

# Incremental processing of telicity in Italian children



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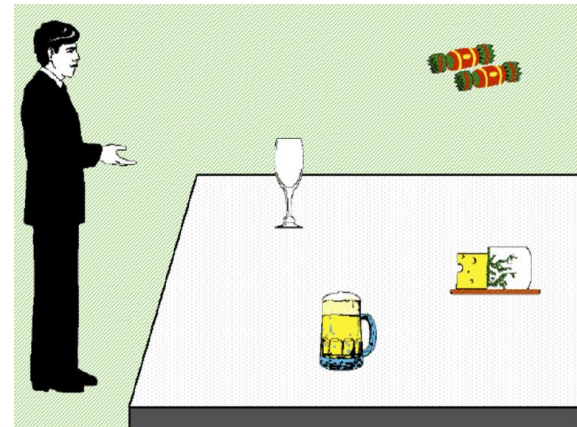
# What's in a verb

People can anticipate upcoming information on the basis of lexical or morphosyntactic cues on the **verb**

(Altmann & Kamide, 1999; Altmann & Kamide, 2007)



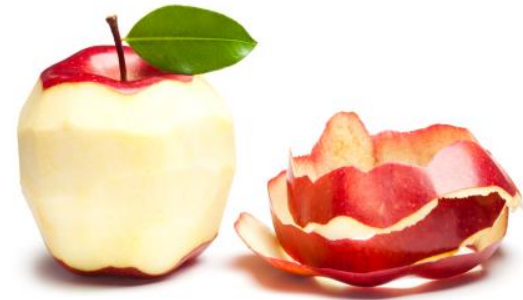
The boy will **eat** the cake  
(**move**)



The man **has drunk** the wine  
(**will drink**)



