The Pragmatics of Telicity and What Children Make of It

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1. Introduction

This study investigates children's comprehension of the subtle pragmatic differences between telicity associated with particle verbs [henceforth 'particle telicity'] (e.g. *eat the apple up, drink the coke up*) and telicity associated with corresponding transitive simplex verbs of creation and consumption with an incremental theme argument [henceforth 'object telicity'] (e.g. *eat the apple, drink the coke*).

Previous studies exploring children's comprehension of particle telicity and object telicity found that children as well as adults treated the two differently (van Hout 1998a,b, 2001 for English and Dutch; Schulz & Penner 2002 for German). Children between the ages of 3 and 6 interpreted particle verbs as telic significantly more often than corresponding transitive simplex verbs, and so did the adults. Van Hout, in particular, concluded that children acquire particle telicity at an earlier age than object telicity. However, this does not explain why adults also treated particle telicity and object telicity differently. The adult facts can be explained by the analysis presented here.

I propose that, in the adult target grammar, particle telicity differs from object telicity on the following pragmatic grounds: particle verbs entail telicity, while corresponding transitive simplex verbs conversationally implicate telicity. The latter was already pointed out by Harnish (1976:319) and Atlas & Levinson (1981:36) inter alia. In the case of particle verbs, a telic interpretation is obligatory, while transitive simplex verbs are not obligatorily interpreted as telic. The implicature may or may not arise. If children understand the pragmatics of telicity in an adult-like manner, they will be able to differentiate particle telicity and object telicity. An additional step involves knowing in what contexts the implicature arises for transitive simplex verbs.

The acquisition path thus involves three levels of competence. Children need to understand that

(1) a particle verb predicate like *eat the cake up* entails *eat the whole cake* (e.g. *John ate the cake up.* entails *John ate the whole cake.*) and is therefore only felicitous on a completion interpretation

(2) a corresponding transitive simplex verb predicate like *eat the cake* conversationally implicates *eat the whole cake* (e.g. *John ate the cake.* implicates *John ate the whole cake.*) and is felicitous on both a completion and a non-completion interpretation

(3) the particle verb predicate is more informative than the simplex verb predicate:
<eat the cake up, eat the cake>

Two things follow from (3): First, *eat the cake up* entails *eat the cake*. This means that the contexts in which the particle verb is felicitous (only a completion context) forms a proper subset of the contexts in which the corresponding transitive simplex verb is felicitous (both completion and non-completion contexts), but not vice versa. Put differently, in all contexts in which the particle verb is

* I am grateful to the children, parents and teachers at the schools in Amherst, MA, and area where the experiment was conducted. I am also indebted to Barbara Zurer Pearson for her help with the statistical analysis.

felicitous, viz. completion only, the simplex verb is felicitous as well. In order to discern the two types of predicates, we also need a context in which the particle verb is NOT felicitous (a non-completion context) to contrast with the context in which both types of predicates are felicitous (completion). Thus, children need to know in what contexts (completion vs. non-completion) particle verbs and transitive simplex verbs are felicitous.

Second, on a completion interpretation, the particle verb predicate *eat the cake up*, as the stronger expression, is preferred to the corresponding transitive simplex verb predicate *eat the cake*. In order to capture this subtle pragmatic difference, an explicit contrast between particle verb and transitive simplex verb is needed as well. When both are available, the particle verb will be preferred on the completion interpretation, while only the simplex verb will be felicitous on the non-completion interpretation. In this case, the completion implicature of the simplex verb does not arise. Thus, children need to know that, on a completion interpretation, the particle verb is preferred to the transitive simplex verb. This study uses a novel experimental design that integrates the two types of contrast.

2. Method

2.1 Subjects

22 adults and 50 children between the ages of three and six participated in the study. There were 12 three-year olds, 17 four-year olds, 12 five-year olds and 9 six-year olds. The adults were tested at UMass Amherst. The children were tested in preschools and elementary schools in and around Amherst, Massachusetts.

