

# Comprehension of Prototypical Tense and Aspect Combinations in Child Spanish

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## Abstract

Both children and adults tend to produce predicates with lexical aspect, grammatical aspect and tense in particular prototypical combinations. While it has been argued that these prototypes constitute the linguistic knowledge that children have of tense, others argue that they are independent dimensions of knowledge, even in child language, and that the prototypical groupings of these dimensions in child language fall together for non-linguistic cognitive reasons. Recent studies of child Spanish suggest non-adult-like use of verb finiteness. In light of these facts, we seek to determine whether Spanish-speaking children are also delayed in their comprehension of prototypical tense and aspect combinations. Twenty-three Spanish-speaking children (mean age = 3;10) from Mexico City were given a comprehension task and scored on their ability to select a picture corresponding to different tense-aspect combinations. Children were largely able to successfully interpret tense and aspect information as it was conveyed in the adult-like cues.

## 1. Introduction

This viewpoints article addresses the development of Spanish-speaking children's interpretations of tense-aspect morphemes, as a function of the lexical aspect of the predicates they occur with. We assume that temporal and aspectual morphology interacts with the lexical aspect (aktionsarten) of the predicates they are produced with. These inflected verbal predicates then interact with syntax and syntax, in turn, interfaces with semantics to produce interpretations of events, situated in discourse. While much child language research has looked at transcripts of children's spontaneous production and then inferred from children's utterances what their temporal and aspectual interpretations must be, we seek in this study to more directly test children's interpretations of tense-aspect morphology, using a comprehension experiment. Concretely, we present children with multiple graphic representations of events designed to represent different temporal and aspectual perspectives on an event and then present them with a predicate containing a verb with a tense-aspect morpheme which can only correspond to one of the images, in

the adult language. Children are then asked to choose which picture best matches the utterance.

Our experiment is motivated by two parallel lines of investigation, which have focused on different dimensions of children’s knowledge of tense. One strand of research has attempted to understand children’s early use of tense marking, as a function of the lexical aspect and grammatical aspect with which the verb occurs, while the other has focused on the syntactic nature of children’s representations of finiteness, which includes both tense and subject-verb agreement. While some authors working in the former line have proposed that children only mark grammatical aspect and tense as a function of lexical aspect and have no independent knowledge of tense, others have proposed that children, like adults, can independently represent tense and aspect and only conflate them for the same reasons adults do, relating to knowledge of the world. Authors working in the second strand of research have proposed that children have adult-like knowledge of syntactic tense, but fail to use discourse-pragmatic knowledge to situate the events in discourse, while others have argued that children have child-particular syntactic representations, which change over time into the adult-like system. While there have been relatively few attempts to bridge these two literatures (though see, for example, Behrens 1993, Hyams 2007), it seems to us that the two phenomena they consider must ultimately stem from the same source and that insight may be gleaned from thinking of them as related to one another.

To be concrete, we will limit our inquiry to child Spanish and we will ask whether children who are in the waning developmental moments of what has been called the “Optional Infinitive Stage” (e.g. Wexler 1998) are able to interpret the tense of predicates in ways that have been referred to as “Prototypical” (e.g. Shirai & Andersen 1995) or whether they do something less adult-like. Our hope is that by considering both approaches to the problem, we may come to a better understanding of children’s temporal interpretations.

### 1.1 Prototypes in child language

It has been observed that children tend to cluster together certain properties of lexical aspect, grammatical aspect and tense in their predicates. Specifically, we find the two groupings illustrated in Table 1 (from Wagner in press).

	Group 1	Group 2
Lexical Aspect	Telic (Punctual)	Atelic (Durative)
Grammatical Aspect	Perfective	Imperfective
Tense	Past	Present

Table 1. Prototypical Tense-Aspect Combinations

In particular, children are likely to produce sentences such as *Bill made a sandwich.*, which is telic, perfective and past and *Mary is flying.*, which is atelic, imperfective and present. Conversely, children are unlikely to produce grammatical sentences that violate these prototypes such as *Bill is making a sandwich.*, which is telic, imperfective and present or *Mary flew.*, which is atelic, perfective and past. This preference for prototypical combinations of lexical aspect, grammatical aspect and tense, especially in spontaneous production studies, has been shown for children learning English (Bloom, Lifter & Hafitz 1980, Shirai & Andersen 1995), Italian (Antinucci & Miller 1976), Polish (Bronckart & Sinclair 1973, Weist, Wysocka, Witkowska-Stadnik, Buczowska & Konieczna 1984), Mandarin (Li 1990), Japanese (Rispoli 1981, Shirai 1998), Hebrew (Berman 1983) and Spanish (Jackson-Maldonado & Maldonado 2001).

