The Role of Object Movement in the Acquisition of Telicity

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1. Introduction

In recent years, research on the interaction between the syntax and the semantics has shown that these two systems work together to build the linguistic system. This type of interaction has been particularly attested in the investigation of telicity and in the acquisition of telicity in L1 and L2. Some of the early research on telicity proposed that the derivation of a telic interpretation is dependent upon the quantification properties of the direct object and that there is a relation between telicity, the properties of the direct object, and syntactic structure. In syntax, telicity has been introduced as a feature that must be checked in the Specifier of the Aspect Phrase via movement of the direct object. Thus, a telic interpretation is derived when the direct object in the form of a count noun checks the verb’s telic features in the Spec of AspP. (Verkuyl, 1972, 1989, 1993; Taylor, 1977; Mourelatos, 1978; Dowty, 1979, 1991; Tenny, 1987, 1994; Pustejovsky, 1991; Travis, 1994; Borer, 1994; Weist, Wysocka, and Lyytinen, 1991; Schmitt, 1996; van Hout 1997, 1998a; among others).

Concerning the acquisition of telicity, previous research in L1 has shown that in languages in which telicity is encoded compositionally such as in English and Dutch, children have difficulties comprehending the semantics of simple telic predicates. For example, children as old as five years of age do not know that the presence of a count noun in a transitive verb frame entails the completion of the event (e.g., he ate the cake), or that the presence of a bare noun does not entail the completion of the event (e.g., he ate cake) (van Hout, 1998a, b; Wagner, 1997). However, research in English, Dutch, and German has also shown that children younger than five years of age are able to interpret telic predicates in an adult-like manner when the predicate contains a particle verb eat up (e.g., he ate up the apple) suggesting that they recognize the completion of an event when is marked by other elements than the count/mass distinction of the direct object (van Hout, 1998a, b; Schulz and Penner, 2002). The results of these studies led some researchers to propose that initially young children pay attention to markers of telicity such as particle verbs and measuring adverbs, but have difficulties recognizing the quantification properties of the object NP as the features that distinguish a telic predicate from an atelic one (Weist, Wysocka, and Lyytinen, 1991; van Hout, 1998a, b; Wagner, 1997; Schulz and Penner, 2002).

This research has revealed an apparent absence of linguistic knowledge in the child’s grammar. But just as children’s adult-like production does not guarantee adult-like competence, neither can children’s apparent comprehension deficiencies be taken as (complete) lack of linguistic knowledge. Instead, the apparent delay may reveal linguistic processes that we may have not known otherwise. Recent research on the interfaces has observed that learners exhibit certain developmental instability on linguistic properties that sit between two linguistic modules, and has proposed that the acquisition of narrow syntax precedes the acquisition between the syntax and other cognitive systems (Serratrice, Sorace, and Paoli, 2004; Sorace, 2003, 2004). This study presents such a case. The study investigates the syntactic movement operation that allows the checking of the verb’s telic features in Spanish telic predicates. My goal in this article is to show that children’s acquisition delay on the comprehension of simple telic predicates is related to movement operations at the interface between the syntax and the semantics. In particular, the study shows that syntactic operations that take place after Spell-out, that is, at LF are acquired at a later age of development. Movement operations at LF might be a probable cause of developmental instability.

New developmental data indicates a delay on children’s comprehension of Spanish telicity in predicates that contain one internal argument, that is, predicates whose telicity is marked by the
properties of the direct object alone (e.g., the boy cleaned the stain). However, the data also indicates that children perform in an adult-like manner when the predicate contains two internal arguments (e.g., the detergent cleaned the stain), that is, a direct object and an object that surfaces in subject position.

This article is organized as follows. Section 2, reviews the syntax of telicity, making an especial emphasis on the checking of the verb’s telic features. Section 3, presents the predictions of the acquisition study. In section 4, the experimental study is introduced. The results and discussion of results are presented in section 5. Section 6 concludes the study.

