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BRIEF ARTICLE

Children's Knowledge of the Spanish Copulas *Ser* and *Estar* with Novel Adjectives

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Previous research suggests that children's behavior with respect to the interpretation of the Spanish copulas *ser* and *estar* may differ depending on their knowledge of the world and whether the copulas occur with real adjectives or novel adjectives in the experimental prompt: Whereas 5-year-old children associate *estar* + real adjective combinations to temporary properties (Schmitt & Miller 2007), children as old as 12 years of age are not adultlike in their interpretation of *estar* + novel adjective combinations, where novel adjectives are paired with properties for which children already have a Spanish word (Alonqueo 2007). In this article, we present two experimental studies on Puerto Rican children's use of copulas and show that when novel adjectives are paired with novel properties and those novel adjectives occur in the experimental prompt with the copula *estar*, children associate the novel adjective to a temporary property by 4 years of age. These results highlight the importance of the copula to the meaning of the copula + adjective combination.

1. INTRODUCTION

The Spanish copula verbs *ser* and *estar*—as illustrated in (1) and (2)—have been the focus of a variety of studies on adult language (Brown & Torres-Cortés 2012; Bruhn de Garavito & Valenzuela 2006; Geeslin 2002, 2003; Silva-Corvalán 1986; Woolsey 2009), and recently acquisition of the copulas in children has received a lot of attention (Alonqueo 2007; Holtheuer & Rendle-Short 2013; Holtheuer 2009; Liceras, Fernández-Fuertes, & Alba de la Fuente 2012; Schmitt, Miller, & Holtheuer 2012; Schmitt & Miller 2007; Sera 1992; Silva-Corvalán & Montanari 2008).¹

¹See Becker (2002, 2004) for a discussion of the English copula and a description about how it is acquired in English-speaking children.

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(1) Bella es gorda.

Belle *ser*-BE.3SG fat

Belle is fat.

(2) Bella está gorda.

Belle *estar*-BE.3SG fat

Bella is (looking) fat

The Spanish copulas *ser* and *estar* show overlapping, but not identical, distributions. Both copulas can occur with adjectives—as shown in (1) and (2)—and also with prepositional phrases, although *estar* occurs more frequently with prepositional phrases than *ser*. *Estar* is used in progressive constructions (e.g., *Jorge está trabajando* ‘Jorge is-ESTAR working’), while *ser* is used in passive constructions (e.g., *El libro fue escrito por Juan* ‘The book was-SER written by John’). In addition, *ser* takes nominal predicates (e.g., *Pedro es profesor* ‘Pedro is-SER (a) teacher’), while *estar* does not.

According to traditional textbook descriptions, adjectives occurring with *ser*—as in (1)—generally denote inherent or permanent properties (e.g., Belle is a fat person) and adjectives occurring with *estar*—illustrated in (2)—tend to denote temporary or transitory properties (e.g., Belle became fat after eating a lot of food). While this description captures the general difference, the distinction is more complex, and various syntactic, semantic, and pragmatic proposals have been put forth to account for the distribution of the copulas (Brown & Torres-Cortés 2012; Luján 1981; Maienborn 2005; Schmitt 1996, 2005).

One view of *ser* and *estar* is that the entire [copula + adjective] construction has specific pragmatic and semantic characteristics and that interpretation arises from the speaker’s knowledge of how each construction is used in the discourse (as determined by variationist analyses). Under this view it is the properties of the co-occurring adjective (e.g., adjective class: size, age, mental, physical state) and the discourse (frame of reference, speaker’s experience with the referent) that are important for meaning (Brown & Torres-Cortés 2012).

An alternative view is that the copulas have a semantic representation independent of the adjective with which they occur and that the distribution of the copulas found in spontaneous speech data (i.e., variationist studies of speech corpora) is the result of this underlying semantic representation. Schmitt (1996) argues that the two copulas are semantically distinct and that the difference between them lies in their aspectual properties: *Estar* is specified for aspectual properties in that it is temporally anchored to the discourse, while *ser* is underspecified for aspect. This view of the copulas differs from the former view in that the copula alone is deemed more important for interpretation.

