

Article

Interpretation of Imperfective Past Tense in Spanish: How Do Child and Adult Language Varieties Differ?

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Abstract: Some studies on the L1 acquisition of aspect in various child languages have discovered that imperfective aspect is acquired later than perfective aspect, whereas others find early adult-like performance. A variety of explanations has been advanced, particularly problems (i) with the semantics of imperfective aspect in combination with telic predicates, (ii) inferring the intended temporal antecedent in a discourse, and (iii) reasoning about an agent's intentions to complete the event when observing a situation of an event in progress. The current study aimed to disentangle which of the purported explanations can best explain the acquisition patterns. Twenty-three Spanish monolingual children (mean age 5;11) and 17 adults were presented with telic sentences with one of two aspectual tenses in Spanish (*pretérito indefinido* and *pretérito imperfecto*). Using a picture-selection task and presenting the sentences either in a narrative setting or in a non-narrative setting, participants were prompted to choose between complete, ongoing, and incomplete situations. In the non-narrative setting children's interpretation of *imperfecto* was adult-like, but in the narrative setting it was not. The target-like interpretation in the non-narrative setting reveals that the semantics of *imperfecto* in telic-imperfective sentences has been acquired (contra explanation i). Furthermore, Spanish five-year-olds did not depend on cues for agent intentionality when interpreting the *imperfecto* (contra explanation iii). The discrepancy between narrative and non-narrative setting suggests the challenge lies in discourse integration (supporting explanation ii).

Keywords: child language; first language acquisition; grammatical aspect; imperfective aspect; Spanish *pretérito imperfecto*; *pretérito indefinido*; psycholinguistic experiments



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1. Introduction

Many studies on the acquisition of semantics in the past two decades have found that children interpret certain function words and sentence constructions differently from adults (see chapters in Lidz et al. (2016) and in Syrett and Arunachalam (2018)). Such variation between child and adult language raises the developmental dimension of the question: what determines variation of form-meaning relations across languages? Acquisition theory not only needs to represent differences between child and adult grammars, but must also explain how learners may overcome their initial, non-adult-like form-meaning mappings on the developmental path to acquiring the adult system.

The acquisition of tense and aspect is precisely such a domain for which child-adult variation has been established in many studies. Although some acquisition studies on the comprehension of imperfective aspect have established an adult-like pattern by age five (Vinnitskaya and Wexler 2001; Weist et al. 1991), several more recent studies involving multiple child languages and a variety of tasks have established that child learners have difficulties comprehending imperfective aspect in combination with telic verbs (van Hout 2005, 2007a, 2007b, 2008; Kazanina and Philips 2007; Wagner 2002; for a recent review, see Martin et al. 2020). The operationalization of perfective and imperfective aspect meanings in these studies was done by contrasting complete situations versus ongoing or incomplete

situations, and investigating which of these situations was chosen or accepted by the participants for event descriptions with perfective or imperfective aspect. Whereas the adults in these studies accepted imperfective-telic sentences as descriptions of both ongoing and complete situations,¹ the children often restricted such sentences to complete situations only. Children's non-target interpretation pattern has been attributed to acquisition challenges at various levels of the grammatical system and beyond. (i) At the semantic level, it has been claimed that learners have difficulties applying the semantic shift imposed by imperfective aspect on telic predicates (van Hout 2005, 2007a). (ii) At the discourse level, it is claimed that children difficulties establishing a proper temporal antecedent to associate imperfective aspect to. Choosing the wrong temporal antecedent may lead them to infer an incorrect relation between the event time and reference time intervals, as a result of which they may incorrectly conclude that the event time was ordered before the reference time instead of inside it, thus choosing a complete situation (van Hout 2007b, 2008; Kazanina and Philips 2007; Martin et al. 2020). (iii) Finally, the learner's challenge may be extra-linguistic, namely, an inability to project full events when a telic sentence with imperfective aspect describes an incomplete event. It has been claimed that agent-oriented cues (for example, portraying an agent manipulating the object in an ongoing situation) can help identify the goal, and thus facilitate the projection of a full event, even when only a part of the event is portrayed (Wagner 2002). In the absence of such a cue, however, children will prefer complete situations because these best represent the telic predicate.

2. Background

2.1. The Spanish Contrast Pretérito Indefinido and Imperfecto

The focus in this study is the progressive meaning of the *imperfecto*, because this is the reading that has been investigated in previous L1 acquisition studies on the comprehension of perfective and imperfective aspect (for an overview of the other uses of the *imperfecto* see Arche 2014; Fábregas 2015; García Fernández 2004).

Spanish *pretérito indefinido* (PI) and *imperfecto* (IMP) differ in two respects. First, they impose different temporal ordering relations. In complex sentences, PI typically establishes a sequence of events: in (1) the picking-up event was complete, and as such, preceded the crying event. In contrast, IMP yields simultaneity with another event: in (2) the crying event was ongoing when the picking-up event happened, and therefore, they happened at the same time. Examples are taken from Vet (2000), cited in (Leonetti 2004); for more illustration of the event ordering effects of PI and IMP in Spanish, see Mulder et al. (2022).

- | | | | | | | | |
|-----|--|----|--------|-----|-------|-----|-------------------------|
| (1) | Cog-íó | en | brazos | al | niño, | que | llor-ó. |
| | Take-PI.3SG | in | arms | the | boy, | who | cry-PI.3SG ² |
| | 'He picked up the boy, who (then) cried' | | | | | | |
| | | | | | | | |
| (2) | Cog-íó | en | brazos | al | niño, | que | llor-aba |
| | Take-PI.3SG | in | arms | the | boy, | who | cry-IMP.3SG |
| | 'He picked up the boy, who was crying' | | | | | | |

Romance imperfectives are claimed to lack referential autonomy and need to be integrated by establishing co-occurrence with a temporal referent in the discourse or, if not explicit, by deducing it. For instance, in (3), a classical example (originally presented in French in Kamp and Rohrer (1983); discussed for Spanish by Leonetti (2018, p. 393)), the event described by IMP (calling on the phone) is ongoing and is interpreted as simultaneous with the previous temporal referent in the discourse (*entering*).

- | | | | | | | |
|-----|--|--------------|-------|--------------|-----|-----------|
| (3) | Pedró | entr-ó. | María | llam-aba | por | teléfono. |
| | Pedro | enter-PI.3SG | María | call-IMP.3SG | by | phone |
| | 'Pedro came in. María was calling on the phone.' | | | | | |

Similarly, in the Spanish version of Bertinetto's (1986) classical example, discussed for Spanish in Fábregas (2015, p. 51), IMP is odd as a first sentence in a discourse, (4a), in contrast to PI, (4b), which is fine.

- (4) a. El teléfono son-aba
 The phone ring-IMP.3SG
 'The phone was ringing'
- b. El teléfono son-ó.
 The phone ring-PI.3SG
 'The phone rang'

The other major difference between PI and IMP is that they generate different entailments when combined with telic predicates: telic predicates with PI give rise to a completion entailment (5) (the washing situation was completed), whereas telic predicates with IMP do not (6) (the washing situation was ongoing). For a complete situation, the statement that the agent did not finish yields a contradiction, but for an ongoing situation it is fine.

- (5) El niño lav-ó al perro, #pero no termin-ó
 The boy wash-PI.3SG the dog, #but not finish-PI.3SG
 'The boy washed up the dog, #but he didn't finish'
- (6) El niño lav-aba al perro, pero no termin-ó
 The boy wash-IMP.3SG the dog, but not finish-PI.3SG
 'The boy was washing the dog, but he didn't finish'

This pattern is known as the *imperfective paradox* (Dowty 1979; Kenny 1963, a.o.). It raises two independent, theoretical problems (Kazanina and Philips 2007): given that telic predicates are characterized as describing endpoints, how does IMP exclude the endpoint of a telic predicate? Additionally, how can an incomplete event be recognized as an instance of the type of event a telic predicate describes, when the event is left incomplete, as in the case of (6)?

A semantic analysis of (the progressive interpretation of) IMP has to account for the following properties: (a) *the anaphoricity issue*: IMP lacks referential autonomy, (b) *the completion entailment issue*: IMP removes the completion entailment when combined with telic predicates and, related to this, (c) *the event projection problem*: IMP identifies an incomplete situation as an instance of an event described by a telic predicate (following Kazanina and Philips' (2007) terminology). These properties have been analyzed in two types of approaches to the semantics of IMP (Leonetti 2004): anaphoric approaches primarily focus on problem (a) and also consider problem (b), while perspective-taking approaches are primarily concerned with problem (b). Additionally, the intensional perspective deals explains problem (c). We summarize how the anaphoric nature of IMP, its lack of completion entailment, and the event-projection issue have been analyzed in these semantic theories.³

In anaphoric approaches to perfective and imperfective aspect in discourse (Berthonneau and Kleiber 1993; Kamp and Rohrer 1983; Kamp and Reyle 1993; de Swart 1998; de Swart and Verkuyl 1999), imperfective aspect does not have independent reference, but retrieves a temporal antecedent from prior discourse with which it establishes a simultaneity relation. Imperfective aspect thus functions as an anaphor (hence the name "anaphoric approach"). In contrast, perfective aspect is autonomous as it introduces a new time referent in the discourse, updating the topic time in a narrative.^{4,5} As a result, the aspects contribute to differences in temporal ordering in a discourse: imperfective aspect is interpreted as simultaneous with the current topic time, while perfective aspect moves the topic time forward, ordering the event after the current topic time (Kamp and Rohrer 1983). The same goes for the aspectual tenses in the Romance languages, (1)–(3) (for Italian, Giorgi and Pianesi (1998); for French, de Swart (1998)). On this anaphoric analysis of aspect, the Spanish aspectual tenses IMP and PI differ in their referential character; IMP is an anaphor and referentially dependent, whereas PI is referentially independent (Bertinetto 1986).⁶

As for the lack of completion entailment for imperfective-telic sentences, within the anaphoric approach to aspect, de Swart (1998, 2000) offers a unified analysis for the aspectual effects of aspect and tense morphology. She treats both as semantic operators that

can modify eventuality types (state, process, or event).⁷ In the derivation, the verb phrase determines the first layer of aspect (i.e., lexical aspect). At the next layer, grammatical aspect morphemes introduce aspect-shifting operators that “map sets of eventualities (of a certain type) onto sets of eventualities (of some possible other type)” (de Swart and Verkuyl 1999, p. 103). To illustrate, progressive morphology (for example, *estaba lavando*, meaning “was washing”) introduces an operator that shifts a dynamic description (of the type process or event) into a state. Similarly, perfect morphology (for example, *ha lavado*, meaning “has washed”) shifts a dynamic description into a state by introducing a result state. At the final level, tense is added; here, aspectually sensitive tenses impose constraints on the type of eventualities they can take as their input. In the case of a mismatch, i.e., when the event description, at the layer of the verb phrase, does not match the requirements of a given aspectual tense operator, the aspectual tense can trigger a hidden aspect shift by means of coercion. In those cases, a covert coercion operator is introduced in the derivation that changes the initial eventuality type into an eventuality of another type so that it matches the required input of the aspectual tense operator. This is the case of the French *imparfait*, which can be compared to Spanish IMP; it only takes homogeneous eventualities (of type state and process) as its input. In the case of telic predicates (which are of type event), a coercion operator must apply to satisfy the homogeneous input requirement of *imparfait*; this operator triggers a progressive or habitual reading (both of type state), as determined by context. In contrast, the French *passé simple*, which is equivalent to Spanish PI, requires a predicate of type event as its input. When *passé simple* combines with telic predicates, no aspect shift or coercion is needed. As a result, on De Swart’s operator analysis of imperfective tense, sentences with telic predicates involve a hidden aspect shift operation, which yields a more complex semantic derivation than sentences with telic predicates that combine with perfective aspect or tense. Furthermore, shifting a telic predicate into a state or process influences temporal ordering, because homogeneous predicates overlap with a prior time, as discussed above, which characterizes the anaphoric property of imperfective tense and aspect.