2. Theoretical Perspectives: the syntax of telicity

Over the past decade researchers have noted a relation between telicity and the direct object (Verkuyl, 1972, 1989, 1993; Taylor, 1977; Mourelatos, 1978; Dowty, 1979, 1991; Tenny, 1987, 1994; Krifka, 1992; Pustejovsky, 1991; Travis, 1994; Borer, 1994; Hodgson, 2006; among others). The research that emerged showed that telicity can be found in different types of syntactic structures such as transitive verbs (e.g., write a letter), unaccusative structures (e.g., the flowers wilted), particle verb constructions (e.g., eat up the apple), resultative phrases (e.g., hammer the metal flat), verbs that contain a goal PP (e.g., push the cart to the door), and locatum structures (e.g., the cleaner removed the rust). Despite the variation of syntactic structure in which telicity can be found, the generalization that came forward was that the derivation of telicity requires a direct object in the form of a count noun in either its canonical position, that is in situ, or as an underlying object that surfaces in subject position as in the case of unaccusatives and locatum structures.

Within the generative framework, the semantic notion of telicity has been syntactically represented by the lower functional category of Aspect and introduced in the syntax as a formal feature that must be checked. In the checking theory of Chomsky (1995), formal features are syntactic primitives that enter into a checking relation with a particular head. This motivates syntactic movement, which allows a derivation to converge. Thus, the interpretation of a telic predicate results from movement of the NP’s features to the Specifier of the Aspect Phrase where it enters into a checking relation with the head.

One of the assumptions in the theory is that there are two types of features, strong features and weak features. Strong features must be checked by overt movement and deleted before Spell-Out because these features are phonologically unacceptable at PF, so they must be checked before the grammar splits. On the other hand, weak features are phonologically acceptable and can be checked at LF, that is, after the grammar splits and via covert movement. In other words, overt movement is the type of movement that feeds morphological requirements of the phonological component and involves movement of the whole category together with its features, otherwise the computation does not converge. Covert movement, on the other hand, does not feed morphology and only involves the movement of formal features and not the whole category.

Research on telicity has not specified whether the checking of the verb’s telic features takes place overtly (before the grammar splits) or covertly (after the grammar splits). It is plausible that in simple telic predicates, the verb’s telic features are checked by covert movement since the presence of a direct object in the form of a count, bare, or mass noun in a transitive verb frame are all acceptable at PF. In other words, the presence or absence of a count noun does not cause the derivation to crash, but rather, the presence of a count noun functions as a delimiter of the event, distinguishing between telic and atelic predicates (e.g., John ate; John ate cake; John ate the cake). Therefore, the feature strength of the NP in telic predicates can be considered weak in view of the fact that it doesn’t feed morphological requirements of phonology.

The simplified structures below represent the syntactic derivation of an atelic, simple telic, and locatum predicates. In (1), the derivation of an atelic predicate is illustrated. In this syntactic

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1 Although the two types of aspect, lexical (which includes the property of telicity) and grammatical aspect are represented syntactically by the same functional category of Aspect, it has been argued that they are located in different positions within the clause structure. Grammatical aspect is located in the upper Aspect Phrase, next to the Tense Phrase, while lexical aspect is located in the lower Aspect Phrase.

2 Feature checking operation is a procedure in which an element that bares a specific interpretable feature in a given structure will be enforced by the checking procedure to match such interpretable feature with the feature head. If the appropriate matching does not take place the derivation crashes at LF (Chomsky, 1995).
derivation, the object NP does not contain the necessary quantification properties that allow the verb’s telic features to be checked, therefore no movement takes place. In (2), however, the object NP does contain the required properties to check telicity, therefore, the verb triggers movement of the quantification features on the object, which in turn allows the telic interpretation of the predicate. However, since this movement is not enforced by the need to check strong features, we can assume that the movement is covert, and as such, it should only involve sets of formal features but not the category.

