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## On the Acquisition of the Aspects in Italian<sup>2</sup>

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Our aspect comprehension study tested children's interpretation of two aspectual tenses in Italian, the *Passato Prossimo* and the *Imperfetto*. We find that our 3 year old subjects did not differentiate these tenses when asked to match them to completed or ongoing situations. From 4 years old on they were able to do so in an adult-like way. We argue that our results do not confirm the Aspect First hypothesis (neither construed as Lexical Aspect First or Grammatical Aspect First) which has been proposed in the eighties to explain a striking asymmetrical pattern in children's early production of these tenses. We conclude that our youngest subjects have not yet acquired the different aspectual entailments of the *Passato Prossimo* and the *Imperfetto* but have not mis-analyzed them as encoding telicity or perfectivity.

### 1 Introduction

Research of the past 25 years on the acquisition of aspect in a variety of languages has produced many puzzles but few answers have emerged so far (Bronckart and Sinclair 1973; Antinucci and Miller 1976; Bloom et al. 1980; Weist et al. 1984). Time is ripe to apply recent insights from formal semantic theories on aspectuality to start developing some explanations. One most striking fact is that children learning any one of a variety of languages, when they first use temporal inflections, produce an asymmetrical pattern. They tend to use present or progressive morphology (depending on the language) mostly with atelic verbs and past or perfective morphology mostly with telic verbs. Whereas adults can use either tense or aspect on all verbs, children seem to be overly restrictive. This asymmetrical

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<sup>2</sup>The research reported in this paper has been done in collaboration with Denis Delfitto and Andréa Peixoto from Utrecht University and forms part of Peixoto (2000). We acknowledge NWO, the Dutch Organization of Sciences, for sponsoring Van Hout's project on the acquisition of aspect (# 300-75-025) and Hollebrandse's project on presuppositional quantification in L1 and L2 (# 360-70-010). We have benefited from questions and comments from many people at various occasions, first of all, the participants at the April 2001 UMass workshop on the *Semantics of the Underrepresented Languages of the Americas*'s and, further, audiences at the 25<sup>th</sup> BUCLD at Boston University, the *Sinn und Bedeutung* meeting at the University of Amsterdam (2000), and at the *Making Sense* conference (2000), acquisition lab meetings and a colloquium, all at Groningen University.

production pattern has been found for a whole range of child languages, including English, French, German, Polish, Hebrew, Mandarin Chinese, Brazilian Portuguese. The only counterexample attested so far seems Greek. The pattern is referred to as the Aspect First hypothesis which expresses the idea that children initially employ their tense morphology to mark aspectuality instead of temporality.<sup>1</sup> The hypothesis was developed to explain a pattern in production. It makes very strong claims about the initial child grammars: tense morphology has been mis-analyzed to bear aspectual semantics. The goal of this article is to test the predictions of this hypothesis in a comprehension study with learners of Italian.

The hypothesis has been construed as Lexical Aspect First, meaning that the child's early tense inflection does not mark temporal relations, but lexical aspect, in particular, the telicity distinction. This has been proposed by Bronckart and Sinclair (1973), Antinucci and Miller (1976) and Bloom et al. (1980), among others. Alternatively, Wagner (in press) has recently construed it as Grammatical Aspect First, meaning that children's early tense inflections mark grammatical aspect, in particular, the perfective/imperfective distinction. We will report on a comprehension study that was designed to put both versions of the Aspect First hypothesis to test. We argue that our results do not support either version.

In lieu, we start developing a theory of how children learn form/meaning mappings at the syntax-semantics interface. Tense and aspect determine temporal relations among events (sequentiality versus simultaneity, posteriority versus anteriority). Especially aspect raises a most intriguing acquisition question. The aspects force speakers to decide what part of the world to "carve out" and put in language and, in addition, choose their own perspective to report on this state or event in the world. Thus, learning the semantics of the aspects is not so much a matter of figuring out the truth conditions for which triggering learning situations may be clear-cut and point the way. Instead, it involves discovering the associations of pieces of morphology with subtle shades of meaning that are often not distinguishable from other meanings in a truth conditional way.

The child has to learn the semantics of all elements of the morpho-syntax that co-determine temporality and aspectuality, the latter comprising lexical and grammatical aspect. She must acquire mappings between inflectional forms (the tenses) and their meanings at the interface between morpho-syntax and semantics so that she can compute proper completion and termination entailments and entailments about event ordering. It may be that Universal Grammar offers some restrictions as to what can be marked how in languages of the world. One example of a very general restriction may be that tense and grammatical aspect meaning components but not lexical aspect meanings are associated with verbal

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<sup>1</sup>Wagner (in press) uses the name Aspect First hypothesis. Other names for this same pattern are: Aspect before Tense hypothesis (Bloom et al. 1980); Primacy of Aspect hypothesis (Bronckart and Sinclair 1973, Antinucci and Miller 1976); Defective Tense hypothesis (Weist et al. 1984). All hypotheses reflect in one way or another the idea that tense morphology is initially mis-analyzed to bear aspectual meaning. Theories differ as to why children would consider such a mis-mapping.

inflection and auxiliaries. This domain of UG morpho-syntax/semantics, is still rather undeveloped (but see Smith 1991; De Swart 1998; Młynarczyk 1998; De Swart and Verkuyl 1999). A possibly parameterized, cross-linguistic theory of the aspects would serve an essential goal in acquisition research.