Of course, adults do produce these non-prototypical sentences, though Wagner (2009) shows that they do not prefer them, in a judgment task, and argues that the preference for the prototypes in both children and adults is the result of the way that the inherent meanings of telic/atelic predicates and perfective/imperfective grammatical aspect and tense interact. For example, she argues that perfective aspect combines more easily with telic predicates than with atelic predicates because in order to evaluate whether an event's termination point has been reached, it is useful if the event itself has a designated endpoint. Similarly, if an event has no inherent endpoint, as with atelic predicates, then it is naturally consistent with imperfective aspect and present tense.

While Wagner argues that the difference between children and adults is not qualitative, but rather quantitative in that children are not as advanced as adults at using their knowledge of the world to impose non-prototypical combinations of tense and aspect, others have argued that children simply have different knowledge of language than do adults. Concretely, Bronckart & Sinclair (1973) and Bloom, Lifter & Hafitz (1980) argue that tense and grammatical aspect do not form distinct dimensions of knowledge for children, but rather constitute a unitary form of knowledge, distinct from the adult system. There is, however, convincing evidence that children are able to comprehend non-prototypical combinations such as telic predicates in imperfective grammatical aspect (Smith, Naigles & Wagner 2002, Weist 1991, Weist, Atanassova, Wysocka & Pawlak 1999, Weist, Lyytinen, Wysocka & Atanassova 1997).

In sum, telicity of predicates, grammatical aspect and tense tend to fall together in prototypical ways in adult languages. While adults and children prefer these prototypical combinations, they are capable of violating them. The fact that children are able to do this supports Wagner's claim that the difference between children and adults is quantitative and not qualitative and relates to knowledge of the world.

## 1.2 Children's knowledge of verb finiteness

A complementary area of research on children's language development has been the study of children's nonfinite verbal utterances. Children pass through a stage, frequently referred to as the "Optional Infinitive Stage" (Wexler 1998), during which they contemporaneously produce both finite utterances, as in (1), and nonfinite utterances, as in (2).

- (1) He walks across the street.
- (2) He walk across the street.

In English, this phenomenon has perhaps been best documented in the longitudinal studies of Rice, Wexler & Hershberger (1998) and Rice, Wexler and Redmond (1999).

The connection between these strands of research is that the studies reviewed in the previous section assess children's temporal interpretations, while research into the optional infinitive phenomenon attempt to explain why children lack adult-like syntactic tense and agreement marking on verbs. Assuming that semantic interpretations are the product of syntactic representations, one expects to find a connection between the two approaches to developmental linguistics.

In child Spanish, there is mixed evidence as to whether there exists an Optional Infinitive stage. While some spontaneous production studies have shown that children seem to produce adult-like finite verbs (Grinstead 1994 and Torrens 1995), others argue that children produce verb forms that could be root infinitives at the same time that they produce apparently finite verb forms (Buesa 2006, Clahsen, Avelado & Roca 2002, Liceras, Bel & Perales 2006). The forms argued to be root infinitives in these studies are both morphological infinitives, as in (3), and bare stems, as in (4) (from Grinstead 1998).

- (3) Carlos – 2;2.7  
*Payaso venir.*  
clown come-inf  
"Clown come."
- (4) Carlos - 3;3.28  
*Yo pone.*  
I-nom put stem  
"I puts."

Evidence using other methodologies has been less equivocal and has shown children using some percentage of non-adult-like forms, which could be root non-

finite verbs of the type alluded to by Wexler (1998). Kernan & Blount (1966) and Pérez-Pereira (1989), for instance, use an elicited production paradigm of the “Wug test” type and show that children are not adult-like in their productions, as illustrated in Table 2 from Pérez-Pereira (1989).

	3 Year-olds	4 Year-olds	5 Year-olds	6 Year-olds
Past-preterit	48%	74%	73%	76%

Table 2. Percentage Correct with Real Verbs in Pérez-Pereira (1989)

Similarly, Grinstead, De la Mora, Vega-Mendoza & Flores (2008) showed that while child Spanish-speakers are proficient at producing adult-like subject-verb agreement and tense marking, they are not perfect and they get better with age, as illustrated in Table 3, from Grinstead et al. (2008).