2.2 Materials

The experiment involved video stories followed by questions. Particle verb – simplex verb contrasts as well as contextual contrasts were built into the experimental design. The stories provided the possible contexts and interpretations, while the questions included either a particle verb or the corresponding transitive simplex verb and thus presented the linguistic stimuli for the particle verb (PV) test condition and the simplex verb (SV) control condition. Each story showed two characters involved in parallel events of the same kind, e.g. a coke-drinking event. One of them, say Mickey, finished drinking his bottle of coke, while the other one, say Donald, did not. Subjects were then asked one question with *who* in either one of the two experimental conditions: either *Who drank his coke?* (SV) or *Who drank his coke up?* (PV). Depending on their interpretation of a question, subjects may relate it to the completion context and choose Mickey or to a context other than completion, such non-completion (Donald), the process of drinking or the mere occurrence of the drinking event regardless of completion or non-completion (Mickey & Donald).

Altogether, there were eight stories and experimental items. Out of the eight stories, two each involved an eating event, a drinking event, a folding event and a wrapping event. Four of the experimental questions were presented in the PV condition and four in the SV condition. This way, we were able to use a PV question and an SV question for each of the four different types of events, without ever asking two questions about precisely the same event and story. In order to make the in-built contrast between PV and SV more noticeable to subjects, nevertheless, the experimental items were on purpose not randomized. Instead, each two stories representing the same type of event were presented immediately following each other, with one SV and one PV question per eating, drinking, folding and wrapping event. This way, the experimental design provided contrasts without biasing subjects' answers. Crucially, the experiment did not ask subjects to give truth-value judgments, but invited them to provide their preferred interpretations for PV and SV in telic and other contexts.

2.3 Procedure

The children were first familiarized with the characters of the story, all of them well-known Disney and Sesame Street characters, and told they would see short movies involving those characters. Prior to the experiment, they were administered a pretest parallel to the experimental design to see whether they understood the difference between PV and SV at all and to make them aware of the contrast between the two experimental conditions without biasing their answers. When ready, they were shown

eight short movies on a laptop using MS PowerPoint and asked one experimental question immediately following each story. Children's responses were recorded by hand and by videotape. The hand-written responses were later checked against the video recordings for further verbal and non-verbal clues.

2.4 Predictions

(4) Prediction 1:
In the presence of an SV–PV contrast, subjects will associate PVs with completion more often than the corresponding SVs.

(5) Prediction 2:
Both adults and children will treat particle verbs differently from their corresponding transitive simplex verbs.

3. Results

3.1 Coding

Responses were coded in a threefold way as completion, non-completion and non-informative answers. Only responses that referred to the character who completed the event he was involved in, were analyzed as completion. Responses that referred to the character who did not complete the event he engaged in or to both characters in a clip were analyzed as non-completion.[1] The category of non-informative answers represents mismatch responses. In addition to the *who*-question, children were also asked two follow-up yes/no-questions in the same experimental condition for each of the two characters separately. This was done in order to elicit exhaustive answers from children who otherwise give non-exhaustive answers to *wh*-question. As a result, some children gave non-exhaustive answers to *who*-questions by picking only one character, but answered "yes" to both yes/no-questions, when asked about the two characters separately. These responses were considered non-informative to the problem under investigation here. Consequently, the analysis of response types comprises three categories.

3.2 Analysis of the results

The numbers and percentages of responses in the two experimental conditions and in the different age groups are given in table 1. How the responses are distributed relative to the simplex verb (SV) and particle verb (PV) conditions at the different ages is explored in more detail below.

[1] It has been pointed out to me that a completion interpretation may include all participants in the event. This will be the case if one understands completion of an event as 'contribute to the event being completed' rather than 'completing the event by doing the last part'. For the experiment here, it means that a response may refer to both characters and, nevertheless, be interpreted as completion response. However, we took the most conservative approach, when coding the responses.