One acquisitional principle in learning form/meaning mappings seems intuitively very plausible. When the mapping is straightforward, that is, one form/one meaning, acquisition is easier than when a certain form bears more than one meaning or conflates various meaning aspects. This may account for the delay in our subjects' acquisition of the Imperfetto as compared to the Passato Prossimo. The latter seems well in place at the age of 4 whereas the former is still not fully reliably established at the age of 5.

First we briefly review the semantics of the two aspectual tenses in Italian and discuss the interaction of lexical and grammatical aspect (section 2).<sup>2</sup> We then discuss the acquisition literature on the early production of the tenses in Italian and various explanations that account for it in terms of the Aspect First hypothesis (section 3). In section 4 we describe our experiment and formulate the predictions of both versions of the Aspect First hypothesis after which we present our results. We then discuss the implications of these results and our conclusions in section 5.

## 2 The Aspects in Italian

Aspectuality can be divided into two basic kinds of aspect. Lexical aspect (or: Aktionsart, situation aspect, inner aspect) deals with the temporal contour of a situation which is independent of time; it describes whether an eventuality is stative or dynamic, punctual or durative, and telic or atelic. This is a property of verb phrases. Grammatical aspect (or: viewpoint aspect, outer aspect) operates on top of a lexical aspect. By using grammatical aspect means a speaker chooses a certain perspective to report on an eventuality. One basic distinction is a perfective or imperfective aspect. Other aspects include progressive, inchoative, ingressive, terminative, completive, iterative, habitual, etc. (see Comrie 1976).

In Italian (as in the other Romance languages as well as the Germanic ones), lexical aspect is determined by properties of verb and object in the VP. As for the verb, its lexical-aspectual semantics ( $\pm$  stative,  $\pm$  durative,  $\pm$  telic) matters. Compare the properties of *dormire* 'sleep' and *finire* 'finish'; both are non-stative and durative, but *dormire* is atelic and *finire* is telic. This is brought out in (1) by the different temporal modifiers with which they can combine; *per ore* 'for hours' modifies atelic predicates and *in 5 minuti* 'in 5 minutes' telic ones.<sup>3</sup> The # sign marks semantic incompatibility.

<sup>2</sup>We only discuss the Passato Prossimo and the Imperfetto as these were the two tenses we tested. In the Trieste dialect that our subjects spoke the Passato Remoto, another Italian past tense, is not used.

- (1) a. *Paola ha dormito #in 5 minuti / per ore.*  
 paola has slept in 5 minutes / for hours  
 'Paola has slept #in 5 minutes / for hours.'  
 ATELIC  
 b. *Paola ha finito in 5 minuti / #per ore.*  
 paola has finished in 5 minutes / for hours  
 'Paola has finished in 5 minutes / #for hours.'  
 TELIC

The quantificational semantics of the direct object (mass term versus count term) also determines telicity. A dynamic verb with a mass term object gives atelicity, e.g., *del pane* 'bread' in (2a), while a count term object yields telicity, as with *la mela* 'the apple' in (2b). Thus, the aspectual semantics of the VP is compositionally determined (Verkuyl 1972, 1993; Krifka 1986; 1992).

- (2) a. *Gianni ha mangiato del pane #in 5 minuti / per ore.*  
 gianni has eaten of-the bread in 5 minutes / for hours.  
 'Gianni has eaten bread #in 5 minutes / for hours.'  
 ATELIC  
 b. *Gianni ha mangiato la mela in 5 minuti / #per ore.*  
 gianni has eaten the apple in 5 minutes / for hours  
 'Gianni has eaten the apple in 5 minutes / #for hours.'  
 TELIC

Grammatical aspect is determined in Italian by the tenses which are therefore called aspectual tenses. The Passato Prossimo (PP in the glosses) is a perfect and gives an entailment of termination. The Imperfetto (IMP in the glosses) gives a continuous, imperfective aspect with no termination entailments (for discussion of the Italian aspectual tenses, see Giorgi & Pianesi 1998).<sup>3</sup> Lexical and grammatical aspect interact as follows. The Passato Prossimo gives an entailment of completion for telic predicates such that the event has progressed to its natural culmination moment; it establishes termination for atelic predicates (there is no natural culmination moment for atelic predicates; the final moment is an arbitrary moment). The Imperfetto does not have any such entailments and since it lacks entailments of completion or termination, it suggests ongoingness with the force of a conversational implicature. This is independent of the telicity of the VP predicate and yields the same effect for both telic and atelic predicates. The interaction is summarized in (3).

- (3) Interaction of (a)telicity and the aspectual tenses:

	IMPERFETTO	PASSATO PROSSIMO
TELIC	<i>ongoing</i>	<i>completed</i>
ATELIC	<i>ongoing</i>	<i>terminated</i>

<sup>3</sup>The Imperfetto has other semantic uses to which we will come back in section 5. Here and in the experiment we focus on its imperfective aspect.

One can test for the entailment of completion or lack thereof by checking whether or not continuation of the same event can be logically conceived in a little discourse of two sentences. In (4)-(5) the telic predicate *mangiare la mela* 'eat the apple' is combined with an Imperfetto and with a Passato Prossimo, respectively. Only the former allows continuation of the same event, (4); the latter yields logical inconsistency, (5).<sup>4</sup>

- (4) TELIC & IMPERFETTO -> ONGOING  
*Questa mattina alle 8 Ludo mangiava la mela, e la sta ancora mangiando.*  
 this morning at 8 ludo ate.IMP the apple, and it is still eating.PRES-PART  
 'At 8 this morning Ludo was eating the apple, and he's still eating it.'
- (5) TELIC & PASSATO PROSSIMO -> COMPLETED  
 # *Questa mattina alle 8 Ludo ha mangiato la mela, e lo sta ancora mangiando.*  
 this morning at 8 ludo has eaten.PP the apple, and it is still eating.PRES-PART  
 # 'At 8 this morning Ludo has eaten the apple, and he's still eating it.'