Perspective-taking approaches to perfective and imperfective aspect have also analyzed the property that imperfective-telic sentences lack the completion entailment associated with perfective-telic sentences (for Spanish, see Alarcos Llorach 1994; Arche 2014; García Fernández 2000, 2004). On these approaches, grammatical aspect morphemes determine the temporal perspective from which a certain situation is observed. In Reichenbach’s (1947) and Klein’s (1994) theories on time, the interval of the event time $\tau(e)$ is located with respect to topic time t , the interval for which an assertion is made. Imperfective aspect locates the topic time within the event time, $t \subseteq \tau(e)$. This means that for telic-imperfective sentences, no assertion is made about the endpoint of the event time, which, in turn, explains the lack of a completion entailment, (6). Perfective aspect establishes the opposite relation: the event time is included in the topic time $\tau(e) \subset t$ and the endpoint of the situation denoted by a telic predicate is visible, which gives rise to the completion entailment, (5). By analyzing imperfective aspect as a perspective with topic time within event time, perspective-taking approaches thus solve one of the theoretical problems of the imperfective paradox, namely, the lack of completion entailment for imperfective aspect.

To explain the event projection problem (how an incomplete event can be recognized as an instance of the type of event to which a telic predicate refers) intensional accounts propose that all telic predicates must be associated with a complete event at some level (Asher 1992; Bennett and Partee 1972; Dowty 1979; Landman 1992; a.o.).⁸ When a telic predicate is marked with perfective aspect, completion is reached in the actual world. Conversely, when it is marked with imperfective aspect, only a subpart of the event occurs in the actual world, while completion of that event occurs in an *inertia* world that coincides with the actual world up to a point immediately preceding the event interruption, projecting what was expected of the event in the real world if it had not been interrupted. Some conditions must hold for the event to continue in the inertia world. One such condition is that the agent must have the intention to complete the event (Asher 1992). For example, in a

scenario where a boy is washing the dog, (6) can only be uttered if the boy has the intention to wash the dog and not just wet it. If someone is in the middle of washing and takes a pause, the way to know if the dog is being washed or just getting wetted is by knowing that person's intention. Therefore, under the intensional account, the agent's intentional state is part of the meaning of imperfective aspect.

Connecting the three properties of IMP (lack of completion entailment, anaphoricity, event-projection issue) and their analysis in the anaphoric, perspective-taking, and intensional approaches, what are the implications of each of these theories for child learners of Spanish? For anaphoric approaches, the acquisition of IMP involves mastery at two different levels of information, which are as follows: At the level of semantics, children must acquire the operation of aspect shift (or coercion) that is imposed by IMP upon telic predicates. The outcome of this shift has implications at the level of the discourse; children must learn that the time of the event must be linked simultaneously with an appropriate temporal antecedent, as required by the discourse cohesion rules for temporal ordering of IMP. To do this, children must learn to determine the relevant topic time. In perspective-taking approaches, the acquisition of IMP entails that children must learn to take an appropriate temporal perspective, namely, establishing an inclusion relation between the time the assertion is about and the time of the event. For doing so, identifying the proper topic time is crucial. Finally, for intensional approaches, the acquisition of IMP requires children to learn to project an *inertia* world in which completion is reached, thus going beyond the incomplete or ongoing status of an event. The agent's intention offers a crucial cue for projecting a full event (in an inertia world). Section 2.2 discusses how all these implications are derived from aspect theories that have been invoked in different explanations for children's struggle with imperfective aspect.

2.2. Grammatical Aspect in Child Language

The acquisition of aspect in child language has a long tradition, starting with [Bronckart and Sinclair's \(1973\)](#) study on child French. Many subsequent studies from the 1970s and 1980s in a wide variety of child languages followed Bronckart and Sinclair's methodology of analyzing children's production of aspect forms, either in spontaneous speech or in elicited production (see [Wagner 2012](#) for a review). From the study by [Weist et al. \(1991\)](#) onward, a new research line appeared that focused on children's interpretation of perfective and imperfective aspect. Many aspect comprehension studies confirmed Weist and colleagues' original finding that young children correctly distinguish perfective and imperfective aspect. Nevertheless, not all found a fully adult-like interpretation of aspect or tense forms encoding the imperfective meaning. Several studies found that the interpretation of imperfective aspect posed more problems for children than perfective aspect ([van Hout 2005, 2008](#); [Kazanina and Philips 2007](#); [Wagner 2002](#)). This section reviews Weist and colleagues' original study and these latter studies, all of which tested telic predicates in sentences with perfective and imperfective aspect to investigate to what extent children are sensitive to the completion entailment or lack thereof. The review here serves as the basis for the design of the current study presented in Sections 1.3 and 2 (for an extensive review, see [van Hout 2018](#)).

Comparing English and Polish learners' interpretation of the perfective–imperfective contrast, Weist and colleagues found that English and Polish children at the age of 2;6 already correctly differentiated perfective and imperfective sentences when provided picture pairs depicting complete and ongoing actions ([Weist et al. 1991, 1997](#)). Their experiment involved a forced-choice sentence-to-picture matching task where children were presented with two alternative pictures and two alternative sentences. Children mostly chose the complete situation for perfective aspect and the ongoing situation for imperfective aspect. [Vinnitskaya and Wexler \(2001\)](#) similarly found adult-like comprehension of perfective and imperfective aspect in child Russian. They analyzed 3;5 to 6;5 year-old children's comprehension of the two aspects with a picture-selection task where children were asked to associate transitive and intransitive telic predicates with perfective and imperfective

morphology to pictures depicting complete and ongoing actions (90% of accuracy at all ages).

In contrast to adult-like comprehension of the grammatical aspect contrast in child English, Polish, and Russian in the studies mentioned above, the Finnish children in Weist and colleagues' (1991, 1997) study had not even acquired the perfective-imperfective distinction in their language by age 6;6. The researchers ascribe this late acquisition to the way Finnish encodes the grammatical aspect distinction: not on the verb, but with different case-marking on the direct object (accusative case implies event completion and partitive case implies ongoingness). Weist and colleagues argue that the aspectual function of the two object cases is acquired late because it is not the primary function of this morphology, in contrast to aspectual morphology on the verb in Polish and English, concluding that the (mostly) one-to-one form/meaning relations in the latter two languages are easier to acquire than the ambiguous, one-to-many relation of Finnish object case marking (see [Martin et al. 2020](#) and Section 5.5 below for discussion of the idea that ambiguous aspect forms are harder to acquire than non-ambiguous ones).

In contrast to the studies above, later studies with English, Polish, and Russian learners discovered that children did not interpret aspect adult-like, in particular, children had problems with imperfective aspect ([van Hout 2005, 2008](#); [Kazanina and Philips 2007](#); [Wagner 2002](#)). Three different lines of explanations have been proposed for the finding that imperfective aspect is acquired later than perfective aspect, each focusing on a different property of imperfective aspect. We first discuss an explanation that posits that the acquisition problem lies in the semantics of canceling the completion entailment. Next, this review introduces a set of similar explanations that all point to children's problems with resolving the anaphoricity of imperfective aspect as the cause of the acquisition challenge. The last explanation focuses on children's problems with the event projection problem and agent intentionality. Below we will summarize relevant details from the experimental tasks in these acquisition studies.

The first explanation locates the acquisition challenge of IMP in difficulties with the cancellation of the completion inference carried by telic predicates, when they combine with imperfective aspect. Referring to [de Swart's \(1998\)](#) analysis with aspect operators, [van Hout \(2007b, 2008\)](#) claims that children's difficulties with imperfective aspect forms arise at a semantic level: in telic-imperfective sentences, there is an operation of aspect shift (or coercion) from an eventuality of type event to type process or state. This makes such sentences semantically more complex than telic-perfective sentences, which do not involve an aspectual change. Using a picture-selection task, 3- to 5-year-old Dutch, Italian, and Polish children were asked evaluate perfective and imperfective sentences in a narrative context. In the setup of the experiment, one picture and a narrative portrayed the beginning of the story, but at some point some curtains close and no one could see what happened except one puppet, who looked behind the picture and uttered the test sentence. Children had to relate these perfective and imperfective sentences to pictures depicting complete, incomplete or ongoing versions of an event. The pictures were presented in three different conditions of picture choices (complete-incomplete, complete-ongoing, incomplete-ongoing).⁹ The Polish and Dutch children differentiated perfective and imperfective sentences mostly appropriately from the age of 3 onward, indicating that they were aware of the grammatical aspect contrast.¹⁰ Nevertheless, their performance with imperfective aspect was not adult-like: while the adults mostly chose ongoing actions for imperfective aspect, and complete actions for perfective aspect, the 2- and 3-year-olds mostly chose complete situations for both perfective and imperfective aspect. Van Hout argues that the complexity of the semantic derivation for imperfective aspect combined with telic predicates presents an acquisition challenge, in contrast to perfective aspect, for which there was a higher accuracy.

