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# Resultative Event Representations in Dutch Children and Adults: Does Describing Events Help Memory?

Miguel Santín, Ciara Hobbelink, Monique Flecken, and Angeliek van Hout

## 1. Background

Observing the continuous flow of information around them, young children learn to segment it into meaningful chunks of relationships between people and objects and the changes they undergo, thus forming event representations (e.g., Baldwin, Baird, Saylor, & Clark, 2001). The development of event representations happens in interaction with language acquisition. In the process of acquiring their mother tongue, children learn to produce event language and interpret event descriptions. This acquisition process involves learning to form associations between verbs, noun phrases and other linguistic elements and components of event representations.

Establishing associations between mental representations and language is more complex than simply mapping what can be seen in a situation onto language. Learners need to figure out exactly which structures and forms in a language link to which subcomponents of events, and vice versa, which features of an event representation (including event participants, intentionality of participants, change of state in participants, subevents, causal relations between subevents, temporal progress and ending, paths in space) are typically expressed by which types of elements in their language (NPs, verbs, tense-aspect morphology, verb satellites such as particles, directional PPs, resultative adjectives).

The present study focuses on adults' and children's event descriptions in relation to memory of events. Events are typically described by verbs, so learners need to acquire for any given verb exactly which event component(s) it refers to. As is well-known, motion verbs can encode either the manner (e.g., *bike*) or path (e.g., *enter*) of motion (Talmy, 2000). Particles in verb-satellite constructions in the Germanic languages often encode a result state (van Hout, 1996; Walkova 2013). For example, Dutch particle verb *doorknippen* 'cut through' (as in *een vel papier doorknippen* 'cut a sheet of paper in two') carries two pieces of

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information: the verb *knippen* ‘cut’ refers to a particular manner (‘cut with scissors’) and the particle *door* ‘through’ indicates that the cutting culminates in a particular result state (the paper ends up in two halves).

The development of event cognition and its link to language acquisition has been extensively studied. Children’s event representations are initially less developed than those of adults, and become richer over time (Bauer, 2007; Zacks, 2020). This has been investigated to a great extent for motion events that show a manner, path and goal of motion. Infants and toddlers are sensitive to such components in non-linguistic tasks. In particular, infants paid particular attention to goals (Lakusta, Wagner, O’Hearn, & Landau, 2007; Lakusta & Carey, 2015). Moreover, they are sensitive to path and manner of motion (Golinkoff & Hirsh-Pasek, 2008). Verb learning goes hand in hand with identification of these event components, with the latter serving as the basis for learning verb meanings (Goksun, Hirsh-Pasek & Golinkoff, 2010; Hirsch-Pasek & Golinkoff, 2006). The relation between event language and event representation also works in the opposite direction. Acquiring the meanings of words, in particular, verbs, may help acquiring more complex event knowledge (Gerson & Woodward, 2014; Goksun, Aktan-Erciyas, Hirsh-Pasek, & Golinkoff, 2017). Linguistic labels help to form event categories (Pruden, Hirsh-Pasek, & Golinkoff, 2008; Pruden & Hirsch-Pasek, 2006).

Seeing that event-to-language associations have been found in development as measured by attention allocation, discrimination and categorization tasks, what about event memory? In the present study, we ask to what extent event language facilitates children’s memory of events. Does describing events aid memory of the rich information that is present in a scene, including the many different components that comprise an event (participants, subevents, causal relations, temporal-spatial progress, etc.)? We were particularly interested in how event endings are memorized. Even though there is agreement in event cognition theory that endpoints of events are salient (Lakusta & Landau, 2012; Ünal et al., 2019), the precise nature of what counts as an endpoint has not been investigated in much detail.

There are two possible ways to conceive of the notion of endpoint, or event boundedness. One construal relates to a difference in event type, namely, the contrast between resultative and non-resultative events (Jackendoff, 1990; Ünal & Papafragou, 2019). It is associated with the linguistic notion of telicity (Comrie, 1976). Resultative events involve one of the participants’ undergoing a change towards a natural culmination moment (a *telos*), an endpoint after which the event can no longer continue (e.g., cutting a sheet of paper in two). In contrast, non-resultative events are homogeneous; they do not involve such change; they have no natural boundary and could in principle continue forever, although in reality they always stop at some (arbitrary) point (e.g., shaking salt into a bowl of soup). The other construal of the notion of endpoint relates to temporal progress of events. This dimension is associated with the linguistic notion of aspect (Klein, 1994). An event has various stages: there is a start, an ongoing part and an endpoint at which the activity stops and no longer continues. This notion of

endpoint is called cessation. For non-resultative event types, there is only the latter type of endpoint; they cease at some point. But for resultative event types, the two notions differ: a resultative event can either reach culmination (e.g., a paper is cut in half), or it can stop before it reaches culmination (e.g., a paper is cut partway).

