Implicit agents in passives and anticausatives of Dutch children

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1. Introduction

This paper looks at two argument structure alternations in Dutch in which an internal argument of a verb appears in subject position at S-structure: *passive* and *anticausative*.[1] One difference between these processes is the fact that one (the passive) is morphologically marked, whereas the other (anticausative)[2] is not. Thus we find the following pattern:

(1)   Jan *smelt* de boter.
        John *melts* the butter
(2)   De   boter   *smelt*.
        The   butter   *melts*
(3)   De   boter   *wordt*   (door Jan)   *gesmolten.*
        The   butter   *becomes*   (by John)   *melted.*[3]

The sentence in (1) shows the causative (transitive), (2) shows the anticausative and (3) shows the (short) passive. Not all transitive verbs behave like *smelten* 'melt'. Most transitive verbs allow passive only and not anticausative.

This paper investigates the acquisition of the supposedly different argument structures of passives and anticausatives. Passives have been shown to contain an

[2] I will use the term *anticausative* to refer to the one-argument version of verbs that alternate between transitive and intransitive argument-structures. The argument that appears in subject-position in the anticausative, is the object in the transitive.

[3] 'Worden', *become* is the auxiliary in present and past tense of dynamic passives. In the perfect tense the auxiliary 'zijn' be is used for both stative and dynamic passives. Thus the passive paradigm is:
a. Jan wordt geslagen John becomes hit   VERBAL
b. Jan werd geslagen John became hit   VERBAL
c. Jan is geslagen   John is hit   VERBAL/ADJECTIVAL

implicit argument, as opposed to anticausatives. Implicit arguments are discussed in section 2. Section 3 considers the acquisition implications of the implicit argument phenomena. Section 4 presents some experiments with Dutch children. Section 5 discusses the implications of the findings, and section 6 summarizes and concludes.

2. Implicit arguments

When a transitive verb undergoes passivisation, the external thematic role of the transitive verb, though not necessarily overtly present in the sentence, is not absent from its interpretation (Roberts 1987, Roeper 1987a). The presence of the implicit (external) argument in short passives can be made visible in examples like the following:

(4)   The butter is being melted *to make a gravy*.
(5)   The vase was broken *with a hammer*.
(6)   The picture was hung on the wall *in a hurry*.

The italic adverbials in (4), (5), and (6) modify the implicit agentive argument. In (4), the PRO subject of the purpose clause is controlled by the implicit argument of the passive. (5) expresses that the 'breaker' used a hammer, and (6) tells something about the state the 'hanger' was in when hanging the picture.

The presence of an implicit argument in passives contrasts with anticausative variants of these verbs, in which the implicit argument is not present. Thus, corresponding to the passives in (4) to (6) we find the anticausatives in (7) to (9)

(7)   *The butter is melting *to make a gravy*.
(8)   *The vase broke *with a hammer*.
(9)   *The picture hung on the wall *in a hurry*.

Jaeggli (1986), and Baker, Johnson and Roberts (1989) suggest that the passive operation consists of assigning the thematic role of the external argument to passive morphology. As a result, the sentence subject position remains empty, and becomes a landing site for the internal argument of the verb. Since the external thematic role is assigned to passive morphology, it is syntactically and semantically present in the passive sentence, and functions as an implicit argument. Supposedly, in anticausatives (in (7) to (9)), the external argument of the transitive verb is deleted at the level of the lexical entry. It does not enter the grammatical representation, and cannot function as implicit argument.

Whatever the exact technical solution, we may conclude that passives contain an implicit external argument, whereas anticausatives do not.

3. Learning

Summarising section 2, the child faces the task of discovering two distinct facts about passive and anticausative verbs:

(10)   Verbal passives obligatorily have an implicit external argument.
(11)   Anticausatives do not have an implicit external argument.

In other words, a child must come to know that in the passive sentences in (4) to (6), the underlined elements predicate over the external argument of the passive verb, and likewise (s)he must learn that the anticausative variants of these sentences like (7) to (9) are ungrammatical. As we have seen, the linguistic analysis of these facts links the distribution of implicit arguments to the assignment of an external argument to passive morphology.

It is quite clear that any particular linguistic analysis of a phenomenon does not immediately provide specific predictions about the development of that linguistic knowledge in children. In order to move from the linguistic analysis to the developmental predictions, we need a developmental theory, explicating how a grammar of the type proposed can be learned. One element that has been proposed as a developmental principle in such a theory is the Subset Principle (Berwick 1985).