# What's in a verb

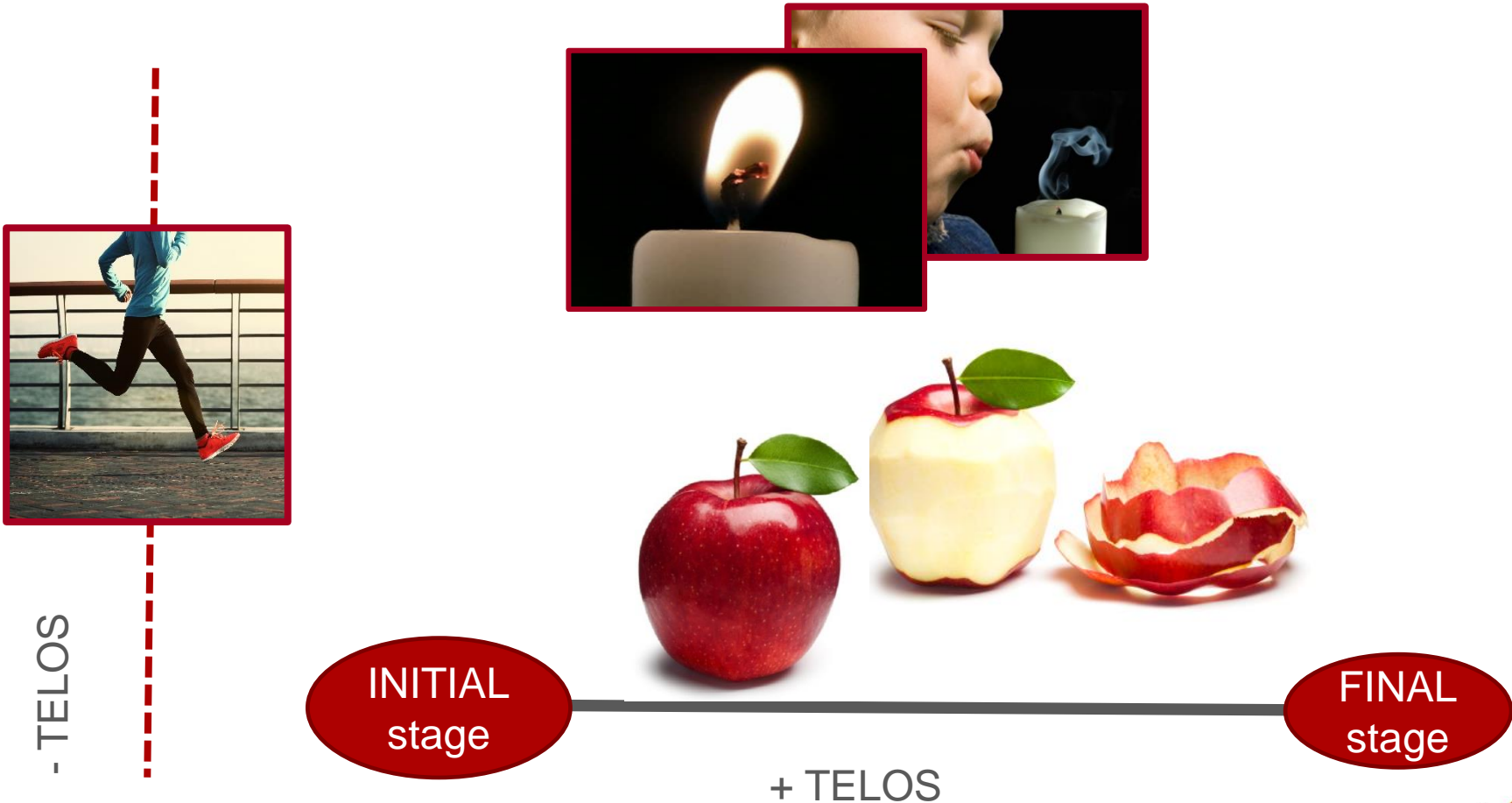


+ TELOS

+ DURATION

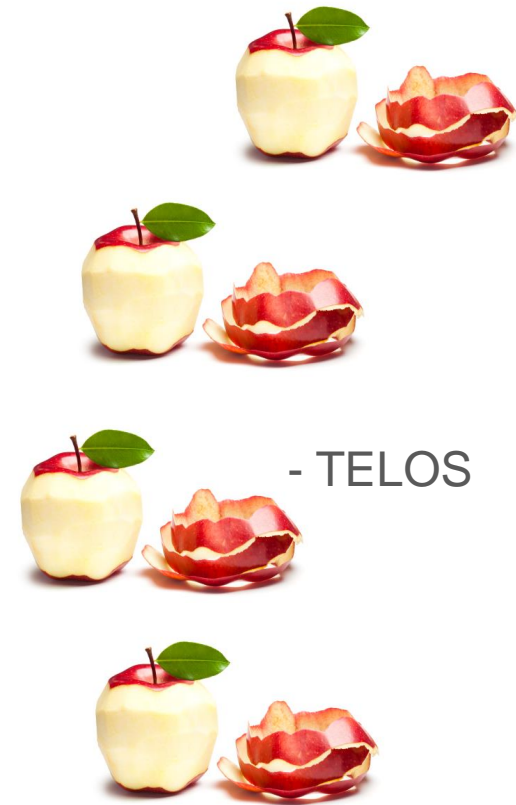
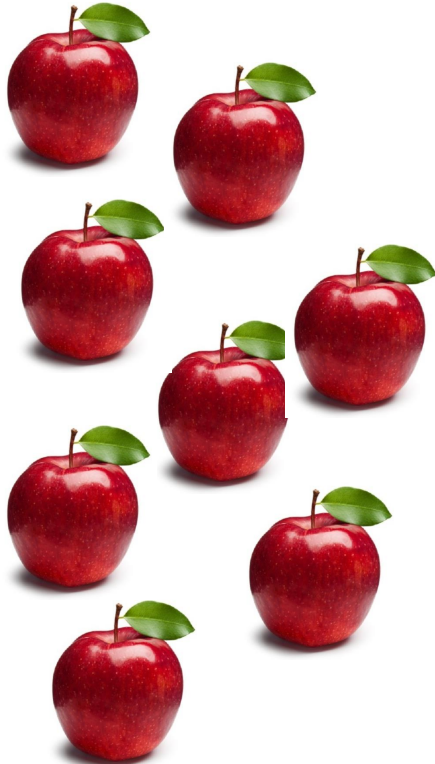


# What's in a verb



# What's in a verb

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- TELOS

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+ DURATION



# What's in a verb

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- **Aktionsart (predicate (dur) + object)**

(1a) Mike peels **the apple** → **TELIC**



(1b) Mike peels **apples** → **ATELIC**



- **Aspect**

(1c) Mike **is peeling** the apple → **ONGOING**



(1d) Mike **has peeled** the apple → **COMPLETED**



# What's in a verb

Mike has peeled the apple

Perfective Aspect

Durative + Definite DP

Culmination inference:  
The event has stopped

Telicity inference:  
The event has a telos



Final interpretation:  
The telos has been reached



# Previous studies

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Previous work has focused on the **timecourse** of the telicity inference