Research examining the interplay between language and event processing has established interesting relations. Talking about an event helps remembering that event, because language (in the form of an event description) focuses the process of event encoding and facilitates ‘deep’ processing of a stimulus (Craig & Tulvin, 1975), thereby creating stronger event representations, which, on their turn, help memory. Talking about specific aspects of an event requires dedicated attention to those aspects, which leads to a stronger representation of those features in memory. This is closely related to “thinking for speaking” (Slobin, 1996): the verbal encoding process highlights particular features during event processing. This effect has been found for adult speakers, as well as for children (e.g. Bunker, Skordos, Trueswell, & Papafragou, 2016; Papafragou, Hulbert, & Trueswell, 2008), in particular, for attention allocation: right before producing an event description speakers inspect specific elements in a visual scene in the particular order in which they subsequently describe that scene. The effect of using specific language on cognition has also been established for another dimension of event cognition: it has been found that talking about events helps event memory. Explicit mention of specific event dimensions in the event descriptions improved adult speakers’ memory of those dimensions (for motion events, see Filipović, 2010, for change-of-state events, see Sakarias & Flecken, 2019), in comparison to memory of events that are watched silently.

Few studies have addressed the question if encoding of events in language helps children’s memory. The only language-and-memory study in children elicited descriptions of motion events and related these to participants’ memory of these events, after two days, using slightly changed events at the recognition stage where the manner or the path had been changed (Papafragou, Massey & Gleitman, 2002). Preschoolers’ memory performance was low overall. Moreover, there was no effect of specific language use (whether they used manner or path descriptions) on the memory task, for adults and children alike. This finding may suggest the absence of a thinking-for-speaking effect on memory, but it is also possible that that the memory task in this study was just too hard. The two-day delay between event encoding and recall may have been too long for remembering subtle details (such as jumping over a log versus tripping over it).

The line of research that examines how talking about events helps event cognition has mostly investigated motion events and has mostly focused on attention allocation. The present study combines two elements in a novel way: i) a different type of event, namely, resultative change-of-state events (such as cutting a piece of paper in two), and ii) memory as a different dimension of event cognition. Given the findings of studies on motion events in adults (e.g. Filipović, 2010), we expected to find effects of language on adults’ memory of event endings. While the effect of describing specific event components has been established for children for event processing (attention allocation), we do not

know how it might affect their memory. So, the question addressed here is whether, and if so how, there is a positive effect of using event language on event memory in adult and child language users alike.

## 2. Present Study

Endpoints of events are salient (Lakusta & Landau, 2012). Memory studies found that talking about events helps remembering them (Craig & Tulvin, 1975). Here, we wanted to see if talking about events helps remembering the endpoints of events. An additional question was to investigate which of the two notions of endpoint discussed above--change of state towards a natural culmination moment, or cessation--is important for representing event endings. Possibly it could be a combination of both: endings are most salient when resultative events cease once they have reached their natural culmination moment. Adding a developmental angle for both of these questions, we were interested to see how children would behave compared to adults. It is an open question whether language encoding affects memory of event representations in the same way in children as in adults, given that earlier thinking-for-speaking studies in children have not addressed this with a memory task. The two research questions are given in (1)-(2).

- (1) Does describing events help in remembering the nature of their endpoints? Is this the same for children and adults?
- (2) To what extent are the two different notions of endpoint--natural culmination moment and cessation--relevant for event representations? Is this the same for children and adults?

To address the first question, we compared memory performance of two groups of participants in a surprise recognition task after they encoded video clips of events either verbally (doing a description task) or non-verbally (doing a probe-recognition task). Participants watched the video clips in either encoding condition without knowing that later their memory would be tested. We expected for the adults that describing events prior to doing the memory recognition task would help remember their endings (Sakarias & Flecken, 2019; Santin, van Hout, & Flecken, in prep.), and so the group who did the verbal version was expected to outperform the non-verbal group.