Developing another explanation, several researchers have invoked difficulties with the anaphoricity of imperfective aspect as the primary cause for late acquisition of imperfective aspect. For her study with Polish children aged 3 to 5, [van Hout \(2005\)](#) used the picture-

selection task described above (van Hout 2007b, 2008) and found that Polish 3-year-olds did not interpret imperfective aspect in an adult-like manner. Van Hout relates children's misunderstanding to an overall immaturity of establishing reference in narratives (Hickmann 2002; Karmiloff-Smith 1979; Karmiloff and Karmiloff-Smith 2001). Van Hout argues that children fail to identify the appropriate temporal antecedent in prior discourse to link the event time to, because they have not yet acquired the discourse grammar restriction to select the current topic time.¹¹ When it is unclear for learners which reference time a sentence with imperfective aspect must be evaluated against, they will guess, and might pick any time, including one at which the event finished (in the setup of the experiment, they could not see what happened behind the curtains), selecting the complete situation.

This explanation about the importance of a clear reference time to interpret imperfective aspect has also been advanced by Kazanina and Philips (2007). They found that Russian 3- and 4-year-olds interpreted imperfective aspect like adults in an experimental setting where the discourse explicitly offered a reference time,¹² but did not perform in an adult-like manner when the reference time was left implicit. Using a sentence-to-scene matching task, the action described in the test sentence was acted in front of the child. A puppet followed a road and stopped in three locations: in one location the action was completed, in another one the action had started but was left incomplete (because the puppet was interrupted); and in the third one the action had not started. Children were asked to point out the location(s) where the puppet did the action, answering a *where*-question with perfective or imperfective aspect. Adults tended to link perfective only to the complete location and imperfective to both the complete and the incomplete situation. In the experimental setting with no explicit reference time, however, some children only selected the complete situation for the imperfective. When the same individuals were tested in another setting (in a different session), their interpretation pattern changed. In the other setting, two simultaneous events were acted in front of participants (e.g., a boy watering plants and, at the same time, a girl cleaning the table). One of these events (here, watering the plants) was used to establish the reference time for the other event in a *while*-clause: *While the boy was watering the plants, the girl was cleaning the table*. The critical event (here, cleaning the table) was portrayed as either complete or incomplete. When given such an overt reference time in a *while*-clause, children's responses for imperfective aspect became adult-like (accepting imperfective aspect for incomplete events). Kazanina and Philips argue that children's success with imperfective aspect in the second setting was triggered by providing an explicit reference time for anchoring imperfective aspect. The authors add that when the reference time was implicit, the children must have assumed a different reference time than the adults.

A study with Spanish and Basque learners (that also used a *while*-clause for anchoring the event described with an imperfective tense) supports Kazanina and Philips' account of how an explicit reference time can help learners (García-del-Real and Ezeizabarrena 2012). In this study, 5-year-olds were asked to accept or reject telic sentences with perfective or imperfective tense as descriptions of complete and incomplete situations, which were depicted in short videos. The critical sentence was introduced by a *while*-clause, which established the reference time (e.g., *While the music was playing, the clown was building a bridge*). Children accepted imperfective aspect for both complete and incomplete events, as adults did (see van Hout and COST A33 Consortium Forthcoming, for an extension of this study with 12 child languages).

Concluding this part about acquisition studies that discuss the anaphoric property of imperfective aspect, children appear to have difficulties relating the event time to the appropriate reference time in a narrative, but they perform much better when there is a temporal anchor for imperfective aspect, such as a *while*-clause. When imperfective aspect was used in a narrative context with several possible temporal antecedents and an occluded scene, children did not perform well, as they did not restrict the topic time to the current one in the story but instead guessed that the event finished behind the curtains (van Hout 2005). For learners whose narrative development is immature (Hickmann 2002;

Karmiloff-Smith 1979), it is difficult to identify the right antecedent in a story that offers many subsequent topic times.¹³ However, in experimental setups where the topic time interval was clear, children were able to relate event time and topic time in an adult-like manner (García-del-Real and Ezeizabarrena 2012; Kazanina and Philips 2007).

The last explanation for the acquisition challenge of imperfective aspect that we review here posits difficulties to infer event projection for incomplete situations when no cues about the intentions of the agent are given (Wagner 2002). In a comprehension study with English 2-to-5-year-olds, children were tested in a forced-choice sentence-to-scene matching task where they had to match two sentences to two pictures: telic sentences with *simple past* and *past progressive* must be linked to complete and incomplete scenes (like Weist et al.'s (1991) task). Instead of using pictures, children were presented with scenes acted out with props depicting different versions of the event (for example, a completely filled puzzle versus a partially filled puzzle). In these scenes, only the complete or incomplete result state of the affected object was portrayed with no agent present; the actual event of an agent manipulating the object was not revealed to the participants. This feature differed from Weist et al.'s (1991) setup, where the ongoing situations portrayed someone doing the action. Even at the age of 5, children's understanding of *past progressive* in Wagner's study was not adult-like, as they associated imperfective aspect to both complete and incomplete events. Wagner's explanation for this surprising difference across these two otherwise highly similar studies is couched within the intensional approach to aspect. For incomplete scenes, it is not obvious to children that the event would have progressed to its completion state. Cues about the agent's intentions can trigger projection to a full event as an inference about a possible alternative outcome (e.g., the agent intended to do a whole puzzle, and would have done so, had he not been interrupted). The ongoing pictures in Weist and colleagues' study portrayed an agent involved in the action, which provided such a cue. But the incomplete result state of the object in Wagner's scene did not give any cues about intentionality or event projection. Instead, children opted for the other situation, which was the complete scene, because that was a good exemplar of the type of event described by the verb. Wagner concludes that 5-year-old children cannot evaluate imperfective aspect when the only information in the scene is the state of the object. She argues that successful interpretation of imperfective aspect when it describes ongoing or incomplete situations requires—at least for children—primarily a basis of intentionality, which assists in drawing the inference that the event was intended to project fully.

In summary, three different types of explanation have been advanced in the literature for the acquisition challenge posed by imperfective aspect: (i) at the semantic level, learners have problems with the cancelation of the culmination entailment in imperfective-telic sentences (van Hout 2008), (ii) given the anaphoric nature of the imperfective aspect, learners have problems inferring the intended temporal antecedent at the discourse level (van Hout 2005; Kazanina and Philips 2007; Martin et al. 2020), and (iii) at a non-verbal level, learners have problems reasoning about an agent's intentions to complete the event when confronted with a situation that does not project the entire event (as in the case of ongoing and incomplete situations, Wagner (2002)).

2.3. Present Study

At present, no clear conclusions can be drawn about the question of whether children have acquired imperfective aspect by the age of 5. Across different child languages and across experimental tasks, some studies find adult-like understanding (Weist et al. 1991, 1997; Vinnitskaya and Wexler 2001), whereas others do not (Kazanina and Philips 2007; van Hout 2005; Wagner 2002). Various explanations have been proposed for children's non-adult-like interpretation, and it is unclear which explanation can cover the result patterns from prior studies, as some explanations are complementary, while others exclude each other. Difficulties may lie in imperfective semantics and the disappearance of the completion entailment (van Hout 2008), shifting or coercing a telic predicate to a homogeneous one (in aspectual-operator approaches, de Swart (1998)), or adopting the

correct perspective (in perspective-taking approaches, [García Fernández \(2000, 2004\)](#), a.o.). Alternatively, the child may have difficulties retrieving the proper temporal antecedent for IMP ([van Hout \(2005\)](#)), following anaphoric approaches to aspect, [Berthonneau and Kleiber \(1993\)](#); [Kamp and Rohrer \(1983\)](#); [Kamp and Reyle \(1993\)](#)). Finally, with some experimental tasks the learner might have problems inferring the agent's intentions ([Wagner \(2002\)](#)), in line with intensional approaches to imperfective aspect, [Asher \(1992\)](#)). The study presented here investigates 5-year-old's comprehension of Spanish PI and IMP past forms, asking the following questions:

- (i) To what extent can Spanish 5-year-olds distinguish IMP from PI, and do they have an adult-like understanding of the progressive reading of IMP?
- (ii) If children do not demonstrate adult-like understanding of Spanish IMP, which property, or properties, of IMP create the acquisition challenge: the lack of a completion entailment, the resolution of anaphoricity, and/or the event-projection issue as related to agent intentionality?

To investigate these questions, [van Hout's \(2005, 2008\)](#) picture-selection task was adapted to Spanish, comparing three types of situations (ongoing, complete, and incomplete), thereby taking a wider scope than prior studies that contrasted either complete and incomplete situations, or complete and ongoing situations. Including all types of situations in three possible pairing conditions allowed us to examine what children need to resolve the event projection problem of imperfective aspect. It has been claimed that the result state of an affected object does not suffice, and children need cues to identify agent intentionality ([Wagner 2002](#)) to project a full event for ongoing and incomplete situations when given a description with imperfective aspect. Comparing ongoing and incomplete situations allowed us to investigate to what extent children need to see an agent engaged in manipulating an object towards a certain goal (as in the ongoing situations, but not in incomplete situations), to be able to project a full event.

Crucially, we introduced a new manipulation in the experimental set-up: the critical sentences with a PI or IMP tense were presented either in a narrative setting (i.e., at the end of a short story) or in a non-narrative setting (where the sentences were given by a puppet as an answer to the experimenter's question of *what happened here?*). This comparison may reveal if children have difficulty with the semantics of imperfective aspect *per se* or rather with its integration in discourse.

The expectations were as follows: First, if the acquisition problems of imperfective aspect relate to aspect shift (or coercion) in telic sentences ([van Hout 2007b, 2008](#)), we expected children to demonstrate the same level of non-adult behavior in the narrative and non-narrative setting. A child who has not yet acquired the semantics of imperfective aspect in combination with telic predicates, particularly the absence of the completion entailment for imperfective aspect, will choose the complete situation in both experimental settings.

Second, if the acquisition problems with imperfective aspect relate to discourse integration, particularly if the learner's challenge is to retrieve an appropriate temporal antecedent ([van Hout 2005](#); [Kazanina and Philips 2007](#)), we expected children to demonstrate less adult-like behavior in a narrative setting than in a non-narrative setting. In an unfolding story, there is a series of subsequent topic times. This array is confusing for a learner who does not know how to choose the appropriate time to associate imperfective aspect to apply the discourse integration rules for temporal ordering (i.e., imperfective aspect imposes simultaneity of event time and topic time). Thus, presenting the critical sentences in the context of a story will create difficulties for learners who may have acquired the semantics of imperfective aspect, but whose discourse integration system is immature. Therefore, a non-adult-like interpretation of imperfective aspect was only expected in the narrative setting.

