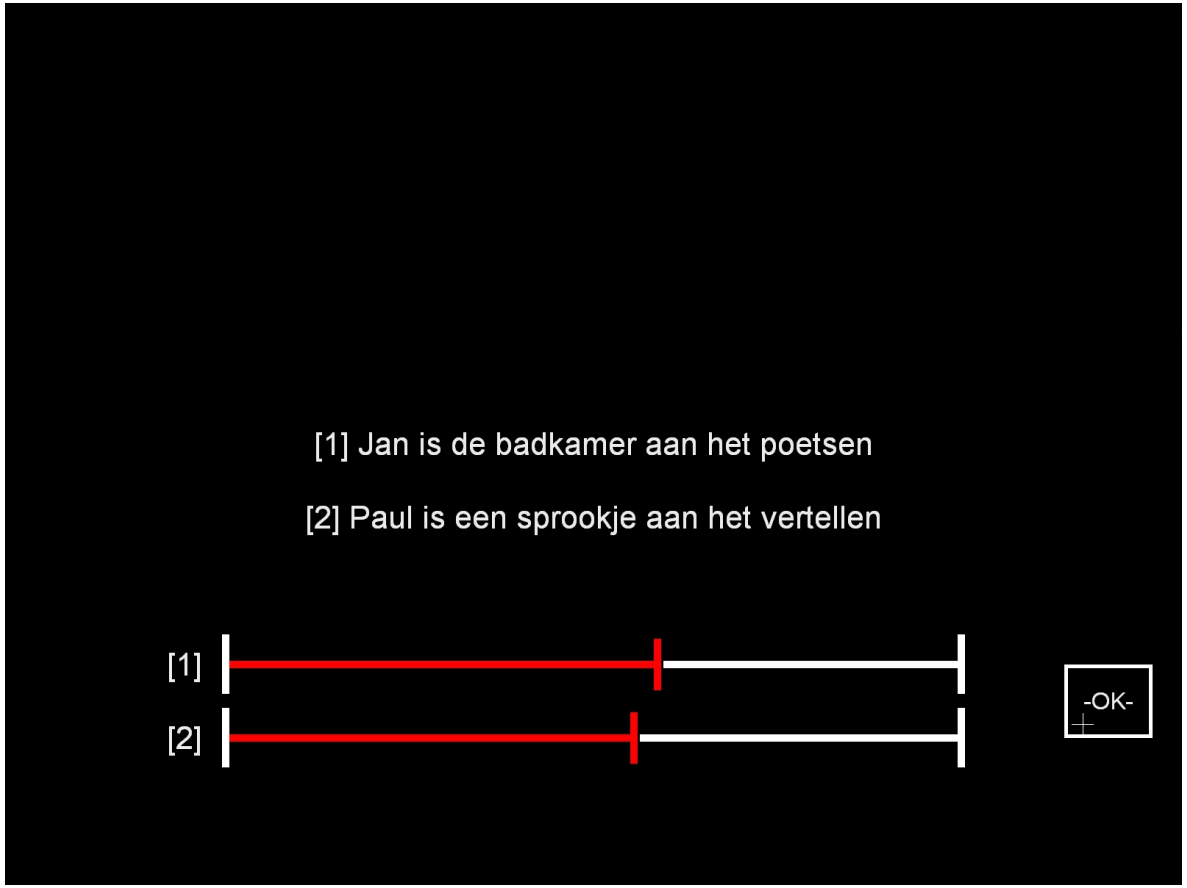
Online questionnaire

- Dutch native speakers rated the duration of 150 actions described in infinitival action phrases (e.g., *'to boil an egg'*, *'to set the table'*)
- Duration ratings in comparison to a standard event ('to boil pasta')
  scale 1-5 (much shorter – much longer)
- Ratings of familiarity

→ 78 actions selected, 3 inherent duration categories:

Short	(1 – 1.67) (n = 26)	e.g., *'to turn a key'*, *'to light a candle'*
Medium	(1.67 – 4.11) (n = 26)	e.g., *'to set the table'*, *'to polish a shoe'*
Long	(4.11 – 5) (n = 26)	e.g., *'to watch a DVD'*, *'to wash a car'*

Experiment 2



LONG, progressive
[1] 'John is cleaning the bathroom'
[2] 'Paul is telling a fairytale'

'drag-the-slider' experiment:

- sentences presented in pairs: matching duration-category & aspect
- no time scale

"Imagine the situations and estimate how long the two guys will be engaged in the activities.
Use the mouse to drag the slider to the right for each sentence,
The further the slider is dragged to the right, the longer you estimate the person to be engaged in the activity."