We might argue then that the range of constructions in which an anticausative appears is a subset of the range of constructions in which a passive appears: anticausatives appear without infinitival purpose clauses and the like, passives may appear with them or without them. If a mechanism like the Subset Principle would structure the acquisition of these argument structure alternations, the prediction is that implicit arguments are never overgeneralised, i.e. they ought never to appear in anticausatives.[4] Children might start out, regarding passives as if they were anticausatives. Positive evidence like (4) to (6) would lead the child to add an implicit argument to the passive sentences.

Very few studies so far have focussed on questions regarding implicit arguments in the acquisition of passive and anticausative. As far as I know, only Roeper (1987), Teng (1988) and Bowerman (1991), investigated children's differentiation between passives and anticausatives.

Roeper (1987) concludes after various types of comprehension experiments with children between three and seven years that three-year-olds do not systematically distinguish passives from anticausatives, whereas seven-year-olds do. What happens in between is not clear. A striking finding is that the three-year-olds seem to overgeneralise the implicit external argument to the

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[4] For a different theory, and the same prediction, see Finer and Roeper (1989).

anticausatives, contrary to what the subset principle would predict. Teng (1988) shows that four-year-old children can link an instrumental PP to an implicit argument in a passive, as in (5). Bowerman (1991) searched for passives, middles and anticausatives in her corpus of early spontaneous speech from her two daughters. She found that her children did not distinguish passives and anticausatives as sharply as adults do. In particular, children create anticausatives from transitive verbs whose meanings imply the presence of an external argument (12), and on top of that, anticausatives were sometimes paired with an oblique agent (13):

(12)   And then the cookie swallowed and (then) went down down down.
(13)   How come these two broke? By who?

Bowerman does not present frequencies for these errors though she notes that they are occasional. An interesting problem emerges from these findings: quite contrary to the predictions of the subset principle, English children overgeneralise implicit agents sometimes. The extent to which they do so is unclear as yet, as is the cross-linguistic distribution of these phenomena. The question arises how children can ever overcome these errors.

    The primary aim of this paper is descriptive. The question I have tried to answer is whether Dutch children between four and seven years of age represent the distinction between passives and anticausatives. If they do not, the question is whether implicit arguments are *overgeneralised* (occuring in passives as well as anticausatives) or *undergeneralised* (occuring in neither passive nor anticausative). A developmental theory based on the subset principle predicts that there will be no overgeneralisation of implicit arguments.

4. Comprehension experiments

Three experimental tasks were presented to children, one involving *picture selection,* one involving *why-questions* and one involving *how-questions.* All experiments were carried out with a group of 24 children, between 4 years 2 months and 6 years 9 months. It has not been possible to find any age effects in the results so far, though the children were distributed over six age groups with a six-months range each.

4.1 Picture selection task

The children were asked to choose between two pictures. The pictures portrayed an event, such as breaking glass. One picture portrayed only the patient under-going the event, the other picture contained the patient undergoing the event as

well as an agent causing the event. They were told to choose the picture that fitted best with the description provided by the experimenter. The experimenter then provided an anticausative or a passive version of a verb. If children represent passives with and anticausatives without an agent, the prediction follows that children choose the *agentive* picture with *passive* prompts, and the *agentless* picture with the *anticausative* prompts. Note, however, that a child who points to an agentive picture in response to an anticausative prompt is providing a correct answer, but, crucially, an agentless picture in response to a passive prompt is incorrect.

It is important to remark here that picture selection experiments like these are extremely sensitive to inference based on 'knowledge of the world'. Children may prefer a picture of a scene that is likely to occur in the real world. Since events like breaking do not usually come about spontaneously, this real-world bias might tempt children to choose the agentive pictures irrespective of the exact meaning of the prompt. A picture-choice experiment shows whether a correlation holds between the constructions used and children's responses. It does not provide direct evidence for children's representation of verbs at the level of argument structure.

The children chose an agentive picture for 60% of the passive prompts, and a non-agentive picture for 65% of the causative prompts. This reflects a significant correlation ($p < 0.025$) between the nature of the prompts and the responses. Besides, 22 of 24 subjects provided at least one agentive answer to a passive prompt. Only 16 of the 24 subjects did so to an anticausative prompt.