Third, if the acquisition problem of imperfective aspect relates to event projection, for which children primarily rely on the identification of agent intentionality ([Wagner 2002](#)), we expected children to demonstrate more adult-like behavior in the narrative setting than

in the non-narrative setting, because the agent's intention is stated at the beginning of each story. Furthermore, it was expected that children would choose ongoing situations over incomplete ones, because the agent's engagement is a good cue for inferring his intention to finish the action.

3. Methods

3.1. Participants

We tested 23 5-year-old monolingual children (range <5;04, 6;03>, mean age 5;11). All children attended a public school in a neighborhood of middle-low socioeconomic class in the south of Madrid. The children were tested individually at their school, where Spanish is the vehicular language. The control group was formed by 17 adults. All of them had a university degree and their first language was Spanish. Some of them were competent bilinguals in additional languages such as Basque or Catalan.

3.2. Design

The picture-selection task used by van Hout (2005, 2007a, 2007b) was adapted to Spanish. Participants were asked to link sentences containing a telic predicate marked with either PI (*indefinido*) or IMP (*imperfecto*) tense with pictures portraying an event in three possible stages: complete situations, incomplete situations, and ongoing situations. For a given test sentence, children had a choice between two pictures: complete vs. ongoing situation (C-O condition), complete vs. incomplete situation (C-I condition) or ongoing vs. incomplete situation (O-I condition). Therefore, the experimental design had two within-subject variables: (i) Aspect: the aspectual tense in the test sentence, PI vs. IMP, and (ii) Picture pair: the different pairings of situations, C-O, C-I vs. O-I. The dependent variables were the participant's picture choice, which varied depending on the contrasting pair, and their response accuracy, as explained in Section 3.4.

Another variable was added to the original design: the experimental setting. Half of the participants evaluated the critical sentence after an introductory narrative, as in the original study (van Hout 2005, 2007a, 2007b); the other half evaluated it as a stand-alone sentence without any directly preceding narrative. As we wanted the two settings to be fully comparable with the exact same items, we decided that the experimental setting should be a between-subjects variable to avoid possible confounding effects from participants evaluating the same item in two different settings. Thus, experimental setting (Setting: narrative vs. non-narrative) was a between-subjects variable, as was age (Age group: adult vs. children).

3.3. Procedure and Stimuli

In the narrative setting, a book was given to the child with many pictures, some of which had become detached. Each of the pages told a story and involved four pictures. In Figure 1, the picture on the left portrays the beginning of the story, as introduced in the narrative. The picture in the middle indicates the closure of the curtains, which interrupted the narration. At this point, a puppet intervened: it looked behind the curtains, and told the participant what happened there by uttering the test sentence. The task for the participants was to choose the correct one of two detached pictures and put it in the empty spot on the right, thus completing the storybook page.

(7) Narrative context setting.

En esta historia había un niño que cumplía años. Le regalaron un puzle muy bonito, pero que era muy difícil de hacer. Lo abrió y empezó a hacerlo, pero se cerraron las cortinas y no podemos ver nada más. Mascota, mira detrás de las cortinas, ¿qué pasaba/pasó?

"In this story it was this boy's birthday. Somebody gave him a really nice puzzle as a present, though it was a difficult puzzle to make. He opened it and started making it. But the curtains closed and we cannot see any more. Puppet, look behind the curtains! What was happening/happened?"

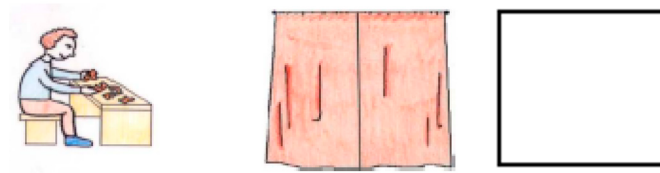


Figure 1. Story book page of an item in the narrative setting.

- (8) Test sentences:
- a. El niño hizo el puzle (PI)
"The boy made the puzzle"
 - b. El niño hacía el puzle (IMP)
"The boy was making the puzzle"

After hearing the test sentence, a pair of pictures (two from the ones in Figure 2) was shown. The task for the participant was to select the correct picture to complete the page if an appropriate picture was available. The pictures were presented in pairs: complete and ongoing (C–O condition), complete and incomplete (C–I condition), or ongoing and incomplete (O–I condition). In principle, there were three possible answers: choosing one of the pictures, or rejecting both (i.e., saying that neither picture was good). Choosing both pictures was also a possible answer, but this answer was never the target, nor was it trained.

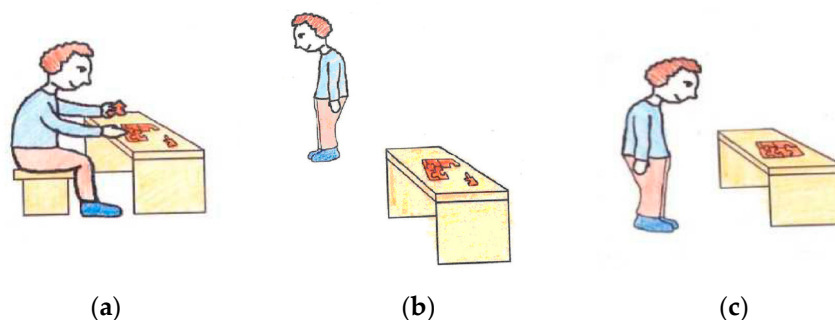


Figure 2. Pictures representing three possible stages of a situation: (a) ongoing; (b) incomplete and (c) complete situation.

In the non-narrative setting, there was another book with pictures. This book only contained picture pairs (again, two from the ones in Figure 2). The participant was told that the book portrayed things that had happened yesterday, but these were mixed up with pictures of things that did not happen. The participant's task was to choose the pictures of the things that happened. The puppet knew what had happened. So, for each pair of pictures, the experimenter asked the puppet *¿Qué pasaba/pasó aquí?* (meaning "what was happening/happened here?").¹⁴ The puppet uttered the test sentence (8) as an answer to this question. The critical sentence itself, (8a) or (8b), was the same in both settings.

There were several differences across the two settings triggered by our research questions. As for the visual stimuli, in the non-narrative setting, only the pair of pictures was provided without further pictures or story. In the narrative setting, the pictures with the introduction and the curtains were portrayed in addition to the picture pair with the two situations. As for the verbal stimuli, in the narrative setting a short story like the one in (3) preceded the test sentence in which the story time progressed along a series of temporal moments: the time when the action started; the time when curtains closed; the time when the puppet looked behind the curtains; the time when the experimenter asked the puppet a question (*¿qué pasaba/pasó*, meaning "what was happening/happened?"); the time when the puppet spoke (*el niño hacía/hizo el puzle*, meaning "the boy was making/made a puzzle"). In addition to these story times, there was the real-time moment itself of experimenter

and participant sitting at the table. In contrast, in the non-narrative setting there was only one possible antecedent. At the introduction to the non-narrative task, it was stated that many things happened “yesterday”, making this the overall large time frame for all events. Furthermore, the question preceding the critical sentence contained the deictic adverb *aquí* (“here”) (*¿qué pasaba aquí?* meaning “what was happening here?”).

The test was administered in two sessions, one for PI and the other for IMP. There were two different sets of pictures, one for each session. As the two sets of materials contained different pictures, in order to control for a possible artifact, subjects were distributed over two lists: one group began with PI in the first session and continued with IMP in the second session, and the other group did the inverse order. In addition to this, two different lists randomizing the order of items were created to control for possible effects of the order of items. The position of the target picture was also counterbalanced left and right to avoid bias.¹⁵

In each of the sessions, nine items were tested, three for each picture pair. There were also three distractors in each session. The distractors had a double function. First, they were used as control items, to check if the participant was focused and could perform a picture-selection task. Second, they were designed to trigger a “neither” answer, balancing the number of “neither” answers in order to avoid a bias toward always choosing a picture. Additionally, the first session included a training in which the participant was introduced to the task and to the different possible responses (the selection of one of the pictures, or the rejection to select any of pictures, the “neither” response). The training had three items. As the time between the sessions was short (between 2 and 5 days), no training was given for the second session.

The forms used for this experiment were the Spanish PI and IMP, both combined with telic, transitive predicates, mostly accomplishments of two different classes: incremental-theme predicates and change-of-state predicates (see Appendix A).

The distribution of subjects across settings and sessions is presented in Table 1.

Table 1. Distribution of participants across experimental settings.

Setting	PI > IMP	IMP > PI
Narrative	5 children *; 4 adults	6 children; 4 adults
Non-narrative	6 children; 4 adults	6 children; 5 adults

* One child was excluded because he provided non-target answers in the training and most of the control items, indicating that he was not focused on the task.

3.4. Coding

The answers were coded in two different ways: the picture choice and accuracy defined in terms of whether the response was the expected one (see Table 2). For picture choice, there were four possible values (complete, incomplete, ongoing, and none), but these choices were not all available, as there were different picture pairs (C–O, C–I and O–I). Instead, coding the answers in terms of accuracy provided a variable with only two possible values that were universal to all conditions. Such coding allows us to perform logistic models fitting all the possible variables (see Section 4).

Table 2. Target responses for all conditions and settings.

Picture Pair	PI	IMP
Complete-Ongoing (C–O)	Complete	Ongoing
Complete-Incomplete (C–I)	Complete	None
Ongoing-Incomplete (O–I)	None	Ongoing

For PI, the target answer was the complete situation because perfective-telic predicates entail completion. For IMP, the target answer was the ongoing situation, because it represents the progressive meaning of IMP. Pictures portraying an incomplete situation were

expected to be rejected both for PI—because of the completion entailment—and for IMP, because the assertion is only about the ongoing part of the event which is not visible in an incomplete state. Moreover, incomplete pictures do not reveal if it is the agent's intention to later complete the action, but intentionality has been claimed to be part of the meaning of IMP (Asher 1992) and a decisive clue for children to understand IMP (Wagner 2002). The target responses in Table 2 were the adult response patterns (see Figure 3 below).¹⁶

4. Results

Figure 3 presents the overall results of picture choices provided by the adults and children in the two experimental settings.