(→ the inference that the event is telic)

- such inferences seems **not** to be computed until there's evidence that they are needed
- when they are computed, they are associated with a computational **cost**

Pickering et al. 2006; Proctor et al. 2004; Todorova et al. 2000  
but see Townsend 2012; Paczynski, Jackendoff & Kuperberg 2014

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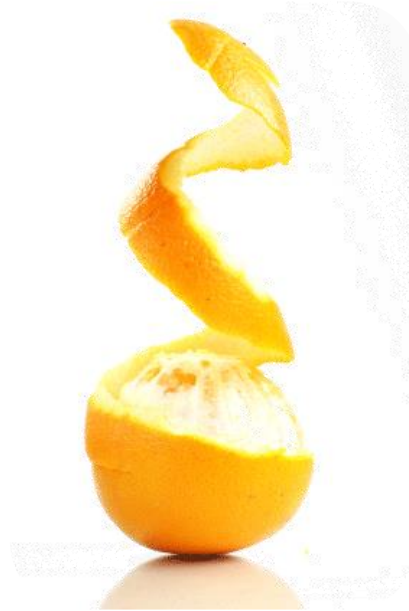
## Zhou, Crain & Zhan (2014)

Mandarin Chinese  
children and adults

incremental processing  
**perfective le** vs. **durative zhe**  
aspectual morpheme

- Laonainai zhong-**le** yi-duo xiaohua.  
old lady plant-PERF one-CL flower  
'The old lady has planted a flower.'
- Laonainai zhong-**zhe** yi-duo xiaohua.  
old lady plant-DUR one-CL flower  
'The old lady is planting a flower.'





# Experimental questions

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1

Is the **culmination inference** (i.e. the telos has been reached, the action is completed) derived incrementally?

2

If yes, at which point in time is it derived?



# Our study: Methods

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## Participants:

34 adult Italian participants\*

26 monolingual Italian children aged 8 to 10 (M = 9;3)

## Materials

- 21 items in total
- 3 experimental conditions
- latin square design – 3 lists (7 items per condition)
- Visual-World Paradigm
- Tobii eye-tracker (\*Eye-Link 1000)
- accuracy of picture selection (> 85%)





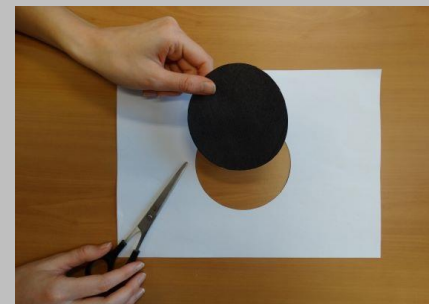
Look in which picture she **has peeled** the...

Guarda in quale foto **ha sbucciato** la...

**NO  
PREDICTION**



**SEMANTIC  
PREDICTION**

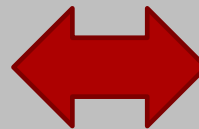


**ASPECT  
PREDICTION**

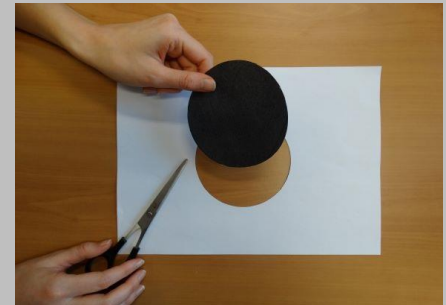
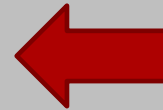