Concluding, one might say that there is a tendency in the adult direction: agents are more likely to be chosen with passives than with anticausatives. On the other hand, the high percentage of non-agentive responses to passive prompts suggests that the implicit argument is not (yet) as firmly established in these children's passives as it is in adults.

4.2 Why-questions task

Dutch *waarom* 'why', can refer to two kinds of reasons: it may refer to the purpose of the agent performing the activity, or it may refer to the cause of a process. In passive why-questions, *why* obligatorily refers to the purpose of the agent. In anticausative why-questions, since there is no agent, *why* obligatorily refers to the cause of the process. Some examples to clarify the contrast:

    (14)   *Q: Waarom werd de boter gesmolten?*
              Why was the butter being melted?
    (15)   *A: Omdat hij een ei wilde bakken*
              Because he wanted to bake an egg (purpose)
              *A: Omdat het in de zon lag
              Because it was lying in the sun   (cause)

(16)   *Q: Waarom smolt de boter?*
         Why did the butter melt?
(17)   **A: Omdat hij een ei wilde bakken*
         Because he wanted to bake an egg (purpose)
         A: Omdat het in de zon lag
         Because it was lying in the sun   (cause)

The experiment exploited this difference in a Modified Judgement Task. Children were told a story in which a rabbit performed some activities, as they were looking at a single picture showing all the elements in the story. The story contained a cue for both a purpose reading and a cause reading, in other words it explained why the rabbit did something, as well as what caused the process to occur. For each story, half the subjects (N=12) was asked an anticausative why-question, and the other half was asked a passive why-question. Every subject was asked two anticausative and two passive questions in order to make both inter- and intra-subject comparison possible.

    An example for clarity: the questions *'why did the egg break?'* and *'why was the egg broken'* were introduced with a story in which the rabbit was preparing breakfast for his family and wanted to have fried eggs *(purpose)*. The rabbit hit the egg on the side of the frying pan *(cause)*, which made the egg break.
Purpose responses were taken to indicate that an external argument was represented in the child's interpretation of the question. *Cause* responses were taken to indicate that no external argument was represented in the child's interpretation.[5]

(18) *Table 1 Responses to WHY*

Question	Response			
	purpose	cause	others	total
anticausative	28 (58%)	11 (23%)	9 (19%)	48
passive	37 (77%)	6 (13%)	5 (10%)	48
total	65 (68%)	17 (18%)	14 (14%)	96

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[5] It was pointed out to me by Kees Hengeveld (pc), that the distinction between cause and purpose does not necessarily coincide with the distinction between agent-oriented and non-agent oriented. That is, agent-oriented causes (Reasons) are possible, for example in John baked an egg *because he was hungry*. The results presented here were calculated insensitive to that distinction. However, if it turns out that some of the children's cause responses are agent-oriented, this will increase the number of responses that can be interpreted as agent-oriented.

Responses to passive and anticausative prompts did not differ significantly. The children responded to the anticausative why-questions as if they were passives: the majority of their responses were purpose responses. Compare this to the responses of a control-group of 24 adults: 90% of the passive prompts received a purpose answer, and 88% of the anticausative prompts received a cause answer. Only 6% of the anticausative prompts received a purpose answer. In short, an important difference exists between children's responses and adult responses, that needs to be explained.[6]

Let us first consider an interpretation that does not rely on the presence of an implicit argument in the children's anticausatives. Note that purpose-clauses combine with any verb that takes an intentional argument. For example, though the surface subject of 'vertrekken' *leave* is generally regarded as an internal argument of the verb, (19) is perfectly acceptable.

(19)   Jan   vertrok [om de trein te halen].
        John   left   [to catch the train]

Back to the class of verbs we are considering here, a purpose clause combines with transitive and passive *break* and not with anticausative *break*. The discussion above suggests that this is due to the nature of the single argument of anti-causative *break*. Now, if the children in the experiment represented anticausatives like *break* and *burn* as if they had intentional arguments, like *leave* or *arrive*, they might come up with purposive answers which, in the child's interpretation, described the purpose of the surface subject (and not, as I interpreted, the purpose of the implicit external argument). In this interpretation, a purpose answer to an anticausative question in the story about the rabbit breaking an egg for breakfast, would describe the purpose of the egg, instead of the rabbit. We may call this the *animist* account.