1. John ate cake

By contrast, a locatum predicate in (3) requires an object NP to move to subject position in order for the derivation to converge. In this case, overt movement of an object is driven by the need to check the EPP’s strong features. As the object NP moves up, and by virtue of being an internal argument of the verb (Hale and Keyser, 1998), it checks the verb’s telic features as the simplified syntactic structure below illustrates:

2. John ate the cake
3. ___removed the rust with the cleaner (the cleaner removed the rust)

Given that the feature strength of the object NP in simple telic predicates is weak and involves only movement of formal features at LF, the question that arises is do children misinterpret the movement operation that triggers the interpretation of simple telic predicates because this operation appears as if no movement takes place? On the other hand, can children comprehend telic predicates in an adult-like manner when an NP undergoes overt movement such as in locatum predicates?

Aspectual information in Spanish is conveyed compositionally. That is, the meaning of a predicate is dependent upon all the elements in the sentence such as the type of verb, the complements, and any other grammatical elements in the sentence. Therefore, the syntactic derivation found in English telic predicates can also be applied to Spanish (but see de Miguel, 1992; 1999; Bosque, 1990; Demonte, 1991a, b for a comprehensive review on Spanish lexical aspect).

3. Predictions

Having presented the syntactic analyses for simple telic predicates and locatum predicates, we are in a position to discuss the specific predictions of these analyses. The general assumption in acquisition is that if learners acquire specific functional categories, they have knowledge of the syntactic and semantic properties involved with those categories. However, having knowledge of functional categories also involves understanding the syntactic operations that allow a particular interpretation, including movement operations. Research in minimalism has addressed the possibility that movement exist because it is required by the interface systems (Chomsky, 1995, 2000; Uriagereka, 1998); therefore, it is possible to conceive that children’s delay on the acquisition of simple telic predicates may be the result of not having complete knowledge of the type of movement operations imposed by the interfaces.

If children have adult-like knowledge of covert movement as well as knowledge of overt movement, certain precise predictions on their performance follow:

1. In simple telic predicates, they should allow the features of the direct object to move at LF, therefore they should interpret simple telic predicates like adults.
2. In locatum predicates, they should allow the underlying object that surfaces as subject to check the verb’s telic features and they should interpret locatum predicates adult-like.

If children do not have adult-like knowledge of covert movement, then specific predictions follow on their performance:
1. They should disallow the features of the direct object to move at LF and should have a non-adult interpretation of simple telic predicates.

4. The Acquisition Study

Participants, Materials, Procedure

This study will report two experiments. The total number of participants for both experiments is sixteen adults and sixty children. One experiment consisted of eight adults that served as controls, and thirty children. The child subjects range in age from 3;6 to 7;11, with a mean of 5;6:8 years-old; ten 5;0-6;2 years-old; and ten 7;0-7;11 years-old. The second experiment consisted of eight adults that served as controls, and thirty children. The child subjects range in age from 3;1 to 7;11, with a mean of 5;8:0 years-old; ten 3;1-4;9, ten 5;0-6;8, and ten 7;4-7;11. All subjects were monolingual native speakers of Spanish. All subjects were tested at their homes or at an elementary school in Zaragoza, Spain.

One experiment tested children’s knowledge of covert movement (simple telic predicates), the other experiment tested children’s knowledge of overt movement (locatum predicates). In both conditions, the object NPs had the same properties, that is, they were definite count NPs. The same verbs were used in both experiments: *cubrir* ‘cover’, *llenar* ‘fill’, *limpiar* ‘clean’, *recoger* ‘pick up’. Each verb was presented in three different situations; therefore, the number of target items per experiment was twelve. The number of control and filler questions per experiment was twenty four; that is, two per target item. The stories and pictures are the same for both experiments. The test statements in Spanish and their respective translation in English are presented below:

Table 1.1. Test Statements in Spanish

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Sentence Statements</th>
<th>Correct Answer</th>
</tr>
</thead>
</table>
| Covert movement (simple telic predicates). | *El niño cubrió la mesa.*  
*La niña llenó el cubo.*  
*El niño limpió la camiseta.*  
*La niña recogió el zumo.* | NO |
| Overt movement (locatum predicates). | *El mantel cubrió la mesa.*  
*El agua llenó el cubo.*  
*El jabón limpió la camiseta.*  
*La esponja recogió el zumo.* | NO |

