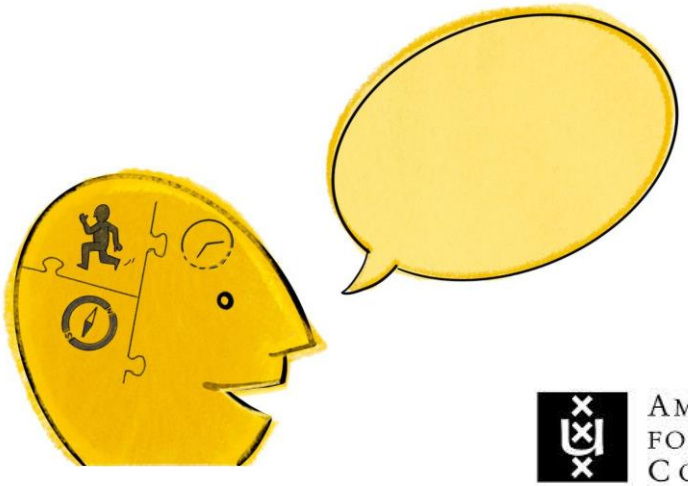
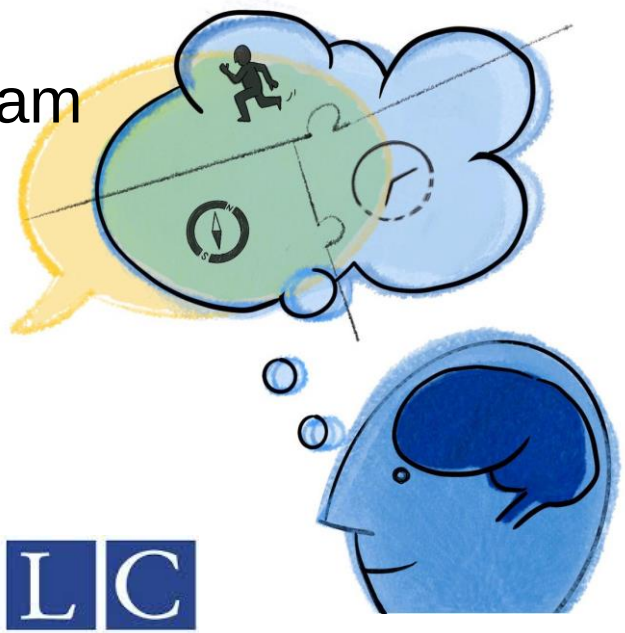
Event construal in L1 and L2:

linguistic and cognitive perspectives

Monique Flecken
University of Amsterdam





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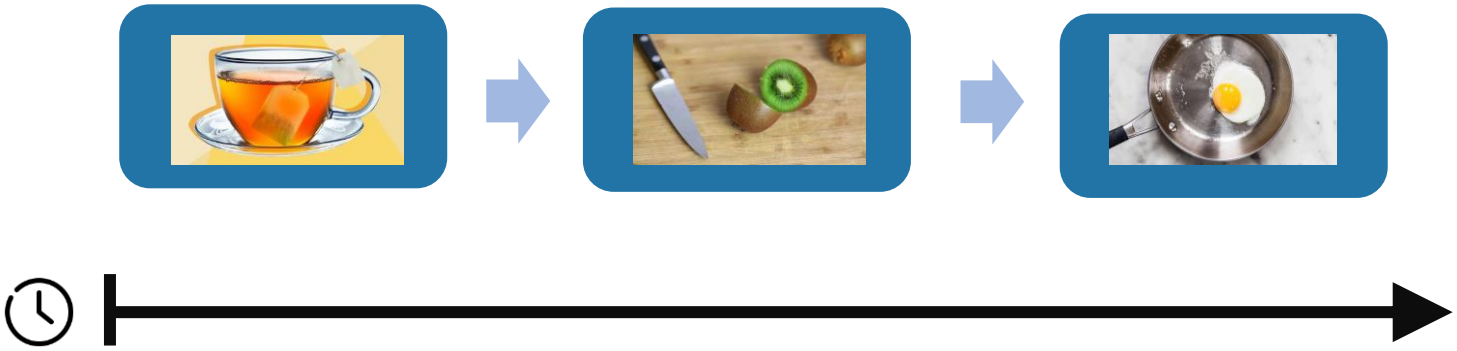
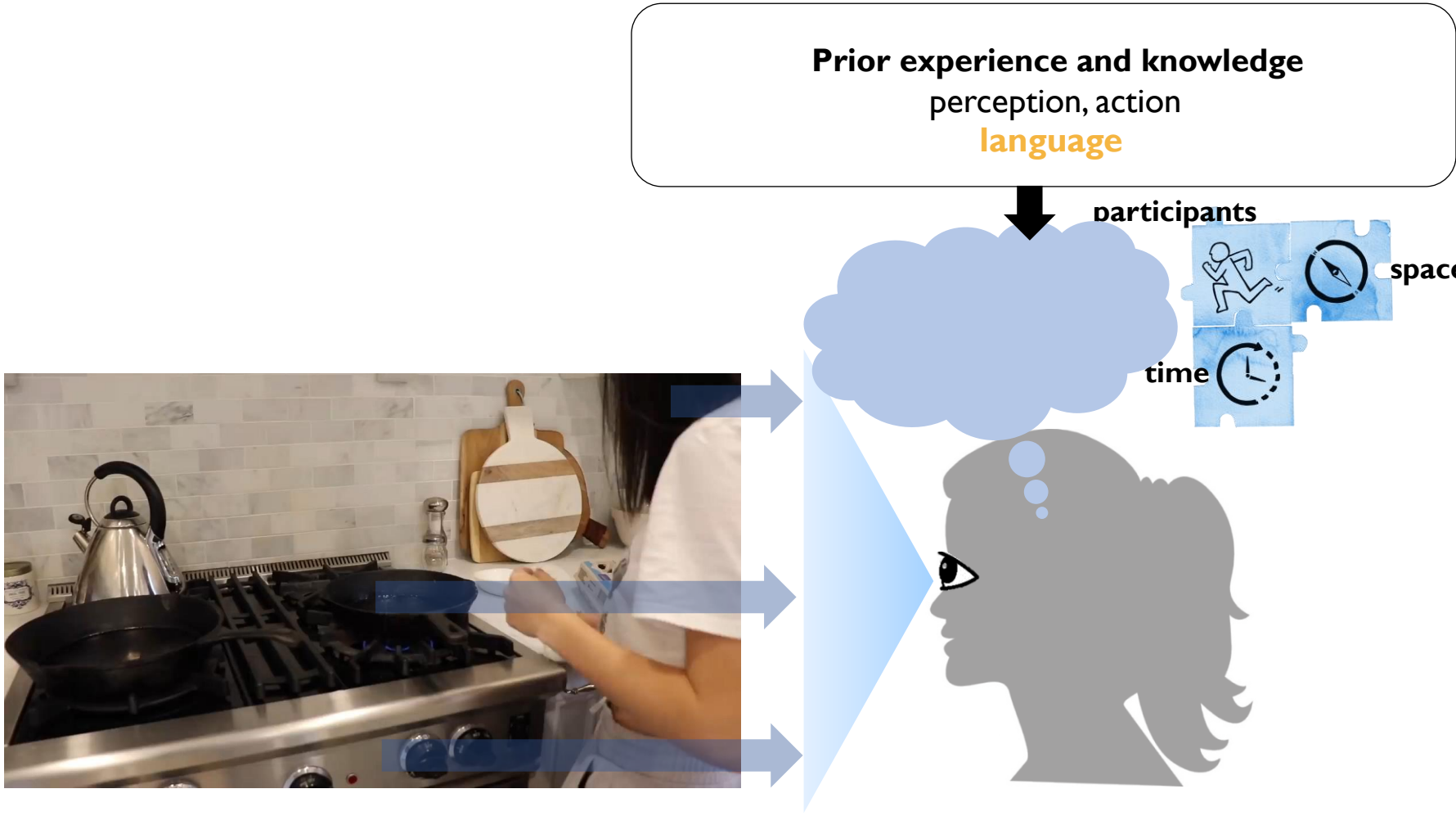
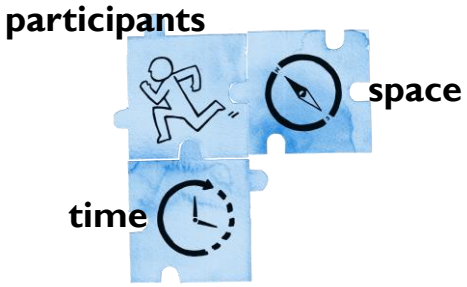
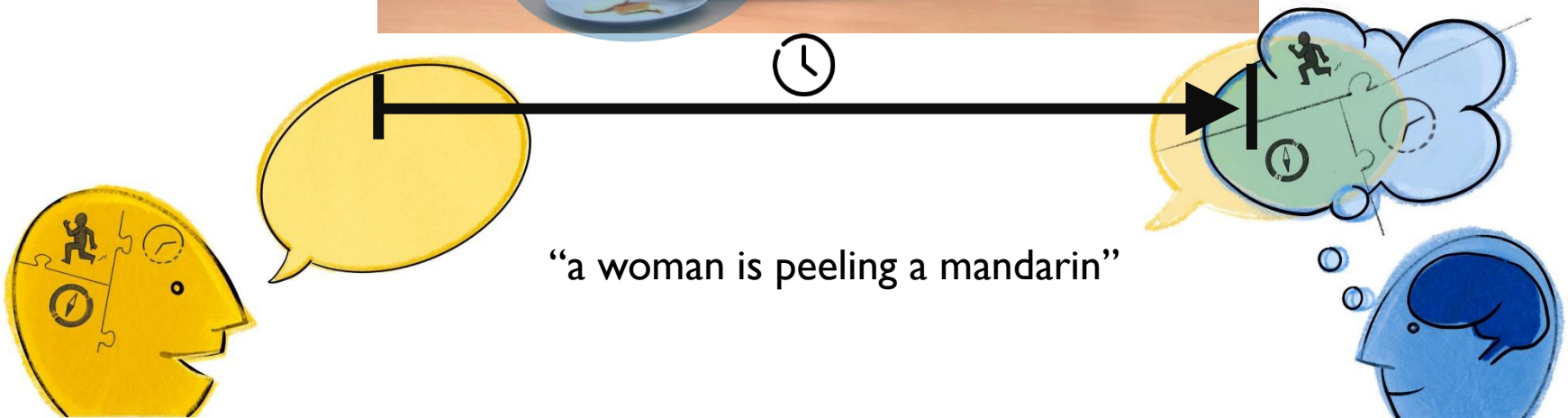