Regardless of the view that one takes, the copulas *ser* and *estar* present an interesting problem for acquisition because their use in adult speech (i.e., the input to children) often depends upon very subtle pragmatic properties of the context situation and the speaker’s point of view, and past research has indicated that children have difficulty integrating elements of the discourse in their interpretation of language (Drozd 2001; Kramer 2000; Munn, Miller, & Schmitt 2006). Holtheuer (2011) summarizes the different interpretations that arise from the two copulas noting that: “. . . *ser* predicates are more relaxed than *estar* predicates in temporal terms. . . . *Ser* is seen

as disconnected from the discourse while *estar* is seen as establishing a link to the discourse” (p. 45). Because *estar* is temporally anchored to the discourse, it gives rise to an implicature of temporariness. On the other hand, *ser* is not temporally linked and, as such, its predicate often receives an inherent/permanent interpretation by default (i.e., it holds regardless of time) (see Holtheuer 2009; Schmitt & Miller 2007, and references therein.)

One observation that has emerged from previous investigations on *ser* and *estar* is that 4- and 5-year-old children are often very restrictive in their interpretation of *estar*—associating *estar* predicates to temporary properties—yet they show more flexibility in their interpretation of *ser* predicates, associating them to both temporary and inherent properties, a finding that is consistent with Schmitt (1996). Nevertheless, Schmitt & Miller (2007) conclude that children’s flexibility in their interpretation of *ser* predicates may also be related to their knowledge of the world. In particular, they assert that if the child knows the inherent properties of the objects or characters in the experimental task (e.g., that tongues are red, or that Sponge Bob has holes), they will be more likely to associate *ser* to the inherent property rather than the temporary property. However, they note that “as the context becomes more complex [i.e., when the inherent properties of the character are unknown] children seem to demonstrate the knowledge that, while *ser* is a copula that can be used in any context with the help of adverbials, *estar* seems to require a temporal interpretation” (p. 1926).

Different findings, however, have emerged from a second line of research carried out by Alonqueo (2007) who finds—through an innovative experimental paradigm testing novel adjectives—that children do not associate *estar* to transitory properties until about 12 years of age. One important difference between Alonqueo’s work and previous studies on *ser* and *estar* is the use of novel adjectives, which can help determine how important the copulas alone are to the interpretation of the [copula + adjective] construction. Since children have no previous input experience with the novel adjectives used in the study, the temporary or inherent interpretation assigned to the adjective rests on the child’s underlying representation of the copula. Alonqueo’s findings suggest—contrary to the previous work with real adjectives—that acquisition of the copulas occurs late and that previous results may be due to children’s interpretation of the [copula + adjective] construction as a whole.

In the present article, we explore the impact of new versus known information on children’s interpretation of the two copulas. We do this in two ways. First, like Alonqueo we pair the copulas with novel adjectives to determine whether children change their interpretation of the adjective depending on which copula it occurs with. However, unlike Alonqueo²—who examines novel adjectives representing real-world properties that Spanish already has a lexical item for (e.g., the novel word *dipa* represents the real property ‘dirty,’ which is *sucio* in Spanish), we introduce novel adjectives paired with novel properties (e.g., the novel word *pogo* represents the novel property of having Sponge-Bob-type holes all over one’s body) for which there is no Spanish adjective. Second, unlike most previous studies on *ser* and *estar* (but see Holtheuer 2009), we used known characters (e.g., Belle, Shrek, Woody) so that children had knowledge of their inherent properties and could easily compare the inherent properties to any new properties

²Further differences between Alonqueo’s study and the present design were that Alonqueo’s experiment used the copula when first introducing the novel adjective, involved inanimate characters, and asked children to choose from a set of three options, rather than just two options.

that were introduced. This allows us to test Schmitt & Miller's hypothesis that world knowledge will increase inherent interpretations of *ser*. The goal of this article is to add to the body of research on acquisition of the copulas by examining children's ability to associate adjectives occurring with *ser* and *estar* to inherent and transitory properties respectively.

This article is set up as follows. In [Section 2](#), we review previous studies on the acquisition of *ser* and *estar*. In [Section 3](#), we present two experiments on Puerto Rican Spanish-speaking children's knowledge of the copulas. [Section 4](#) provides a discussion and conclusion.

