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

(The 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

+ DURATION

+ TELOS
What’s in a verb

- TELOS

INITIAL stage

+ TELOS

FINAL stage
What’s in a verb

+ DURATION

- TELOS
What’s in a verb

• Aktionsart (predicate (dur) + object)

(1a) Mike peels the apple $\rightarrow$ TELIC

(1b) Mike peels apples $\rightarrow$ ATELIC

• Aspect

(1c) Mike is peeling the apple $\rightarrow$ ONGOING

(1d) Mike has peeled the apple $\rightarrow$ COMPLETED
What’s in a verb

Mike \textit{has} peeled \textit{the apple}

\begin{itemize}
\item Perfective Aspect
\item Culmination inference: The event has stopped
\item Durative + Definite DP
\item Telicity inference: The event has a telos
\end{itemize}

Final interpretation: The telos has been reached
Previous studies

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

(→ the inference that the event is telic)

→ such inferences seem **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
Zhou, Crain & Zhan (2014)

Mandarin Chinese children and adults

incremental processing

**perfective le vs. durative zhe**

aspectual morpheme

a. Laonainai zhong-\textcolor{red}{le} yi-duo xiaohua.
old lady plant-PERF one-CL flower
‘The old lady has planted a flower.’

b. Laonainai zhong-\textcolor{red}{zhe} yi-duo xiaohua.
old lady plant-DUR one-CL flower
‘The old lady is planting a flower.’
Is the **culmination inference** (i.e. the telos has been reached, the action is completed) derived incrementally?

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

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

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

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

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

- 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 morphsyntax (aux+past participle))

- this might also explain why the effect of anticipation shows up later in children
Thank you!

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