	Number Correct	Percent Correct
3 and 4 Year-olds (n=10)	117/142	84%
5 and 6 Year-olds (n=20)	285/299	95%
Total	402/441	91%

Table 3. Results of the elicited production task, by age, from Grinstead, De la Mora, Vega-Mendoza & Flores (2008)

The children in Grinstead et al. (2008) were also not adult-like in their ability to judge non-finite verbs as ungrammatical in a forced choice experiment (a “Grammaticality Choice Task”, Pratt & Grinstead 2008) in which children chose between the adult form (e.g. *Yo duermo*. ‘I sleep.’) and the putative root infinitive (*Yo dormir*. ‘I sleep.’-infinitive or *Yo duerme*. ‘I sleep.’-bare stem). The results from the children who took the elicited production test (n=38) were correlated with the children’s ages ( $r = .505$ ,  $p = .004$ ) and the scores of a sub-group of children who took both the elicited production test and the Grammaticality Choice task (n = 22) were correlated between the two tests ( $r = .652$ ,  $p = .001$ ).

In summary, it appears that there is evidence that child Spanish-speakers pass through a stage, albeit possibly less protracted than in child English, during which they use both finite and nonfinite verbs in root clauses.

### 1.3 Comprehension of prototypical combinations

What we have seen thus far is that across languages, children seem to use tense and aspect in prototypical combinations. Further, we have seen that there is evidence that child Spanish-speakers have some adult-like ability to mark verbs as finite, yet

they are not completely adult-like when they are 3 or 4 years old. Given children's non-adult-like expressive finiteness marking ability and receptive finiteness judgment ability, it is an open question as to whether their comprehension of tense – half of the finiteness marking pairing with agreement – is adult-like or child-particular.

Though there are not many studies of Spanish-speaking children's use of tense and aspect combinations, Jackson-Maldonado & Maldonado (2001) tested 33 monolingual Spanish-speaking children in Mexico and showed that atelic predicates ("activity" predicates) first occurred in the simple present (e.g. *Juega*. '(s/he) plays/is playing.') and in the present progressive (e.g. *Está jugando*. '(s/he) is playing.'). Telic predicates ("change of state" or "stative"), in contrast, occurred in the imperative (e.g. *Ponle*. 'Put to/for it/him/her.') or in the perfective past (e.g. *Tapamos*. 'We close (it).'). As with the studies of other languages, then, Jackson-Maldonado & Maldonado (2001) show that lexical aspect, grammatical aspect and tense pattern together.

In light of these production facts, our study seeks to determine whether monolingual Spanish-speaking children's knowledge of tense will allow them to interpret prototypical combinations of lexical aspect, grammatical aspect and tense in adult-like ways or whether the non-adult-like syntactic knowledge of tense represented by the Optional Infinitive stage will translate into non-adult-like temporal interpretations.

## 2. Methods

### 2.1 Participants

Twenty-three monolingual, Spanish-speaking children (age range = 2;11-4;7, mean age = 3;10) from a daycare center in Mexico City participated in this experiment.

### 2.2 Procedures

Children were introduced to a Winnie the Pooh puppet and were told that Pooh likes to ask children questions about pictures of himself. They were then told that Pooh likes to hear the children tell stories about the pictures so much that he blindfolds himself so that he can just listen to what they say. To acquaint the children with the format, and also for use as filler items, children were shown three pictures: one in which Pooh is driving a car, one in which he is in a boat and another in which he is holding a basketball (see Figure 1).



Figure 1. Warm-up/Filler Images

Winnie the Pooh then asked children to show him “I am driving a car.”: *Enséñame “Yo manejo el coche.”* This was done to make sure that children could match a picture with a sentence. There are 2 such comparisons, in which corrective feedback was given. None was given thereafter. Two similar items served as fillers. Children had to do both correctly to be included in the sample.

Next, children were shown three pictures and the experimenter explained that the stories had a beginning, a middle and an end (see Figure 2). This was illustrated by pointing while telling the story to show that the events progress from left to right.



Figure 2. Left to Right Sequence Warm-up Item

Children were then shown three pictures and asked to explain what they showed (see Figure 3). Only children who said, in whatever way, that the pictures represented the time before the event happened, the event in progress and the aftermath of the event were included.