The possibility of continuation is the same for atelic predicates; continuation is only possible after an Imperfetto, (6), but not after a Passato Prossimo, (7).

- (6) ATELIC & IMPERFETTO -> ONGOING  
*Questa mattina alle 8 Ludo mangiava del pane, e lo sta ancora mangiando.*  
 this morning at 8 ludo ate.IMP of-the bread, and it is still eating.PRES-PART  
 'At 8 this morning Ludo was eating bread and he's still eating it.'
- (7) ATELIC & PASSATO PROSSIMO -> TERMINATED  
 # *Questa mattina alle 8 Ludo ha mangiato del pane, e lo sta ancora mangiando.*  
 this morning at 8 ludo has eaten.PP of-the bread, and it is still eating.PRES-PART  
 # 'At 8 this morning Ludo has eaten bread, and he's still eating it.'

So, only with an Imperfetto in the first clause can the second clause be construed as talking about the same event. A Passato Prossimo requires the first event to be finished or terminated. The Imperfetto lacks this strong entailment of completion or termination.

This does not mean, however, that it has an entailment to the opposite, imperfective effect, i.e., that the event must be necessarily ongoing (like the English progressive would have it, for example; the translations are a bit misleading in this respect). In fact, the Imperfetto may also have the effect that the first event is taken to be terminated before a second one, as illustrated in (8) (and notice that the best

<sup>4</sup>*Mangiando* is the present participle of *mangiare* 'eat', glossed as PRES-PART. Combined with auxiliary *stare* 'be, keep on', it gives a progressive construction.

English translation is a simple past now). This termination has the force of a conversational implicature which may be canceled, as demonstrated by (4) and (6).

- (8) *Questa mattina alle 8 Ludo mangiava la mela, e uscirva.*  
 this morning at 8 ludo ate.IMP the apple, and left.IMP  
 'At 8 this morning Ludo ate the apple and left for school.'

Our experiment tested similar completion entailments by checking whether subjects choose a picture of a completed or ongoing situation given one of the two tenses combined with a telic predicate. First, we review some literature on tense production in early Italian and the various versions of the Aspect First hypothesis that have been proposed to account for Italian and other languages.

### 3 Early tense production in Italian and the Aspect First hypothesis

In a longitudinal study Antinucci and Miller (1976) collected data based on spontaneous speech from seven Italian learners (followed from 1;6 through 2;3 and 2;5) and coded children's early past tense production. They found that of the two past tenses in Italian, Imperfetto and Passato Prossimo, the Passato Prossimo appears in the children's speech from the earliest recordings (at 1;6); the Imperfetto comes in about half a year later (around 2;1). There was a skewed production pattern in the use of these two tenses. Initially, the Passato Prossimo is mainly used on what Antinucci and Miller classified as change-of-state verbs, e.g., *venire* 'come'; *cadere* 'fall'; *prendere* 'take'; *mettere* 'put'; *trovare* 'find'; *uscire* 'go out'; *chiudere* 'close'; *rompere* 'break'; *mangiare* 'eat' (the only counterexamples to this pattern were *aspettare* 'wait'; *dormire* 'sleep' and *piangere* 'cry'). As for the Imperfetto, once they start using it, it is initially used to mark past states and activities.<sup>5</sup> So, children are overly restrictive in how they use their tenses.

Antinucci and Miller analyze the early markings of the Passato Prossimo on change-of-state verbs, i.e., the past participle forms, as adjectives describing the end-state an object is in. As support they point out unadult-like agreement of the participle with the object noun phrase in the same stage.<sup>6</sup> This intriguing error is taken as an indication of the adjective status of the participle. Why would the child

<sup>5</sup> The children also used the Imperfetto incorrectly in hypothetical contexts, instead of using the adult conditional subjunctive form.

<sup>6</sup> For example, in the child utterances in (i) and (ii) from Antinucci and Miller, the participle agrees with the object. The adult grammar does not allow agreement here.

- (i) *Chi gli ha levat-e le gambe?*  
 who them has taken-P1 the-P1 legs.P1  
 'Who took off the legs?'  
 (ii) *La signora ha chius-a la porta*  
 the lady has closed-Fem the.Fem door.Fem  
 'The lady closed the door.'

take the past participle as an adjective? Taking a Piagetian model, Antinucci and Miller claim that children of this age are cognitively not ready to entertain abstract, temporal relations. At this point in their development, they lack an abstract conception of time that would allow them to construct the relation "event x precedes event y" for any two events. Instead, they are able to observe states in the present that have the specific characteristic that they are linked to a preceding event of which they are the result. This works well in the case of change-of-state verbs. For these the past event (the process) and the present moment (the endstate) are related not only by an abstract temporal relation (as adults would represent them), but also by a concrete relation of some tangible effect on an entity. This concrete link enables the child to represent the past event by way of this endstate in the present. Therefore, Antinucci and Miller argue, it seems reasonable that the child is first able to represent and encode past events only in those situations where there is such a concrete, practical effect, i.e., with change-of-state verbs, as these offer the child a conceptual support that leads her from the present, observable state of an entity to the representation of the preceding event. The child thus initially uses the participle to describe the state of an entity, she treats it grammatically as an adjective and makes it agree with the object noun phrase.