The question of age was addressed by comparing memory accuracy in adults and children. If labelling events indeed creates stronger event representations, talking about events may enhance children's memory of event endings too. Event memory in children has been found to follow a developmental trajectory, with memories becoming richer and more robust as children grow older (Bauer, 2007), we expected that adults and children would exhibit the same memory patterns, but that adults would perform better than children.

In addition, we explored whether the semantics of verb predicates used to describe events influenced children's and adults' memory of event endings. Previous studies with adults found that describing particular aspects of events

affects event representation (e.g. Filipović, 2010; Sakarias & Flecken, 2019). In line with these studies, we wanted to see if talking about resultative events makes their endpoints more salient in event representations, and as a result more easily remembered. To this end, we were particularly interested in people's encoding of event culmination (i.e., events with an inherent endpoint, reaching a state of completion). We reasoned that the explicit expression of this event dimension may boost memory of event endings, because resultative verbs may guide speakers' attention to these endings as they emphasize this dimension. Given enhanced memory in studies where participants used specific language to describe events (Sakarias & Flecken, 2019), we expected that the production of verb predicates that denote culminating change-of-state-events would strengthen the representation of the endings of ceased, resultative events in memory. We did not have any specific expectations for the children given the lack of earlier studies on the effect of language use on memory in children.

To address the second question, we manipulated event type (resultative, non-resultative) and temporal progress (ceased action, ongoing action). If people are sensitive to changes in the event type dimension, representations of resultative events with an affected event participant should be stronger than those of non-resultative events with non-affected participants. Likewise, if people are sensitive to changes in the temporal progress dimension, representations of ceased actions should be stronger than those of ongoing actions. Thus, it was expected that clips of ceased, resultative events would be recognized best because the two notions of event endpoint come together when the culmination of a resultative event type is actually reached and the action ceases.

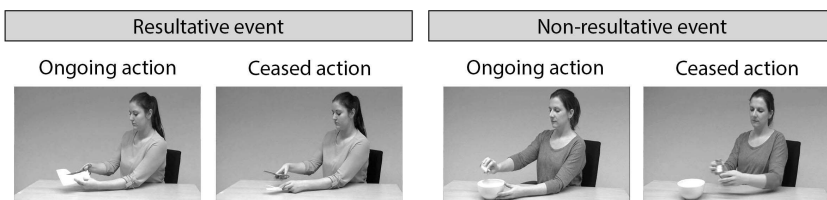
### 3. Method

*Participants* Dutch preschoolers (N=45) were recruited at several schools in the province of Friesland (The Netherlands); adult native speakers (N=48) were recruited via one of the authors' personal network. Children and adults were randomly assigned to the two different encoding groups. 24 children (mean age=4;7, age range 3-6 years old) and 24 adults (mean age=45) took part in the verbal encoding condition, and 21 children (mean age=4;8, age range 4-6 years old) and 24 adults (mean age=45;4) in the non-verbal encoding condition.

*Procedure* The experiment consisted of three stages. i) In the encoding stage participants watched short video clips on a laptop showing a person manipulating an object, and carried out either an event description task (verbal encoding group) or a probe-recognition task (non-verbal encoding group). ii) In the distractor stage children and adults did an oral digit span task (Woods, Kishiyama, Yund, Herron, Edwards, Poliva, Hink & Reed, 2011) to clear their verbal working memory. iii) Finally, in the (surprise) recognition stage, participants judged, by pressing one of two designated keys on the keyboard, whether or not a screenshot correctly depicted the ending of the events they had previously watched in the encoding stage.

*Stimuli* 24 pairs of 3-second long video clips of an agent manipulating an object were used for the first stage with the encoding task. Half of these (N=12) showed resultative events in which the agent's action produced a clearly visible change in the intrinsic properties of the affected object (e.g., cutting a sheet paper in two with scissors, cutting an apple in two with a knife). The other half (N=12) showed non-resultative events in which the agent's action did not produce a change in the physical properties of the object (e.g., pouring salt in a bowl, stirring in a pan). Furthermore, at video offset, one video of each pair showed an ongoing action (i.e., the agent's action was still in progress when the video ended, N=12), while the other one showed a ceased version of the same event (i.e., the actor stopped manipulating the object, marking this ending by putting her hands on the table; N=12). Figure 1 illustrates these different types of events and temporal progression at video offset. Two lists of stimuli were created (24 videos per list), counterbalancing event type and temporal progress at offset.