Table 1 Distribution of responses by condition and age group

Age group	Responses	Particle Verbs	Simplex Verbs
3-year olds (n=12)	Completion	16 (33.3%)	12 (25.0%)
	Non-completion	10 (20.8%)	12 (25.0%)
	Non-informative	22 (45.8%)	24 (50.0%)
	Total	48 (100%)	48 (100%)
4-year olds (n=17)	**Completion**	**32 (47.1%)**	**28 (41.2%)**
	Non-completion	23 (33.8%)	29 (42.6%)
	Non-informative	13 (19.1%)	11 (16.2%)
	Total	68 (100%)	68 (100%)
5-year olds (n=12)	**Completion**	**29 (60.4%)**	**26 (54.2%)**
	Non-completion	16 (33.3%)	16 (33.3%)
	Non-informative	3 (6.3%)	6 (12.5%)
	Total	48 (100%)	48 (100%)
6-year olds (n=9)	**Completion**	**24 (66.7%)**	**20 (55.6%)**
	Non-completion	9 (25.0%)	11 (30.6%)
	Non-informative	3 (8.3%)	5 (13.9%)
	Total	36 (100%)	36 (100%)
Adults (n=22)	**Completion**	**80 (90.9%)**	**43 (48.9%)**
	Non-completion	8 (9.1%)	45 (51.1%)
	Non-informative	0	0
	Total	88 (100%)	88 (100%)

Figure 1 shows the distribution of the three response types (completion, non-completion and non-informative) by age, with both conditions collapsed. The pattern of response types was different for children and adults. Most of the answers were either completion answers or non-completion answers, as elicited by the experimental tasks. However, there was a third category of response which was neither a completion response nor a non-completion response, viz. a non-informative response. (See the description above under "Coding.") As we can see in figure 1, the proportion of non-informative responses is considerably higher in the group of 3-year olds than in the other age groups. It declines sharply from almost half of all responses for the 3-year olds to below 20% at age 4 and none among the adults. Before turning to the principal analyses, we examined these defective responses to determine whether they interacted with the study variables in any important ways.

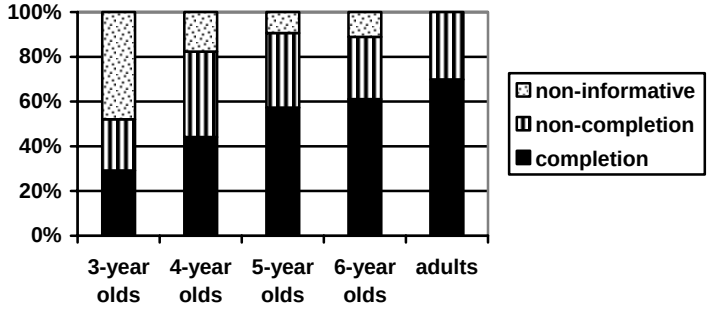

Figure 1 Completion, non-completion and non-informative responses across age

An Analysis of Variance of the non-informative responses with Condition (PV or SV) as a within-subject variable and Age as a between-subject variable showed that Age was significant ($F(4, 67)=9.819$, $p<.0001$), whereas Condition was not significant ($F(1, 67)=2.2$, $p=.139$). There was no interaction between Age and Condition ($F(4, 67)=1.12$, n.s). Pairwise comparisons showed that the 3-year olds performed significantly differently from all the other age groups in both conditions ($p<.0001$ for each comparison). The 4-year olds performed differently from the adults ($p=.014$), but not from the

5-year olds and 6-year olds. Since the percentage of non-informative answers is not different in the two experimental conditions PV and SV (cf. table 1), we proceeded with the rest of the analyses focused only on the completion and non-completion responses.

The principal comparison was the percentage of completion responses by age in the two experimental conditions, as shown in figure 2.