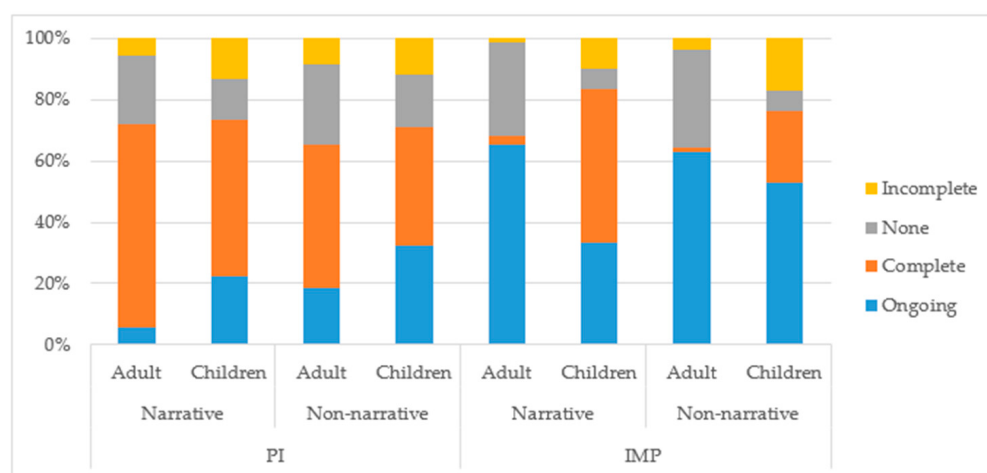


Figure 3. Distribution of picture choices per age group and experimental setting.

Figure 3 shows that adults demonstrated clear patterns of responses for PI and IMP forms in both settings alike: they mostly chose the complete situation for PI and the ongoing situation for IMP, as expected (see Table 2 with target answers). Occasionally, they chose the ongoing picture for PI in the non-narrative setting (19%); we discuss this result in Section 5. Additionally, they provided a “none” response for picture pairs for which neither of the pictures was the appropriate one (between 21–36%, see Figures 4 and 5 below); this was the expected response for two of the six conditions (Table 2). Children’s responses were more varied. In the narrative context, they tended to choose, when available, the complete situation for PI (53%), but nevertheless sometimes also chose the ongoing situation (20%). In the non-narrative setting, they chose the ongoing (40%) and the complete (33%) situation for PI almost equally often. In the narrative setting they chose the ongoing picture (42%) and the complete picture (40%) for IMP almost equally often, while in the non-narrative setting they primarily chose the ongoing (53%), when available. One notable difference between adults and children was that children were reluctant to reject both pictures; the “none” response was provided by only 8–15% by the children.

Figures 4 and 5 provide a more detailed picture of participants’ choices by observing the three different picture pair conditions separately.

For PI, there was a difference across settings. For the C–O condition in the narrative setting, children and adults chose the target complete situation almost all the time, but for the same pair in the non-narrative setting, both groups chose the complete in addition to the ongoing situation. It was not expected that adults would choose an ongoing situation for PI; we will discuss in Section 5.1 why the non-narrative setting may have occasionally triggered this response. For IMP, there was a difference between children and adults in the narrative setting. For the C–O condition, children chose the target ongoing response less often than adults; in fact, they mostly selected the complete situation. In the non-narrative setting children, like adults, almost always chose the ongoing situation for IMP. Finally, children occasionally chose the incomplete picture both for PI and for IMP; they did so in

both settings in conditions where the target situation was not an option (for PI, in the O–I condition and for IMP, in the C–I and O–I condition). The adults hardly ever chose this situation, but instead said that neither of the pictures was right.

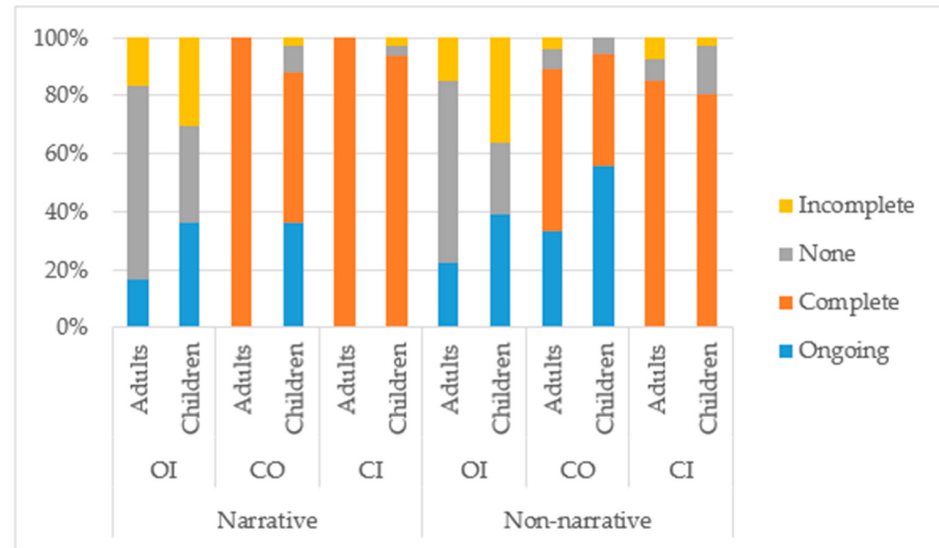


Figure 4. Picture choice for PI for the three different conditions (C–O, C–I, O–I) in the narrative and non-narrative settings.

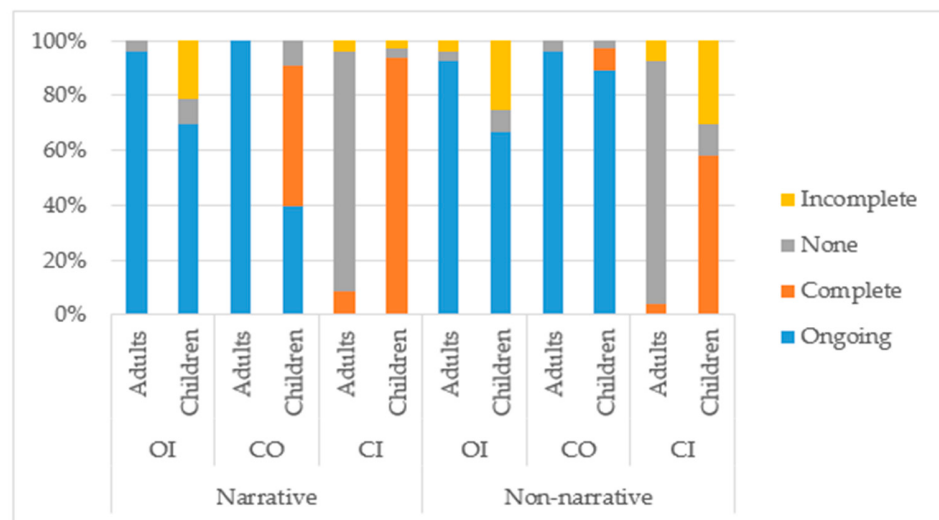


Figure 5. Picture choice for IMP for the three conditions (C–O, C–I, O–I) in the narrative and non-narrative settings.

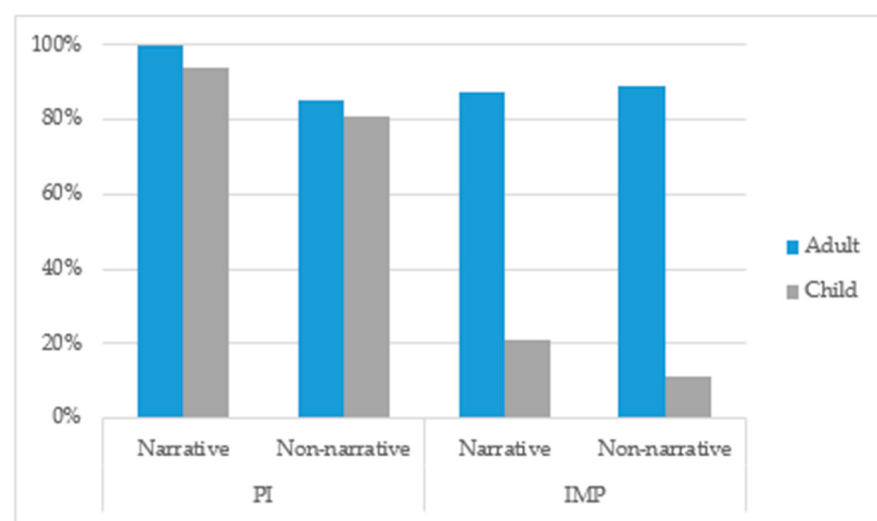
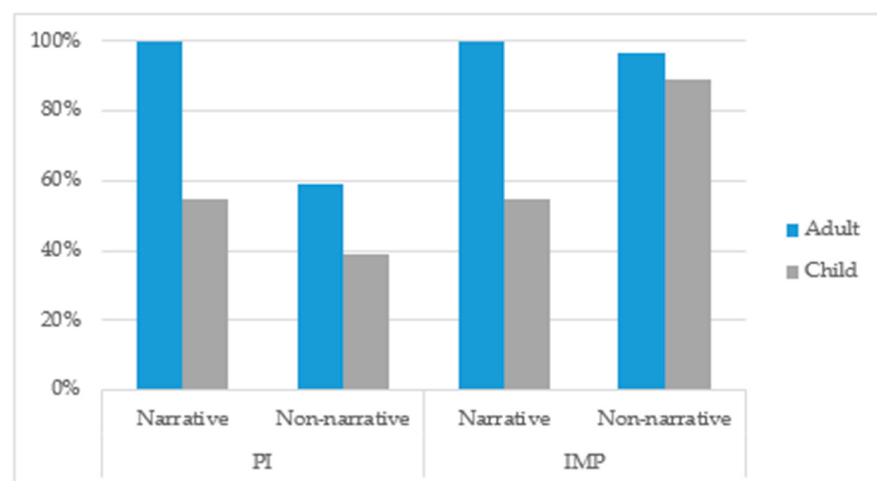
The adults chose the “none” option for the expected picture pairs, namely, for the O–I condition with PI and for the C–I condition with IMP (Table 2). These were the picture pairs in which the target situation was not among one of the two to choose from, so a “none” answer was appropriate. In contrast, the children hardly ever selected the “none” answer. For PI in the O–I condition, children chose ongoing and incomplete situations equally often, not indicating a preference for one or the other, and for IMP in the C–I condition, they mostly chose the complete situation, particularly in the narrative setting.

Table 3 presents the means (out of 9 items) and standard deviations of target responses of adults and children in the two settings (Table 2).

Table 3. Means and standard deviations of expected responses for both age groups and settings (the maximum is 9).