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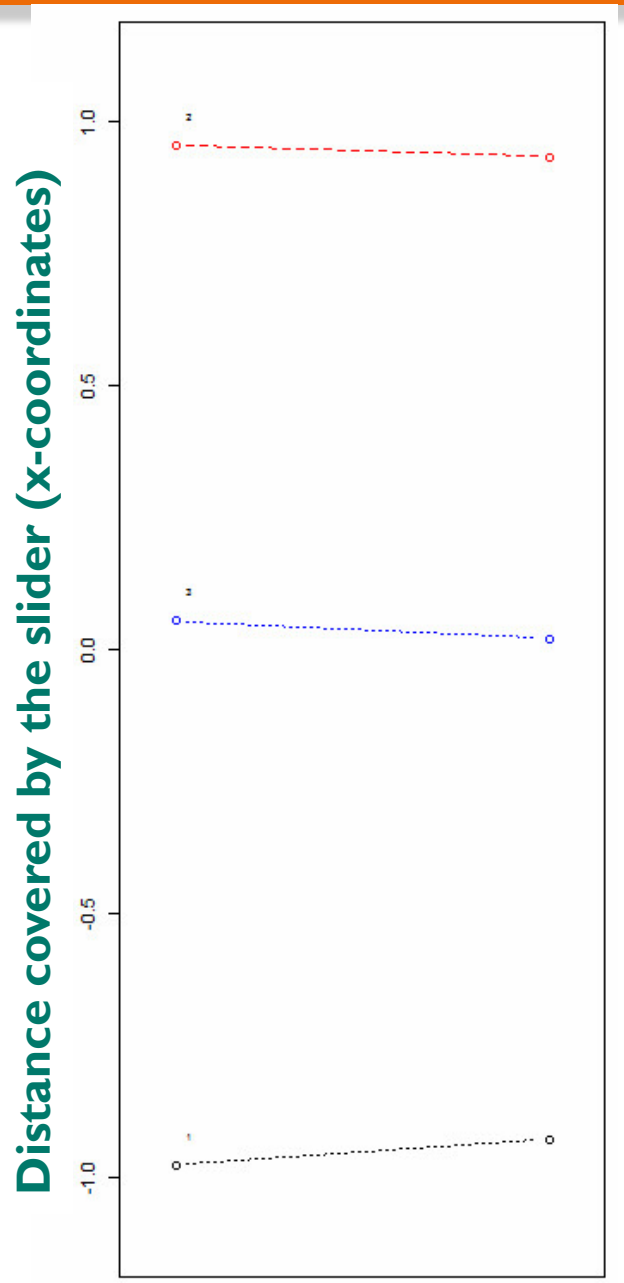
Higher on the y-axis means longer duration!



Long events

Analysis of centred log-transformed slider x-coordinates:
Main effect of inherent duration
Interaction inherent duration * aspect