Table 1.2. Test Statements in English

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Sentence Statements</th>
<th>Correct Answer</th>
</tr>
</thead>
</table>
| Covert movement (simple telic predicates). | The boy covered the table.  
The girl filled the bucket.  
The boy cleaned the shirt.  
The girl picked up the juice. | NO |
| Overt movement (locatum predicates). | The cloth covered the table.  
The water filled the bucket.  
The soap cleaned the shirt.  
The sponge picked up the juice. | NO |
4. Story for the covert-movement condition (simple telic predicates):

La profesora y el niño tienen que limpiar la pizarra. La profesora le dice al niño ve a buscar un espray especial para limpiar la pizarra. Pero dentro de la clase hay un muñeco y este muñeco lo observa todo.

El muñeco que lo observa todo dice: Yo vi lo que pasó, el niño buscó un espray y limpió la pizarra.

The Experimenter: ¿Es verdad lo que dice el muñeco? ¿Por qué?

The teacher and the boy have to clean the blackboard with a special spray. The teacher tells the boy, go get a spray and clean the blackboard. But inside the classroom there is a puppet and this puppet sees everything.

The puppet that sees everything says: I saw what happened; the boy found a spray and cleaned the blackboard.

The Experimenter: Is that right? Why?

5. Story for the overt-movement condition (locatum predicates):

La profesora y el niño tienen que limpiar la pizarra. La profesora le dice al niño ve a buscar un espray especial para limpiar la pizarra. Pero dentro de la clase hay un muñeco y este muñeco lo observa todo.

El muñeco que lo observa todo dice: Yo vi lo que pasó, ayer el niño buscó un espray para limpiar la pizarra y ¡fijate! El espray limpió la pizarra.

The Experimenter: ¿Es verdad lo que dice el muñeco? ¿Por qué?

The teacher and the boy have to clean the blackboard with a special spray. The teacher tells the boy, go get a spray and clean the blackboard. But inside the classroom there is a puppet and this puppet sees everything.

The puppet that sees everything says: I saw what happened, yesterday the boy found a spray and look! The spray cleaned the blackboard.

The Experimenter: Is that right? Why?

The main focus in designing the task was to bring out children’s comprehension of the notion of completion as expressed by the two types of telic predicates. The two experiments consisted of a picture-statement-matching task.

All participants were presented with a story and accompanying pictures projected on a laptop. The children were tested at their respective school or day care center, the adults were tested at home. Before the presentation took place, all participants were told that they were going to listen to a story and at the end of the story they had to answer to a yes/no question and a why question. The subjects were also told that there is a puppet in the story, and that they have to pay attention to what the puppet says because sometimes the puppet says very silly things.

In all twelve scenarios, the outcome of the event is always incomplete. The first picture of the story introduces the main character or characters. The story states the situation the characters are in and the event they have to accomplish. The second picture shows a puppet that says he watched what the character or characters did, and always states the incorrect outcome of the event. That is, the puppet always states one of the test statements (e.g., the boy cleaned the blackboard or the spray cleaned the blackboard) although the outcome of the event is always incomplete, i.e., the blackboard is never completely cleaned. Since each story relates an event that the puppet has already observed, the verbs in the target sentence were in the Spanish pretérito or simple past. The third picture shows the outcome of
the event, which is an incomplete event. At that time the experimenter asks *Is that right?* referring to the statement the puppet made.

The task of the participant is to agree or disagree with what the puppet just said based on the final outcome the participant is observing. The correct answer for the experimental question is always NO, since the outcome of the events is always incomplete. Then the experimenter asks *why?* referring to the answer the participant just gave. At that point, the participant gives the reasoning behind his/her answer. While the story was being told, the characters of the story were never seen involved in the event, therefore, the participants could not guess the outcome based on the characters’ intentions or actions. The characters of the stories were toys that were standing next to the object they have to work on.

In addition to the main experimental questions, there are also filler/control questions within the story that require a specific answer (e.g., *can you show me where the boy cleaned the blackboard*), and a yes/no question after the test questions that always requires a YES answer (e.g., *the puppet says: the boy wears a yellow shirt. Is that right?*). The character(s) in the final picture serve as part of the control/filler questions. The answers to the filler questions demonstrate children’s ability to focus and stay on track.