Furthermore, screenshots were taken from the last frame of all the videos, creating a set of 48 still images showing the ongoing or ceased ending of the 24 events (12 resultative, 12 non-resultative). These images served as recognition cues for the memory task. They were counterbalanced on two recognition lists in such a way that the ending of half of the videos per condition on each list matched with the recognition cue and the other half did not match. Both lists also included 12 filler videos (also from Sakarias & Flecken, 2019) showing actions with only one participant (e.g., sleeping at a table), or actions in which two actors interacted with each other (e.g., to put a hat on someone's head).



**Figure 1. Screenshots of two types of temporal progression at video offset (ceased and ongoing action), illustrated for two types of events (resultative and non-resultative)**

After each video, people in the verbal encoding condition provided a short description of the event they just watched by answering the question *Wat gebeurde er?* ('What happened?'). Their responses were recorded using the microphone of the laptop. For the non-verbal encoding task, in order to keep participants' attention engaged, filler items were used to create a set of screenshots of actions in progress (N=11). After watching a video, participants in the non-verbal encoding condition judged whether or not one of the filler images was part of the event they had just watched. These probe-recognition trials were evenly distributed to appear after filler events (for which they matched), resultative events and non-resultative events (no match).

#### 4. Results

*Digit span task* Unsurprisingly, an independent samples t-test comparing the mean span scores of Dutch children and adults indicated that the verbal working memory performance of children ( $N=45$ , mean score=4.1,  $SD=0.6$ ) and adults ( $N=48$ , mean score=7.3,  $SD=1.2$ ) was different;  $t(73)=16.015$ ,  $p<0.001$ .

*Non-verbal encoding task* An independent samples t-test on participants' accuracy ratios in the non-verbal encoding task showed that adults' performance as a group was higher (mean=1.0,  $SD=0$ ) than children's (mean=0.79,  $SD=0.31$ );  $t(20)=3$ ,  $p<0.01$ . Mean accuracy by participant revealed that 5 children scored below or equal to 60% accuracy. As the goal of the non-verbal encoding task was to maintain participants' attention on the events displayed in the stimuli, these participants were taken out of the memory analyses below.

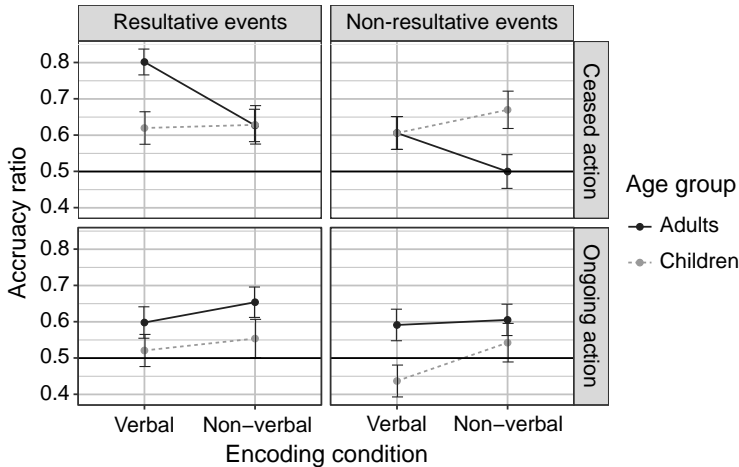
*Verbal encoding task* The descriptions of the resultative and non-resultative events (but not the fillers) were transcribed and then coded. Descriptions without a verb were coded as "NA" (not available). In the adults' descriptions 8 out of 576 utterances lacked a verb, and in the children's descriptions 104 out of 576. We extracted the verb plus, if present, a satellite from the descriptions and treated them as different verb predicates (for example, *knippen* 'cut', *door-knippen* 'though-cut' and *doormidden knippen* 'through-middle cut' constituted three different predicate types). The participants used 110 different verb-predicate types in total.