		Narrative		Non-Narrative	
		Mean	SD	Mean	SD
Adults	PI	8.00	0.756	6.44	1.810
	IMP	8.50	0.535	8.44	1.014
Children	PI	5.67	1.414	4.31	1.653
	IMP	3.44	1.130	5.08	1.038

Figures 6–8 present the proportion of target responses for PI and IMP by adults and children for each picture pair.

**Figure 6.** Proportion of target responses per age group and experimental setting for the C-I condition.**Figure 7.** Proportion of target responses per age group and experimental setting for the C-O condition.

Considering all conditions, a first logistic model with mixed effects was performed with Accuracy (see Table 2) as response variable and Age (adult or children), Aspect (PI vs. IMP), Picture-pair (C-I, C-O or O-I) and Setting (narrative or non-narrative) and their interactions as explanatory variables. Since Aspect and Picture-pair jointly determine what the correct answer is, and, therefore, target-answer (complete, ongoing or none, depending on the condition, see Table 2) cannot be fitted in the model with the other Aspect and Picture-pair options, a second

logistic model with mixed effects was performed with Accuracy as the dependent variable and Age, Aspect, Setting, and Target-answer and their interactions as explanatory variables. The results are summarized in Table 4, where Exp (coef) indicates the variation in odds ratio in the multiplicative scale for a change in the corresponding explanatory variables, holding the other variables as defined by the preferential profile.

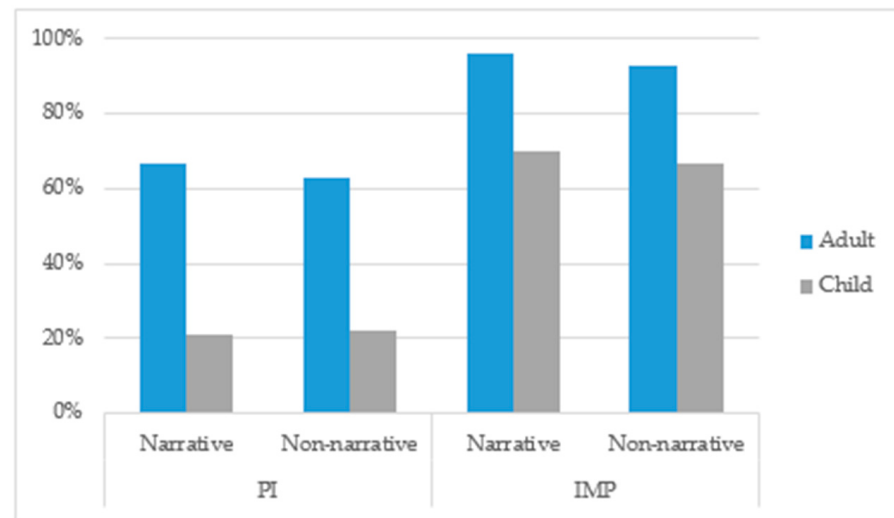


Figure 8. Proportion of target responses per age group and experimental setting for the O-I condition.

Table 4. Results from the logistic models with mixed effects. “–” indicates that the corresponding variable is not part of the model.

	Model 1 Exp (coef)	Model 2 Exp (coef)
Referential profile (intercept)	4.08 *** (1)	169.49 *** (2)
Age Children	0.06 ***	0.34
Aspect IMP	9.17 ***	0.61
Situation Non-narrative	0.32 **	0.32 **
Picture-pair C–O	2.98 ***	–
O–I	22.33 ***	–
Target-answer Complete	–	0.06 *
None	–	0.04 ***
Age x situation	2.69 **	2.65 *
Aspect x picture pair C–O	0.49	–
O–I	0.00 ***	–
Age x aspect	–	0.14 **
Age x target-answer Complete	–	0.47
None	–	0.21 (3)

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. (1) The referential profile is an adult in a narrative situation tested with PI for the C–I picture pair. (2) The referential profile is an adult in a narrative situation tested with PI where the correct response is ongoing. (3) $p = 0.06$.

According to Model 1, children's responses tended to be less accurate overall. Adults' responses were significantly more accurate in the narrative setting than the non-narrative setting. Particularly for PI and the C–O condition, adults chose the non-target ongoing picture roughly equally as often as the target complete one (Figure 7; see Section 5.1 for discussion of this surprising finding). Children's accuracy rate was lower than adults for both aspect forms overall. The difference across the two settings was not equally relevant for the children. For IMP in the C–O condition, children's accuracy was higher in the non-narrative setting than in the narrative setting (Figure 7). Furthermore, IMP yielded significantly more accurate responses than PI overall, in children and adults, except for the C–I condition. This may be because, for this picture pair, the expected response was the "none" answer, which yielded fewer accurate responses generally, particularly in the children, as we can observe in Model 2.

According to Model 2, no differences in accuracy (for IMP or PI) can be drawn from the adult data, but IMP for children yielded significantly fewer accurate responses than for adults. The adults' responses tended to be more accurate in the narrative setting than in the non-narrative one overall, but the difference in setting was not as relevant for children. Additionally, "none" responses were significantly more difficult generally, particularly for children, where the *p*-value for this interaction nearly reached significance.

Looking more closely at the results for IMP, which is the focus of this paper, we observe that the biggest differences between adults and children appeared in two conditions. In the C–I condition (see Figures 5 and 6), participants had to reject both pictures and provide a "none" answer. As the above analysis indicates, this is difficult generally, particularly for children, so the difference between adults and children may arise from difficulties to indicate "none" here. The difference between children and adults was also large in the C–O condition (see Figures 5 and 7), which was the crucial condition for our research question. Zooming in further on the data for IMP in the C–O condition, a Pearson's chi-square test was performed, comparing which of the two pictures was chosen in this condition in the narrative and the non-narrative setting (see Table 5). The results indicated that adults and children behaved differently in the narrative setting ($\chi^2 = 22.408$, *df* = 2, *p* < 0.001), but not in the non-narrative setting ($\chi^2 = 2.3836$, *df* = 2, *p* > 0.1), suggesting that IMP seems to be acquired in the non-narrative setting, but was still difficult to interpret in the narrative setting.

Table 5. Number of times each of the two pictures was chosen for IMP by adults and children in the C–O picture pair condition in the narrative setting (adults *n* = 8, children *n* = 11) and the non-narrative setting (adults *n* = 8, children *n* = 12) (with three data points per condition).

Situation	Picture Choice	Adults	Children
Narrative	Ongoing	24	13
	Complete	0	17
	None	0	3
Non-narrative	Ongoing	26	32
	Complete	0	3
	None	1	1

5. Discussion

The aim of this study was to investigate Spanish children's acquisition of the imperfective past tense (*imperfecto*, IMP), to determine if they differentiated IMP appropriately from the perfective tense (*pretérito indefinido*, PI), and to what extent they have adult-like understanding of IMP. After summarizing the main findings in Section 5.1, we discuss how the results of our study speak to each of three explanations that have been proposed in the literature to explain children's difficulties with imperfective aspect in the subsequent sections.

5.1. Main Findings

The results from both versions of our comprehension experiment indicate that children indeed differentiated PI and IMP, as they provided different answers for each aspect. Nevertheless, their understanding of IMP differed from the adults in two respects.

First, in the narrative setting children mostly chose the complete situation for IMP when that was one of the two options, whereas the adults never did when ongoing was one of the two options. This contrasted with the non-narrative setting, where children, like adults, almost always selected the ongoing situation when ongoing was one of the two options. Children's choice of a complete situation for IMP instead of the target ongoing situation aligns with findings from earlier aspect comprehension studies with other child languages (for Dutch, [van Hout \(2008\)](#); for English, [Wagner \(2002\)](#); for Polish, [van Hout \(2005, 2008\)](#); for Russian, [Kazanina and Philips \(2007\)](#)). Below, we discuss what the difference between narrative and non-narrative setting reveals about children's acquisition of IMP.

Second, for the two conditions where neither picture fit the sentence (see Table 2, a "none" answer was expected for PI for the I–O condition, and for IMP for the C–I picture pair condition), the adults indeed indicated that neither picture was appropriate, but the children rarely provided "none" answers. In these conditions, the children mostly chose one of the two situations, seemingly at chance, although neither was appropriate. Apparently, when given two choices, children felt forced to choose one, despite our training which highlighted that sometimes "none" answers were necessary. [van Hout \(2005, 2008\)](#) reports the same reluctance in her studies. Given that these conditions constituted one third of all items, the low rate of expected "none" response for these particular picture pairs raised the overall numbers of responses for complete, incomplete, and ongoing situations for PI and IMP. Despite this methodological issue, relevant conclusions can be drawn by closely observing the other four conditions for which we did not expect a "none" response, as well as by comparing the two versions of the study.

In addition to these non-adult-like patterns in the children, there was a surprise in the adult results for PI: in the non-narrative setting, adults (and children) occasionally selected the ongoing situation, whereas only the complete one was expected (Table 2). The ongoing situation was never selected for PI in the narrative setting. We believe that this may have been an unwanted side-effect of the way the visual stimuli were designed. In the ongoing picture, the agent was portrayed as engaged in the action, while in the complete picture she was not doing anything, and thus the pictures of these complete situations did not guarantee that the agent had actually been engaged in the action; the mere presence of a character does not imply agentivity.¹⁷ In contrast, in the narrative setting, both adults and children always chose the complete picture because, there, the story established the intentionality of the character, and, moreover, the introduction picture portrayed the beginning of the event with the agent engaged in the action.

The reason we ran the experiment in two different settings was to compare various explanations in the literature as to what causes children's problems with IMP. Does the acquisition challenge lie in: (i) dropping the completion entailment (i.e., applying aspect shift or coercion, or taking a perspective with the reference time inside the event time), (ii) anaphoricity (i.e., determining the appropriate reference time in a story context), or (iii) the event-projection problem (i.e., projecting a full event from an incomplete or ongoing situation related to the agent's intentions)? In the narrative setting, the critical sentences were embedded in a short story, whereas in the other version, they were presented as answers to "what happened here?" without any narrative. Our design and the choice of accompanying visual stimuli (complete, ongoing and incomplete situations) allowed us to compare these three explanations. We discuss them one by one, then we offer some further discussion on the ambiguity of IMP and the acquisition of discourse integration in narrative development more generally.