Event horizon model (Radvansky & Zacks, 2014); Event segmentation theory (Kurby & Zacks, 2008)

Events in language

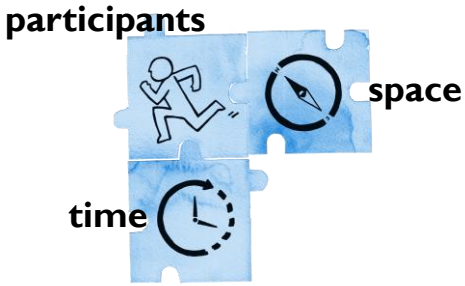


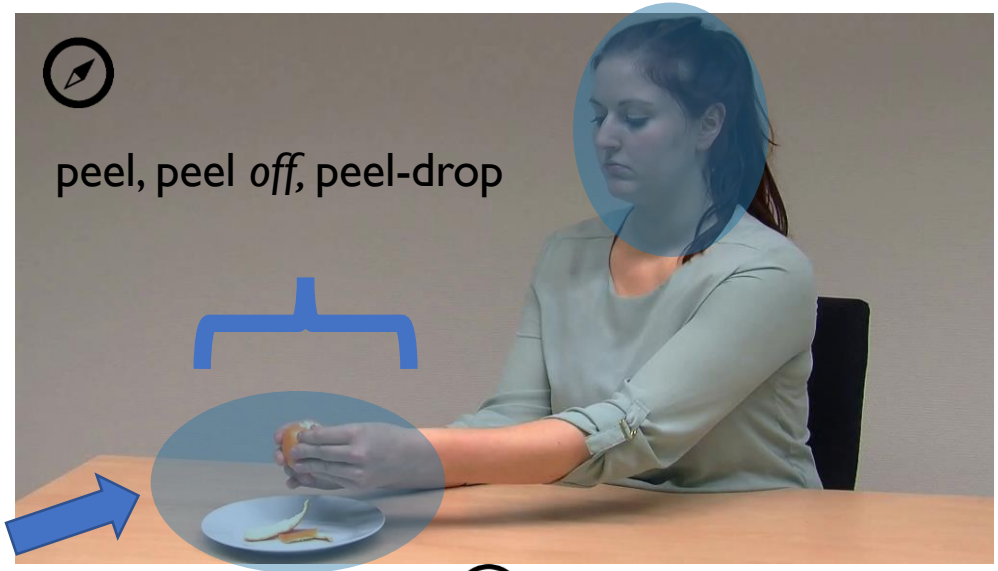


"a woman is peeling a mandarin"

Events in language: variation

the woman peeled a mandarin



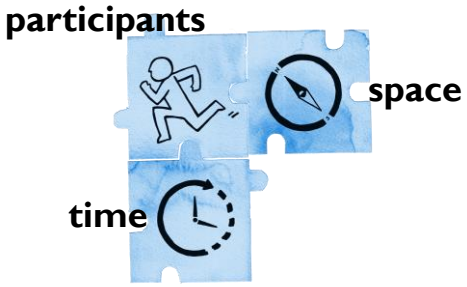


the mandarin was peeled (by a woman)

was peeling, has peeled

Talmy (2000), Beavers et al., (2008), Rappaport Hovav & Levin (1998), Klein (1994)

Questions

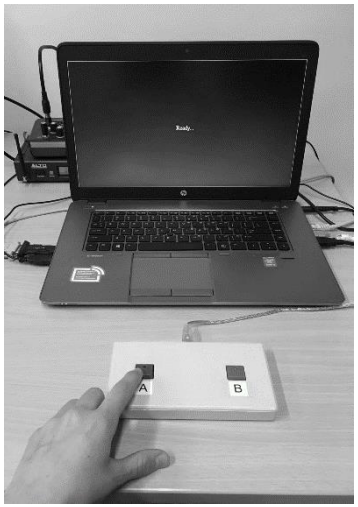


To what extent does variation in the linguistic expression of event viewpoints guide event perception and memory?