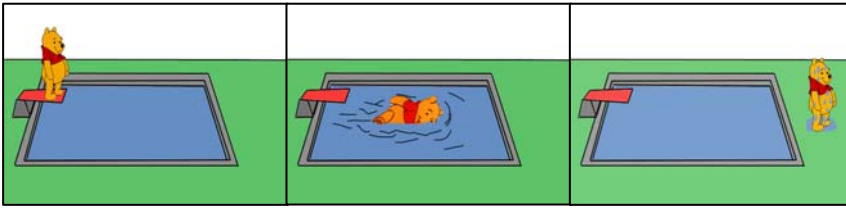


Figure 3. Narration Sequence

Crucially, children did not have to use inflectional morphology to express these concepts; however, they did have to show us that they conceived of the event depicted as having three temporal stages. This part of the test provides us with an inflectional morphology-independent measure of the child's temporal interpretations. Children who could not narrate the three pictures in this way were excluded.

Pooh's blindfold was then removed and he would tell children that he needed some help understanding what was going on in the pictures, since he was blindfolded and couldn't see them. For each set of 3 pictures, Pooh uttered one of the three following request types:

Show me: "I'm going to sleep." - *Enseñame: "Yo voy a dormir."*  
 Show me: "I am sleeping." - *Enseñame: "Yo estoy durmiendo."*  
 Show me: "I slept." - *Enseñame: "Yo dormí."*

Children were shown 6 such sets of 3 pictures that varied by conjugation class and telicity, as illustrated in Table 4.

Predicate-English	Predicate-Spanish	Conjugation Class	Telicity
To play soccer	Jugar al futbol	AR	atelic
To draw a boat	dibujar un barco	AR	telic
To ride the horse	montar el caballo	AR	atelic
To eat the cereal	comer el cereal	ER	telic
To bite the apple	morder la manzana	ER	telic
To sleep	dormir	IR	atelic

Table 4. Predicates Used By Conjugation Class and Telicity

The verbs were taken from the Spanish version of the MacArthur CDI (Jackson-Maldonado, Bates & Thal 1992) to make it more likely that the children



would be familiar with them. The order of presentation of the scenarios was counterbalanced.

When referring to our stimuli, we will use the following cover terms:

- “Future” - for future tense and irrealis grammatical aspect
- “Present” - for present tense and progressive grammatical aspect
- “Past” - for past tense and perfective grammatical aspect

The pictures as well as the sentences we used depicted both tense and grammatical aspect. The children’s job was to match the sentence with the picture that represented the appropriate tense and grammatical aspect.

### 3. Results

Children’s mean correct answer rate was 62%. Children’s adult-like interpretations of grammatical morphology were, by unpaired t-test, significantly above chance, which is 33% in our experiment: Past -  $t(22) = 3.180$ ,  $p = .004$ , two-tailed; Present -  $t(22) = 12.810$ ,  $p < .001$ , two-tailed; Future -  $t(22) = 3.153$ ,  $p = .005$ , two-tailed. Figure 4 shows images corresponding to Future, Present and Past interpretations given below the corresponding scores in the graph.

Children were best at matching the present tense sentence with the present tense picture. This tendency was statistically significant, for a one-way ANOVA,  $f(2, 66) = 6.840$ ,  $p = .002$ , as illustrated in Figure 4. According to post-hoc tests of least significant differences (LSD), the correct present-present match was chosen more frequently than past-past match ( $p = .005$ ) or the future-future match ( $p = .007$ ), as seen in Figure 5.

~~We believe that this tendency to excel in the present partially reflects a “present bias” which appears to be nonlinguistic in that “present” pictures are frequently the best depiction of the event.~~ We believe that this tendency to excel in the present partially reflects a “present bias” which appears to be nonlinguistic in that “present” pictures are frequently the best depiction of the event. In fact, the present was picked more frequently, regardless of correctness (for a one-way ANOVA,  $f(2, 66) = 53.324$ ,  $p < .001$ ), than either the past ( $p < .001$ , by post-hoc LSD testing) or the future ( $p < .001$ , also by post-hoc LSD testing), as illustrated in Figure 6.

