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Copulas *ser* and *estar* production in child and adult heritage speakers of Spanish

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Abstract

The present study examines the production of the Spanish copula verbs *ser* and *estar* among child and adult heritage speakers of Spanish born and raised in the United States. We investigate copula use in *estar*-favored and *ser*-favored adjectival predicates and in event locatives in which *ser* is required. We predicted overextension of *estar* with adjectives and with event locatives, following previous work. We also expected a relationship between language experience and target performance. Results showed ungrammatical use of copula *estar* in *ser*-favored adjectival contexts among the child heritage speakers. The adult heritage speakers, however, appear to overcome these divergences. Regarding event locatives, both experimental groups overextended *estar* significantly compared to child and monolingual baseline groups. We argue for protracted development in child and adult heritage Spanish stemming from input conditions, maturational development, and low patterns of language activation and use.

Keywords: Copula *ser* and *estar*; Spanish heritage speakers; Event locatives; Language activation and use

1. Introduction

Previous work on the acquisition of copula verbs *ser* and *estar* in Spanish has found divergences in the target production of copula *estar* in adjectival contexts and with event locatives. Sera (1992) found overextension of copula *estar* with event locatives where *ser* is required. Schmitt et al. (2004) also found inconsistent use of *estar* among five-year-olds, who achieved 83% accuracy with *ser* but only 29% accuracy with *estar*. Copula *estar* was overextended into *ser* contexts over 70% of the time. Similar overextension of *estar* and *estar* omission in contexts where *ser* is favored has been found among bilingual and multilingual children (e.g., Arnaus Gil, 2013; Arnaus Gil and Müller, 2015; Arnaus Gil et al., 2018; Fernández Fuertes and Liceras, 2010; Silva-Corvalán, 1986, 2014; Silva-Corvalán and Montanari, 2008) and second language (L2) learners of Spanish (e.g., Bruhn de Garavito and Valenzuela, 2008; Geeslin, 2002; Perpiñán et al., 2020; Pérez-Leroux et al., 2010; VanPatten, 1985). Regarding Spanish/English bilingual children specifically, Silva-Corvalán and Montanari (2008) found slight developmental delays in the use of *estar*, which they attribute to contact with English. More recently, Arnaus Gil et al. (2018) found significant *estar* omission in spontaneous production in adjectival contexts where *ser* was expected in Spanish among bilingual and trilingual children (Spanish--French, Spanish--Catalan--German, Spanish--French--Italian).

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We build on previous research by examining the acquisition of *ser* and *estar* in child and adult heritage speakers of Spanish of Mexican descent born and raised in the United States (U.S.). The current study is one of the first to focus on the acquisition of copula *ser* and *estar* among heritage speakers of Spanish in the U.S (Valenzuela et al., 2015). Specifically, we mirror previous work by Schmitt and Miller (2007) and Cuza and Guijarro-Fuentes (2017) in eliciting copula production in adjectival contexts in which either *ser* or *estar* are possible depending on the intended meaning of the speaker, and in event locatives where only *ser* is typically allowed, as in (1a) and (1b) below:

(1) a. Betty *está*/*es* guapa. (adjectival context, *ser*v/estarv)
"Betty is good looking."
b. La boda *es*/**está* en la iglesia. (event locative, *ser*v/estar*)
"The wedding is at the church."

In (1a), copula *estar* is used to indicate a temporal attribute of the subject while the use of *ser* is used to indicate a more permanent attribute. In (1b), only copula *ser* is allowed in Spanish to indicate event location. Copula selection with event locatives is challenging for bilingual speakers because the speaker has to take into consideration the subject of the clause, as opposed to non-eventive locatives (see Camacho, 2012).

In line with previous work, we expect overextension of *estar* in adjectival contexts in which *ser* is preferred (individual-level conditions denoting more permanent qualities) (e.g., Arnaus Gil, 2013; Arnaus Gil and Müller, 2015; Arnaus Gil et al., 2018). Furthermore, we expect child and adult heritage speakers to overextend *estar* to event locatives following previous work with Spanish/English bilingual children and L2 learners (e.g., Pérez-Leroux et al., 2010; Sera, 1992; Silva-Corvalán, 2014). Pérez-Leroux et al. (2010) found that English-speaking L2 learners of Spanish do not reject *estar* with event locations, but they do reject *ser* with object location. The authors argue that L2 learners are using the semantic cues of *estar* when locating events. This makes it difficult for the learner to reject *estar* when locating something in space, whether it is an object or an event (Pérez-Leroux et al., 2010, p. 216). Finally, we expect the asymmetries found, if any, to be related to the specific patterns of minority language use for production and interpretation, as recently argued by Sánchez and colleagues (e.g., Perez-Cortes et al., 2019; Putnam and Sánchez, 2013; Sánchez, 2019). We follow Sánchez's (2019) recent work to argue that some of the divergences that child and adult heritage speakers of Spanish have with copula selection might be explained in terms of their patterns of language experience and ability.

In Section 2, we discuss the syntax and semantics of copula verbs *ser* and *estar* in Spanish. Section 3 reviews previous work and presents the research questions and hypotheses of the study. We then present the study in Section 4 and the results in Section 5. The discussion and conclusions are presented in Section 6.