The classification of these predicates was done with respect two dimensions: culmination and change-of-state. For this, 16 other Dutch native speakers filled out an online survey in which they had to indicate whether a given verb (or verb predicate) refers to an event that reaches an endpoint (culmination) or not, and whether the meaning of the verb (or verb predicate) entails a change in the intrinsic properties of an affected object (change of state) or not. They were instructed to follow their intuitions. Verb predicate types for which people agreed (50% or more consensus) that they denoted both culmination and change-of-state were classified as expressing "culminated change-of-state" ( $N=36$ ); the rest as expressing "other semantics" ( $N=74$ ).

*Recognition task* Figure 2 shows the mean accuracy of children and adults in each of the four conditions for the verbal and non-verbal encoding groups. To analyse the effect of describing events on the memory of event endings in children and adults, a mixed-effects logistic regression analysis was conducted on the recognition data in both encoding conditions, using LME4 (Bates, Mächler, Bolker, & Walker, 2015) in RStudio (version 3.6.1). Model selection was performed in a forward stepwise selection of the random intercepts (by subject and items) and random slopes for all fixed factors that improved the akaike information criterion (AIC). In all models recognition accuracy was the binary dependent variable and they included the same fixed factors and interactions. All



fixed factors were sum-coded and included: a) Encoding Condition (verbal, non-verbal encoding), b) Temporal Progress (ceased, ongoing actions), c) Event Type (resultative, non-resultative) and d) Age (Adults, Children), as well as a four-way interaction between those factors. The random-effects structure of the final model included random intercepts for Items and a random slope for Temporal Progress by Item.



**Figure 2. Performance of children and adults in the recognition task across event conditions**

The final model (Table 1) revealed a main effect of Age, Event Type and Temporal Progress. Additionally, the model indicated two-way interactions between Encoding and Age, between Event Type and Age and Encoding and Temporal Progress. Moreover, the analysis showed a three-way interaction between Age, Event Type and Temporal Progress. These results suggest that overall, the endings of resultative events were remembered better than non-resultative events, and ceased actions were remembered better than ongoing actions. However, in both conditions (resultative events and ceased actions, independently) adults performed better than children. Furthermore, verbal encoding of events improved adults' memory, but not that of children. In fact, the recognition accuracy of adults was especially good for ceased resultative events when they encoded events verbally (adults: mean=79.8%, SD=0.4; children: mean=61.8%, SD=0.48; Figure 2).

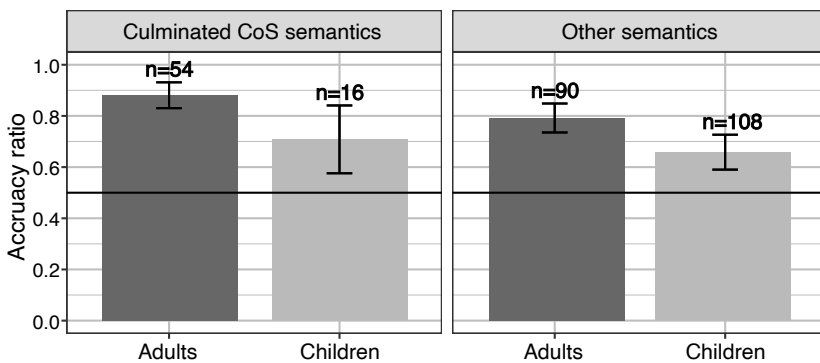
**Table 1: Logistic mixed-effects regression model on recognition accuracy data (fixed effects and interactions above  $\alpha=.05$  only)\***

*Formula in R: glmer (Accuracy ~ Encoding \* TempProg \* Event \* Age (1 + TempProg | Items.ID), data = data, family = binomial)).*

	Estimate	Est. Error	z value	Pr(> z )
(Intercept)	0.409	0.046	8.746	< 0.001
Age	0.112	0.046	2.450	0.014
Event	0.123	0.046	2.653	0.007
TempProg	0.153	0.066	2.294	0.021
Encoding : Age	0.117	0.046	2.551	0.010
Age : Event	0.091	0.046	1.982	0.047
Encoding : TempProg	0.115	0.046	2.508	0.012
Age : Event : TempProg	0.109	0.046	2.381	0.017

\* The main effect of encoding and all other interactions were above  $\alpha=.05$