Medium events

Short events

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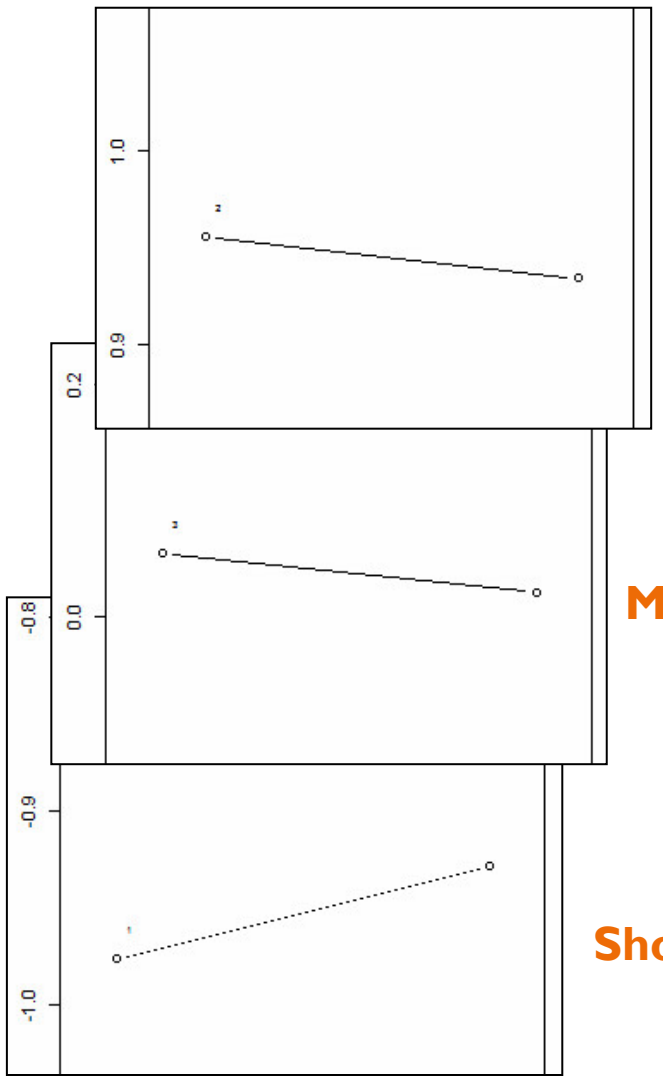
Higher on the y-axis means longer duration!



Long events

Medium events

Short events

Simple **Progressive**

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Summary

Aspect influences how we perceive the duration of everyday events!

'Max opens a door'

'Max is opening a door'

'John repairs a bike'

'John is repairing a bike'

short → **long**

Object-state change

- Degree to which objects are affected in an event is central in language and cognition (Kemmerer, 2012; Altmann & Ekves, 2019)

- To what extent does grammatical aspect modulate our mental representation of an object in a change-of-state event?

Experiment: The State of the Onion

- Sentence-picture verification task: sentence, followed by picture of an object

was the object in the picture mentioned in the sentence, y/n?

- Aspect manipulation in the sentences

The chef chopped/ was chopping the onion

- Picture types include

Unrelated (U) **No-State-Change (NSC)** **State-Changed (SC)** objects

No!

Yes!

Yes!

Misersky, Slivac, Hagoort & Flecken, subm.