5.2. Does the Absence of the Completion Entailment with IMP Pose an Acquisition Challenge?

Telic-imperfective sentences create the so-called imperfective paradox: the completion described by a telic predicate disappears when the predicate combines with imperfective aspect (Section 1). In aspect-operator approaches, the paradox is resolved by shifting (or coercing) a telic predicate into a homogeneous one, as required by the semantics of IMP (de Swart 1998). In perspective-taking analyses (Klein 1994; Reichenbach 1947), IMP creates a perspective with the reference time within the event time for Spanish (Arche 2014; García Fernández 2000, 2004, a.o.). Dropping the completion entailment is the core feature of the semantics of IMP. If the learner's difficulty lies at this level (i.e., if she cannot apply aspect shift or take a perspective with reference time inside event time, van Hout 2007a, 2007b, 2008), difficulties with IMP were expected to appear in both experimental settings alike, because applying aspect shift or taking the inside perspective must be applied independently of presence or absence of a narrative discourse. However, the results indicated that there was a dissociation between the narrative and non-narrative setting. Children's performance on IMP was much more like adults in the non-narrative setting—where both groups selected the ongoing situation—than in the narrative setting. The difference between the two settings was especially clear for the C–O condition: the children chose complete (51.5%) as well as ongoing (39.9%) pictures in the narrative setting (Figure 5); by contrast, they chose mostly, and appropriately, ongoing pictures in the non-narrative setting (88.9%). The finding that children's performance was adult-like in the latter setting suggests that children know the progressive semantics of IMP. They were able to apply the aspect shift imposed on telic predicates (on De Swart's model) or, alternatively, apply the reference-within-event time perspective (following perspective-taking approaches to IMP). Thus, our results do not support Van Hout's hypothesis that children's misinterpretation of IMP is due to an overall difficulty related to dropping the completion entailment.

5.3. Does Determining the Appropriate Reference Time for IMP Pose an Acquisition Challenge?

IMP is an anaphoric aspect and must be linked to an appropriate temporal antecedent (Bello 1841, 1847; Rojo 1974; Rojo and Veiga 1999, a.o.). Several acquisition researchers have claimed that it is difficult for learners to retrieve a proper temporal antecedent time for imperfective aspect (van Hout 2005; Kazanina and Philips 2007; Martin et al. 2020). Assuming this explanation, it was expected that the two versions of the experiment would lead to a difference in performance on IMP, with the narrative setting posing a more challenging task, because retrieving the appropriate reference time from the discourse context was hypothesized to be more difficult. The result that children's accuracy was indeed lower in the narrative setting than in the non-narrative one suggests that children have difficulties correctly integrating IMP in the story, supporting the explanation proposed in these earlier studies.

In Section 5.2 we concluded that the children in this study know the semantics of IMP (i.e., the lack of the completion entailment). Nevertheless, immature development of the narrative discourse rules that regulate temporal ordering effects of a sequence of sentences with perfective and imperfective aspect in a story (Kamp and Rohrer 1983; Kamp and Reyle 1993) may have hindered children's performance on IMP in the narrative setting. In this setting, the story time progressed along a series of temporal moments: the start of the event, the curtains' closure, the puppet's glance behind the curtains, and several times in the question–answer dialogue between experimenter and puppet, in addition to the real-time moment of the experiment. Adults associated the event time of the critical sentence (*hacía el puzzle*, meaning “was making a puzzle”) to the time of what was happening (*pasaba*, meaning “was happening”) when the puppet looked over the curtains (“Puppet, look behind the curtains! What was happening/happened?”). The time of looking-over-the-curtains was the current topic time and was taken as the intended antecedent for IMP. However, what can we expect from learners who know the ongoing semantics of IMP (they performed well in the non-narrative setting), but lack the discourse knowledge that the current topic

time must be selected for IMP? Which moment will they select for IMP from the potentially confusing array of possible temporal antecedents presented in the story, moreover, the real-time times in the conversation between experimenter and child (the moment of the puppet looking behind the curtain and the time after his looking)? Given the suspense created by the closed curtains and the focus on what was happening behind them, children may have selected as their point of reference the time behind the curtains after, instead of during the puppet's looking, and guessed that the event finished, thus selecting the complete situation as their answer. This is explainable; in children's reading experience, all stories come to an end.¹⁸ In contrast, in the non-narrative setting, this method of reasoning was not possible, as the task was to evaluate whether events had happened in the past ("yesterday" as established in the overall introduction to the task). Thus, the narrative setting offered children with immature narrative cohesion skills the temporal "space" to pick a different reference time for IMP than the adults.

This explanation connects to several prior studies. It aligns with [Kazanina and Philips \(2007\)](#), who argued that an explicit reference time ("while the boy was watering the plants") helped children to select the appropriate reference time to interpret sentences with imperfective aspect ("the girl was cleaning the table") as an ongoing event. In our non-narrative setting, the reference time was implicit. Nevertheless, the adverb *aquí* meaning "here", used in combination with a point to the book page, suggested a punctual temporal dimension ("what was happening in that moment?"), which strongly favors a progressive reading of IMP: the reference time given by *pasaba aquí* must be included in the event time expressed by IMP in the critical sentence. Apparently, this sufficed for anchoring IMP in the non-narrative setting.

Our finding that children were adult-like in the non-narrative setting is like findings for imperfective aspect comprehension in Russian learners ([Vinnitskaya and Wexler 2001](#)) and Polish learners ([Weist et al. 1991, 1997](#)). These studies also used a sentence-picture matching task with a choice of an ongoing and a complete situation; the test sentence with imperfective aspect was provided without any (narrative) context. Even the 3-year-olds mostly chose the ongoing situation for imperfective aspect (around 75% in both studies) and almost all the 5-year-olds did so (around 90% in both studies). In contrast, Polish learners in another study ([van Hout 2005](#)), who were tested with the same method as the current study, namely a story and curtains, often did not choose the ongoing situation for imperfective aspect (in the C–O condition: 2-year-olds 46%; 4-year-olds 58%). The contrast in accuracy on imperfective aspect in the non-narrative setting used by Weist and colleagues versus the narrative setting used by Van Hout points toward the same conclusion: integration of imperfective aspect in a narrative is challenging.

5.4. Does Event Projection Pose an Acquisition Challenge for IMP?

The third type of explanation posited that children need cues about an agent's intentions to project a full event for IMP, such as cues in the visual stimuli about the agent's intentions ([Wagner 2002](#)), or, for the narrative setting, cues provided by the discourse context. To investigate this, two different states of the agent were depicted in the pictures (Figure 2). In the ongoing situation, seeing someone in action provides evidence for the agent's intention to reach a goal. This contrasts with pictures of complete and incomplete situations which lack agent engagement. Pictures of incomplete situations do not provide any cues for the agent's intention to reach the goal; in fact, they suggest the opposite (i.e., that the agent will not continue the action). Pictures of complete situations portray an object in a result state, and merely suggest, without actually portraying, that the character standing next to it had performed the action. In the narrative setting the story helped to draw this inference (see (3) in Section 2), but in the non-narrative setting, this causal relation had to be inferred from the picture only. So, it was expected that children would prefer ongoing situations for imperfective aspect over complete and incomplete situations, because these indicate goal-directed engagement, especially in the narrative setting, given the additional cue about the agent's intention at the start of the story. However, our results

do not support these expectations about the status of the agent in the visual stimulus and story context. While the incomplete situation was hardly ever selected, the complete situation sometimes was, particularly in the narrative setting (51.5% in the C–O condition). This suggests that a situation with an agent whose intention is not portrayed visually (i.e., he is not manipulating an object) was acceptable in children’s interpretation of IMP (despite having the ongoing situation as the other option, which clearly indicates the agent’s intention). Moreover, contrary to expectations, the non-narrative setting did not turn out to create more problems, but, in fact, fewer problems (as children almost always chose the ongoing situation here). This indicates that an explicit statement of the agent’s intentions was not needed to perform accurately¹⁹. Overall, the findings do not support Wagner’s (2002) explanation that availability of information about the agent’s intentions facilitates children’s understanding of imperfective aspect.

5.5. Does Ambiguity Pose an Acquisition Challenge for IMP?

In a recent review of the literature on children’s non-adult-like interpretations of telic predicates, Martin and colleagues (2020) discuss children’s difficulties with imperfective aspect from a crosslinguistic perspective, arguing that ambiguous forms are generally challenging for children, because they must determine for each of the meanings in which context it applies.²⁰ In particular, for the acquisition of perfective–imperfective aspect, children are predicted to have problems acquiring aspectual forms that have multiple meanings, acquiring these later than forms that have only one meaning. For example, in the Slavic languages, imperfective aspect is the ambiguous form in perfective–imperfective verb pairs (Grønn 2008).²¹ Findings from the child Slavic languages support the generalization that ambiguous forms are more difficult (as discussed in Section 2.2): children indeed acquire imperfective aspect with more trouble than perfective aspect (for Polish, the authors refer to van Hout (2005), and for Russian, to Kazanina and Philips (2007)).

Comparing the aspectual tenses in Romance languages to Slavic aspect morphology, Martin and colleagues highlight a crucial semantic difference between imperfective aspect in the Slavic languages versus imperfective tense in the Romance languages. In contrast to the ambiguity of Slavic imperfective forms, which have a perfective and an imperfective meaning, Romance imperfective forms are claimed to be unambiguously imperfective. Martin and colleagues argue that, since no disambiguation is required, Spanish imperfective forms should be easier than Slavic imperfective. Our finding that children’s accuracy on IMP was low (at least, in the narrative setting) does not support this prediction for Spanish. Martin and colleagues’ claim that IMP is not ambiguous does not consider the fact that IMP has three possible readings (progressive, continuous, and habitual), all three of which are imperfective. The fact that the same tense form, IMP, encodes an array of meanings, has been claimed to be a stumbling block in the case of second language acquisition (Domínguez et al. 2017). Low accuracy on IMP in the present study may have been caused by the same reason.

5.6. Discourse Integration and Narrative Development

We have reached the conclusion that learners have difficulties with discourse integration of IMP, which aligns with conclusions of several earlier studies (van Hout 2005; Kazanina and Philips 2007; Martin et al. 2020). This conclusion can be framed more generally within studies that examined cohesion in children’s narrative development. Cohesion involves the linguistic means that express meaningful relations across sentences, including anaphoric relations for nominal and temporal reference. Most, if not all, studies on narrative development find that the linguistic marking of cohesion is acquired late in development. For example, for nominal reference, the choice of a definite or indefinite noun phrase or a pronominal in a narrative depends on the information structure status of the referent, which is determined by the discourse context (e.g., introduction of a new referent, continuation with an old referent, switch to a previously mentioned referent). This choice poses a challenge in narrative production tasks for French and English learners

up to the age of 8 or 9 (Kail and Hickmann 1992; Karmiloff-Smith 1979; Karmiloff and Karmiloff-Smith 2001). Similarly, pronoun comprehension in stories with multiple referents has been proven to be difficult for Dutch 5-year-olds (Wubs et al. 2009).