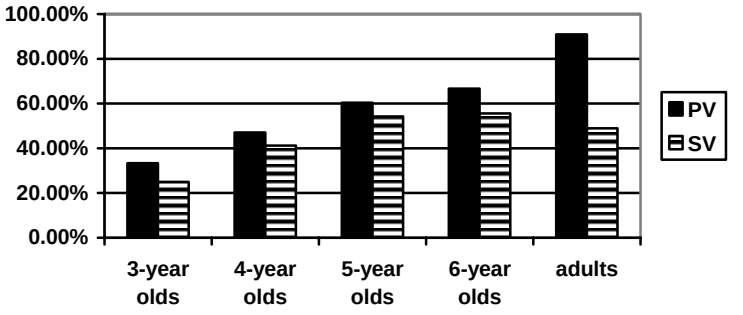

Figure 2 Completion responses by age in the PV and SV condition

An ANOVA with Condition as within-subject factor and Age as between-subject factor revealed significant effects of Condition ($F(1,67)=23.56$, $p<.001$)and Age ($F(4,67)=4.527$, $p=.003$), and a significant interaction between Condition and Age ($F(4,67)=7.908$, $p<.001$). Pairwise comparisons between age groups showed that the completion responses of the 3- and 4-year olds differed significantly from those of the adults ($p=.002$ and $p=.05$ respectively), while the 5- and 6-year olds did not differ in their completion responses from the 3-year olds ($p=.14$ and $p=.107$ respectively) and the 4-year olds ($p=.753$ and $p=.623$ respectively) nor from the adults ($p=.719$ and $p=.927$ respectively). Examination of the within-subjects contrast by age group revealed that the difference between the two conditions in completion responses was highly significant for the adults ($F(1,21)=111.485$, $p<.001$), but for no other age group. This finding is reflected in figure 2. Here we can see that the adults gave completion responses about 90% of the time in the PV condition, but only about 50% of the time in the SV condition, where they are as likely to give a completion response as a non-completion response.

Now let us take a closer look at the distribution of the adult and child responses within the two conditions separately. Let us first look at the PV condition to see children's understanding or non-understanding of completion entailments of particle verbs. Figure 3 shows the distribution of responses by age within the PV condition.

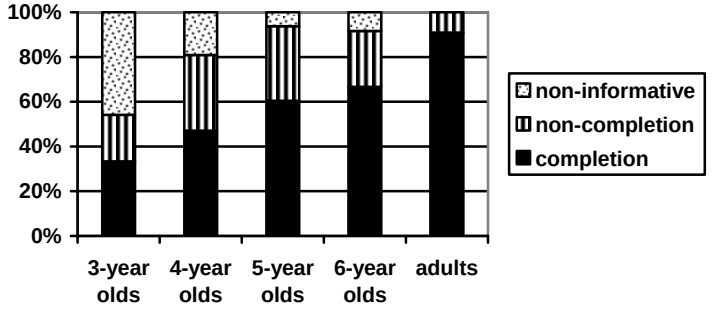

Figure 3 Distribution of responses by age within the PV condition

The ANOVA revealed significant effects of Response type ($F(1,67)=32.509$, $p<.001$) and Age ($F(4,67)=9.423$, $p<.001$), and a significant interaction between Responses type and Age ($F(4,67)=6.428$, $p<.001$). Pairwise comparisons between age groups revealed, first, that the responses of the 3-year olds differed significantly from those of all other children and the adults ($p<.001$).

Second, the responses of the 4-, 5- and 6-year olds did not differ from those of the adults (p=.062, p=.93 and p=.869 respectively). Examination of the within-subjects contrast by age group showed a significant difference between completion and non-completion responses for the adults (F(1, 21)=273.8, p<.001), but not for any of the other age groups. The non-significant difference between child and adult responses (excluding the 3-year olds) in the pairwise comparisons, despite the difference in the age group analyses and the apparent difference in figure 3, can be attributed to the high variability within the age groups of the 4-, 5- and 6-year olds.

Let us now turn to the SV condition to see whether children treated the completion implicature of simplex verbs in the experiment in an adult-like manner. Figure 4 shows the distribution of responses by age within the SV condition.