Where do we find general cognitive biases, unrelated to language use and variation?

Approaches and methods

1. Cross-linguistic analyses of event perception and memory, during linguistic and nonlinguistic tasks
2. Within-language analyses of event perception and memory, cued by different types of event descriptions
3. Analyses of L2 users/bilinguals of languages that differ along certain dimensions (lexicon, grammar) relevant to event construal



Linguistic variation: verb semantics

- Talmy (1991; 2000):
  - Languages differ in the locus of encoding of event dimensions
  - Languages differ in the semantics typically encoded in the verbal lexicon

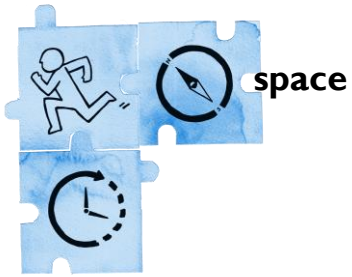
MOTION EVENTS: manner of motion vs path of motion

satellite-framing	*A man walks **into** the church*
verb-framing	*A man **enters** a church (on foot)*

CHANGE OF STATE EVENTS: manner of action vs result of action

satellite-framing	*A woman pours juice **into** a glass /*
	*A woman pours the glass **full***
verb-framing	*A woman **fills** a glass (by pouring)*

1. Motion events

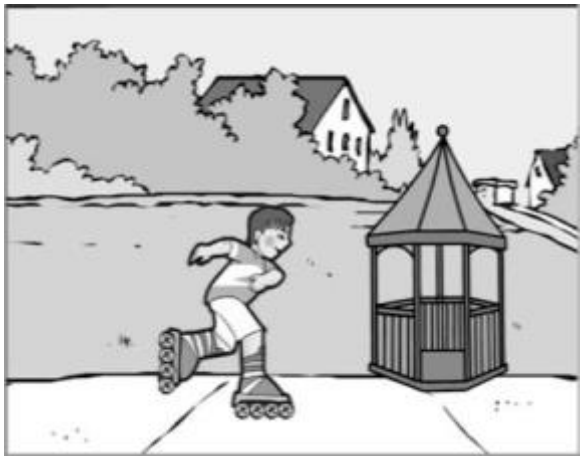


a) Motion event description and processing (Eye tracking) in German/French L2

b) Motion event processing (EEG) in Turkish-Dutch bilinguals

Language and motion event cognition

- How do speakers of different languages view, linguistically encode and memorize events?
- Measures:
  - Description patterns
  - Eye movement patterns during scene encoding
  - Memory after scene encoding
  - Event segmentation: when do people perceive an event boundary?



Satellite-/verb-framed languages

Satellite-framed languages
e.g., English, German, Dutch

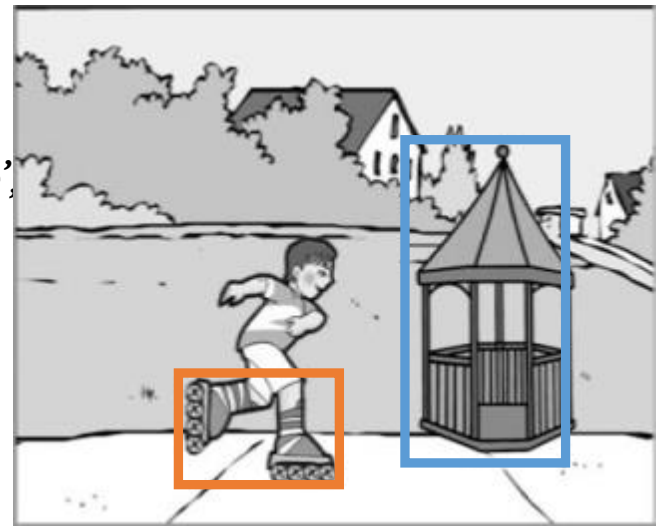
to skate, slide, stroll, run, creep, tiptoe
....across/along/to/towards

High manner saliency
More **attention** to Manner
Better **memory** for Manner

Verb-framed languages
e.g., Greek, Spanish, Turkish

to enter, cross, 'traverse', 'advance', approach
(...on skates)

Low manner saliency
More **attention** to Path
Better **memory** for Path



Talmy (2000); Slobin (1996)

e.g., Papafragou et al., 2008, 2010, Gennari et al. 2002; Soroli & Hickmann, 2010; Flecken et al., 2015

Event segmentation: how many events?

“running situation”

Manner-focus

“approaching situation” “entering situation”

Path-focus

Gerwien & v. Stutterheim (2018)

Stimuli

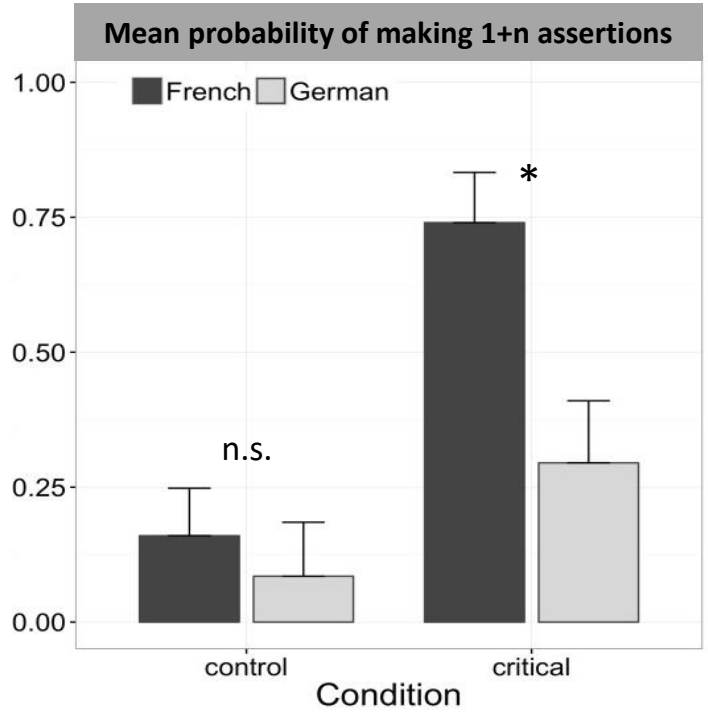
critical

change in direction

control

Gerwien & v. Stutterheim (2018)

Results: event description



Typical responses control condition:

German: *Ein Motorradfahrer* ***fährt*** *eine Gasse entlang.*

French: *Un scooter* ***passe*** *dans une rue pavée.*

Typical responses critical condition:

German: *Ein Ball* ***rollt*** *die Treppe runter.*

French: *Une balle* ***roule*** *et* ***descend*** *des escaliers*

Gerwien & v. Stutterheim (2018)

Exp. 2: event segmentation

Languages: German, French (new groups)