This limitation also explains why the child does not use the participle form on state or activity verbs, since these do not yield clear effects that last into the present. Antinucci and Miller further claim that the first instances of the Imperfetto also do not mark a past relation, but instead the cognitive distinction between pretend versus real world, with the Imperfetto encoding the pretend plane.

In their version of the Aspect First hypothesis, Antinucci and Miller take a cognitive deficit as the underlying cause why tense inflection cannot be marking temporal relations for the child. The claim that children would not be able to entertain past temporal relations has been challenged since, for example by Behrens (1993) who found clear instances in her child German data of the child's ability to refer to past events before the onset of linguistic tense marking, suggesting that children have a basic temporal orientation of past long before and dissociated from their morphological tense marking.

Bloom, Lifter and Hafitz (1980) propose a linguistic version of the Aspect First hypothesis. They are inspired by Jakobson's Aspect Before Tense hypothesis which is a cross-linguistic generalization: when both tense and aspect are marked in a language, the aspectual marking will be closer to the verb stem. Bloom et al. suggest that this principle may support developmental sequences, i.e., that the grammatical feature aspect is acquired before that of tense. So, in the initial stage, the child does not have the linguistic category of tense to map tense inflections onto. Instead, she maps them onto a basic aspectual distinction. Bloom et al. claim that the aspectual distinctions durative/non-durative and complete/non-complete are basic semantic components in the development of the verb inflection system. Thus, the child takes past morphology to mark telicity and present morphology atelicity, instead of pastness and presentness, respectively. This idea is supported by their data of early English in which Bloom et al. find that the selective use of the different morphemes was largely determined by the inherent aspectual meaning of the individual verbs. Tense and aspect morphemes are initially not used contrastively by the children; most verb stems occurred with just one morpheme. Bloom et al. note that on this

interpretation of the early use of tense morphemes, inflection is essentially redundant with the aspectual semantics of the verbs.

One problem with this conception of the Aspect First hypothesis is that the initial grammar that Bloom et al. propose is not a grammar of any natural language found so far. Languages seem not to have dedicated morphology that singles out the telic-atelic distinction. So, why would the child entertain such a grammar? Dealing with this problem Olsen and Weinberg (1999) propose a typologically sounder version of the Aspect First hypothesis, making crucial use of the Subset Principle (Berwick 1985). Introduced as a developmental strategy that takes into account the no-negative-evidence problem, the Subset Principle restrains initial form/meaning mappings by requiring children's initial hypotheses to be most restrictive, where restrictive is defined with respect to the range of possible adult languages. Only when presented with counter evidence to the initial hypothesis, i.e. positive exemplars in the input, will the child revise it. In languages for which the default value is the adult value, the child does not need to revise her initial hypothesis.

Olsen and Weinberg assume that children in all languages posit as an initial hypothesis that imperfective marking is restricted to [+dynamic] and [+durative] verbs and the perfective marking to [+telic] verbs. These are the initial settings because there exist languages that indeed have grammars that are restricted in such a way. Spelling this out for English this comes down an association of the morpheme *-ing* with [+dynamic] and [+durative] verbs and the morpheme *-ed* with [+telic] verbs, and, since [+telic] verbs are also [+dynamic], they occur with both *-ed* and *-ing* morphemes. When the child is confronted with positive evidence to the contrary, she will revise her initial assumption. For English she will eventually learn to associate imperfective *-ing* with [ø dynamic] and [ø durative] and perfective *-ed* with [øtelic] as she will hear examples of that kind.

Olsen and Weinberg classified all verbs and their inflections from 8 children and their caretakers from the Childes database (MacWhinney and Snow 1990). Their results reveal that for the children [+telic] correlates with presence of *-ed* during all stages, whereas the adults show a significant skew in the opposite direction: *-ed* occurs significantly more often with atelic verbs than with telic verbs. The number of atelic verbs with *-ed* increased developmentally. Early use of *-ing* is highly correlated with [+dynamic] and [+durative]; this is replicated in the adult patterns. Given that the adults show the opposite pattern w.r.t. *-ed*, Olsen and Weinberg conclude that children's initial productions cannot be the result of tuning to frequency in child-directed speech. Their model predicts that these asymmetries exist, given that there are adult languages that show the relevant restrictions as well. Olsen and Weinberg thus show that the same organizing principles may be used to characterize both cross-linguistic variation in the adult state and the early stages of development. They claim that the production data argue for a continuous growth of grammatical knowledge and a strong innate component that delimits possible adult grammars and defines early stages.

While Bloom et al.'s Aspect First hypothesis is formulated in terms of tense inflection (past and present) bearing lexical aspect semantics in the child grammar, Olsen and Weinberg's version put the hypothesis in terms of grammatical aspect morphology (for English, imperfective *-ing* and perfective

-ed) being restricted to apply only to verbs from certain lexical aspect classes. Both of these versions fall under the label Lexical Aspect First hypothesis in that they argue that certain pieces of morphology (which for adults conflate both tense and grammatical aspect information) are initially mis-analyzed as marking lexical aspect classes. Yet another version of the Aspect First hypothesis was recently proposed by Wagner (in press). She formulates the so-called the Grammatical Aspect First hypothesis: children initially associate past morphology with perfectivity and present morphology with imperfectivity, instead of pastness and presentness, respectively. It is similar to the other hypotheses in that inflectional tense morphology is initially mis-mapped, but in Wagner's proposal it is mapped onto grammatical aspect meanings.

