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

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Abstract

This study examines the comprehension of the Spanish copulas *ser* and *estar* by Puerto Rican children between the ages of 4;0-7;0 (M = 5;8). Fifty-two Spanish-speaking children (20 boys and 32 girls) were presented with a picture matching task that included known cartoon characters. After having heard and seen a story, children had to decide which character responds to a question that included one of the copulas. Our results showed that in the *ser* condition, participants chose the permanent picture 44% of the time; whereas in the *estar* condition they chose the temporary picture 86% of the time. This study shows that by the age of 4, children seem to understand the differences between Spanish copula + adjective.

1. Introduction

The current paper addresses children's interpretation of adjectives when they are paired with the Spanish copulas *ser* and *estar*. In recent years there has been an increasing interest in children's knowledge of the copulas at various stages of development. Because the distinction between the two copulas is often quite subtle, previous work has focused on determining what properties of the input allow the learner to bootstrap these very subtle meaning differences (Schmitt, Miller, & Holtheuer, 2012). Since very little is known about the acquisition of the copulas, the goal of most work has been first to establish the learner's knowledge at various stages of development and also to also examine the properties of the input. One set of experimental studies testing child comprehension has investigated whether children associate adjectives occurring with *estar* (but not *ser*) to transitory properties. While the results of these studies have moved us closer to an understanding of child knowledge of the copulas, we believe there are still questions to be addressed. One such issue is related to children's underlying knowledge about the inherent properties of the characters used in experimental tasks. In particular, most previous studies introduced new or unknown characters to children, a task that requires the child to learn during the experimental session not only about the transitory (TEMP) properties of those characters, but also about their inherent properties (PERM). That work has shown that children are able to learn very quickly the inherent properties and transitory properties of novel characters (Schmitt & Miller, 2007); however, children's performance on the interpretation of *ser* + adjective was not always as high as might be expected. To address this issue, in the present study we include familiar characters (well-known cartoon characters) with known properties to determine whether this impacts children's interpretation of *ser* and also of *estar* followed by adjectives. As such, this paper builds on and extends previous research. The following two research questions guide our study:

1. How do Spanish-speaking children interpret adjectives occurring with *ser* and *estar*?
2. How does the use of familiar characters with known inherent properties affect children's performance?

2. Linguistic Background

The distribution of *ser* and *estar* varies by syntactic context. For instance, nominal predicates are only allowed with *ser*. This copula could appear as the auxiliary verb in passive constructions, while *estar* is the progressive auxiliary. However, both copulas can appear with prepositional phrases, adverbial phrases, and adjectival phrases. In this case, the interpretation is different with each copula.

In order to explain the differences between *ser* and *estar* + adjective, traditional textbook accounts often attribute permanent (PERM) properties to *ser* and temporary (TEMP) properties to *estar*. These generalizations are illustrated in examples (1) and (2) below.

(1) El perro es negro
The dog SER-PRES.3SG black
'The dog is black'
(2) El perro está enfermo
The dog ESTAR-PRES.3SG sick
'The dog is sick'

In the first example (1), the use of *ser* indicates that the dog's color is fairly permanent. In (2), the use of *estar* is associated to a temporary property. However, these generalizations do not always hold, especially when dealing with adjectives. Two clear examples of this are shown in (3) and (4). The adjective *muerto* 'dead' in (3) requires the copula *estar* even though being dead is considered a permanent condition. Example (4) shows another instance in which *estar* allows uses that are considered to be permanent. These examples suggest that the terms 'permanent' and 'temporary' may not seem to be the best way to differentiate between the two copulas.

(3) Mi primo ?es/está muerto
My cousin ?SER/ESTAR-PRES.3SG dead
'My counin is dead.'
(4) Puerto Rico *está* en el Caribe
Puerto Rico ESTAR-PRES.3SG in the Caribbean
'Puerto Rico is in the Caribbean.'

Franco and Steinmentz (1986) approach the selection of the copulas from a somehow different perspective. They argue that the selection of *ser* or *estar* in constructions with predicative adjectives can express different types of implied comparisons. In example (5) *ser* is used to express an implied comparison of the type X/Y; that is, an entity X is compared with one or more entities Y, which provides the standard by which a quality is attributed to X. That is, Laura (X) is skinny and we can compare Laura with Rosa (Y), so Laura is skinnier than Rosa. By contrast, in example (6), *estar* implies a comparison of the type X/X, where, an entity X is compared to itself. Here, the comparison is between Laura at certain point in time (Xa) with Laura at another point in time (Xb). Therefore, when the construction *ser* + predicative adjective is used in a sentence it is a *class* comparison. However, when *estar* + predicative adjective is used, it is an *individual* comparison.

(5) Laura *es* delgada
Laura SER-PRES.3SG thin
'Laura is thin.'
(6) Laura *está* delgada
Laura ESTAR-PRES.3SG thin
'Laura is thin.'