2. CHILD ACQUISITION OF *SER* AND *ESTAR*

The main goal of previous research on children's acquisition of the copula verbs has been to determine the age at which children show adultlike distributions of the copulas in production and the age at which they make the temporary/inherent distinction of the copulas + adjectives in comprehension.

In production, children have been shown to use the copulas in a variety of syntactic constructions that are consistent with the adult speech by 3 years of age (Holtheuer 2009; Sera 1992; Silva-Corvalán & Montanari 2008). Holtheuer (2009) is the first large-scale study on the early acquisition of the distribution of the two copulas. In a corpus analysis of 22 hours of 11 caregiver-child interactions (ages 1;10–3;07), she finds that children make few errors in their use of the copulas and that—with respect to the use of the copulas with adjectives—children produce the adjectives with either *ser* or *estar* but rarely produce the same adjective with both copulas. In particular, Holtheuer reports that children produced copulas with 47 adjectives: 19 adjectives with *ser*, 24 adjectives with *estar*, but only four adjectives with both *ser* and *estar*. Even so, Holtheuer notes that of the 19 *ser* adjectives, all but two of them could also occur with *estar* in adult speech if a temporary interpretation were intended. However, for the 24 *estar* adjectives, only 12 of them could also occur with *ser* in the adult speech (see also Silva-Corvalán & Montanari 2008 for data with Spanish-English bilingual children). While certain adjectives may occur more frequently with one copula or the other—as indicated by corpus studies—it is important to emphasize that many adjectives can occur with both copulas. While corpus studies can provide information about the frequency of certain copula + adjective combinations, they cannot provide evidence for the existence (or lack thereof) of copula + adjective combinations in the input. If particular combinations are not frequently produced, they may not show up in the corpus data; moreover, certain caregiver-child discourse genres will bias toward the use of particular combinations over others.

Comprehension studies have indicated that adjectives occurring with *estar* are associated to transitory properties when the adjectives are real words that children know. One recurring experimental paradigm—presented in Schmitt & Miller (2007)—has been to introduce two new characters who were born with certain properties (e.g., a cat that was born fat or skinny) and then to alter those properties temporarily during the course of the experiment (e.g., the fat cat becomes temporarily skinny after eating magic beans). The goal of this experimental manipulation was to create a context where the cat was inherently (*ser*) fat but was temporally (*estar*) skinny.

Schmitt & Miller's initial study found that children were restrictive in their interpretation of *estar*, associating it to transitory properties by 5 years of age, but were more flexible in their interpretation of *ser*, allowing it to represent both temporary and inherent properties, which Schmitt and Miller note is expected, since *ser* is unspecified for temporal information. Since this initial

study, modifications of this experimental paradigm were carried out using the same experimental pictures and stories, and the findings continue to show the same results—that children are more restrictive in their use of *estar* and more flexible in their use of *ser* (Holtheuer, Miller, & Schmitt 2011). One drawback of this work is that children must learn during the experimental task not only the temporary properties of the characters in the story, but also the inherent properties, since the characters in the experimental story are new to the children.

In Schmitt & Miller (2007) the more flexible use of *ser* in children's comprehension was not found in the adult behavior. Unlike children, the adult controls showed more restrictive interpretations of *ser*, associating it to inherent properties. One explanation of this difference between child and adult behavior may be related to contextual factors. Many studies emphasize the importance of contextually salient information in child interpretation of utterances, information which is often absent in experimental studies (Gualmini et al. 2008; Gualmini 2004; Kramer 2000). Schmitt, Holtheuer, & Miller (2004) indicate this also may be the case for the comprehension of *ser* and *estar* by showing that children's interpretation of *ser* becomes more adult-like—children associate *ser* with inherent properties more often—when the character or object and the inherent property are previously known to the child (see also Holtheuer 2012).

One way to tease apart the contribution of the copulas in children's interpretation of copula + adjective combinations is through an experimental design that uses novel adjectives. The hypothesis is that if children have a semantic representation for *estar* that includes a temporal feature, they will assign a temporary/transitory interpretation to any novel adjective that occurs with *estar*. Alonqueo (2007) tests this hypothesis and finds that it is not until around 12 years of age that children acquire nativelike comprehension of the temporariness associated to *estar* (see also Alonqueo & Soto 2011 for production of adjectives describing personality traits), suggesting that the interpretation that children assigned to the copula + adjective combinations in previous studies may be related to their knowledge of the real adjectives that were used and less so to their knowledge of the copulas.