Wagner designed a comprehension study in which she wanted to find out which kind of aspect (lexical or grammatical) might initially be involved in tense interpretation. In one experiment she compared children's performance in a forced choice scene selection task with telic and atelic verbs, varying the tense of the progressive auxiliary (present is versus past was auxiliaries combined with a progressive verb form, e.g., *is* versus *was drawing a flower*). She did not find any effects of telicity. In another experiment she varied the kinds of scenes, showing present, ongoing situations and contrasted these either with completed situations or incomplete situations in the past. Again, children had to select a scene when prompted with a present or past tense (of the auxiliary). The youngest children (2;6 year-olds) were only able to correctly differentiate past and present when presented with two acted-out scenes showing a completed/ongoing contrast, but not when given an incomplete/ongoing contrast. Wagner argues that this suggests that children map past tense on completion and present tense on incompleteness, so that they cannot do the task when they are given an incomplete-past and an incomplete-ongoing situation. She takes this result as support for the Grammatical Aspect First hypothesis: children interpret past and present morphology as bearing the grammatical aspect meanings perfective and imperfective, respectively.

The two kinds of Aspect First hypotheses discussed in this section are summarized in (9). The Lexical Aspect First hypothesis can be construed in one of two ways: depending on the language, either the present/past morphology or the perfective/imperfective morphology is initially mis-mapped.

- (9) a. Lexical Aspect First hypothesis:  
Children initially mis-analyze past and present tense inflection or perfective and imperfective aspect morphology to encode the lexical aspects telic and atelic, respectively.
- b. Grammatical Aspect First hypothesis:  
Children initially mis-analyze past and present tense inflections to encode the grammatical aspects perfective and imperfective, respectively.

The Aspect First hypotheses were advanced to explain an intriguing production pattern. Both versions make strong claims about the child's initial mis-mappings of tense or aspect forms and their meanings. Note, however, that there is nothing wrong about the produced child verb forms: a speaker always chooses her or his own aspectual point of view in production. So, the true test of the Aspect First

hypotheses comes from doing controlled experimental comprehension studies for which very precise predictions can be formulated, along the lines as Wagner has done. In the next section we present a comprehension study of the Italian Passato Prossimo and the Imperfetto. We will discuss our results in terms of both versions of the Aspect First hypothesis.

#### 4 Comprehension experiment with Italian aspectual tenses

The experiment tested children's comprehension of telic sentences in the Imperfetto or Passato Prossimo tenses using a picture selection task. Subjects were presented with short stories and accompanying pictures. The final picture of each story was missing. The child's task was to choose at the end of the story one of two pictures triggered by a sentence in one of the two tenses. The choice was between a picture of a completed situation and one of an ongoing situation. Half of the trigger sentences had an Imperfetto and the other half had a Passato Prossimo.

##### Subjects

Subjects were drawn from the kindergarten Casa dei Bambini kindergarten in Trieste, Italy. A total of 64 children were tested in the following three age groups: 3 year-olds (3;0-3;11, n=17), 4 year-olds (4;1-4;11, n=21) and 5 year-olds (5;0-6;1, n=26). In addition a control group of 10 adults were tested, all undergraduate students at Trieste university, none of them majoring in linguistics.<sup>7</sup>

##### Stimuli and procedure

The experimenter tells the subject a story showing along some pictures in a book. In the first picture a story character is introduced; she or he was just about to start some action. On the second picture the curtains closed so experimenter and child could not see any longer see what was going on behind them. The story continues and says that the curtains suddenly opened up, but the third and final picture is missing. The task for the subject is to choose the right picture as prompted by the final sentence of the story which has either an Imperfetto tense form or a Passato Prossimo. The choice is between two pictures. The ongoing picture shows a situation with the action having progressed a little when compared to the first picture, but still going on, not yet terminated; the completed picture shows a situation of the event having finished and resulted in its natural culmination moment (see below for examples).

Eight stories were presented; 4 trigger sentences were asked in the Imperfetto and four in the Passato Prossimo, mixed in together. The time of the whole story is set in the past and past tenses are used

<sup>7</sup>We thank Andréa Peixoto for testing the children and we thank the children and teachers at the kindergarten for their willing cooperation. We are very grateful to Paola Crisma (Trieste University) for her help with the practicalities of the experiment, including the fine-tuning of our stories, and her connections with the kindergarten.

throughout the story. This made for a natural termination of the story with a trigger sentence in a past tense.

All predicates used were telic and had a transitive verb with a quantized object. We used telic predicates as opposed to atelic ones so that the completed event could be pictured straightforwardly in its natural culmination state; with atelic ones this situation would not have been as clear-cut since the predicate does not give any indication as to what constitutes a good final moment. (10) lists the predicates.

(10) List of predicates used in the stimuli:

- mangiare un gelato* ('eat an ice cream cone')
- mettere i blocchi e i pallini in una scatola* ('put the blocks and balls in a box')
- costruire un portone* ('build a gate')
- colorare il nostro frigorifero* ('paint our fridge')
- bere la coca-cola* ('drink the coke')
- scrivere la lettera* ('write the letter')
- lavare il suo cane* ('wash her dog')
- riparare la sua macchina* ('repair his car')

All stories included the scene with the closed curtains which suddenly open up. This was necessary so as to introduce an explicit anchoring moment in the narration to connect the trigger sentence to. This explicit temporal antecedent in the discourse was particularly needed for the Imperfetto, which is a so-called anaphoric tense which cannot appear on its own but requires a temporal antecedent (a temporal adverbial, a matrix clause tense) in the same sentence or in the discourse (Giorgi and Pianesi 1998).