2. The syntax and semantics of copula *Ser* and *Estar* in Spanish

A copula verb typically establishes concepts such as existence/identity, location and inherent or temporal attributions. For example, English copula (to be) covers all of these functions while the Spanish copulas *ser* and *estar* can select different meanings depending on the intended meaning of the speaker (e.g., Camacho, 2012; Demonte and Masullo, 1999; Diesing, 1992; Leonetti et al., 2015; Maienborn, 2005). In some cases, both copulas are possible with adjectival predicates depending on the intended meaning of the speaker (e.g., *Juan es/está flaco* "John is skinny"). In other cases, only one copula is possible since the selection of the verb is carried out by the adjective itself not by the discourse. For example, adjectives denoting temporal attributions only allow copula *estar* (e.g., *Rosa *es/está cansada* "Rosa is tired"). Likewise, adjectives denoting inherent attributions like citizenship (e.g., *Juan es/*está canadiense* "John is Canadian") or professions (e.g., *Susana es/*está doctora* "Susan is a doctor") only allow copula *ser*. However, as a reviewer points out, categorization related to nationality can also take copula *ser* as in the case of *¡Juan está muy Canadiense hoy!* "John is acting very Canadian today". In this case, being Canadian is no longer an inherent property of the individual but a temporal attribution due to aspectual coercion. Similarly, there are cases in Spanish where adverbial locatives can appear with either copula as in *El baño es/está ahí* "The bathroom is over there" (see Camacho, 2012). In addition to copula selection with adjectival predicates, copula *estar* is required with adverbial locatives involving persons or objects (e.g., *Los niños están en la escuela* "The children are at school") while *ser* is required with event locatives (e.g., *El partido de fútbol es en el estadio* "The football game is at the stadium"). This is summarized in Table 1.

Copula selection with adjectival predicates has been described in terms of transitory (stage-level predicates) versus absolute values (individual-level predicates) embodied in the predicate adjective (e.g., Carlson, 1977; Diesing, 1992). Individual-level predicates (ILP) mark more permanent qualities unlikely to change, and they usually select *ser*. Stage-level predicates (SLP) denote temporary conditions, and they usually select *estar*. The ILP/SLP distinction does not, however, explain cases where *estar* is used to refer to an irreversible condition (e.g., *Napoleón está muerto* "Napoleón is dead") or cases where *ser* refers to a temporally delimited condition (e.g., *Rosa es popular en la escuela* "Rose is popular

Table 1
Main uses of copula verbs *ser and estar* in Spanish.

Function	Be	Ser	Estar
Existence/identity	Rosa is a young woman	Rosa **es** una mujer joven	*Rosa **está** una mujer joven
Categorization	Juan is Mexican	Juan **es** mexicano	*Juan **está** mexicano
Adverbial locatives	The book is on the table	*El libro **es** en la mesa	El libro **está** en la mesa
Event locatives	The wedding is at church	La boda **es** en la Iglesia	*La boda **está** en la iglesia
Inherent attributions	Dogs are smart	Los perros son inteligentes	*Los perros están inteligentes
Temporal attributions	My daughter is tired	*Mi hija **es** cansada	Mi hija **está** cansada

at school'') (e.g., Camacho, 2012; Zagona, 2013). Camacho (2012) observes that although the ILP/SLP distinction is useful, it does not completely account for the distribution of *ser* and *estar* in Spanish. The author argues that this can be seen in the contrast between predicate adjectives such as *muerto* (''dead'') and *mortal* (''mortal''). These are two separate lexical items. Even though both would seem to describe permanent, unchanging conditions, *muerto* (''dead'') is always paired with *estar* while *mortal* (mortal) is paired with *ser.* Indeed, *estar muerto* (''to be dead'') implies that an event (death) has initiated the state of being dead so it can be said that *muerto* (''dead'') has an inchoative feature that agrees with the inchoative feature of *estar.* On the other hand, *ser mortal* (to be mortal) is a permanent condition of humanity, i.e., every human being is going to die at some point. *Mortal* (''mortal'') does not have an inchoative feature that would agree with *estar* and is paired with *ser* by default. To account for this ambiguity with certain adjectives, and why certain predicates can be coerced into the opposite meaning via the discourse or an adjunct, Camacho (2012) proposes the concept of coercion, and a tripartite distinction between adjectives: adjectives that are ambiguous (two lexical entries) (e.g., *alegre* ''happy''), adjectives which are unambiguous but can be coerced (e.g., *simpático* ''nice'') and adjectives which are lexically unambiguous but cannot be coerced (e.g., *mortal* ''mortal''). Camacho (2012) cites the case of *Es simpático* ''S/he is nice'' which can be easily coerced into a SLP as in *Es simpático pero* ***hoy*** *no* ***está*** *simpático* ''S/he is nice but today s/he is not nice'' (Camacho, 2012, p. 471). In this case, the ILP has been coerced into a SLP with the aid of a time adverbial and the coercion process provides a boundary that matches the uninterpretable feature of *estar*. That is, when there is apparent overlap in the selection of copulas, semantic coercion via an adverbial phrase or the discourse repairs the semantic anomalies or mismatches between the predicate and the copula.