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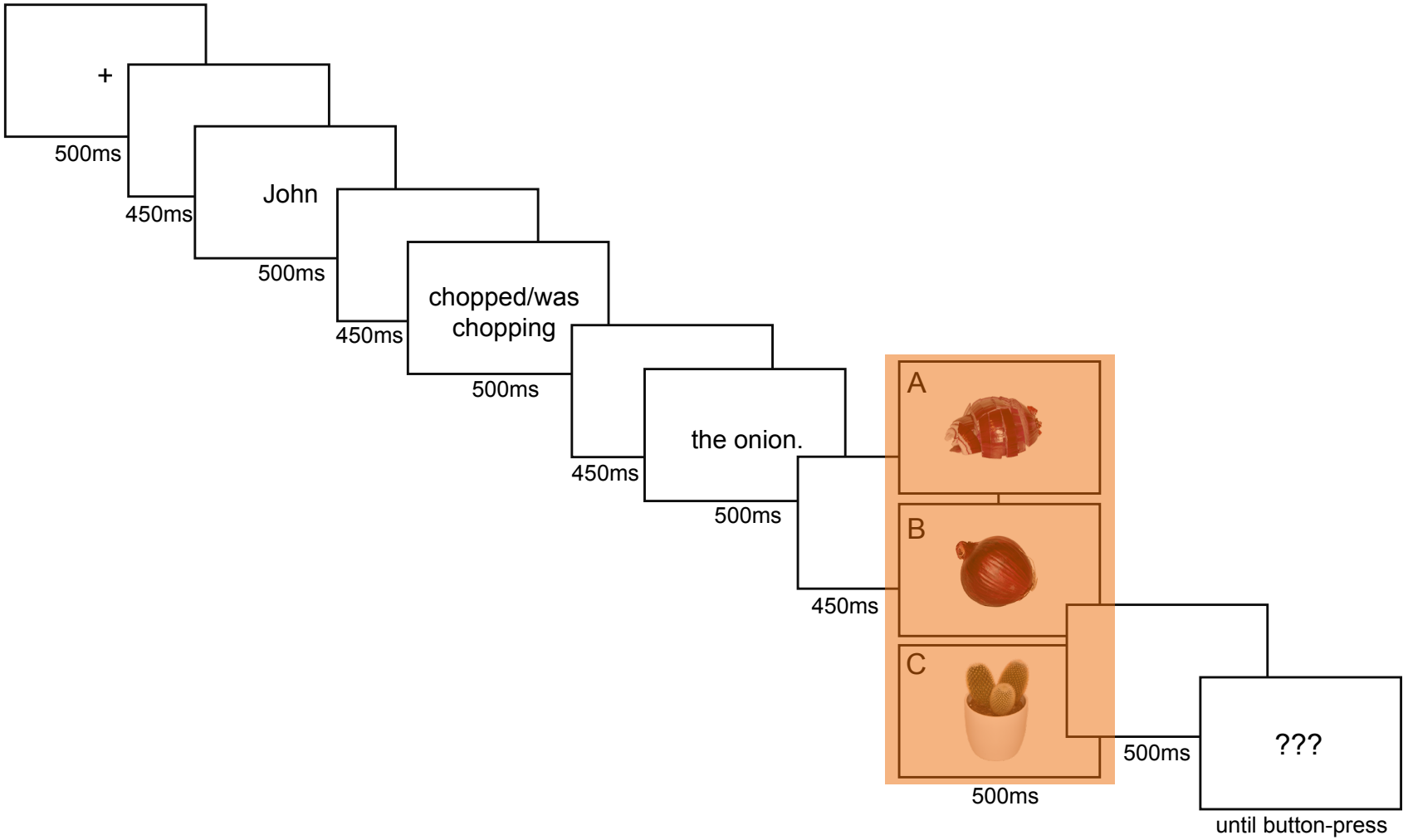
Procedure


+
500ms
John
450ms
500ms
chopped/was
chopping
450ms
500ms
the onion.
450ms
500ms
A
B
C
450ms
500ms
???
500ms
until button-press

EEG registration

- Ms. by ms. brain responses → we can capture very subtle differences in automatic brain responses

- We can shed light on the cognitive processes underlying sentence-picture matching, prior to decision-making processes

- Focus on EEG responses between 300 and 500ms after picture onset:
- **N400**: brain signature indicative of categorical semantic match
- **P300**: brain signature indicative of attentional processes, related to degree of match between what you see and what you expect on the basis of prior context which rendered a specific mental representation

Misersky, Slivac, Hagoort & Flecken, subm.