Two excerpts from the protocols are given in (11) and (12); one is followed by a question in the Imperfetto; the other illustrates the Passato Prossimo.

(11) Excerpt from protocol with an Imperfetto:

*Guarda, c'era una volta Mickey Mouse che stava riparando la sua macchina dietro una tenda. Poi la tenda si è chiusa e non abbiamo potuto vedere più niente. Improvvisamente la tenda si è riaperta e sai che cosa ho visto?*  
*Mickey Mouse riparava la sua macchina.*  
*mickey mouse repaired* the his car  
*Quale dei due disegni è il disegno giusto?*

In fact, two native speakers pointed out to us that for a most natural continuation with the Passato Prossimo the past auxiliary *aveva* 'had' sounds better than the present auxiliary *ha* 'has' we used. Nevertheless our control adult subjects did not have any problem with the present task.

'Look here. Once upon a time Mickey Mouse was repairing his car behind the curtains. Then the curtains closed and we couldn't see anything anymore. Suddenly the curtains opened up again and you know what I saw? Mickey Mouse was repairing his car. Which of the two pictures is right?'

One picture shows Mickey Mouse standing next to a totally fixed car that has all its parts attached again, the completed situation. The other picture shows him still lying under the car and handling a tool; the car is fixed up a bit as compared to the first picture but there are still several loose parts lying around. This is the ongoing situation.

(12) Excerpt from protocol with a Passato Prossimo:

*Guarda, c'era una volta la mia amica Marisa che stava lavando il suo cane dietro una tenda. Poi la tenda si è chiusa e non abbiamo potuto vedere più niente. Improvvisamente la tenda si è riaperta e sai che cosa ho visto?*

*Marisa ha lavato il suo cane.*  
*marisa has washed* the her dog

*Quale dei due disegni è il disegno giusto?*

'Look here. Once upon a time my friend Marisa was washing her dog behind the curtains. Then the curtains closed and we couldn't see anything anymore. Suddenly the curtains opened up again and do you know what I saw? Marisa has washed her dog. Which of the two pictures is right?'

For this story the first picture showed a woman washing a dog that is dirty all over. On the ongoing picture the dog is half clean and the woman is still washing him. On the completed picture there is no washing going on anymore and the dog is fully clean. The colors on the picture bring out the various stages of dirtiness of the dog.

The correct answer for an Imperfetto is the ongoing picture and for a Passato Prossimo the completed picture. This was indeed the pattern that our control group of 10 adults showed.

Two versions were made; half of the subjects got version A, the other half version B. The stories that got an Imperfetto sentence in version A got a Passato Prossimo in version B and vice versa. The order of the stories also differed in both versions.

*Predictions*

Under the Lexical Aspect First hypothesis, the child takes the Passato Prossimo and Imperfetto as markers of lexical aspect, rather than aspectual tenses. By hypothesis then, see (9a), the perfective PP encodes telicity and the imperfective IMP atelicity.<sup>9</sup> To answer questions about "telic" PP sentences, the child will look for a quantized event: a situation with a culmination moment. This can be either an actual completion moment or a potential moment of completion. The child is not looking for a perfectivity difference in the pictures (which would be the adult behavior), but for a difference in terms of culmination. Both pictures show situations that have a culmination moment: the completed picture shows actual culmination; the ongoing picture shows activity towards potential culmination. Thus the prediction for the PP condition is that subjects will choose at random. To answer questions about "atelic" IMP sentences, the child will look for a non-quantized event, a situation without any culmination moment. The prediction for the IMP condition is that subjects will choose the ongoing picture. The completed picture is rejected because it includes a culmination moment and hence cannot be construed as non-quantized. Instead, subjects will choose the ongoing picture because this situation may be construed as an activity (e.g., Mickey Mouse is involved in repairing; Marisa is involved in washing). Therefore, children are expected to differentiate the two tenses from early on, choosing either picture for the PP and the ongoing picture for the IMP.

(13) Predictions Lexical Aspect First hypothesis:

Lexical Aspect First	IMP	ongoing	PP
Grammatical Aspect First	completed	random	

The Grammatical Aspect First hypothesis claims that the child takes past and present tenses as markers of grammatical aspect (perfective or imperfective) rather than expressing past and present temporal relations. Both tenses here are past tenses, so both encode perfectivity under this hypothesis. This is the correct value for the PP, but not for the IMP which is an imperfective tense. Since both (past) tenses are taken as markers of perfectivity, subjects are predicted to choose the completed picture in both conditions and reject the ongoing picture. For the PP, this is correct, but for the IMP it is not. Thus, children are expected not to differentiate PP and IMP and to always choose the completed picture.

(14) Predictions Grammatical Aspect First hypothesis:

Grammatical Aspect First	IMP	completed	PP
Lexical Aspect First	ongoing	random	

<sup>9</sup>In principle, an alternative application of the Lexical Aspect First hypothesis would be to say that the two past tenses both encode telicity, while the Present encodes atelicity, taking present as the starting point rather than perfective-imperfective as above. We are arguing on the basis of the latter distinction, however, because children differentiate the Imperfetto and Passato Prossimo in an Aspect First pattern in their production.

Note that one would need a different design to test if they indeed have problems with the past versus present meanings of these forms (for example, the one Wagner (in press) used).

*Results*

Table (15) shows mean percentages correct for both condition for the different age groups, where the correct picture for the IMP condition is the ongoing picture and for the PP condition it is the completed one.