**NO  
PREDICTION**



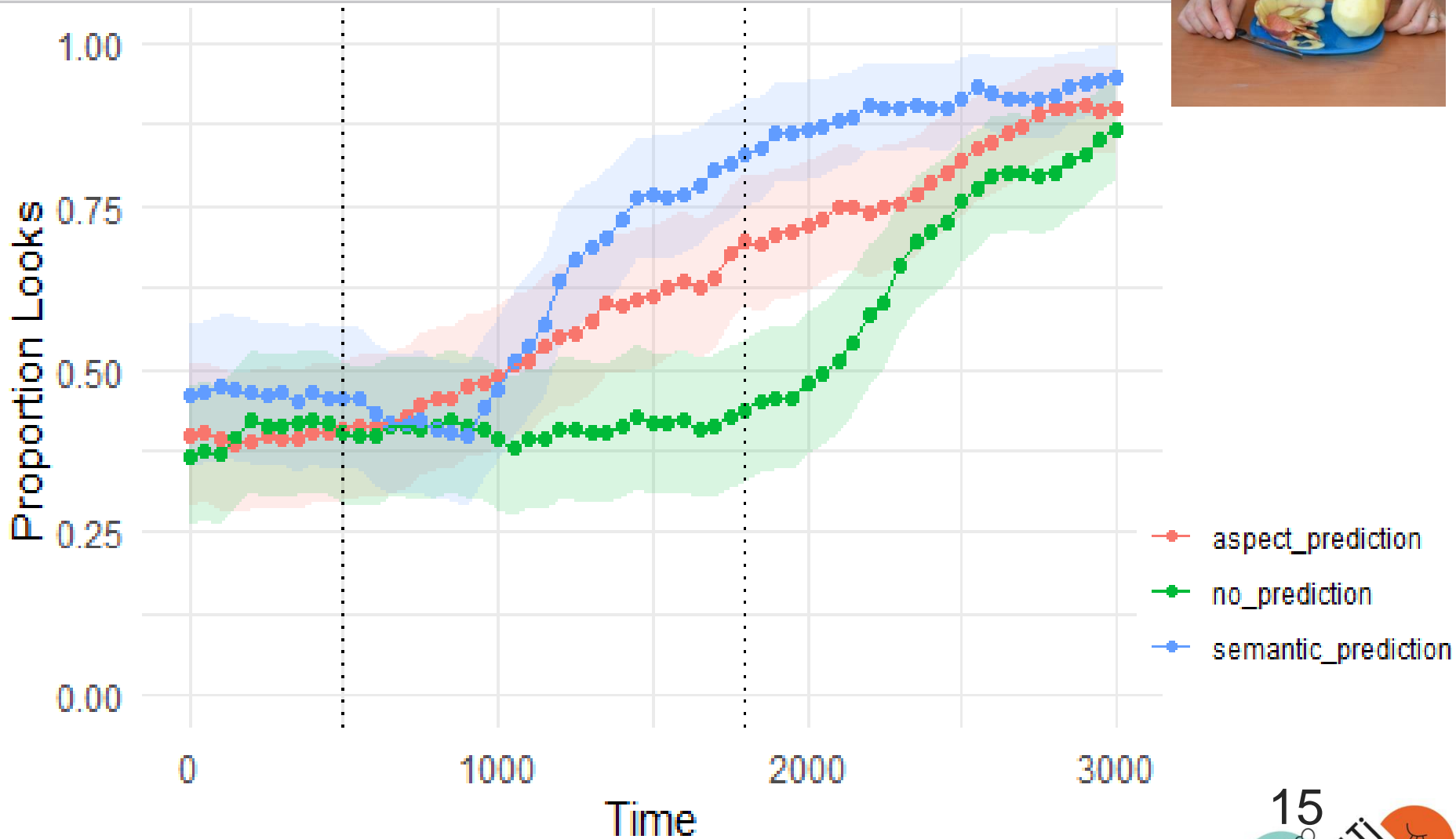
**SEMANTIC  
PREDICTION**



**ASPECT  
PREDICTION**



# Results: adults



Guarda in quale foto

ha sbucciato

la mela