While Alonqueo (2007) presents a variety of experimental studies on the acquisition of *ser* and *estar* in Spanish-speaking children, we will focus here on the one that is most relevant for the purposes of the present article. The experiment used a picture matching task in which children were shown pictures of familiar objects (e.g., towel, cup, dress, candle, box, among others) while a puppet used novel adjectives to describe the objects. The novel adjectives represented inherent properties (e.g., colors: blue or green, shapes: square or round, and size: big or small) and temporary properties (e.g., dirty, open, lit, and full). Figure 1 shows a sketch of a sample trial (Note that for clarity we wrote the word that represents the properties that each object had). Children were presented first with one object (Towel 1) and a novel adjective (e.g., *lusante*) describing one of the properties of the object. The novel adjective was always introduced with either *ser* or *estar*. The assumption of the task was that if the novel adjective was introduced with *ser* for Towel 1, then children would associate the novel adjective (e.g., *lusante*) to the color blue. If the novel adjective (e.g., *lusante*) was introduced with *estar*, children should associate the adjective to the property of being dirty. After this introduction phase, children were then asked to look at the next three objects (Towels 2, 3, and 4) and decide which one was (*ser/estar*) *lusante*. If the copula *ser* was used in the introduction phase, the expectation was that children would choose Towel 2 because they would have interpreted *lusante* as representing the color blue. If the copula *estar* was used in the introduction phase, children would choose Towel 3 because *lusante* would have been interpreted as associated to the property of dirtiness.

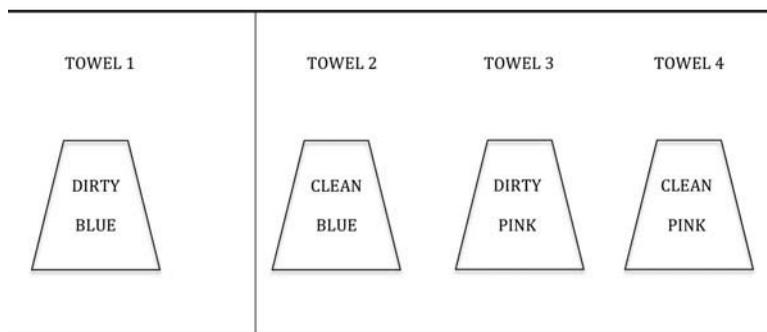


FIGURE 1 Sample drawing of experimental display used in Alonqueo 2007.

It is possible that young children's poor performance on this task is due to having difficulty learning a new word for properties that they already have words for, a finding which may be related to the mutual exclusivity principle (Markman, Wasow, & Hansen 2003; Markman 1989)—whereby children show a dispreference for allowing second labels for an object that they already have a name for—and Clark's (1983) principle of contrast, which states that a difference in form indicates a difference in meaning (Clark 1983).

In the present study, we extend upon Alonqueo's study by presenting the copulas with novel adjectives representing novel properties for which Spanish does not already have a word. This will allow us to determine whether children associate just *estar* to a temporal interpretation. In addition, we use well-known characters in the stories so that children already know the inherent properties of each character. This will allow us to determine whether children's past flexibility in their interpretation of *ser* is the result of having to learn the inherent properties of the characters during the task. We seek to answer the following two research questions:

- (i) Will children associate novel adjectives representing novel properties to temporary interpretations when the adjectives are presented with the copula *estar* in the experiment?
- (ii) Does the use of known characters with known properties result in more inherent interpretations of *ser* in children?

3. EXPERIMENTAL STUDY

Experiment 1 asks whether children distinguish between *ser* and *estar* when they occur with real adjectives. Experiment 2 goes a step further by asking whether children will infer inherent or transitory interpretations of novel adjectives when they occur with *ser* and *estar* respectively. We used a between-subjects design such that participants were either tested only on *ser* or on *estar*. This means that each participant heard the same copula in both experiments. Given that our study seeks to eliminate the lexical effect of particular copula + adjective combinations, Experiment 2 (with novel adjectives) was run before Experiment 1 (with real adjectives). In this way, we could lessen the possibility that participants might activate a familiar copula + real adjective combination that might impact their interpretation of the novel adjectives.