As for the expression of temporal reference in children's narratives, various studies found that children at school age initially do not use cohesive devices such as temporal connectives to ground temporal information across clauses. Thus, it has been found that connectives that mark temporal overlap of situations (simultaneity, for example, *while*, *when*, and *just as*) were hardly produced by learners of English, French, and German, even at age 10 (Hickmann 2002). Mandarin learners in the same study used them, but only robustly from the age of 7 onward. Moreover, the same simultaneity connectives were not fully comprehended by age 5 and were acquired later than connectives that express sequentiality in English, Thai, and Lisu (Feagans 1980; Winskel 2004). As for the use of tense and aspect markers on the verb to mark sequentiality and simultaneity of events, learners of English, French, German, and Mandarin started to vary their tense-aspect markers to encode overlap only from the age of 7 onward (Hickmann 2002). Furthermore, the temporal perspective that German children initially take in their stories was presented as a series of almost exclusively past-tense sentences (using the German present perfect) (von Stutterheim et al. 2012). It is not until the age of nine or ten that they start to vary their tense use, by also including present tense to mark the unfolding of an event in a back-shifted perspective; even at age 14 this use was not yet adult-like (von Stutterheim et al. 2012).

To our knowledge, there are no comprehension studies that have investigated the temporal ordering of sentences with perfective and imperfective aspect in narratives in child learners. This domain appears to be fully unexplored.

6. Conclusions

This study indicates that a carefully designed experiment that compares language varieties in adults' and children's interpretation of aspect can disentangle different explanations about children's non-adult-like performance on imperfective aspect. The findings reveal that 5-year-old Spanish learners appropriately differentiated perfective and imperfective aspect. They also demonstrated adult-like knowledge of the semantics of the *imperfecto* in the non-narrative version of the experiment, but this knowledge was reduced in the version that was presented with a narrative discourse. Given that children performed well in the non-narrative setting, we conclude that it is not the semantics of *imperfecto* that is necessarily difficult, rather the additional restrictions on its meaning in a narrative context imposed by discourse integration rules. The acquisition process appears to proceed in stages: the core semantic meaning of Spanish *imperfecto* is acquired earlier than its discourse semantics. Further acquisition research could investigate to what extent children employ the role of the aspectual tenses as marking temporal progress in a narrative, particularly different ways in which perfective and imperfective aspect contribute to the progress of the reference time in a story.

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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Ethics Committee of the University of Groningen (protocol code 86566297, signed on 3 March 2022).

Informed Consent Statement: Informed consent was obtained from the parents of all child subjects as well as the adult subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to ethical restrictions.

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Appendix A

Table A1. List of predicates and test items.

	C–O Condition	C–I Condition	O–I Condition
Session 1	Hacer el puzzle <i>Do the puzzle</i> Lavar al perro <i>Wash the dog</i> Atarse el zapato <i>Tie up the shoe</i>	Dibujar el tigre <i>Draw the tiger</i> Cortarle la coleta a la niña <i>Cut off the ponytail</i> <i>(to the girl)</i> Doblar el papel <i>Fold the paper</i>	Construir el castillo <i>Build the castle</i> Comerse una zanahoria <i>Eat up a carrot</i> Recortar el círculo <i>Cut out the circle</i>
Session 2	Leer el libro <i>Read the book</i> Escribir la carta <i>Write a letter</i> Comerse la sardina <i>Eat up the sardine</i>	Construir la torre <i>Build the tower</i> Dibujar una flor <i>Draw a flower</i> Cerrar la chaqueta <i>Tie up the jacket</i>	Hacer un muñeco de plastilina <i>Make a boy out of clay</i> Borrar el círculo <i>Erase the circle</i> Descolgar la toalla <i>Take the towel off the line</i>

Notes

- ¹ In the experimental setups in these studies, the events were presented in various forms: pictures showing two different situations (Weist et al. 1991); scenes acted out with props in front of the participants (Kazanina and Philips 2007); the result scenes of events that were acted out below the table (Wagner 2002); a series of pictures in a picture book presented with a story (van Hout 2005, 2007a, 2007b, 2008). These visual materials created either complete versus ongoing situations (Weist et al. 1991), or complete versus incomplete (interrupted) situations (the other studies). Given the nature of the task in these setups (assessing description or choosing a picture), imperfective aspect was expected to be acceptable, and indeed was for adults, for ongoing, incomplete, and complete versions of these events. See Section 2.2 for more details.
- ² For easy reference, we have simplified the Leipzig Glosses convention and marked *pretérito indefinido* as PI and *pretérito imperfecto* as IMP.
- ³ This review of semantic theories of imperfective aspect is necessarily brief and is meant to introduce enough linguistic background to frame our acquisition study and describe the patterns in child language that we have found. It is not intended to be an exhaustive comparison of different theoretical approaches, nor do we suggest any conclusions as to which approach deals best with each property.
- ⁴ The term *topic time* in these approaches refers to the time that the story is about. We primarily use the term *reference time* in this paper, and occasionally *topic time*. For the purposes of the paper, the meaning of both terms is the same.
- ⁵ There is a parallel between the anaphoricity of definite and indefinite noun phrases and the anaphoricity of various tenses (Bennett and Partee 1972; Kamp and Rohrer 1983; Kamp and Reyle 1993; de Swart 1998, 2000; Vet 1999, a.o.). It would lead us too far afield to summarize this connection between nominal and temporal reference here.

- 6 According to Gehrke (2022) a fully compositional account of the discourse relations must integrate grammatical aspect with a number of other elements: the event type of the verb phrase, adverbials, the tense-aspect system in a given language (Gehrke discusses Russian and Czech), syntactic structure (subordinate vs. main clauses), and pragmatic reasoning based on the context or common sense. As Gehrke highlights, “a fully compositional account [. . .] has to await future research” (Gehrke 2022, p. 14). In our study, we focus on the role of grammatical aspect, keeping everything else constant.
- 7 Following the tradition in Discourse Representation Theory (DRT), de Swart (1998) distinguishes three types of eventualities: state, process, event. These are similar to Vendler’s (1957) aspectual classes; his activity class is labeled in DRT as a process, and his two telic classes (accomplishments and achievements) are collapsed as events in DRT.
- 8 These approaches are called *intensional* as opposed to *extensional* approaches. Imperfective is defined in terms of the subinterval property: IMP(*p*) is true if the event *e* described by IMP(*p*) is part of an event *e* described by *p*. In intensional approaches, for an IMP to be true, it also must be associated to a complete event in at least one possible world (Bennett and Partee 1972).
- 9 The aspectual forms that were included in each language were: for Dutch, simple past (*onvoltooid verleden tijd*), present perfect (*voltooid tegenwoordige tijd*), and a past periphrastic progressive (*aan-het* construction) (van Hout 2007a, 2008); for Italian, imperfective past (*imperfetto*) and present perfect (*passato prossimo*) (van Hout and Hollebrandse 2001; van Hout 2008); for Polish, imperfective past (*czas przeszły niedokonany*) and perfective past (*czas przeszły dokonany*) (van Hout 2005, 2007b, 2008). We refer to the original papers for their motivation of these choices of perfective forms. The Italian data were originally presented in van Hout and Hollebrandse (2001). The current study used the same method; see Section 2 for more details.
- 10 The Italian children in these studies did not perform above chance with imperfective and perfective aspect until age four. This may have been due to some methodological differences when testing Italian children versus Dutch and Polish children, see discussion in van Hout (2008).
- 11 van Hout (2005) offers two other possible versions of an immature discourse grammar: (i) Children do not know or apply any discourse rules in the semantics-pragmatics interface and instead order events in a non-verbal manner (according to what seems most plausible to them); (ii) Children have discourse rules, but these are different from the adult rules. We will not discuss these other explanations further here.
- 12 In Kazanina and Philips’ (2007) experimental setting, there was exactly one reference time. This was different from van Hout’s (2005) setting that involved a story introducing a series of times. See Section 2 for more details, as the current study used Van Hout’s setup, and see Section 4 for detailed discussion.
- 13 Note that the conditions and the tasks were different across the various studies. While a sentence-picture verification task measures acceptance as well as rejection, a picture-selection task targets preferred interpretations (van Hout et al. 2010). For a detailed discussion of this issue for the acquisition of aspect, see García-del-Real et al. (2014).
- 14 In both settings, this question was formulated with PI or IMP, parallel with the tense in the test sentence. We thought that the use of the IMP in the preceding question would favor the progressive reading of the form in the test sentence.
- 15 Statistical analyses revealed no influence of item order (for PI: children $\chi^2 = 2.968$; $p > 0.05$ and adults $\chi^2 = 0.629$; $p > 0.05$; for IMP: children $\chi^2 = 0.696$; $p > 0.05$ and adults $\chi^2 = 0.629$; $p > 0.05$) or the order of sessions (for PI: children $\chi^2 = 0.287$; $p > 0.05$ and adults $\chi^2 = 0.629$; $p > 0.05$; for IMP: children $\chi^2 = 0.001$; $p > 0.05$ and adults $\chi^2 = 0.993$; $p > 0.05$).
- 16 Except for PI in the narrative setting, where adults, instead of always choosing the complete picture, sometimes chose the ongoing one. The same pattern was revealed for the children. This deviation from the target response will be discussed in Section 5.
- 17 This was mentioned in the informal feedback from adults after testing.
- 18 We thank Bert Le Bruyn, one of the editors of this special volume, for this insight.
- 19 Interestingly, agent intentionality played a (small) role for the adults with PI in the C–O condition in the non-narrative setting. Since the picture of a complete situation does not indicate if the character in the picture had performed the action, the adults sometimes preferred the ongoing situation for PI, remarking that there, they could be sure that the agent was indeed doing the action.
- 20 Martin et al.’s (2020) explanation also covers two other types of non-adult-like interpretation patterns of aspect interpretation that are not pertinent to the current discussion here; thus, their explanation has a wider coverage than just the challenge with imperfective aspect.
- 21 Grønn (2008) argues that the disambiguation of Russian imperfective aspect towards an imperfective reading in the adult grammar is easier in the presence of an explicit element providing a discourse referent for the reference time. When no such explicit element is present, the underspecified interval corresponds to “the whole past preceding the reference time” (Grønn 2008, p. 11), favoring a perfective interpretation. To obtain an imperfective reading where the reference time *t* refers to “some point in the past” (Grønn 2008, p. 11), accommodation is required.

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