Critical stimuli: same as in study 1

Control stimuli: same as in study 1

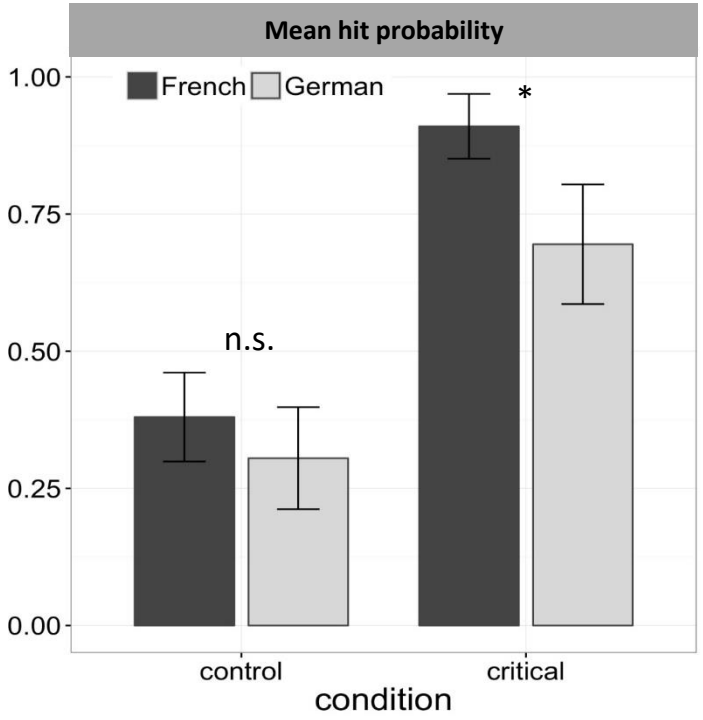
Task: "press a button whenever you think one activity ends, and a new one begins"

Gerwien & v. Stutterheim (2018)

Results: event segmentation

- 'hit probability':
the probability of pressing the button at least once per video

- Control: low likelihood of perceiving changes in activity
- Critical: higher likelihood of perceiving activity changes → more so in **French**, than German



Gerwien & v. Stutterheim (2018)

Summary

Differences in segmentation frequency French & German:

- French: A change in direction triggers the use of a new verb, e.g., 'roule et descend'

→Segmentation on the basis of changes in direction of the Figure

- German: Changes in direction packaged into a single clause, e.g., 'rollt die treppe runter'

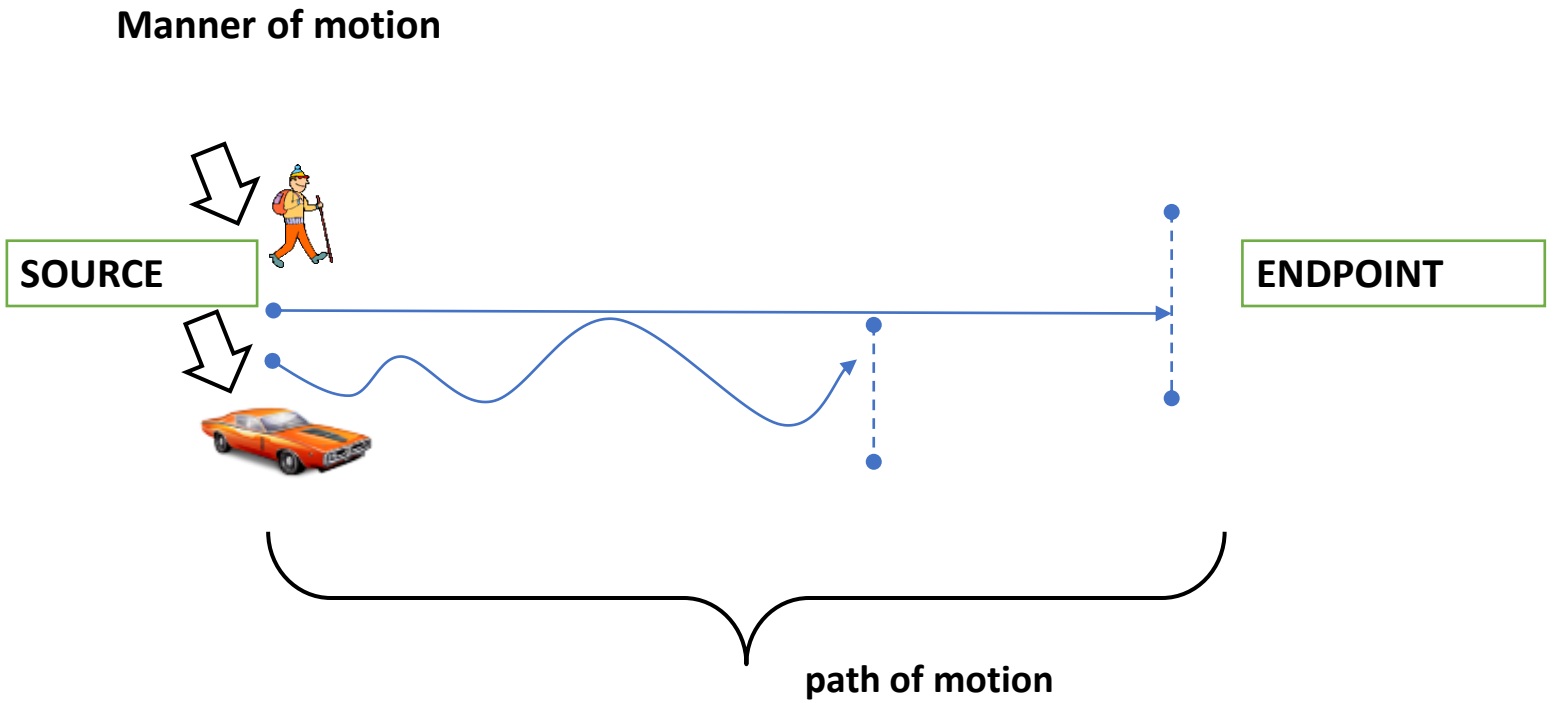
→Events are segmented and perceived holistically

❖ The way in which events are chunked and packaged linguistically is also reflected in the way people perceive and segment events in general (without speaking)