Schmitt (1992, 1997, 2005) has argued that the two copulas are semantically and syntactically distinct. *Estar* predicates are always interpreted as states, so they always receive *stage level* (SL) readings. That is, since *estar* is a state that holds at time *t*, it implies temporariness. Moreover, *ser* is flexible in terms of its event type properties. This proposal incorporates syntactic factors to traditional semantic interpretations of these copulas. Schmitt (*op cit*) and others propose then that the difference between *ser* and *estar* is aspectual. That is, *estar* holds at time *t*, and thus it triggers an implicature of temporariness. Moreover, *ser* is flexible in terms of its event type properties, so it could be considered the *default*.

Given that the purpose of this paper is not to provide evidence for one account or another but to shed further light on the knowledge of children's comprehension of the copulas, we will assume that

estar has a more restrictive meaning in the temporal domain that can also be described in terms of a stage-level reading. However, we will also assume that the meaning of these predicates does not come from the copula in itself, but from the implicatures triggered by its choice. For simplicity, in this paper we will describe the meanings conveyed by *estar* as 'temporary'.

3. Acquisition Background

The study of monolingual acquisition of Spanish copulas *ser* and *estar* can be traced back twenty years ago to Sera's (1992) four studies which "As a beginning step […] started to map out the semantic and distributional bases of this unique linguistic contrast" (p. 423). Much more recently, Schmitt and Miller (2007) (SM) reported two studies that examine children's ability to distinguish the two copulas. The first one consisted on an elicitation task that required children to have previous knowledge of the color of different parts of the body (a tongue is:SER red but is:ESTAR green after eating green candy). The results indicated that Mexican and Chilean preschool children treat both copulas differently, associating *estar* to the TEMP properties. One crucial observation the authors make about this task is that knowledge of the world suffices to determine which color is the a-temporal (or PERM). Their second experiment, a picture-matching task, was conducted on Chilean preschoolers. It presented children with a three-stage story of two kittens (one fat and the other skinny). During the story the properties of these cats changed upon eating magic beans. In particular, one of the cats turns green (the fat cat) and the other cat turns fat (the previously skinny cat). They also told participants that this magic only lasted some minutes before both cats change back to their original size and color. After the story, participants were presented with a forced choice task where they were asked either *¿Cuál gato es gordo?* 'Which cat is (*ser*) fat?' (*ser* condition), or *¿Cuál gato está gordo?* 'Which cat is (estar) fat?' (*estar* condition) in a between subjects design. Their results showed that in the *estar* condition children chose the picture of the cat that had temporarily turned fat after eating the magic pills. The authors interpreted those results to suggest that children 4;7-6;0 understand that *estar* is temporally bounded and that, in addition, they use *estar* in a very restrictive way (as described by Schmitt, 1992, 2005). In other words, when presented with a complex discourse context, children behave differently from adults assigning a more restrictive TEMP interpretation to *estar*. In the *ser* condition, however, children performed at chance.

In the experiment we present below, we build on SM's second task by using cartoon characters that were familiar to the children. In this way our experiment also deals with discourse integration, but in a different way than in SM's work. While their task included more discourse in the preamble story told to the children (including between two and three mentions of the target adjectives), this one adds the positive effect of the sufficiency of world knowledge as a shortcut to the inherent properties of the characters in the stories. We hypothesized that by drawing on real world knowledge of the inherent properties, the *ser* condition would become easier and thus, participant performance would be above chance.

4. Experiment

In order to address our research questions an adapted experimental task was created.

4.1 Real Adjectives with Known Properties

The goal of this experiment was to investigate if Spanish-speaking children distinguish between *ser* and *estar* in comprehension. Also, it seeks to replicate SM's (2007) findings that children are able for the most part to comprehend the implicatures associated with the use of the two copulas between 4;7-6;0. Like their task, the one reported here included known properties (tall, short, fat, and thin) for which kids already knew the words. However, a modification to the original design was made to reduce task complexity by drawing on children's knowledge of the world about the PERM features of the characters involved in the task. Thus, cartoon characters that were familiar to the participants were used rather than introducing novel characters whose inherent properties the children would need to learn.

4.1.1 Participants

Fifty-two Spanish-speaking children (20 boys and 32 girls) between the ages of 4;0-7;0 (M = 5;8) and eight Spanish-speaking adults from the same community participated in the experimental task. The children were recruited at a preschool and an elementary school in Puerto Rico. Written consent from the parents was collected as well as oral assent from each child before testing.

4.1.2 Method, materials and procedure

A picture matching task (PMT) was used to test children's use of the copulas *ser* and *estar* in comprehension. This experimental task was made up of two phases: a familiarization phase and an experimental phase. Participants were tested in a quiet room in the school using a laptop computer. The task was presented as a slide show.

4.1.3 Familiarization Phase

During the familiarization phase, images of eight widely known cartoon characters (Belle, Woody, Dragon, Giant, Shrek, Aladdin, Ursula, and Tinker Bell) were shown to the participants and they were asked to identify those characters.

After successful identification of all the cartoon characters, participants were told that they would hear stories about those characters and were asked to anticipate which characters would appear in each upcoming story. A blinking animation on the screen drew participants' attention to two of the characters. See experimenter's script in (1).