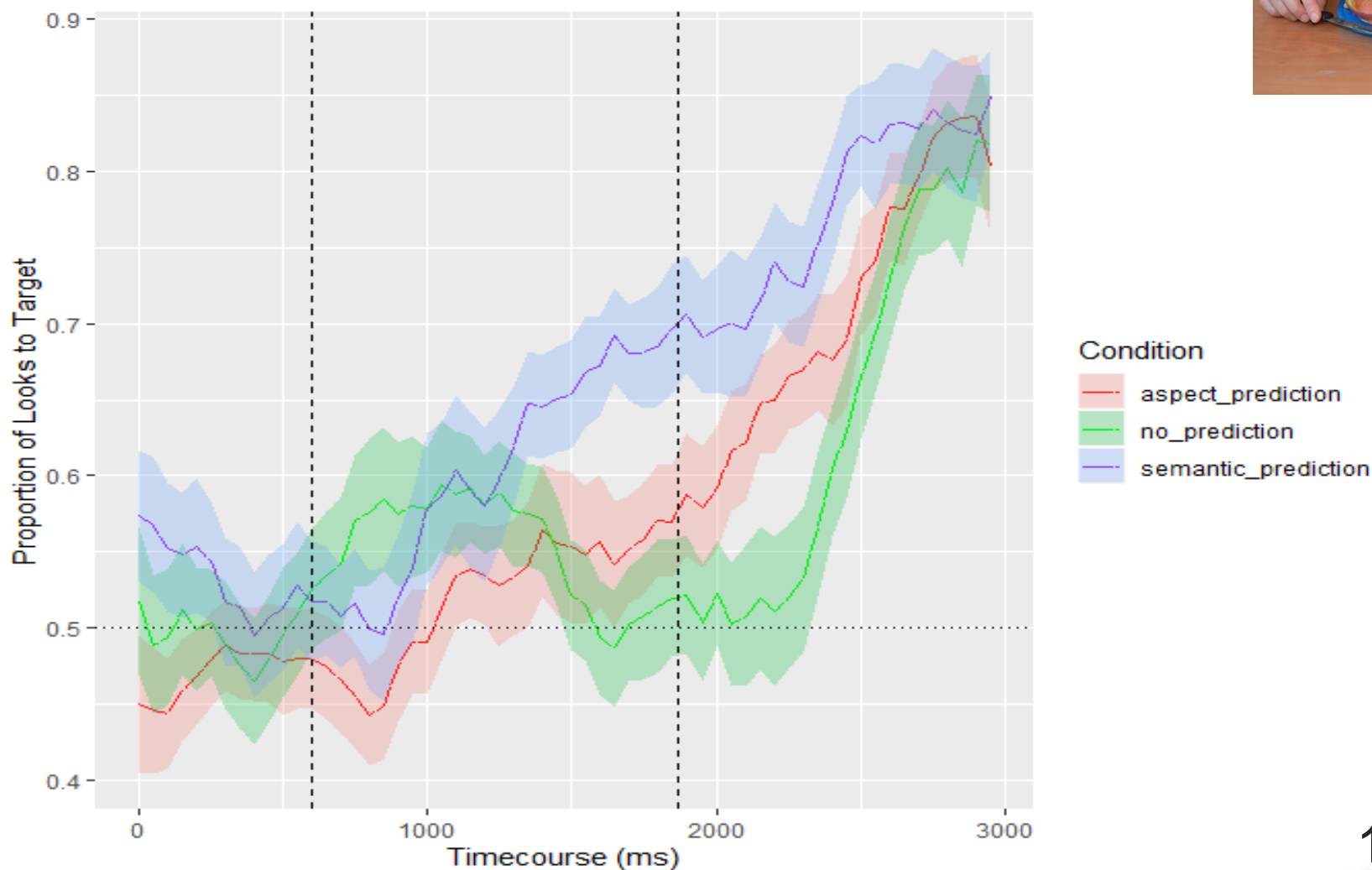
Look at which picture (she)

has peeled

the apple



# Results: children



Guarda in quale foto

ha sbucciato

la mela

Look at which picture (she)