To explore the effect of verb-predicate semantics on the recognition of culminated (ceased-resultative) events, we examined the semantics of the verb predicates used to describe them, in relation to recognition accuracy for those items. We asked, whether participants, when they had produced verb predicates expressing both culmination and change-of-state (as categorized in the verb classification survey), remembered those video endings better than when they had produced verbs with other semantics (Figure 3). Unfortunately, children produced very few such verb predicates ( $N=16$ ), so it was not possible to run a reliable statistical analysis on these data. Descriptive statistics suggest no effect of semantics: neither in adults (culminated change-of-state semantics: mean accuracy=88%,  $SE=0.05$ ; other semantics: mean accuracy=79.2%,  $SE=0.05$ ), nor in children (culminated change-of-state semantics: mean=70.8%,  $SE=0.13$ ; other semantics: mean=65.8%,  $SE=0.07$ ).



**Figure 3. Performance of children and adults in the verbal group for the recognition of ceased-resultative events after they produced verbs categorized as “culmination plus change-of-state” or “other semantics”.**

## 5. Discussion

The goal of the present study was to investigate if talking about events helps memory of events, and if this is the same for adult and child language users. In particular, we compared the memory of event endings in participants who verbally encoded movie clips of resultative and non-resultative events in two different stages of temporal progress (ongoing versus ceased) to participants who did a non-verbal encoding task. The results showed that describing events enhanced adults' memory of certain types of endings. We did not find a similar effect in children, however.

The finding that talking about events helped adults' memory of event endings suggests that, when language is used during event encoding, the mere fact of describing an event strengthens event representations. This can be explained as an effect of language triggering deeper processing and memory encoding of stimuli (Crain & Tulvin, 1975). The finding that specifically memory of endings of resultative-ceased events was enhanced confirms claims in the event cognition literature that endpoints of events constitute a salient feature of event representations (Lakusta & Landau, 2012). Moreover, it is in line with similar findings in language-and-memory studies in the domain of motion events (Filipović, 2010) and the domain of change-of-state events in two recent studies with speakers of Dutch, Estonian, Mandarin and Spanish (Sakarias & Flecken, 2019; Santín et al., in prep.), all of whom found memory enhancement in the verbal encoding condition.

But why does talking about events not help children? It is, of course, conceivable that this reflects a methodological issue: maybe the memory task was too difficult overall, despite our effort to make it easy by doing the memory task shortly after the encoding task (which is much earlier than the two days in Papafragou et al., 2002). But there are several other explanations that may be more likely. One possibility is that, in general, children's episodic memory at this age is less rich compared to adults (Bauer, 2007), thus, their representations of event endings may not be as detailed as compared to adults. Another possibility, in particular, is that the previously reported verbal boost for memory in adults (Crain & Tulvin, 1975) had not yet been fully developed in the children tested here. In relation to this, it may also be the case that children's use of language is not specific enough to allow differentiation between the rather subtle contrasts in event dimensions we investigated here. In other words, in their event descriptions, children may not have distinguished sufficiently between the four different types of event endings at hand, which means that verbalization did not offer a reliable tool to support memory in this case. This would suggest that children are still, to some extent, learning to 'think for speaking' at adult-like levels of detail, and the lower level of detail has had consequences for the relation between language use and memory attested here. We conclude that language does not play the same facilitating role in children than in adults.

Endpoints of events are salient (Lakusta & Landau, 2012; Ünal et al., 2019). But exactly which properties of the temporal progress of events determine what

qualifies as an endpoint? Linguistic theory distinguishes two dimensions of endpoints in language: telicity (Comrie, 1976) and perfective aspect (Klein, 1994). Looking at the associations of these two linguistic dimensions with different features of boundedness in events, namely, natural culmination moment (as related to telicity) and cessation (as related to aspect), we asked if one or the other (or both) is more pertinent in the representation of events, and if this is the same for children and adults alike. The results showed that both notions played a role (main effects of Event Type and Temporal Progress). Moreover, when the adults talked about events, culmination (the combination of resultative event type plus a ceased ending) was better remembered. In contrast to the adults, the children did not show sensitivity to this type of endpoint, combining the two dimensions manipulated. This could be explained by any of the reasons discussed in the previous paragraph. We conclude that, at least for adults, the notion of endpoint must be jointly defined by both dimensions: the resultativeness of events and cessation.