3.1. Participants

Fifty-two monolingual Spanish-speaking children from Puerto Rico (4;00–7;00; $M = 5;08$) participated in both experiments. Children were divided into two groups: 27 children (4;00–7;02, mean 5;07) were tested on *ser* and 25 children (4;00–6;11, mean 5;08) were tested on *estar*. Eight Puerto Rican adults from the same local area were tested to determine adult behavior.

3.2. Experiment 1: Real Adjectives

3.2.1. Stimuli and Design

We used a Picture Matching Task that followed very closely the design of Schmitt & Miller (2007) except that we used well-known cartoon characters. Children were told a story about two cartoon characters that underwent a change in size after eating magic beans. After hearing the story, they were asked to point to the character that was described in an experimental prompt with either *ser* or *estar*. Figure 2 shows a sample experimental trial. All pictures were shown in color.

In each experimental trial, one of the characters changed in size, and the other changed in color. Upon hearing the experimental prompt with *ser* (*¿Cuál es gorda?* ‘Which is:SER fat?’), the expectation was that children would choose Ursula (character on the right who is inherently fat) if they associate *ser* with inherent properties. Upon hearing the experimental prompt with *estar* (*¿Cuál está gorda?* ‘Which is:ESTAR fat?’), they should choose Belle (character on the left who became fat after eating the beans) if they associate *estar* to temporary properties.

We used similar adjectives to those used in Schmitt & Miller (2007): (*gordo* ‘fat,’ *flaco* ‘thin,’ *alto* ‘tall,’ *bajo* ‘short’); however, we changed *bajo* to *pequeño* (both can mean ‘short’) because the second author—a native speaker of Puerto Rican Spanish—found *pequeño* to be more commonly used to describe a person’s size. Two adjectives were presented in the feminine form and two in the masculine form. Thus, our four experimental trials included: *gorda* ‘fat-FEM,’ *flaco* ‘thin-MASC,’ *alto* ‘tall-MASC,’ and *pequeña* ‘small-FEM.’ Three of the four adjectives were found to occur with both *ser* and *estar* in a corpus study of adult-to-adult Puerto Rican Speech, as shown in Table 1 (Brown & Torres-Cortés 2012). Testing began with two practice trials; no distractors or fillers were included.

3.2.2. Procedure

Children were tested in a quiet room in a private elementary school in Puerto Rico. Parental written consent and child oral consent were obtained for each child. The researcher (second author of this article and native speaker of Puerto Rican Spanish and from the same local area as the children) started the experiment by playing with children using puzzles and books that contained the characters used in the tasks. Next, the researcher presented the child with the first slide (Figure 2, Slide 1) to check children’s familiarity with each character by asking whether or not they knew their names, where they had seen them before, and whether or not they knew any of their friends (e.g., *¿Los conoces?* *¿Cómo se llaman?* *¿Dónde los has visto?* *¿Tienen amigos?* ‘Do you know them? What are their names? Where have you seen them? Do they have friends?’).

Script	Pictures
	Slide 1
Ahora te voy a contar una historia de lo que les pasa a estos personajes cuando toman pastillas mágicas. 'I am going to tell you a story about what happens when these characters take magic pills.' (Pictures of Belle and Ursula blink to catch child's attention)	
Cuando Bella y Úrsula las toman. 'When Belle and Ursula take them.'	Slide 2
	
¡Míralas! 1. ¿Cuál es gorda? 2. ¿Cuál está gorda? <i>'Look at them!</i> 1. Which one is:SER fat? 2. Which one is:ESTAR fat?	Slide 3
	

FIGURE 2 Sample trial for Experiment 1.

TABLE 1
Distribution of *Estar* in Puerto Rican Adult-to-Adult Spanish
(adapted from Brown & Cortés-Torres 2012)

Adjective	% <i>Estar</i>	Total N
<i>flaco</i> 'thin'	68	22
<i>gordo</i> 'fat'	68	22
<i>grande</i> 'big'	21	92
<i>chiquito</i> 'small'	12	33

Note. *Chiquito* ('small') was included as a comparison to *pequeño* ('little'). In B&C-T's corpus study, *pequeño* was not discussed as being used with copulas.