(1) Experimenter:
Ahora te voy a contar historias de lo que les pasa a estos personajes cuando toman pastillas mágicas. ¿Qué dos personajes crees que aparecerán en esta historia?" Presta atención.
'Now I am going to tell you stories of what happens to these characters when they take magic pills. Which two characters do you believe will appear in this story? (Child answers and two characters blink.) Pay attention.'

4.1.4 Experimental Phase

The experiment consisted of two practice trials and four experimental trials. The practice trials aimed at making sure children could perform the task of pointing at the picture that answered a question introduced by: *¿Cuál tiene…* 'Which one has…?' The experimental trials contained the two-syllable adjectives: *gorda* 'fat.F', *flaco* 'thin.M', *alto* 'tall.M', *pequeña* 'small.F'. Two trials contained feminine adjectives and two contained masculine ones.

Each experimental trial consisted of a familiarization phase (one slide) plus the experimental story (two slides). The first one of the two experimental story slides contained a color image of two of the cartoon characters from the familiarization task depicted from a frontal perspective. This modification to the SM's task relied on children's knowledge of the world (i.e. on representations that children already had about how those characters generally look like) and as such, it made the task more naturalistic. The second slide of the experimental story (and last slide of each trial) consisted of images of the same two characters as in the previous slide, except for a critical change in each of the characters. For example, in the *gorda* 'fat.F' trial, Ursula was presented with her face green and Belle was presented as fat as Ursula (see slide 3 on Figure 1 below).

Slide 1	*Slide 2*	*Slide 3*
		
Ahora te voy a contar una historia de lo que les pasa a estos personajes cuando toman pastillas mágicas.	Cuando Bella y Ursula las toman.	¡Míralas! 1. ¿Cuál es gorda? 2. ¿Cuál está gorda?
'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)	*'When Belle and Ursula take them.'*	*'Look at them!'* *1. Which ser-PRES.3SG fat?* Which one is fat? (child could point to either character, or just points to Ursula) *2. Which estar-PRES.3SG fat?* Which one is fat? (child points to Belle)

Figure (1): Sample trial

Having presented the story about what happened to the cartoon characters after they took the magic pills, the experimenter asked the target question, as shown in slide 3 of Figure (1). This was a between subjects task. Twenty-seven children were asked the comprehension question 1 (with *ser*) and 25 children were asked the question 2 (using *estar*) in a between-subject design. Adults were tested on the same task as child participants.

4.1.5 Results

The adult control group performed almost categorically (>95%) as expected. In what follows, we report on child participants. In the *ser* condition, participants chose the PERM picture 44% of the time; whereas in the *estar* condition they chose the TEMP picture 86% of the time. These results are shown in Table 1. One-sample t-tests show that children performed at chance levels in the SER condition ($t(1,26)= -0.744$, $p= 0.5$).[1] This is not surprising in the light of the argument for *ser* implying a property that "holds independent of time" (Schmitt & Miller, 2007:1913). However, children chose the picture illustrating TEMP properties in the ESTAR condition at above chance levels ($t(1,23)=6.725$, $p=0.0001$).

[1] Schmitt & Miller (2007) found cases of children pointing at both pictures. Thus, they used 33% chance level as well as 50%. In this paper chance level was considered only 50%.

Table (1): Percentage of PERM picture choice with SER and and TEMP picture choice with ESTAR

SER Condition	% PERM interpretation (Bella)	ESTAR Condition	% TEMP interpretation (Ursula)
GORDA 'fat'	33 (9/27)	GORDA	88 (22/25)
FLACO 'thin'	37 (10/27)	FLACO	80 (20/25)
PEQUEÑA 'small'	52 (14/27)	PEQUEÑA	84 (21/25)
ALTO 'tall'	55 (15/27)	ALTO	84 (21/25)
Total	44.25 $p = .5$		86.25 $p = .0001$*

One-sample t-tests compared the performance of younger (4 and 5 year-old) and older (6 and 7 year-old) participants. The results show that both the younger ($t(1,7)=5.0$, $p=.002$) and older ($t(1.15)=5.168$, $p=.000$) groups chose the TEMP picture in the ESTAR condition significantly more often than the PERM picture. These results indicate that children treated the two copulas differently.

5. Discussion

The goal of this paper was to address two research questions mentioned below again. First, we explored how Spanish-speaking children interpret adjectives occurring with *ser* and *estar* and found that children treat both copulas differently in comprehension. Specifically, we found that *estar* triggers a TEMP interpretation even in the younger group. This result supports SM's report on *estar* having more restrictive temporal interpretation end provides evidence for child knowledge of the temporal meaning attached to *estar*. Second, we asked how the use of familiar characters with known inherent properties might affect children's performance. More specifically, we sought to test if this manipulation would change performance in the *ser* condition. The introduction of familiar characters does not seem to help children reach adult-like performance for the *ser* condition. Taken together with MS's results, this study finds additional support for children being more flexible with *ser* than with *estar*. Further studies (see Requena *et al*, in prep) should then focus on the strength of the interpretation achieved by *estar* + adjective, specifically to find out whether this effect could be driven by frequency effects due to the adjectives employed in the experimental design.

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