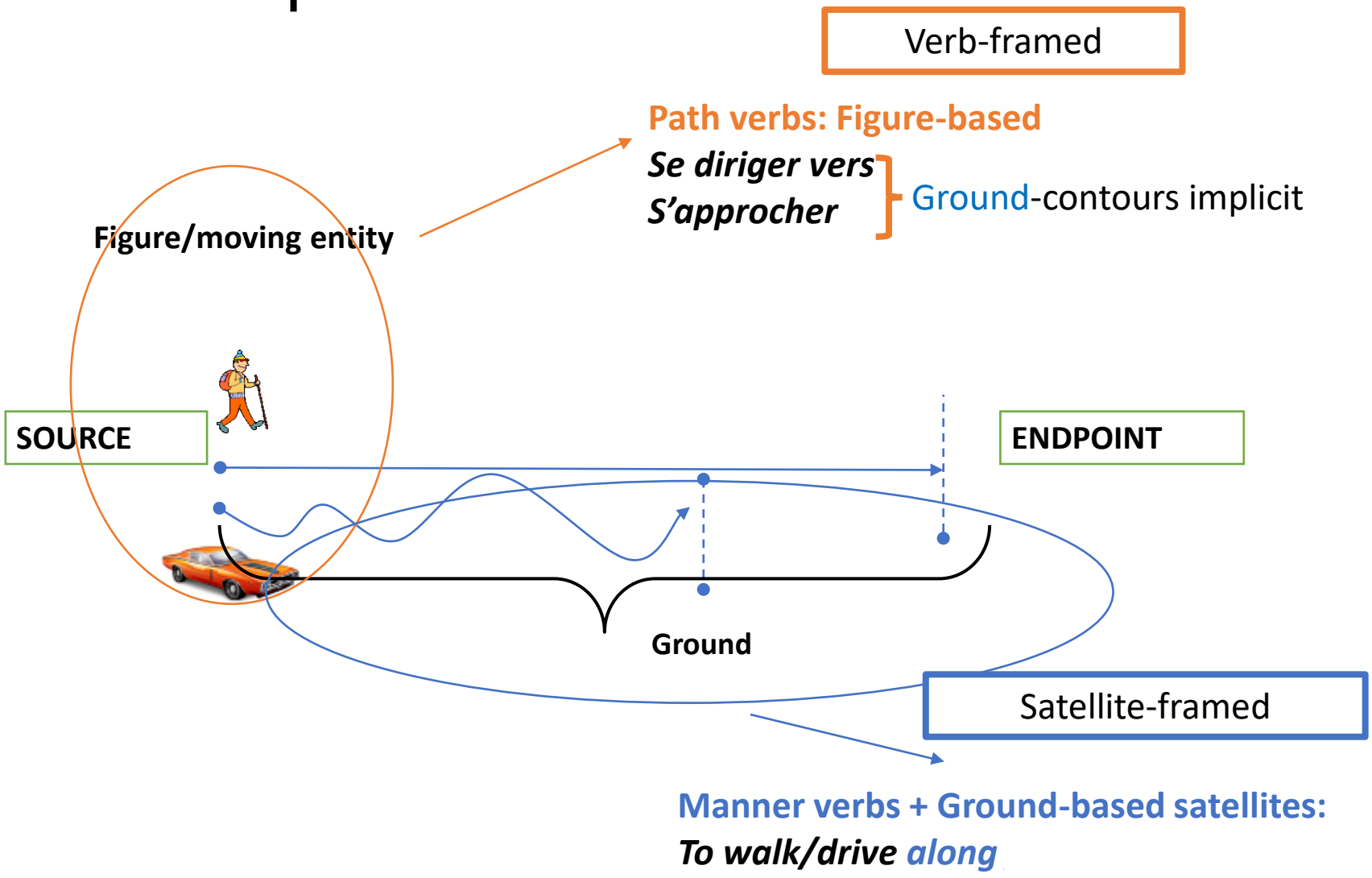
❖ **Verbs** (semantics) define what we perceive to be an event

Zooming in on satellite-/verb-framing

- Path verbs: From what element is path information derived?



Path conceptualization



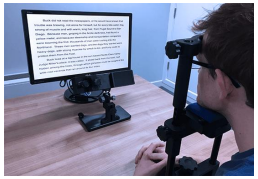
Implications for processing and L2 learning

Motion directed towards endpoint (not reached)

"What is happening in the video?"

Conceptualization:
What to say?
- Perspective-taking
-Information selection

Focus on Figure/moving entity may differ depending on the L1
→ Eye tracking method



Highly automatized processes:
- An **L2** speaker may rely on processing routines as used in the L1
- Conceptual transfer, as reflected in **eye movement (attention)** patterns during sentence planning

Early stages of sentence planning:
- Information relevant to **verb** selection important
- Using **Figure-based Path** verbs requires an assessment of the spatial relation between Figure and Endpoint (*s'avancer vers* vs. *s'approcher* vs. *marcher*?)
- Using **Ground-based** concepts, less so (*walk toward*)

Tracing trajectories

Participants (N=20 per group):

- German native speakers (Heidelberg Uni)
- French native speakers (Paris 8)
- Advanced French L2 learners of German (Heidelberg Uni, immersed in German environment, minimum C1 proficiency level)

Stimuli:

- Motion events with varying degree of directionality towards an endpoint (all *not* reaching endpoints) (see paper for details ☺)

Flecken et al. 2015

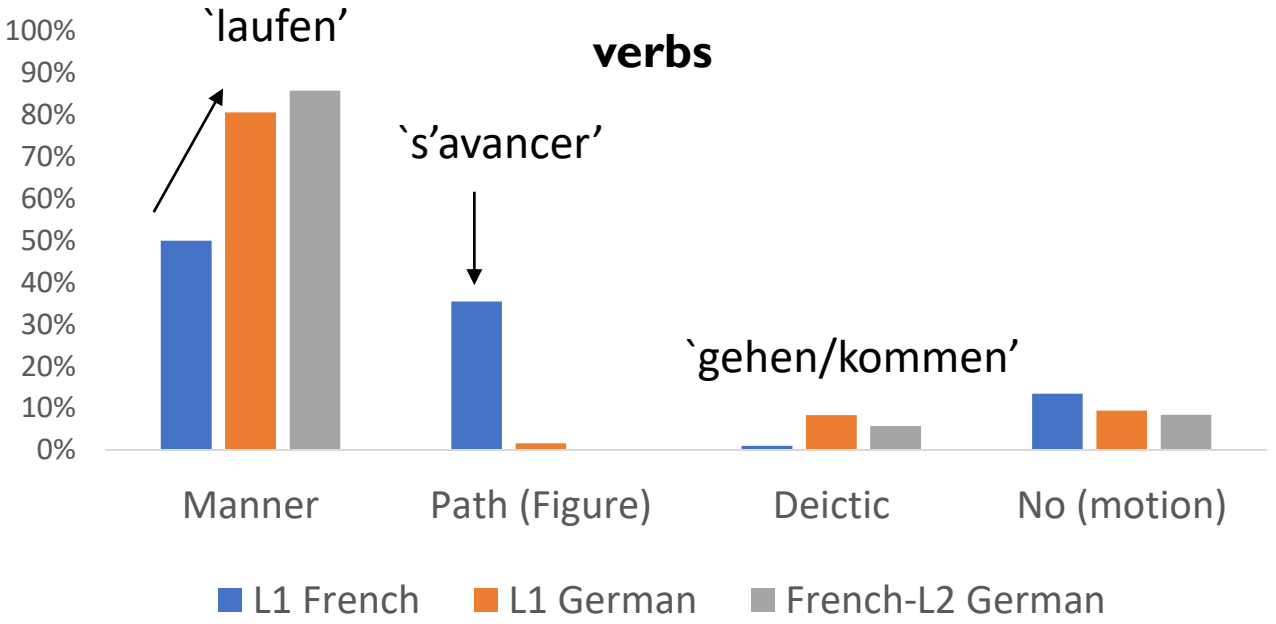
Procedure

"describe what is happening in the videos"

- L1 French -> in French
- L1 German -> in German
- French-L2German -> in German

- Analysis of event descriptions:
  - Manner/Path information encoded in verbs plus verb satellites