Children who answered two or more of these questions correctly for a character were assumed to be familiar with that character. After successful identification of the characters, the main part of the experiment began.

3.3. Experiment 2: Novel Adjectives

The second experiment used a similar design to the one used in the first experiment, except that Experiment 2 used novel adjectives to refer to novel properties.

3.3.1. Stimuli and Design

Similar to Experiment 1, a Picture Matching Task was used in Experiment 2. A sample trial is shown in Figure 3. Children were told a story about a boy named Juan who underwent a transformation after eating magic candy. While Juan was in his transformed state, the researcher introduced the novel adjective to the child by presenting it in a sentence frame where adjectives generally occur (e.g., *¡Qué gudo! ¡Muy gudo!* ‘How gudo! Very gudo!’). Then, Juan changed back to his normal state. After hearing the story, children were asked to point to one of two cartoon characters that was described in the experimental prompt with either *ser* or *estar*. All pictures were in color.

Upon hearing the experimental prompt with *ser* (*¿Cuál es pogo?* ‘Which one is:SER pogo?’), the expectation was that children would choose Sponge Bob if they associate *ser* with inherent properties. Upon hearing the experimental prompt with *estar* (*¿Cuál está pogo?* ‘Which one is:ESTAR pogo?’), they should choose Spiderman if they associate *estar* to temporary properties. There were four experimental trials that were preceded by three practice trials where children practiced learning novel nouns. The practice trials were used to familiarize children with learning novel words for novel objects so that they would feel comfortable with this sort of task. The four novel adjectives with their corresponding pictures are shown in the appendix.

3.4. Results

In Experiment 1 children associated *estar* + real adjectives to transitory properties 86% of the time and *ser* + real adjectives to inherent properties 44% of the time. These percentages are very similar to those reported in Schmitt & Miller (2007), except that we find a slightly higher percentage of choosing the transitory property in our *estar* condition (77% in Schmitt & Miller). In other words, we did not find that the use of well-known characters resulted in increased inherent readings for *ser*. The temporary picture (out of four trials) was chosen at higher rates in the *estar* condition ($M = 3.36$, $SD = 1.15$) than in the *ser* condition ($M = 2.22$, $SD = 1.55$). Figure 4 shows the percentages for each adjective. Levene’s Test for the Equality of Variances indicated unequal variances in the two groups ($F = 6.361$, $p = .015$), and the Shapiro-Wilk test showed that the data were not normally distributed, $W(52) = .816$, $p = .000$. As such, a nonparametric test was used to compare children’s selection of the temporary picture across the two conditions. An independent samples Mann-Whitney Test showed that the children differed significantly in their choice of the temporary picture in the *ser* versus *estar* conditions, $U(52) = 501.5$, $p = .001$. In addition, there was no correlation between the children’s age and choosing the temporary

Script	Pictures
<p>Ahora viene una historia de Juan y alguien más. Adivina adivinador ¿Qué otros personajes aparecerán con Juan en esta historia? A ver... <i>'Now comes the story about Juan and somebody else. Can you guess which characters will appear together with Juan in this story? Let's see...'</i> (Pictures of Spiderman and Sponge Bob blink to catch child's attention).</p>	<p style="text-align: center;">Slide 1</p> 
<p>Un día a Juan.... <i>One day to Juan....</i></p>	<p style="text-align: center;">Slide 2</p> 
<p>la bruja le dio un dulce mágico. <i>the witch gave a magic candy.</i></p>	<p style="text-align: center;">Slide 3</p> 
<p>Y, ¡míralo aquí! ¡Qué pogo! ¡Muy pogo! <i>And look here! How Pogo! Very pogo!</i></p>	<p style="text-align: center;">Slide 4</p> 
<p>Pero después de un rato... míralo otra vez. <i>But after a while... look at him again.</i></p>	<p style="text-align: center;">Slide 5</p> 
<p>1. ¿Cuál es pogo? 2. ¿Cuál está pogo? <i>Look at them!</i> <i>1. Which one is:SER pogo?</i> <i>2. Which one is:ESTAR pogo?</i></p>	<p style="text-align: center;">Slide 6</p> 