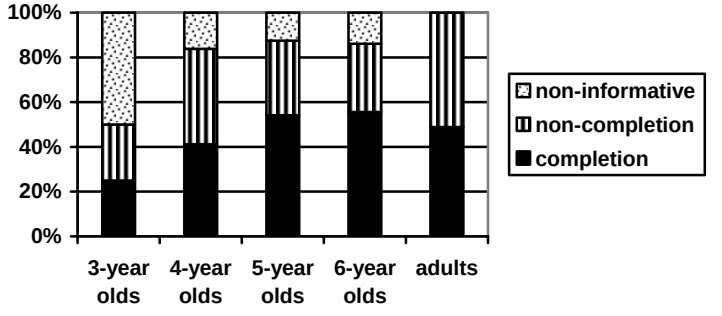

Figure 4 Distribution of responses by age within the SV condition

The ANOVA revealed a significant effect of Age (F(4,67)=8.637, p<.001), but not of Response type (F(1,67)=1.41, p=.239) and no significant interaction between Age and Response type (F(4,67)=.666, p=.618). Pairwise comparisons between age groups revealed that, again, the responses of the 3-year olds differed significantly from those of all other children and the adults (p<.001). The finding parallels the finding for that age group in the PV condition. Again, the responses of the 4-, 5- and 6-year olds did not differ from those of the adults (p=.233, p=.592 and p=.585 respectively). Examination of the within-subjects contrast by age group showed no difference between completion and non-completion interpretations in any of the age groups, as is reflected in figure 4.

4. Discussion

The results show that adults clearly interpret particle telicity and object telicity differently. In line with prediction 1, they associated particle verbs with completion interpretations significantly more often than corresponding transitive simplex verbs. For adults, a telic interpretation is obligatory for particle verbs, but not for transitive simplex verbs. They choose a completion interpretation for particle verbs almost 100% of the time, but for simplex verbs only 50% of the time. As the experiment elicited their preferred interpretations, rather than truth-value judgments, they preferred particle verbs to transitive simplex verbs to denote completion. This finding substantiates the validity of the analysis proposed here for the pragmatics of telicity.

Prediction 2, on the other hand, was not borne out. Children did not interpret particle verbs and transitive simplex verbs in an adult-like manner. Figure 2 above seems to show that children associate particle verbs with completion interpretations more often than transitive simplex verbs. Yet the apparent difference between particle telicity and object telicity in the child responses is not significant for any of the age groups. Even though children's completion responses increase with age, they do so in both conditions alike. Compared to the adults, children of all age groups seem to provide fewer completion responses for particles verbs, while the 5- and 6-year olds seem to offer more completion responses for simplex verbs than the adults do. However, the pairwise comparisons between the age groups showed that the 5- and 6-year olds did not perform statistically differently from the adults.

The illustration of the response pattern within the PV condition in figure 3 seems to show a linear development of increasing completion responses and decreasing non-completion and non-informative

responses with increasing age. Yet even the 6-year olds did not perform adult-like yet. The difference between completion and non-completion responses is only significant for the adults, as they interpreted particle verbs almost exclusively as telic. Due to the large proportion of non-informative responses, the 3-year olds cannot be said to have an understanding of telicity yet. The 4-year olds have some grasp of telicity, but even the 6-year olds still gave fewer completion responses (67% vs. 91%) and more non-completion (25% vs. 9%) responses than the adults. Thus, children as old as 6 years of age do not fully know yet that telicity entailments are obligatory for particle verbs.

The response pattern within the SV condition, as illustrated in figure 4, seems to suggest a U-shaped developmental curve: while the 3-year olds appear to give fewer completion responses than the adults, the 5- and 6-year olds actually seem to give more completion responses and fewer non-completion responses than the adults. If this was indeed the case, it would mean that the older children compute an implicature of completion for transitive simplex verbs more often than the adults do. Crucially then, they would still have to learn under what conditions the implicature does NOT arise in adult speech, viz. in the presence of the more informative particle verb. However, the suggested developmental pattern is not supported statistically. Except the 3-year olds, none of the other age groups performed differently form the adults. Again, the 3-year olds do not have an understanding of telicity yet. Just as we saw in the development of telicity entailments of particle verbs, children start to compute conversational implicatures of telicity for transitive simplex verbs at age 4.