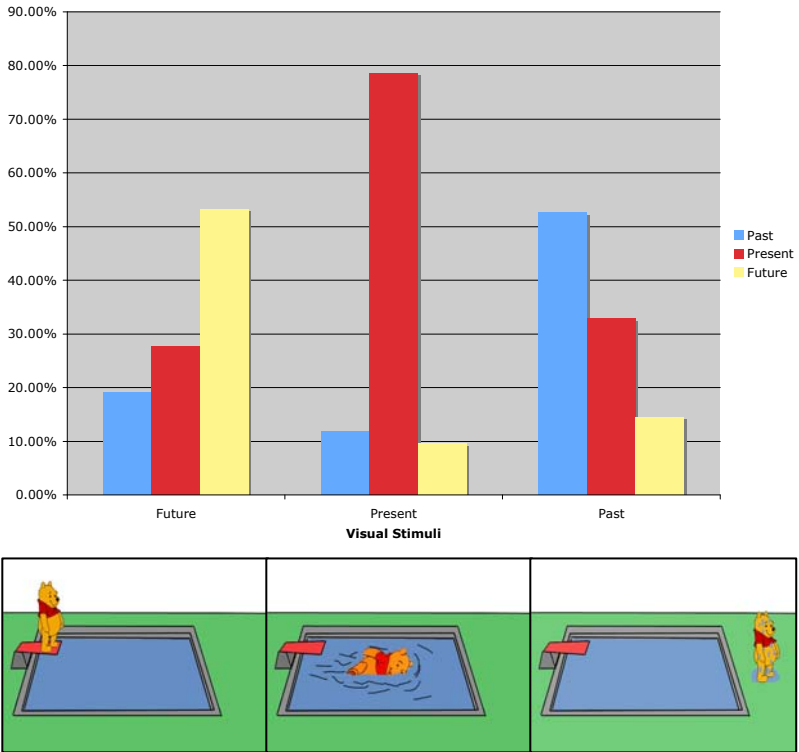


Figure 4. Percent Correct Pairings of Future, Present and Past Tense Predicates with Corresponding Images

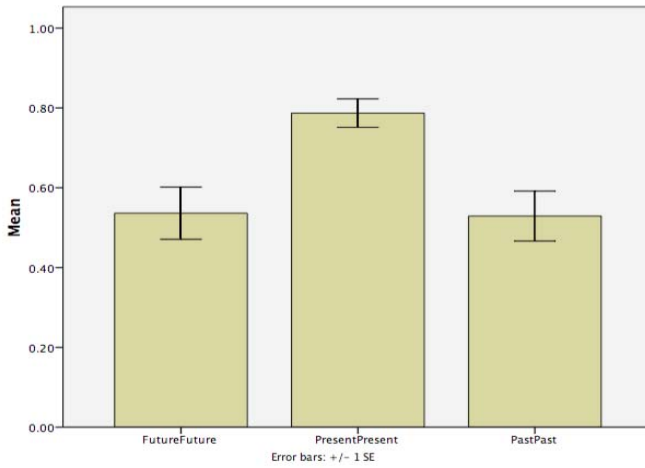


Figure 5. Significant Differences Among Future, Present and Past Tense Image and Sentence Matches

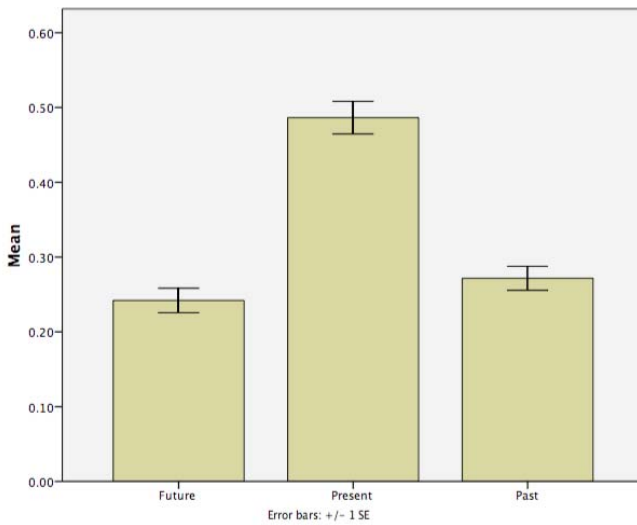


Figure 6. Significant Differences Among Future, Present and Past Tense Choices, Regardless of Correctness

Returning to our research questions, what impact did lexical aspect have on children's interpretations? Specifically, if lexical aspect guides children's choices of temporal interpretations, as in Jackson-Maldonado & Maldonado's (2001) production study, children should do better at interpreting past sentences when they involve telic verbs and present sentences when they involve atelic verbs.