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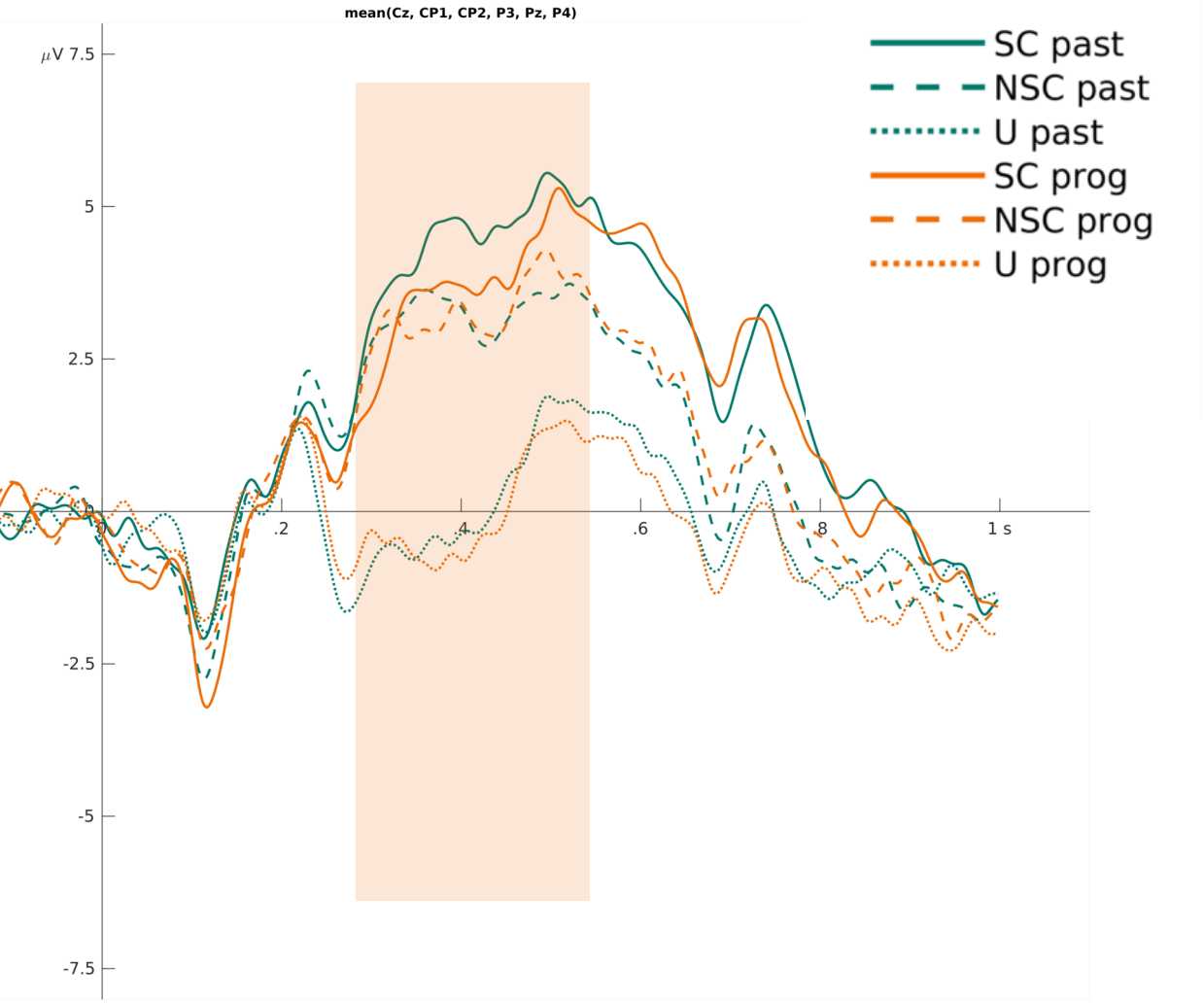
Results



- Effect of **Picture type**:

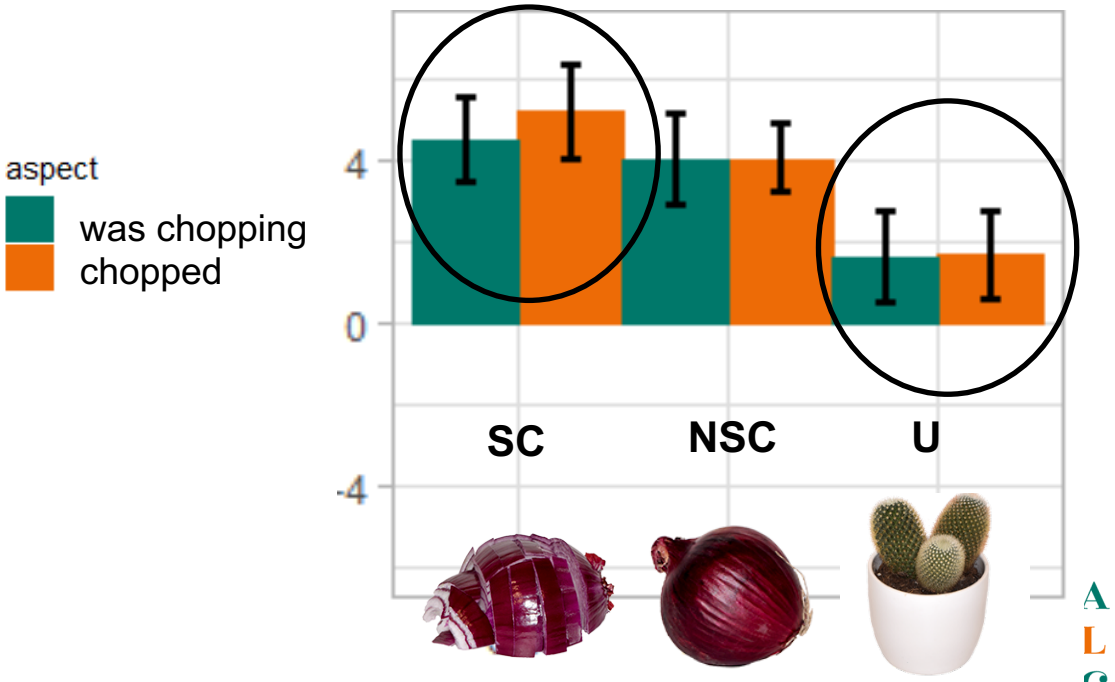
→ Unrelated pics elicit N400: semantic mismatch