FIGURE 3 Sample trial for Experiment 2.

picture in neither the *ser* condition ($r = -.054, df = 25, p = .789$) nor in the *estar* condition ($r = .067, df = 22, p = .751$). This indicates that Puerto Rican children associate *estar* to transitory properties significantly more often than they do so for *ser* and that—at least for the ages discussed here—performance does not change as a function of the children's age. Adult controls performed

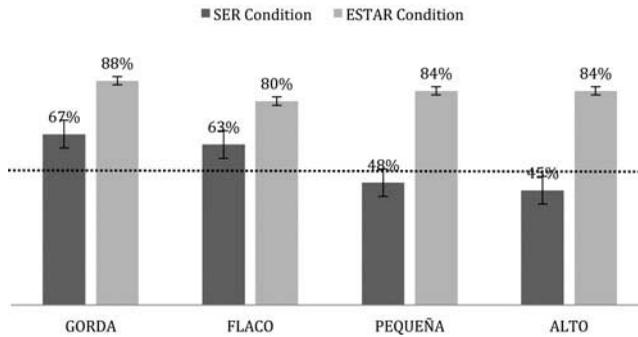


FIGURE 4 Percentage of temporary picture choice with *ser* and *estar* in Experiment 1.

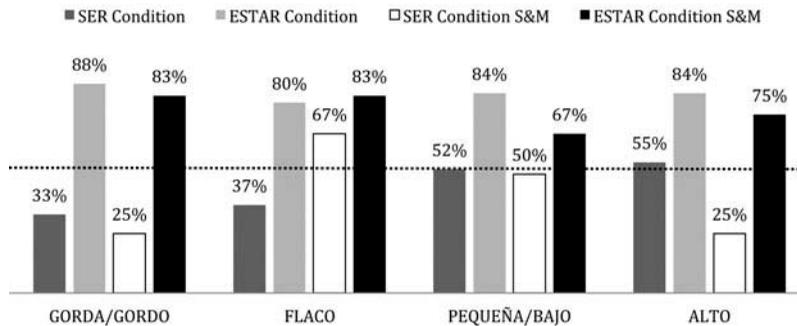


FIGURE 5 Experiment 1 results compared to results from Miller & Schmitt 2007.

at ceiling in the four trials, never choosing the temporary picture in the *ser* condition and always choosing only the temporary picture in the *estar* condition.

These results—taken together with those in Schmitt & Miller (2007)—indicate that by 4 years of age children show a strong preference for associating *estar* + real adjectives to transitory properties but are flexible in their interpretation of *ser* + real adjectives, regardless of whether they know the inherent properties of the characters or not. In other words, contrary to Schmitt & Miller's prediction, real-world knowledge did not increase children's inherent interpretation of adjectives occurring with *ser*. Figure 5 shows the results of Experiment 1 compared to those from Schmitt & Miller (2007).

One limitation of previous experimental studies—including Experiment 1—is that the adjective may have biased children toward one interpretation or the other, as indicated in Figure 5. In order to determine the contribution of the copula alone, we designed Experiment 2, which tests novel adjectives with novel properties. In Experiment 2, the character displaying a transitory property was chosen 71% of the time in the *estar* condition, whereas the picture displaying an inherent property was chosen only 40% of the time in the *ser* condition. Scores on the choice of the temporary picture (out of four trials) were higher for participants in the *estar* condition

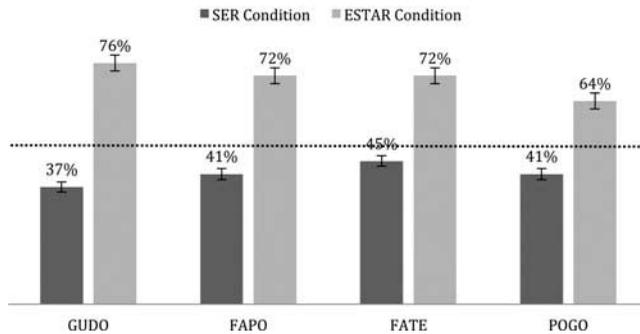


FIGURE 6 Percentage of temporary picture choice with *ser* and *estar* in Experiment 2.