The finding that lexical aspect, grammatical aspect and tense fall together in child Spanish production is replicated in our study of child Spanish comprehension. Mean scores for past telics (62.3%) were significantly better than for past atelics (43.4%):  $t(22) = 3.12, p = .005$ . Mean scores for present atelics (85.5%) were significantly better than for present telics (72.5%):  $t(22) = 2.83, p = .010$ , as illustrated in Figure 7.

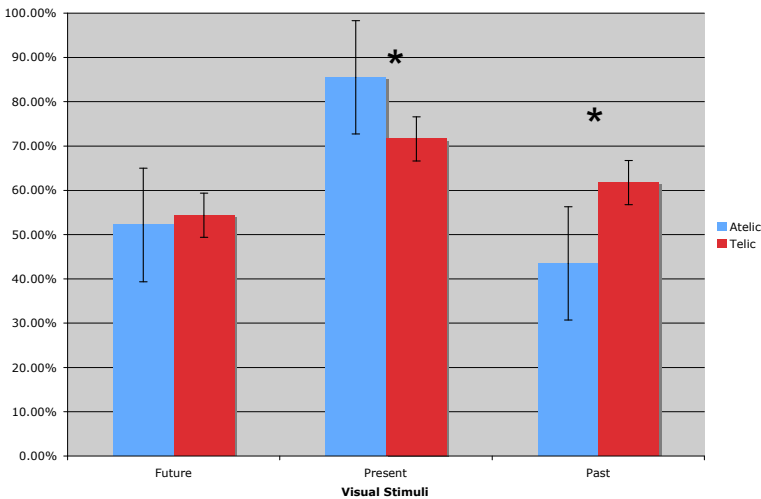


Figure 7. Telicity Comparisons For Each Tense/Aspect Combination

#### 4. Discussion

In this article, we have observed that child Spanish-speakers pass through the Optional Infinitive Stage, as measured by elicited production and grammaticality judgment tasks. On the basis of this non-adult-like tense behavior, we have asked whether they would have adult-like temporal interpretations or whether these, too, would be child-particular. We have taken the prototypical combinations of lexical aspect, grammatical aspect and tense observed in many languages to be adult-like and our experiment has shown that child Spanish-speakers are better than chance at associating past-perfective predicates with images representing past-perfective events and similarly at associating ongoing-present predicates and images. Further, as in the majority of adult and child language studies, we have found that children

are better at associating prototypical combinations of tense and aspect than they are at atypical combinations.

In short, in the same way that the Spanish-speaking children in Grinstead et al. (2008) are proficient, though not quite adult-like, in their productions and judgments of morphosyntactic tense, the children in this study, who are of a similar age, are proficient, though not quite adult-like, in their temporal interpretations. What this seems to suggest is a consistency between the syntax and semantics of tense in development and that the linguistic representations across subdomains of language are related, as an integrated linguistic account of language development would predict.

Given the evidence presented earlier that the grammaticality judgments and elicited and spontaneous productions of child Spanish speakers are not adult-like with respect to tense marking, these results might at first blush seem to constitute a kind of counter-evidence. However, we hasten to point out that the grammars of children in the optional infinitive stage are more powerful than the adult grammars of the same languages in that they generate a larger set of utterances than the adult grammar, which includes both root finite and root nonfinite verbs. What we have seen in this study is that children are relatively adult-like in their interpretations of finite verbs. This is in no way contradictory with the possibility that their grammars also allow root infinitives, which were not tested here.

A further question raised by this line of research is whether prototypical combinations of lexical and grammatical aspect will associate with prototypical temporal interpretations in the nonfinite verbs used by Spanish-speaking children in the Optional Infinitive Stage. The answer to this question will await future research.

Returning to the over-arching question of how temporal and aspectual inflectional morphology fit into a model of grammar, we have seen that the lexicon and morphology integrate to produce prototypical combinations of lexical aspect, grammatical aspect and tense and that Spanish-speaking children are aware of and use these combinations from very young. Our evidence for this conclusion comes from children's interpretations of sentences which they had to match with pictures portraying different tense-aspect combinations. This evidence demonstrates that the lexical-morphological pairings had to be further integrated by syntax into compositional meanings which were interpretable by the children's semantic knowledge in order to perform the task. In this way, we see how lexical properties integrate with inflectional properties to produce predicates that syntax composes to be interpretable by semantic knowledge. Finally, we see that these semantic representations are shaped, if Wagner (in press) is correct, by non-linguistic cognitive constraints which cause telic predicates to be prototypically interpreted as perfective and past, while atelic predicates are prototypically interpreted as imperfective and present.

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