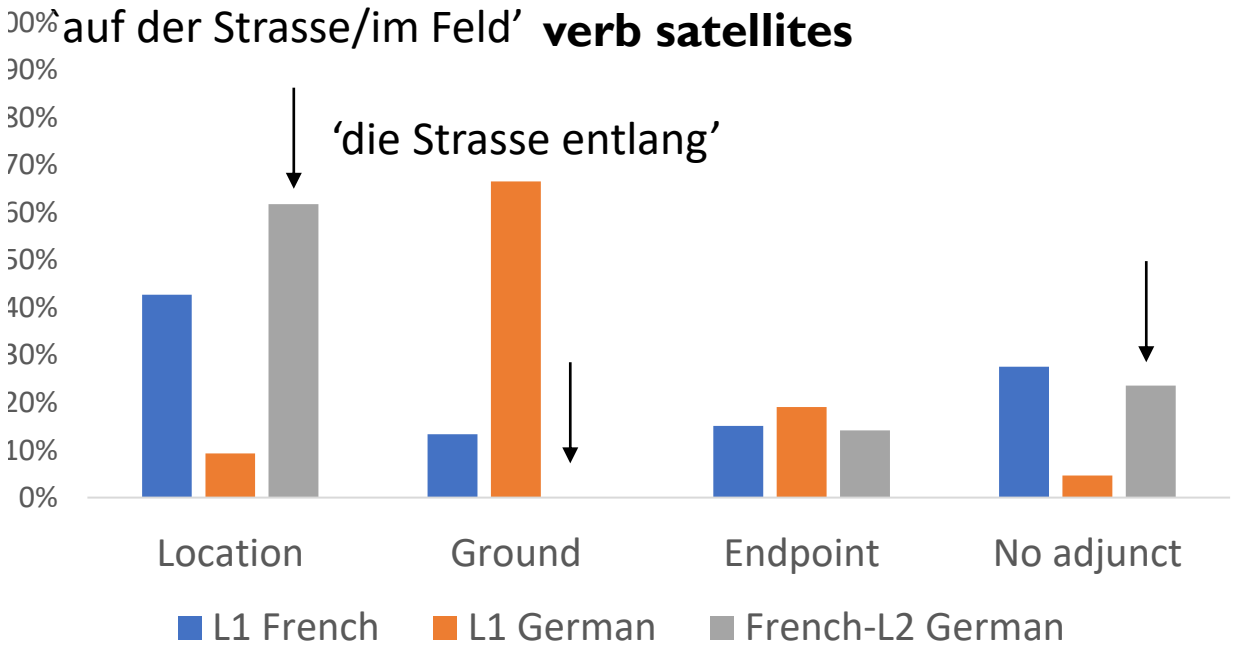
- Analysis of eye movements during scene inspection + verbalization
  - Focus on fixations in two areas of interest: **Figure/Moving Entity** (+ Endpoint)



Verbs:
French-**L2**German
– mainly manner verbs
(target-like)

Satellites:
French-**L2**German
– mainly location adjuncts
(L1French-like)

L1German:
Eine Frau laeuft eine Strasse <u>entlang</u>
L2German:
Eine Frau laeuft <u>auf</u> der Strasse.
Eine Frau laeuft.

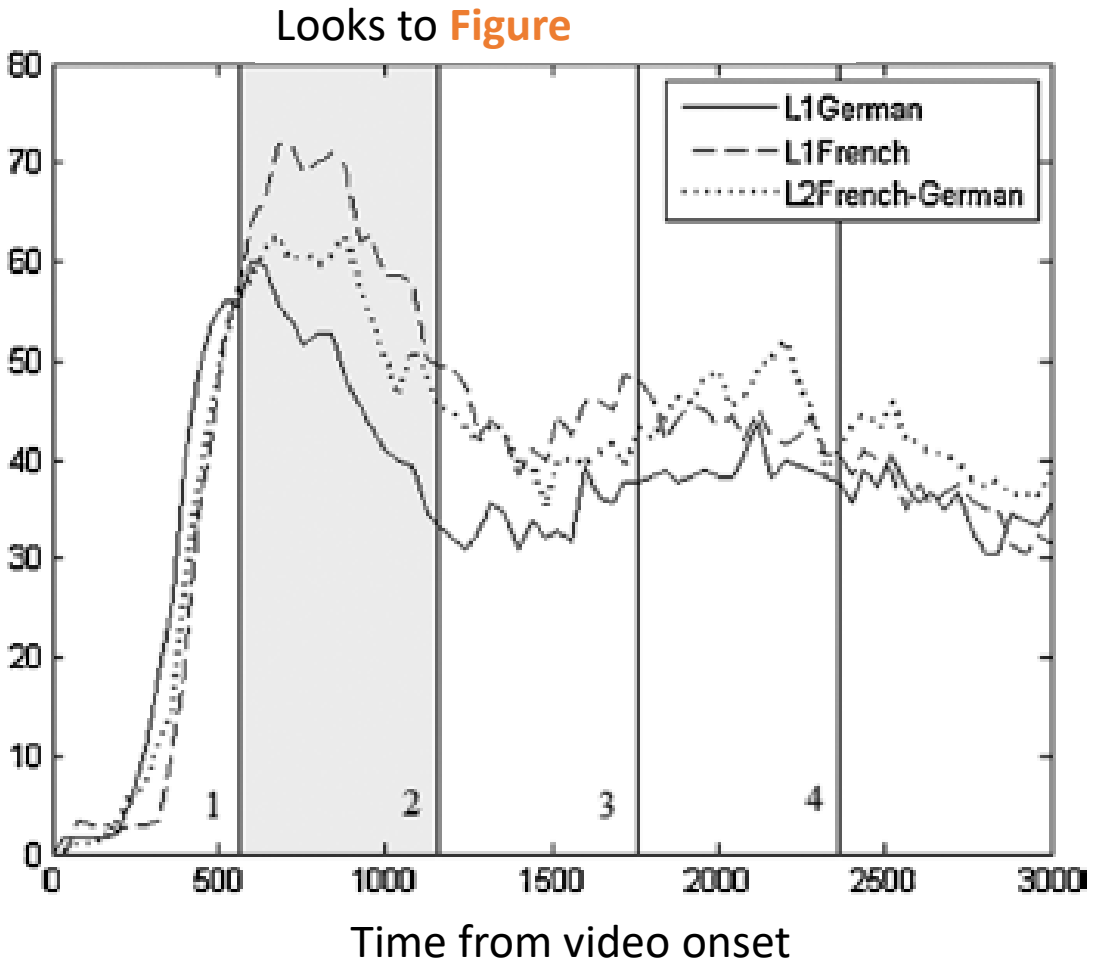


L1 French:
more early looks to Figure

French-L2German:
pattern in between L1French and L1German

→ L2German: despite target-like use of manner verbs, their looks are quite Figure-focused

→ L2German descriptions are figure-focused too:
- Manner verbs plus location adjuncts or single Manner verbs



Discussion: L2 learning

- Conceptual transfer; only *partly* reflected in the language data

→target-like use of Manner verbs, but use (or lack of) verb satellites evidences L1-centred event conceptualization (Figure based -> locating the Figure in space)

(see also Berthele & Stocker, 2017; Stefanowitsch, 2013)

→L1-centred event conceptualization pattern evident from the eye movement data, reflecting early scene processing and sentence planning processes

- L2 event conceptualization (even at highly advanced levels) shows an intricate interplay of L1-based processing routines and both L1/L2-based 'output'

Discussion: xling differences

- In French, and also other languages with verb-framed features (e.g., Mandarin with variety of Path-verbs; Liao et al. 2019), events are conceptualized with a strong focus on the **Figure**
- This is reflected in
  - Description patterns: Use of Figure-based path verbs / Manner verbs + Location
  - Eye movement patterns while inspecting the scenes for verbalization: early looks towards Figure's orientation and distance to goal
  - Event segmentation patterns: French speakers segment videos of motion on the bases of changes in the direction of a Figure (Gerwien & v. Stutterheim, 2018)

- Crosslinguistic differences between verb- and satellite-framed languages in cognitive saliency of Figure, akin to previous differences in cognitive saliency of Manner vs Path

Manner-saliency electrified: "Minding the manner"

- Speakers of satellite-framed languages show more attention to Manner of motion than speakers of verb-framed languages (e.g., Soroli et al., 2010; Gennari et al., 2002)

✓What about **nonverbal** attention patterns?