($M = 2.84$, $SD = 1.59$) than for participants in the *ser* condition ($M = 1.59$, $SD = 1.73$). Percentages are shown in Figure 6. Levene's Test for the Equality of Variances indicated that unequal variances was not an issue ($F = 1.452$, $p = .234$); however, the Shapiro-Wilk Test showed that the data were not normally distributed, $W(52) = .761$, $p = .000$. Thus, a nonparametric test was used to compare children's selection of the temporary picture across conditions. An independent samples Mann-Whitney Test showed—similar to Experiment 1—that children differed significantly in their choice of the temporary picture in the *ser* versus *estar* conditions, $U(52) = 469.0$, $p = .011$. Furthermore, there was no correlation between the children's age and choosing the temporary picture in the *ser* condition ($r = -.100$, $df = 25$, $p = .620$); however, there was a significant correlation in the *estar* condition ($r = -.398$, $df = 23$, $p = .049$), which indicates that performance changed as a function of the children's age. We next ran an additional Mann-Whitney nonparametric test on both the younger and older child groups. The results showed that the younger children chose the temporary picture in the *estar* condition significantly more often than in the *ser* condition, $U(21) = 83.000$, $p = .025$; however, the older children's differential behavior in the *ser* and *estar* conditions did not reach significance, $U(31) = 160.000$, $p = .109$.

The nonsignificant result for the older children is interesting and also somewhat surprising, given the results of Experiment 1. The data indicate that in older children there is a decrease in transitory interpretations of *estar*, suggesting that the interpretation of *estar* is less restrictive as age increases. It is noteworthy that in previous studies adults are also not as restrictive in their interpretation of *estar* as 4–5-year-old children are—although the adults in the present study were.

Schmitt & Miller (2007) find that adults associate *estar* to transitory properties only 50% of the time in comprehension tasks, and they suggest that adults may be picking different relevant time intervals or stages of the character with the inherent property when interpreting the *estar* + adjective construction (i.e., the inherent and the changed property both represent temporal slices in the same individual). In an elicitation task, Holthueur, Miller, & Schmitt (2011) also find that adults produce *estar* when describing transitory properties significantly less often than children do. Instead, adults often use *ser*. The children in the study, on the other hand, show a strong preference for using *estar* in transitory contexts.

It may be that in the present study the older children are becoming more adultlike and, as such, are becoming less restrictive in their interpretation of *estar*. We believe that this change in older children may have more to do with the ability to interpret the experimental question from more than one perspective rather than to a change in the underlying semantic representation of the copulas. However, further investigations are needed to untangle the variability that has been reported in copula interpretation in participants over 6 years of age. Nevertheless, the findings for the younger-child group indicate that at 4 and 5 years of age, Spanish-speaking children show a strong preference for associating *estar* with transitory properties. Figure 6 shows that—even in the presence of novel adjectives—children chose the transitory property when the novel adjective was presented with *estar* significantly more often than when it was presented with *ser*.

The findings reported here—taken together with those of previous studies on 4- and 5-year-old children—indicate that at 4 and 5 years of age, children have acquired the aspectual properties for the copula *estar* and interpret it as temporally anchored to the discourse.

4. CONCLUSION

In summary, this article has documented Puerto Rican children's interpretation of both real and novel adjectives when they occur with the copulas *ser* and *estar* and, in addition, the article has examined the importance of real-world knowledge on children's interpretation of *ser* + adjective combinations. This study reveals that by 4 years of age, Puerto Rican children overwhelmingly associate *estar*—but not *ser*—to a temporal interpretation, indicating that they have acquired the knowledge that *estar* is temporally anchored, while *ser* is underspecified for aspect.

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APPENDIX

Novel Adjective and Novel Property	Inherent Property	Temporary Property
<p>GUDO</p> 	<p>Mike</p> 	<p>Mickey Mouse</p> 
<p>FAPO</p> 	<p>Tigger</p> 	<p>Winnie the Pooh</p> 
<p>FATE</p> 	<p>Lisa Simpson</p> 	<p>Dora the Explorer</p> 
<p>POGO</p> 	<p>Sponge Bob</p> 	<p>Spiderman</p> 