(15) Mean percent correct (correct is ongoing event for IMP and completed event for PP):

Age	IMP	PP
3 (n=17)	.62	.54
4 (n=21)	.69	.68
5 (n=26)	.69	.92
adult (n=10)	1.00	1.00

Do subjects choose randomly given an IMP; do they choose randomly given a PP? There were two options for subjects to choose on each trial so chance performance is set at .50. The answer patterns were analyzed in a 2-tailed t-test to see if children's answers were different from chance. For the 3 year olds the analysis shows no significant effects in both conditions (although for the IMP it was near significant); their behavior was random. The 4 year-olds and also the 5 year-olds year-olds reliably chose the correct picture for each condition (p-values for the 4-year olds, p=.003 for IMP and p=.008 for PP; for the 5-year olds they were even better). Moreover, the 3 year-olds did not significantly differentiate IMP and PP, but the 4 and 5 year-olds did (p-values on 2-tailed t-test were .001 and .000, respectively). Table (16) repeats the predictions of both hypotheses and summarizes these facts.

(16) Answer patterns, predictions and facts:

Lexical Aspect First	IMP	ongoing	PP
Grammatical Aspect First	completed	random	
Facts	3: random 4: ongoing ** 5: ongoing **	completed	3: random 4: completed ** 5: completed **

The results do not conform to the predictions of either of the hypotheses. So, we conclude that neither is supported.

Looking at individual performance, we looked for each tense whether subjects performed adult-like. Taking 3 or 4 out of 4 correct as the passing criterion, table (17) lists for each age group the percentage of subjects who performed correctly on each tense.

(17) Percentage of subjects who perform correctly, passing criterion 3 or 4 out 4 correct:

	IMP	PP
3 (n=17)	35 %	47 %
4 (n=21)	71 %	57 %
5 (n=26)	58 %	92 %

Not even half of the 3-year olds know the semantics of the tenses. This number goes up quickly for the PP, but not so for the IMP. Almost half of the 5 year-olds still do not seem to know the semantics of the IMP. Testing for age effects with 2-tailed t-tests we found no developmental effects for IMP. For PP on the other hand there were no effects between the 3 and 4-year olds, but there was a clear effect between the 4-and 5 year olds ( $p=.004$ ).

#### Discussion

Our main finding in testing the Lexical and Grammatical Aspect First hypotheses is that initially, many children do not distinguish the two aspectual tenses (there was no significant difference between IMP and PP for the 3 year-olds). From 4 years old on, children start to distinguish the two aspectual tenses (significant difference between IMP and PP for 4 as well as 5 year-olds). This pattern was unexpected under either hypothesis. The Lexical Aspect First hypothesis (IMP = atelic, PP = telic) predicted a random choice for the PP (both pictures show a quantized situation; one actual culmination, the other potential) and the ongoing picture for the IMP (since this picture can be construed as an unbounded and therefore non-quantized situation). We found random behavior on both tenses, however. The Grammatical Aspect First hypothesis (IMP and PP = perfective) predicted the completed picture for both tenses. Again, this is not what we got. So, our results cast doubt on both sets of hypotheses.

What is most unexpected in our results is that the youngest subjects, who were 3, did not do very well on the task, neither looking at their individual scores nor the general pattern across subjects. Remember that in Antinucci and Miller's (1976) production data, PP comes in around 1;6 and IMP at about 2. So our results are highly surprising since these children have already been producing both tenses for at least one to one and a half years.

Finally, subjects learned the PP faster than the IMP. There was no (statistically relevant) developmental effect in the acquisition of the Imperfetto (3, 4 and 5 year-olds's behavior remains at about 62-69% correct). The numbers of subjects who perform correctly on PP increases steadily over the age groups, reaching near-adult levels with the 5 year-olds performing 92% correctly. The developmental effect between 4 and 5 year-olds was statistically significant.

## 5 Conclusions

Italian children produce the two Italian past tenses from very early on (1;6-2). They use them in a more restrictive way than the adult grammar allows: PP goes mainly on telic verbs, IMP on atelic ones. This skewed production pattern has been taken to suggest that their grammar at this stage reflects a so-called Aspect First bias. The Lexical Aspect First and the Grammatical Aspect First hypotheses are invoked to explain the pattern. They both claim that the initial child grammar has mismatched forms and meanings. Lexical Aspect First claims that, depending on the language, tense or grammatical aspect inflection is taken by the child to encode lexical aspect notions, in particular, telicity. Grammatical Aspect First claims that tense inflection has grammatical aspect meanings, present bearing imperfectivity and past perfectivity. Both claim that the initial grammar differs crucially from the adult grammars in that tense inflection is not taken by the child to mark temporal relations.

The first conclusion from our experimental comprehension data is that they do not support either Aspect First hypothesis. If PP and IMP in the child's grammar encoded telic and atelic meanings respectively (under Lexical Aspect First) or if both tenses encoded perfectivity since they are both past tenses (under Grammatical Aspect First), the children's performance should have shown particular patterns. Under Lexical Aspect First one would expect random choices for the PP but a clear preference for the ongoing situation for the IMP; Grammatical Aspect First predicted the completed situation for both tenses. This is not what we found.