- Mixed evidence (e.g., Papafragou et al. 2008; Filipovic, 2010; Montero-Melis et al., 2016)

✓What about **early bilingual** speakers? (i.e., speakers growing up with a satellite- + a verb-framed language from birth/before 4 years)

- Suppress habitual expression of manner in their Verb-framed language
- Combine manner information with path (ground/goal)-information in their Satellite-framed language

Kamenetski, Lai & Flecken, 2022

Method

Participants:

- Native speakers of Dutch
- Early bilingual speakers of Turkish (verb-framed) and Dutch (satellite-framed), residing in the Netherlands (heritage speakers)

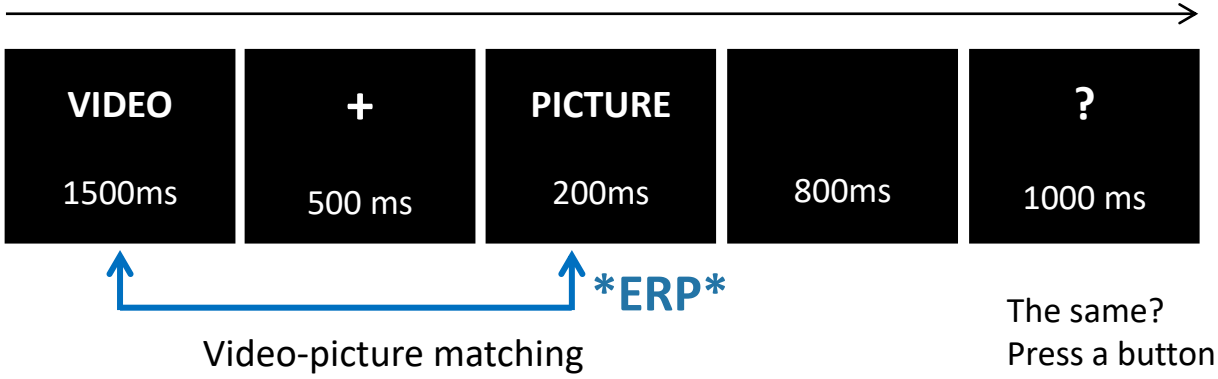
Video-picture matching task, with EEG recording (carried out in Dutch setting)

- Type of overlap (manner/path-endpoint) between video and picture is manipulated
- Oddball design (frequency manipulation)

Flecken & van Bergen 2019; Flecken et al. 2015

Picture matching task

'Press a button when the picture looks exactly like the scene depicted in the video clip"



Tapping into implicit effects of a viewer's language background on perception

- EEG: ms by ms brain responses
- How fast does the brain pick up a difference/overlap in terms of Manner/Path-Endpoint between video and picture? Language differences?

ERP

- **P300**: between 350 and 700ms after picture onset -> attention
- **Late Positivity**: between 700 and 1000ms after picture onset -> reanalysis/'check'

Conditions

Oddball conditions should trigger stronger **P300/Late Positivity** brain responses -> processed with more attention and/or requiring an extra analysis or check

Differential processing of Endpoint(Path)/Manner match conditions?

Full match
walk to a barrier
skate to a tunnel

Endpoint match
walk to a tunnel

Manner match
skate to a barrier

skate to a tunnel

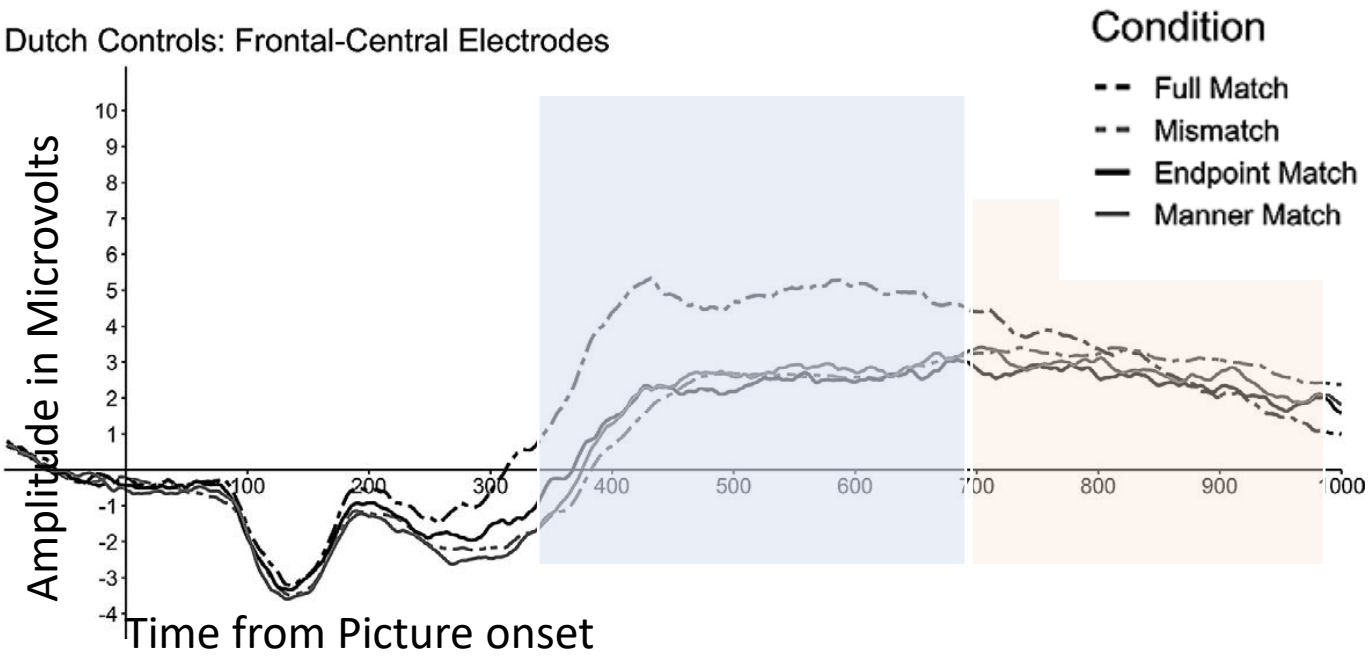
Video

Picture

Infrequent (oddball) conditions:
each occurring only in 10% of trials (40 times)