→ NSC/SC pics elicit P300: SC > NSC, highest degree of match

- Interaction of **Aspect** with **Picture type**:

→ SC **perfective** > SC **progressive** →

perfective 'chopped' fit best with state-changed pictures

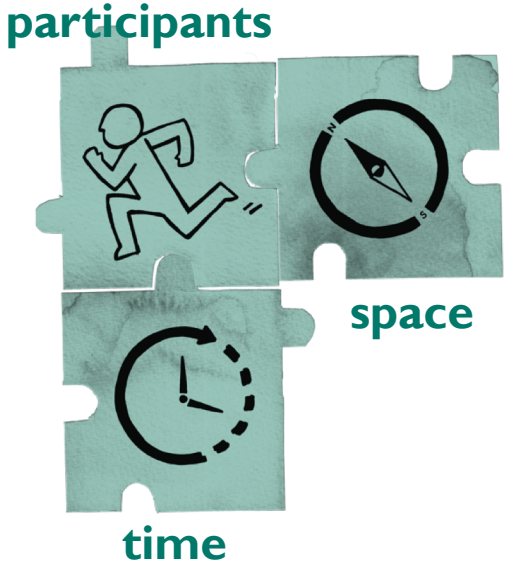


Discussion

- Aspectual viewpoint expression affects our mental representations of objects in events → already within 500ms of viewing the picture!

- Perfective leads to a representation of an object changed in state (completed action)
- Progressive does not lead to a specific representation of an object in its original unchanged or changed state

Language production



- When planning a sentence to describe an event, we gather information on event participants, and event time from a scene

- What is the relation between these two 'ingredients' of an event during sentence planning?
  - Are they independent of one another?
    - event participants first, *and then* we select the viewpoint to take on the event
  - Or are they interrelated?
    - Event participants & time together form the basic skeleton of an event

→ When using progressive aspect, does event structure (number of event participants, transitive/intransitive) play a role?

Priming in language production (cf. Pickering & Branigan, 2017)

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Experiment: It's time to prime time!

- Structural priming experiment, with distracter memory task (Bock & Loebell, 1992)

→ Priming manipulation is hidden

- Pictures of events that involve an affected object, favouring transitive descriptions (e.g., man folding airplane, woman knitting scarf, child inflating balloon)

Gerwien & Flecken, 2015; in prep.

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Procedure

PRIME

Read the sentence

Encountered before?

TARGET

Describe the picture

Encountered before?

Analysis of use of progressive aspect in event descriptions, under the dependency of different prime conditions

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Prime conditions

Neutral prime	Form prime	Intransitive progressive prime	Transitive progressive prime
Non-progressive	Non-progressive incl. PP ***aan het***	Intransitive progressive	Transitive progressive
De buurvrouw koopt een oven	De man timmert **aan het** dak	De sporter is **aan het** hoesten	Jo is een biertje **aan het** drinken
'the neighbor buys an oven'	'the man hammers on the roof'	'the athlete is coughing'	'jo is drinking a beer'

Under which conditions can we boost the use of the progressive *aan het* in people's event descriptions?