Instead, the results indicate that our 3 year-olds do not reliably know the grammatical aspect semantics associated with PP and IMP (perfective and imperfective), as they showed random choices on both tenses. So, their grammar at this stage is not a Lexical Aspect First, nor a Grammatical Aspect First, nor the adult grammar. This suggests that the child production data on the Italian aspectual tenses Imperfetto and Passato Prossimo are elusive in the sense that children use them from as early as 1;6 (PP) or 2 (IMP) years on, but when we confront them with those same tenses in a controlled experimental setting we find that 3 year olds cannot distinguish IMP and PP and even many 5 year-olds have problems correctly interpreting the IMP. How do these children represent of the syntax-semantics of PP and IMP? A series of questions springs to mind, (18).

(18) Questions on Italian children's aspectual tenses:

- What do young children do when they produce aspectual tenses in a skewed pattern?
- Many 3 year-olds do not perform correctly on the two tenses. What is the problem?
- Many 5 year-olds still do not perform correctly on the IMP. Why?

As for the first question, it may be a frequency effect from the input. It may be that children use their two past tenses on verbs that they mainly hear them on, without having established any proper semantics yet. This has been put forward as a possible explanation for the production of *-ing* and *-ed* in L2 English and is formulated as the Distributional Bias hypothesis (Andersen 1991; Shirai and Andersen 1995). Adult native speakers tend to use past or perfective inflections more with accomplishments and achievements that with states or activities, and progressive inflections primarily

with activities. However, when Olsen and Weinberg (1999) checked for similar distributional effects in English child production data and compared those with the patterns in their caretakers' speech, they did not find similar distributions. There are no similar studies of Italian that compare child and adult inflectional patterns, as far as we know. Future research may shed light on this. In any case, as mentioned before, there is nothing wrong with the child's production of the inflections, so maybe the production pattern is some kind of artefact which does not lead to any linguistic insights into child grammar.

We found that 3 year-old children do not differentiate PP and IMP. Why? One must wonder whether 3 year-olds have problems with lexical or grammatical aspect. Suppose first they cannot distinguish telic and atelic predicates, but do know the proper semantics of the aspectual tenses. Confronted with an IMP form, the child should have no trouble since it yields ongoingness for both telic and atelic predicates. Confronted with a PP, if the child knows PP gives some result state, she will reject the ongoing picture since it does not show a result state, and therefore opt for the completed picture. So, she should pick out the right picture independent of the telic or atelic nature of the predicate. This is not the pattern we found, however.<sup>10</sup>

Suppose next that our 3 year-old subjects cannot distinguish perfective and imperfective tenses, but do know the syntax-semantics of telicity. If so, they will be at a loss what to do in the present experiment and choose randomly with either tense form. This is indeed the pattern we found. So, we conclude that the present results suggest that our 3 year-old Italian subjects have incomplete knowledge of the different semantics of the aspectual tenses Passato Prossimo and Imperfetto.

Finally, why would Italian children have longer lasting problems with the Imperfetto in comparison with the Passato prossimo? More specifically, why do they choose ongoing as well as completed situations for IMP? The PP seems to be acquired earlier than IMP. This, we suggest, may follow from a One-Form/One-Meaning developmental principle that would say: one form/one meaning associations are easier to learn than more complex mappings (one form/many meanings: many forms/one meaning), cf. Pinker (1984); Slöbin (1985); Clark (1993). PP associates with just one meaning (the perfect, which on its turn entails completion for telic predicates and termination for atelic ones). IMP on the other hand associates with progressive and continuous meanings, but also carries certain modal readings and plays a special role in narratives. Hence, there are more meanings to be acquired for the IMP. Therefore, its full acquisition may be delayed and our results reflect this delay.

An alternative interpretation of the relatively bad performance of the 4 and 5 year-olds on the IMP is that they have a problem linking the anaphoric tense variable with the preceding discourse (cf.

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<sup>10</sup>If we wanted to test children's knowledge of the difference between telic and atelic predicates, we must present them with a choice between complete and incomplete past situations and see if they correctly restrict telic predicates with a PP to completed situations. Van Hout (1998a, b, to appear) has tested English and Dutch children on such a design.

Hollebrandse, Delfitto, van Hout and Vroeg-Peixoto 2001). For an adult the variable introduced by the IMP needs to be co-indexed with the temporal variable of the preceding sentence, since it is an anaphoric tense (here, the moment of the curtains opening up). Suppose the child lacks this piece of knowledge and is able to link the past tense variable introduced by IMP to any moment in the past in the preceding discourse. The missing piece of knowledge may be that they take IMP as a deictic tense and have not yet learnt that it is an anaphoric tense. Or, possibly in addition, they may not have established the pragmatic rules of ordering temporal variables in a discourse, in particular, the rule that the open interval introduced by an imperfective can be ordered simultaneously with the preceding interval introduced by a perfect (here, the curtains being closed as simultaneous with the action indicated by the IMP). Either way, suppose they can link the variable introduced by IMP to any moment in the past (of the story). They are then free to associate it with the variable introduced by the curtains opening up in which case they will choose the ongoing situation, just like an adult. But they may also associate it to any earlier moment, say, the time when the curtains were closed and we could not see what was happening behind them. It is possible then that the event behind the curtains has progressed towards its culmination, so that at the moment of the curtains opening up, it was finished. In this case the child would opt for the completed picture. This would account for the answer pattern they showed (mainly ongoing situations, but also some 30% completed situations).

To conclude, our study has shown that children's initial grammar of the aspectual tenses in Italian is not a non-adultlike grammar such as Lexical Aspect First or Grammatical Aspect First, and also that it is not the adult grammar. Learning the subtle semantics associated with the Passato Prossimo and the Imperfetto is not yet completed at 3 years old even though children use these tense forms in their own production from very early on.

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