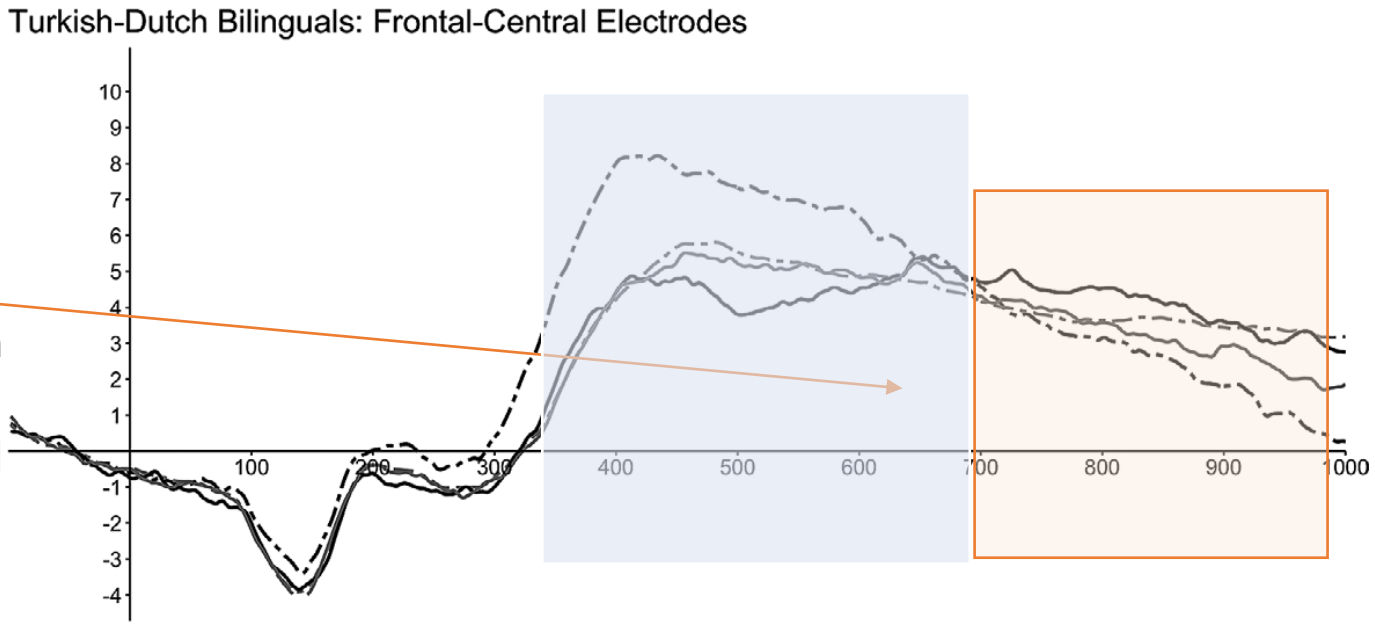
Results

No group differences in task-related **attention** (P300: 350-700ms)
→ Equal attention to Path and Manner



In **Turkish-Dutch bilinguals**, more reanalysis/extra check (Late Pos.) for **Endpoint-match** than Manner-match condition

→ **reanalysis**/enhanced processing of **Path**-information
→ Driven by **Turkish**?



Summary: Motion events

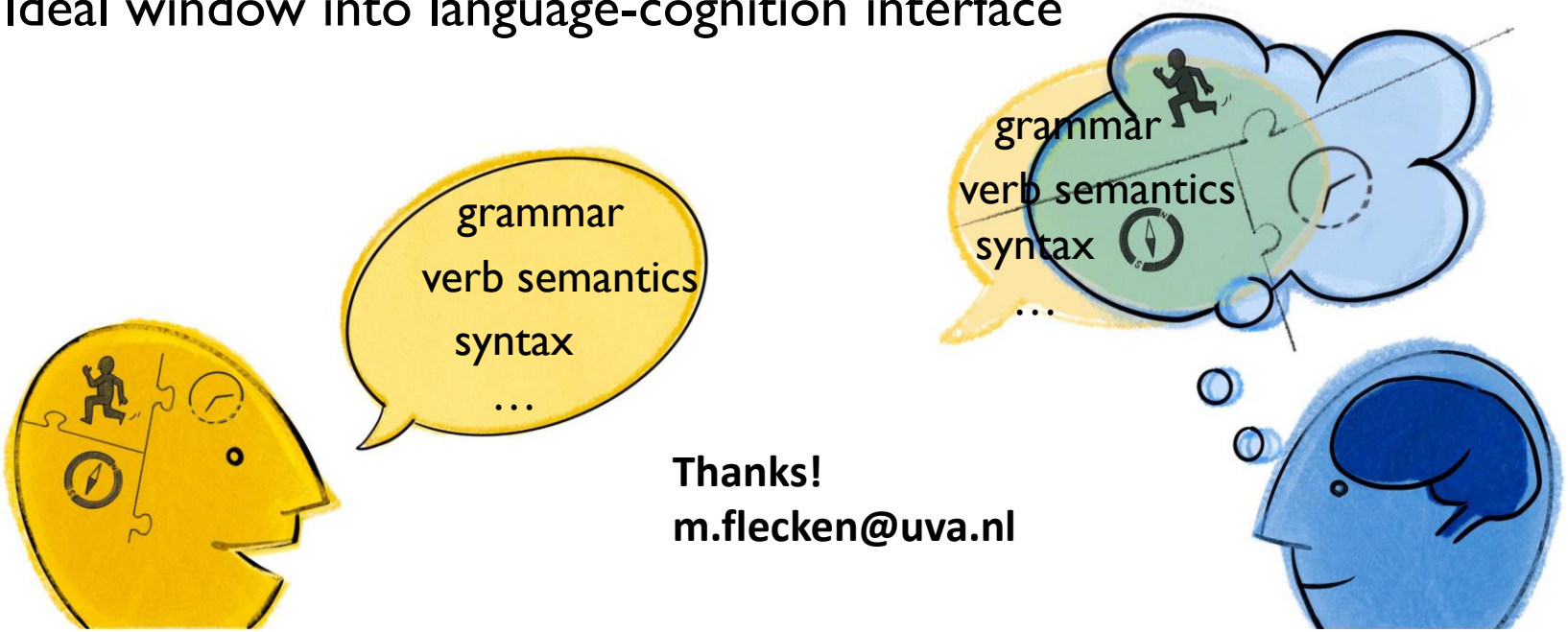
- Differential processing of Path (Figure) (vs. Manner) of motion information in L2 learners and early bilinguals of typologically different languages

- Verb- / Satellite-framing has cognitive consequences

- Such consequences can be captured in both verbal and nonverbal tasks, using time-sensitive methods
  - These cognitive biases are found within 1 sec after people are presented with depictions of motion events!

- Variation in linguistic event description [verb- vs satellite-framing] is reflected in cognitive processes
- Processing differs in native speakers vs L2 learners and bilinguals, as a result of conceptual transfer or convergence
- *Events* as critical units of representation in both language and cognition

→ Ideal window into language-cognition interface



Thanks!
m.flecken@uva.nl

www.moniqueflecken.com
@moniqueflecken

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