5. Results and Discussion

Figure 1.1 below represents the overall percentages of correct responses for all participants in the two conditions. Tables 1.3 and 1.4 below show the results in percentages and standard deviation of correct answers for all the groups in both conditions.

Figure 1.1  Comparison of Correct Responses by Age and Condition.

<table>
<thead>
<tr>
<th>Table 1.3. Covert Movement</th>
<th>Table 1.4. Overt Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>The boy cleaned the blackboard</em></td>
<td><em>The spray cleaned the blackboard</em></td>
</tr>
<tr>
<td>Age</td>
<td>Correct Answers</td>
</tr>
<tr>
<td>Adults (n=8)</td>
<td>86%</td>
</tr>
<tr>
<td>3-4 (n=10)</td>
<td>52%</td>
</tr>
<tr>
<td>5-6 (n=10)</td>
<td>31%</td>
</tr>
<tr>
<td>7-8 (n=10)</td>
<td>73%</td>
</tr>
</tbody>
</table>
As seen from the tables above, most adults did not accept incomplete events when described by either type of predicate. This indicates that adults have knowledge of both types of object movement. By contrast, the results from the 3-4 year-olds indicate that movement at LF poses a problem for them as shown by the data. Only 52% of their responses were correct. Conversely, predicates that undergo overt movement appear not to present a problem. This group responded correctly 73% of the time. A similar pattern is demonstrated by the 5-6 year-olds. The results for the group tested in the covert-movement condition performed lower than the previous group, 31% correct, but performed similarly to the 3-4 year-olds in the overt-movement condition, 80% correct. Finally, the 7-8 year-olds pattern like the adults in both conditions.

In order to know whether the difference between the two conditions and between ages were statistically significant, Analyses of Variance were conducted. The one-way ANOVA showed a highly significant effect of condition (F (1, 68) = 12.188, \( p < .001 \)) for all participants, which suggests that there is a difference in interpretation between the two predicates. Further ANOVA analyses showed that there was a significant effect of age (F (3, 68) = 6.434, \( p < .001 \)), which indicates that the subjects’ answers vary between the ages. There is also a significant interaction between the age and condition (F (3, 68) = 3.801, \( p < .014 \)), indicating that the relationship between the conditions is different at the different ages.

We can further assess children’s knowledge of movement operations by examining individual results. Figures 1.2, 1.3, 1.4, and 1.5 below present percentages of correct responses of each participant in each age group and in each condition.

Figure 1.2 Age 3-4 % Correct Answers

Figure 1.3 Age 5-6 % Correct Answers

Figure 1.4 Age 7-8 % Correct Answers

Figure 1.5 Adults % Correct Answers
The results show that children between the ages of 3-6 have overall difficulties interpreting simple telic predicates adult-like, but perform significantly better interpreting locatum structures as telic predicates. To test whether children answered significantly different depending on the type of predicates, ANOVA tests were run comparing the conditions within the groups. The data confirms that there is a significant effect of condition for the 3-4 year-olds (F (1, 18) = 4. 715, p< .044), as well as for the 5-6 year-olds (F (1, 18) = 14. 630, p< .001). These results clearly show that children answered differently depending on the type of predicate. By contrast, the results reveal that there is not a significant effect of conditions for the 7-8 year-olds, (F (1, 18) = 150, p>.703), and for the adults, (F (1, 14) = .211, p>.653), indicating that both groups did equally well with both types of predicates. Thus, it appears that children’s knowledge on the comprehension of telic predicates differs from that of adults only in the condition that requires movement at LF.

We now have experimental evidence that young children have difficulties interpreting simple telic predicates. We predicted that the problem with simple telic predicates could arise from the type of NP movement imposed by the interface systems. We specifically predicted that covert movement could be troublesome for young learners since this represents movement after the branching off to the PF and LF components. Thus, it seems that young children cannot assign a correct interpretation to simple telic predicates because in these predicates only the features move and not the NP.