The main problem with this account is, that the children respond with purposes that are presented in the story as purposes of the rabbit. For example, when the rabbit breaks wood to make it fit the fireplace, the purpose answers to *'Why does the wood break?'* refer to making the wood fit the fireplace. The story contains nothing that would indicate that the wood wants to go to the fireplace, but the rabbit is said to want to make a fire there to make the room comfortable and warm. Therefore, though it is not possible to exclude a mystic reading

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[6] The question arises whether children in this age range might prefer prupose-answers for why-questions anyway. To answer this question, a search was made through experimental data on 4- and 5-year old children, collected by Jill de Villiers and Bill Philip for entirely different purposes. In particular, the number of purpose and cause responses were tabulated for why-questions about stories that contained both a purpose and a cause reading. There was no detectable preference for purpose-answers. In fact, cause answers were the preferred answers for these children.

analysis altogether, the reasoning required to make it work seems clumsy and a little far-fetched.

4.3 How-questions task

Additional evidence that children's anticausatives are more like passives than adults' anticausatives, comes from the third experiment I carried out with these children. The design is similar to the why-experiment. *How* may ask for specification of an agent's activity, or of an entire event. It may only refer to an agent if that agent is represented somehow. The children were again confronted with a little scene, and the experimenter drew their attention to some striking features of both the event and the agent. For example, one picture showed a little person-like cat, rolling a hoop with a stick. The story emphasised the fact that the hoop was rolling extremely fast (*event*), as well as the fact that the cat used a stick (instrument of *agent*) to make the hoop roll. Then a how-question ensued, either passive or anticausative.

(20)   *Q: Hoe wordt de hoepel over de speelplaats gerold?*
         How is the hoop being rolled over the playground?

(21)   *A: Heel hard*
         Very fast   (event)
         A: Met de stok/ door te duwen
         With the stick/ by pushing   (agent)

(22)   *Q: Hoe rolt de hoepel over de speelplaats?*
         How does the hoop roll over the playground?

(23)   *A: Heel hard*
         Very fast   (event)
         ?A: Met de stok/ door te duwen
         ?With the stick/ by pushing   (agent)

The examples in (20) to (23) show that *how* in a passive question may modify either the agent or the event, whereas in an anticausative it may modify the event only.

Responses that modified the agent were scored as agentive. If the response referred to the rolling-event only, it was scored as non-agentive.[7]

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[7] Responses with an instrumental phrase lik 'met de stok' *with the stick* were scored as instrumental and therefore as indicative of an implicit agent. Responses with a phrase like 'door de stok' *by the stick*, were scored as non-agentive, because the use of 'door' *by* suggests the child interpreted the stick itself as a kind of agent, not necessarily as the instrument used by an implicit agent. It is obviously a matter of empirical research whether (these) children have the relevant knowledge of prepositions.

(24) *Table 2. Responses to HOW*

Question	Response			
	agentive	nonagentive	others	total
anticausative	16 (33%)	24 (50%)	8 (17%)	48
passive	18 (38%)	26 (54%)	4 (8%)	48
total	34	50	12	96

As in the case of the why-questions, the responses to anticausative items do not differ significantly from the responses to passive items (p < 0.05) In the how-task however, there is no preference for agentive answers overall. Compare the results to the control group of 24 adults: *agentive* answers were given to 88% of the passive prompts and to 25% of the anticausatives. *Non-agentive* answers were given to 73% of the anticausative prompts, compared to 10% of the passive prompts. The comparison makes two things clear: first, adults allow agentive readings for anticausative *how*-questions more frequently than they were expected to. Second, the adult responses do show signifcant impact of the contruction on the response type, as opposed to the children's response. On the other hand, the fact that adults gave so few non-agentive responses to passive how-questions, even though these would be grammatical, suggests that the stories may have contained a hidden bias to give an agentive answer. The children tend to include the implicit argument in their interpretations, independently of the anti-causative/passive distinction, whereas adults make a clearer distinction between the two.

In view of the fact that the results are consistent with the findings for the *why*-questions and the *picture selection*, we may take these findings as additional evidence for overgeneral implicit arguments.

4.4 Summary

Summarizing the findings in 4.2 and 4.3 we may conclude:

(25)   Anticausative wh-questions *do* yield agentive answers.
(26)   Passive wh-questions yield agentive answers, too.

This is clearly evidence against the role of the subset principle in this domain. Should we conclude from this that children may represent agents in any non-

agentive verb? Or that they add external arguments to anticausative verbs? How are these faulty representations to be amended in the course of development?