With respect to the cognitive basis of event boundedness, this conclusion adds to the picture of the role of boundedness than recently advanced by Ji & Papafragou (2020) in a categorization study with adults. We concur with the authors' conclusion that boundedness is an essential feature of event representation. Nevertheless, whereas they only found an effect of one dimension, namely event type (in their terms, "bounded" versus "unbounded" events, equal to our terms "resultative" versus "non-resultative" events), our study shows that adult speakers were sensitive to both event type and temporal progress. Further research on this understudied aspect of event endpoints will need to clarify the notion of event boundedness.

In addition to analysing the overall effect of language on memory, we explored if there was an effect driven by the semantics of verbs and verb predicates in the descriptions given by the participants in the verbal encoding condition. Based on previous language-and-memory studies (Filipovič, 2010; Sakarias & Flecken, 2019), we expected that, here, the use of telic verb predicates that denote resultative events with a culminating change of state might enhance memory of event endings, since telic verbs express the designated endpoint of an event (a *telos*). Contrary to expectations, there seemed to be no effect of verb semantics, and so we did not find a thinking-for-speaking effect on memory. This may mean that using telic verb predicates does not lead to deeper processing of event endpoints. There is, however, another possible explanation as to why we did not find an effect. It is possible that the semantic classification that we applied to the verb predicates that were produced, based on native speaker intuitions in an online survey, did not allot such verbs predicates in the right semantic categories. The notions of change of state and culmination that were explained in the online survey may not have been understood appropriately by people. Future work might explore if operationalizing the semantic classification of verbs differently, can reveal thinking-for-speaking effects on memory.

## 6. Conclusions

This study fits in a line of research that connects event language and event cognition. In particular, we asked if talking about events helps memory in adults as well as children. Our study contributed two novel elements to this research tradition. First, most earlier work has looked at motion events. We focused on a different type of event, namely, resultative change-of-state events (such as cutting a piece of paper in two). Second, most work investigating thinking-for-speaking effects with children has looked at the effect of using language on event processing by measuring attention allocation during the production of event descriptions. Our study examined the effect of event descriptions on memory after verbal encoding. The memory task turned out to be quite hard. In the non-verbal encoding condition, accuracy was rather low, between 50 - 65%, both in adults and children. In contrast, in the verbal encoding condition, adults showed sensitivity to event endings of culminated events: after producing descriptions of ceased-resultative events, adults remembered their endings better than the endings in the other three conditions, and also better than the non-verbal group. Children in both conditions, on the other hand, showed low accuracy on the recognition task overall, suggesting that i) talking about events did not help their memory, or ii) the memory task was too hard for them.

In order to further investigate the question why talking about events did not seem to help children, whereas it did help adults, future studies could look in more detail at potential differences in the verbal expressions of children and adults. Children's verb repertoire is less rich as the one of adults (Gentner, 2006), and this more restricted verb choice might lead to more shallow processing of event stimuli. Furthermore, children's verb semantics may not be exactly the same as that in the adult lexicon. It has been proposed that children initially do not represent change-of-state verbs with a designated endpoint (Wittek, 2002), or even have a manner bias (Gentner, 1978). It would be pertinent to investigate how Dutch children categorize the verb predicates produced in this study with respect to the dimensions of change and culmination, and compare this to the adult judgments that have been collected for the present paper. One could do this by presenting children with different verb predicates in combination with movie clips from the various conditions, and asking them if the predicates match the movie (van Hout, 1998).

The present study could not answer whether adults and children exhibit thinking-for speaking effects on memory, although the descriptive analysis of the available data suggests that there is no effect of the different kinds of meanings expressed by the verb predicates in the event descriptions and subsequent memory for the event features (culmination plus change or other) lexicalized in those predicates. In ongoing work, we are analysing the elicited productions from the present study in more detail to see if there are similarities and differences between adults and children. We plan to extend the verb semantics analysis presented above by analysing the types of verbs and verb predicates in various other ways, looking at their form (single verbs or particle verbs) and their meaning (verbs that

express activity, change with no given endpoint, or change towards a particular endpoint). Such a careful analysis can answer questions as to how Dutch speakers package information about resultative change-of-state events in language, expressing a particular manner and/or particular result, and if this is the same for children and adults.

To conclude, the investigation into talking about events and possible effects on memory has not reached its culmination, as many answers are still left open.

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