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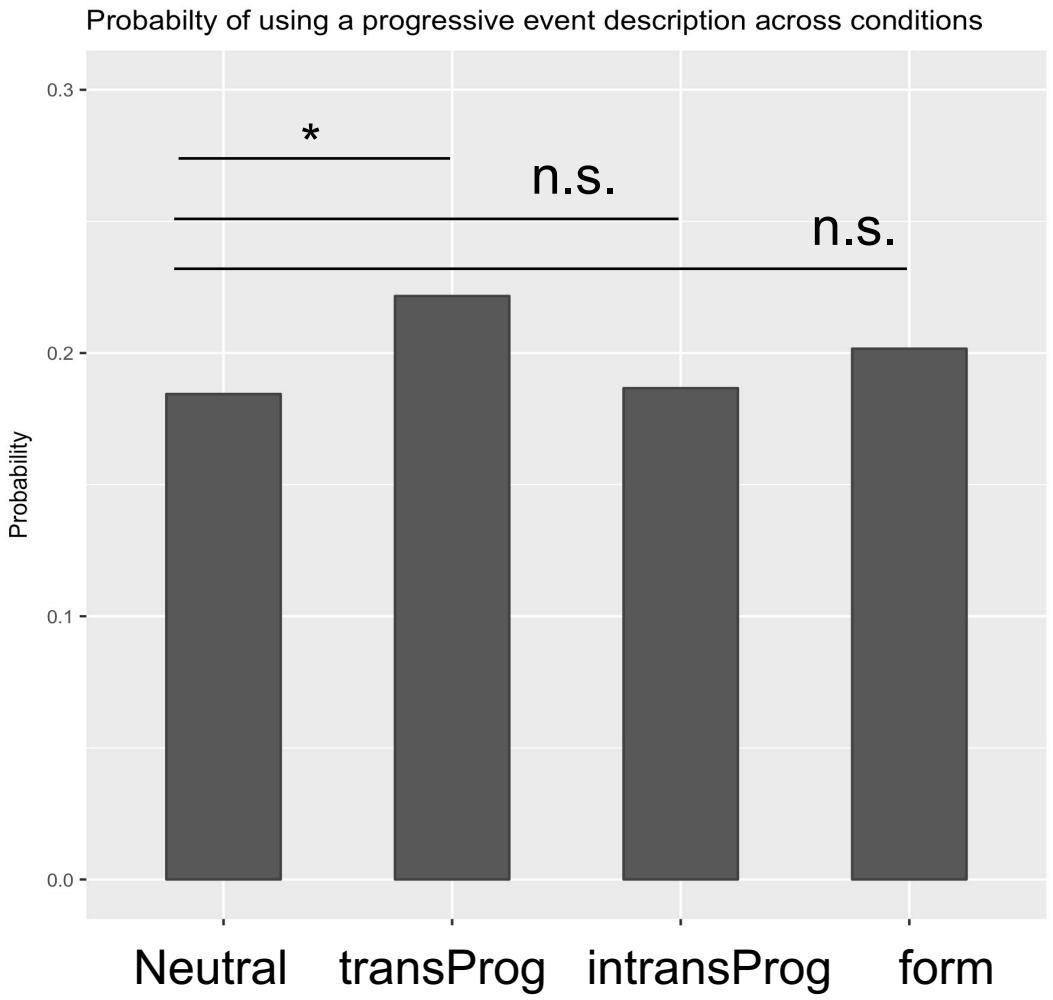
Results

Proportion of using the progressive *aan het* in the event descriptions



Discussion

Speakers *can* be primed to use progressive aspect in Dutch:

- Form features (aan het) alone are not sufficient to elicit a boost in the use of the progressive

- This only happens when there is overlap in event structure (transitivity):
  - transitive progressive sentences boost the production of transitive progressive sentences

In (primed) production, aspectual viewpoint selection and event structure go hand in hand

General discussion

Aspect influences how we view and interpret core event dimensions, i.e., duration, and object-state change in an event

Given that events are omnipresent in language and cognition, more research into the interplay between event perception, understanding, memory, and language is needed!

☺

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