Although the results of the present study seem to contradict previous acquisition studies, a closer look suggests that they may actually be compatible. Both van Hout (1998a,b, 2001) and Schulz & Penner (2002) concluded that children understood particle telicity from early on, while the results for object telicity were less clear. However, a closer look at van Hout's English data reveals that the 4-year olds in that study, in contrast to the 3- and 5-year olds, did not interpret particle verbs and transitive simplex verbs differently. This questions how reliable the difference is that she found for the 3-year olds. While the 5-year olds did interpret the two types of predicates differently, they also provided more telic interpretations for transitive simplex verbs than the adults did. This parallels the apparent pattern found for the 5- and 6-year olds in the present study.

Another parallel can be found in the adult data. While van Hout's approach did not predict a difference in interpretation between particle telicity and object telicity for the adults, the adult English native speakers in her study, in fact, associated particle verbs with telicity more often than transitive simplex verbs. They treated particle telicity and object telicity differently from each other, just as the adults in the present study did. Since the adult English and Dutch data differ in her study, cross-linguistic variation with regard to this question may indeed play a role, as van Hout suggests.

Furthermore, the same overall developmental tendency of telicity in children can be observed in the two studies. Both of them show a steady increase in telic interpretations across conditions. The overall proportion of telic interpretations, however, is higher in van Hout's study than in the one here. This difference between the two studies may be attributed to the differing experimental designs employed.

By asking yes/no-questions about completed and incomplete events, van Hout's study asked subjects to interpret the events as either completed or incomplete. There were only two options available: true or false. Imagine, for example, a situation in which a cake-eating event took place, but was not completed. A situation like this is set up in favor of a completion interpretation. If you are asked to decide whether or not someone *ate the cake up*, the answer will be 'no' if you understand particle verbs target-like as telic. If, in the same situation, you are asked whether or not someone *ate the cake*, 'yes' and 'no' are both felicitous answers depending on whether you interpret *eat the cake* as telic or atelic. Yet, recall that, from a pragmatic point of view, the particle verb is more informative on a completion interpretation, so that the weaker transitive simplex verb may receive a non-completion interpretation more often than not.

The study presented here, however, specifically integrated pragmatic clues and invited subjects to provide their preferred interpretations by asking them *who*-questions about the participants of an event. Imagine two characters engage in two parallel cake-eating events, with one of them finishing his cake and the other one not finishing his. Regardless of whether I ask you *Who ate his cake?* or *Who ate his cake up?*, there are four responses available: one of them, the other one, both or none. In a situation like the one described here, all responses are equally likely for each of the two questions. What kind of response the questions receive depends on whether you choose to interpret one or the other question as telic or not. As there are four possible answers, the probability of a completion interpretation to occur is lower than in the situation described first. Therefore, van Hout's experimental design may have

elicited more telic interpretations altogether and pulled out the contrast between particle telicity and object telicity more clearly.

Consequently, both studies show that age 4 is a benchmark age in children's developing comprehension of telicity. At that age, children start to develop an understanding of telicity. But even at age 6, they do not have a fully adult-like understanding of the pragmatics of telicity yet.

5. Conclusion

The novel experimental design of this study was able to capture the subtle pragmatic differences between particle telicity and object telicity, as verified by the adult data. Starting at age four, children show some understanding of the concept of telicity. Yet children as old as six years of age do not treat particle telicity and object telicity in an adult-like manner. Six-year olds do not always compute the obligatory telicity entailments of particle verbs yet. Nor do they fully understand in which contexts to compute or not to compute the conversational implicature of telicity that transitive simplex verbs carry. To conclude, at age four children start to develop an understanding of telicity, but even at age six they do not have an adult-like understanding of the pragmatics of particle telicity and object telicity yet.

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