has peeled

the apple



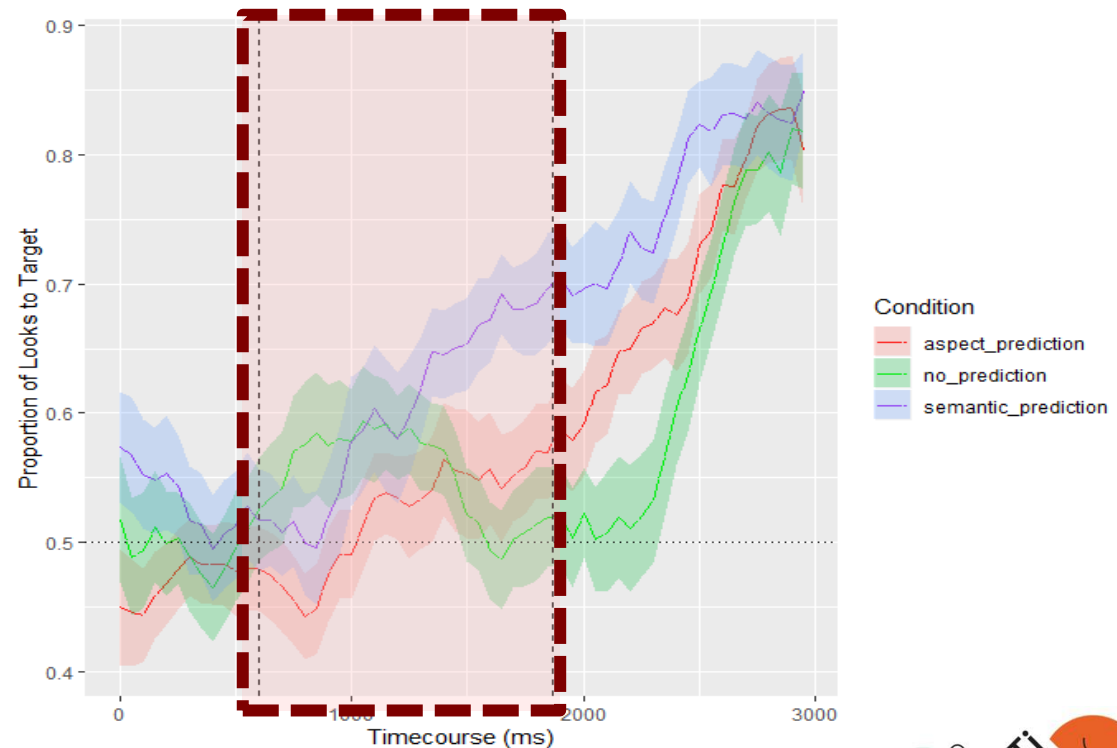


# Results

Generalized linear mixed effect models on the odds of target fixations in the three time regions. as a function of condition (random intercepts for subjects and items)

**Verb:** looks to the target significantly greater in the **Semantic** condition compared to the other conditions

Est. odds ratio=1.08, 95%  
CI =1.04-1.12,  $p < .0001$



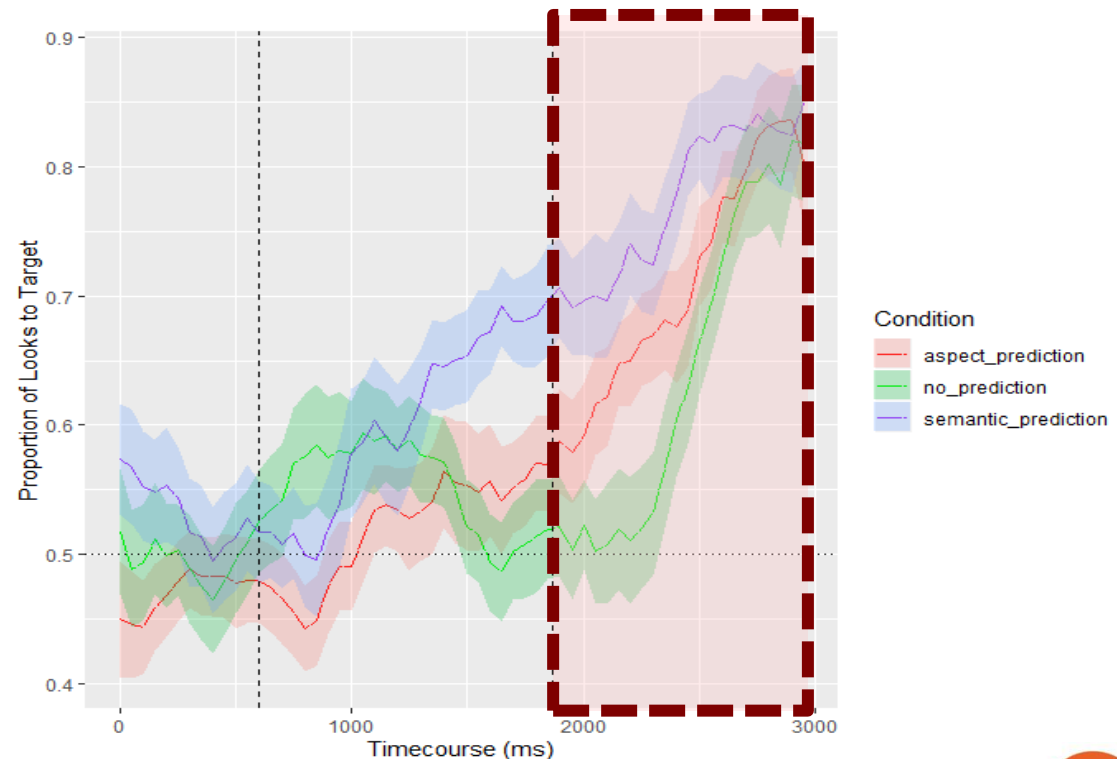
# Results

**Final noun:** (i) looks to the target significantly greater for **Aspect** condition than **No-prediction** condition.

Est. odds ratio=1.27, 95%  
CI =1.20-1.35,  $p < .0001$

(ii) looks to the target were still more likely in the **Semantic** than the **Aspect** condition