Further evidence that children show a deficit in assigning a correct interpretation to simple telic predicates are the results from the why? and show me where questions. The records show that when they were asked show me where (i.e., show me where the character cleaned the blackboard), the children just pointed at the part of the blackboard that was cleaned, ignoring the incomplete part. When the children were asked why? (i.e., tell me why) instead of referring to the outcome of the event, some children replied that the character had done the activity because the teacher (or the adult personage in the story--their mommy for instance) had asked the character to do it. In other words, some children were not considering the final outcome of the event at all, they were only considering what the figure of authority had asked the character to do, and assumed the character had done it. For example, the children said: sí, porque la profe lo mandó ‘yes, because the teacher ordered it’; Sí, a mitad ‘yes, half of it’; Sí, lo llenó poco ‘Yes, she filled it a little; Sí, porque le hizo caso ‘Yes, because he listened to her’; Sí, pero le falta un poco ahi ‘Yes, but she missed some there’. Thus, for some of these children, reading the intentions of the character of the story or assuming that the character had initially begun to carry out the task was enough to interpret the event as complete even though the outcome of the event was always incomplete.

The results we have discussed so far show an apparent deficiency in children’s linguistic knowledge of telicity in simple telic predicates. Thus, having shown that covert movement pose a developmental problem for young learners, we turn now to data from the experiment on locatum predicates, the overt-movement condition. The significant differences between the two conditions points again to syntactic operations. If children understand the notion of completion in one type of predicate but not in the other when both predicates contain the same NPs, then we can perhaps assume that children’s absence of linguistic telic knowledge is not the result of lack of knowledge of quantification properties of the NP as previously assumed, but perhaps lack of knowledge of syntactic operations involved in the interpretation. Children’s data from the overt-movement condition showed that their grammar did not diverge from that of adults when the checking of telic features was overt. It appears that overt applications of movement within one linguistic module do not pose a problem to young learners. We have now experimental evidence that children can assign adult-like interpretation to locatum predicates.

The syntactic analysis presented on the derivation of locatum structures illustrated that telicity could be checked as the object NP moved up to fill EPP requirements. If this checking procedure is correct and children are able to assign an adult-like interpretation to these predicates as the data confirms, we would expect that the answers to the why? and show me where questions would also confirm children’s linguistic knowledge of telicity and would support their answers to the test statements, just as we found in the covert-movement condition. We can observe this by examining children’s responses to the questions. The children’s answers reveal that they were able to focus on the outcome of the event instead of the intentions of the character as the participants from the covert-movement condition had done. Some of the children’s responses were as follows: No porque aquí le
falta un trozo ‘No because here it is missing a piece.’ No, porque mira, se ve ‘No because look, you can see it.’ No, porque ha dejado un trozo ‘No because a piece is left out. No, aún queda esto ‘No there is still this.’ No, porque le veo una mancha ‘No because I see a stain.’ No porque la mancha no se quita ‘No because the stain doesn’t come off.’ No, tiene que echar más jabón ‘No he has to put more soap.’ These responses show that children recognized that the puppet’s statements did not represent the outcome of the event they had observed. This data confirms and supports children’s answers to the test statements and further indicates they comprehend the notion of completion as entailed by the locatum predicates.

5. Conclusion

The goal of this article was to present experimental evidence for children’s apparent developmental instability in their knowledge of telicity. The study showed that understanding telic predicates in languages whose telicity is encoded compositionally requires knowledge of movement operations involved in the checking of telic features. In particular, telic predicates that undergo covert movement are more difficult to acquire because they require movement at LF. This has been shown by the data obtained in simple telic predicates. On the other hand, predicates whose movement is overt, such as locatum structures appear not to present a problem for young learners. It was proposed that this is due to object movement before spell-out. Overall, the data showed that children at the age of 3;9 have adult-like knowledge of the notion of telicity expressed in locatum structures, but their knowledge diverges from that of adults in simple telic predicates. Thus, covert movement appears to be a source of developmental instability for young learners.

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References