The important question arises again whether these agents are part of the anti-causative verbs' argument structure, or whether the presence of agents in the children's reponses derives from children's sensitivity to such factors as inference from real world knowledge and the context provided by the story. In other words, do the children give agentive responses *in spite of* their adult-like grammatical representation of anticausatives, or do they do so *because* they represent anticausatives as if they were passives?

5. Implications

For Bowerman (1991) the overgeneral use of agentive phrases with anticausatives is one indication that children do not have 'complete structural and functional differentiation' between the passive and the anticausative. From Bowerman's perspective, the question whether the implicit agent in a child's anticausative is part of the argument structure of the anticausative verb is not crucial. Her main concern is to show that a dichotomy between lexical operations (the deletion of the external argument in the anticausative) and syntactic operations (the sup-pression of the external argment in passives) breaks down when children's use of passives and anticausatives is considered carefully (Bowerman, personal com-munication).

Roeper's (1987) picture choice experiment resulted in an overall preference for pictures with agents. Roeper proposes principle (27) to account for these findings.

(27)   Children prefer sentences that include agents.

According to Roeper, children's choice for agentive pictures supposedly reflects inference strategies, not grammatical representations of the anticausatives. Roeper suggests that (27) is an *extralinguistic, cognitive* precursor of transitivity. It is this cognitive precursor that makes children 'look for' agency, and not simply recogn-ise it contextually.

We may conclude then that so far, investigators have not found the evidence sufficient to claim that passive-like use of anticausatives in children indicates non-adultlike argument structures of anticausatives.

The results presented in this paper, however, ought to lead to this conclusion. There is an important difference between Roeper's experiment and mine, especially with respect to the *why-questions*. As noted above, a child who chooses a picture with an agent in response to an anticausative prompt, gives a *correct* response even from the perspective of the adult grammar. The children in

Roeper's experiment did not react to the *contrast* between passives and anticausatives, but their responses to anticausatives were not incorrect.

However, the overgeneral agents in the present study do not follow from adult representations. If it is true, as most of the linguistic literature seems to agree, that the presence of an implicit agent in a passive can be diagnosed with the facts presented in (4) to (6), the conclusion is justified that the anticausatives in this experiment are represented like passives.[8]

How are the overgeneral external arguments ruled out in the course of development? This issue remains unresolved for now. Note however, that it is no less unresolved in an 'inference-story' à la Roeper. If children in this age group are more sensitive to inference and real-world knowledge than to syntax, the question remains why, how and when they are going to rely on syntax like adults.

Immediately then, the question arises whether all anticausative verbs at some stage are represented with external (agent-like) arguments. It seems unlikely that an overgeneralisation like this would be entirely unconstrained. One possible hypothesis is that only verbs that universally alternate between causative and anti-causative in adult languages are subject to this overgeneralisation. Another possibility was suggested in Verrips (1993). Space does not allow more discussion of the alternatives here.

6. Summary

In this paper I discussed an experimental study carried out with Dutch children between 4;2 and 6;9. Three experiments were designed to elicit differences in argument structures between grammatical passive and anticausative variants of a set of Dutch verbs.

The results indicate that these children do not limit implicit external arguments to passives. There was no significant difference in this respect between passives and anticausatives.

Another striking finding was that there was no detectable age effect. Children in the oldest age groups were as likely as the younger ones to give an agent-oriented respons to an anticausative wh-question.

I proposed that the findings in this paper indicate that the children in this age group allow a passive representation of anticausative verbs. In other words, the overgeneral implicit arguments would have to be described as affix-less passives.

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[8] Note that the fact that anti-causatives have no affix to 'carry' the external thematic role, is no counterargument to a passive-like representation. Affix-less passives appear in the linguistic literature here and there. For example, Bruijn and Veenstra (to appear) claim that Negerhollands and Berbice Dutch (two Dutch-based creoles) have verbal passives without passive morphology.

It was suggested that this faulty initial analysis may be restricted to a subset of anticausative verbs in a language.

The explanation opens a host of questions for further research. With respect to the resolution of learnability problems, it looks like the subset principle is going to be of little help, since the results presented here show that subset-problems simply arise in the course of development (Verrips, in press for related discussion). The present findings point to the importance of empirical developmental studies for a proper understanding of the nature of learnability problems involved in native language acquisition.

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