Est. odds ratio=1.62, 95%  
CI =1.52-1.71,  $p < .0001$



# Discussion

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1

Is the **culmination inference** derived incrementally?

- participants can anticipate the upcoming noun
  - they look earlier to the target in the aspectual than in the no-prediction condition
- they can do so on the basis of the aspectual cue on the verb
  - semantics alone does not provide enough cue to disentangle the two events

YES



# Discussion

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2

**When** do we start to compute the culmination inference?

- participants can anticipate the upcoming noun
  - they look earlier to the target in the aspectual than in the no-prediction condition
- they can do so on the basis of the aspectual cue on the verb; however, this takes additional time compared to lexical semantics alone
  - semantics provides a faster cue

incrementally after hearing the verb

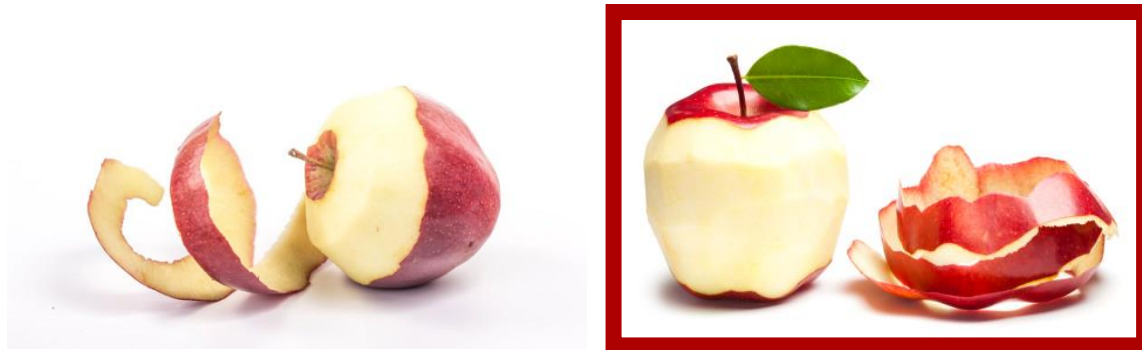


# Conclusions

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1

The morphosyntactic cue on the verb (perfective aspect) is integrated incrementally  
→ the **culmination inference** (i.e. the telos is reached, and the event is completed) is derived incrementally



# Conclusions

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2

This inference requires some additional time to be derived, compared to the integration of basic lexical semantics of the verb

→ it *might* reflect a cost of the derivation of the culmination inference (which is NOT derived in a second step, though)

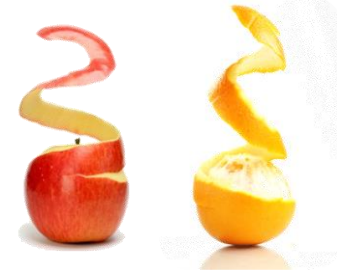


# Conclusions

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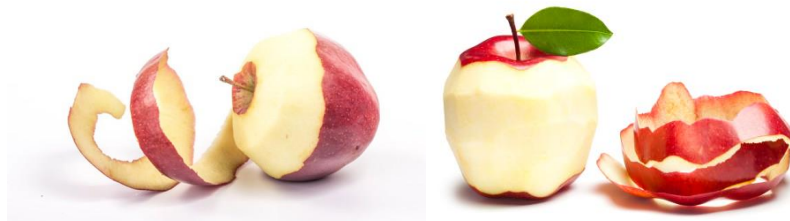
→ It might also reflect the process of integration of visual and linguistic cues:

i. identification of the event  
(triggered by lexical semantics)



ii. identification of **degree of completion** of the event  
(triggered by morphosyntax (aux+past participle))

→ this might also explain why the effect of anticipation shows up later in children



# Thank you !



Jasmijn Bosch



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