Regarding copula *ser* use with event locatives, Camacho (2012) argues that generally speaking, *estar* is the default copula with locative prepositional phrases but with event locatives it is the interpretation of the subject noun phrase (NP) what leads to copula *ser* selection. The author further argues that locative prepositional phrases ''do not typically alternate with *ser*'', and that ''their lexically specified feature [$i_{ASP[]}$] must be valued by *estar* (Camacho, 2012, p. 470). However, subjects with an eventive interpretation are aspectually marked with the wrong feature which blocks agreement with *estar* and with the prepositional phrase.

Camacho's (2012) theoretical approach aligns with previous research arguing that copula distinctions are aspectual in nature, and that the selection of the copula implies nuances of meaning that depend on the conceptualization of the temporal domain (e.g., Fernández-Leborans, 1995; Leonetti et al., 2015; Maienborn, 2005; Schmitt and Miller, 2007). Camacho's approach on copula use with adjectival predicates is optimal for our study in that it centers on aspectual coercion and on the aspectual nature of copula selection. This approach could explain the divergences that child and adult heritage speakers of Spanish might have with cases in which the use of *ser* or *estar* depends on the intended meaning of the speaker and the discourse. Previous work with child and adult heritage speakers of Spanish has demonstrated significant difficulties in the aspectual domain (e.g., Cuza and Miller, 2015; Cuza et al., 2013; Montrul, 2002; Montrul and Slabakova, 2003). Furthermore, Camacho's view regarding the use of *ser* with event locatives might shed light on potential divergences with *estar* overextension with event locatives (**La boda está en la iglesia* ''The wedding is at the church''). Specifically, child and adult heritage speakers might have difficulty interpreting the [+eventive] aspectual features of the subject NP which trigger *ser* selection. In what follows, we discuss previous acquisition research and pose our research questions and hypotheses.

3. The acquisition of Spanish copulas

3.1. Previous research

Research on the acquisition of Spanish copulas has shown inconsistent use of copula verbs among children as old as 5;0 years of age. While children may produce the copulas from an early age, they do not necessarily understand them in

the same way adults do (e.g., Holtheuer, 2011, 2013; Sera, 1992; Schmitt and Miller, 2007). In her pioneering study, Sera (1992) examined monolingual children's acquisition of copula verbs by contrasting their oral production with that of adults via spontaneous and elicited production. Results revealed that Spanish monolingual children use the copulas contrastively from an early age. This first experiment, however, did not examine copula selection with adjectives or locatives. In a subsequent experiment, Sera examined adult use of copulas with adjectives, and whether they differentiate between the two copulas in relation to the location of objects and events. Results showed overwhelming production of *ser* when describing defining characteristics of an object in relation to adjectives. Adults were also tested on the production of copulas in sentential contexts that referred either to the location of objects or to the location of events (e.g., The wedding is at the church). Results showed target use of *ser* with event locatives and target use of *estar* with adverbial locatives.

Schmitt et al. (2004) examined monolingual children's comprehension of the copulas in two empirical tasks. The first study was a picture matching task aimed at testing the children's ability to distinguish the copulas by choosing *ser* to refer to permanent or typical characteristics and *estar* to denote temporary, atypical conditions. The second study was an acceptability judgment task (AJT) designed to evaluate the children's ability to distinguish the copulas using discourse clues. They hypothesized that children would first acquire the logical meanings of expressions and only later are able to compute the implicatures associated with discourse. The results showed that children do not treat copulas in complementary distribution, and overextend *estar* in *ser*-preferred contexts that contrasted with adult usage. The authors concluded that children aged 4;0–5;0 have not yet acquired the copula distinctions categorically. Although they produced both copulas, they do not necessarily distinguish them through the implicatures of the discourse.

In a subsequent study, Schmitt and Miller (2007) further examined children's ability to conceptualize the temporal domain. Thirty-five Spanish-speaking children (ranged 4;5–6;3) and 24 monolingual adults completed an elicited production task in which they were shown drawings of people with body parts that were permanently or temporarily colored. The participants were expected to provide the permanent color using copula *ser* and the temporary color using *estar.* The adults were 100% accurate in both conditions, while the children responded with 82% accuracy in the *ser*-condition and 84% accuracy in the *estar*-condition. In a second experiment (which we mirror for the purpose of the current study), 24 children (ranged 4;7–6;0) and 20 adults were tested on their comprehension of the copulas via a picture matching task. Each item presented a story in which a character goes through a temporary physical change by eating some magic beans. Participants had to answer questions about the story by responding with one of the copulas. The adults interpreted *ser* as referring to permanent qualities consistently but were less consistent in their use of *estar* in reference to temporary qualities. The children, on the other hand, preferred *estar* in reference to temporary qualities consistently, but only 42% of them selected *ser* with permanent qualities. The authors argue that although children are able to distinguish the copulas in simple contexts, they have difficulty in conceptualizing the temporal domain in more complex contexts.

Regarding Spanish/English bilingual children, research also shows asymmetries in the target use of copula verbs in Spanish (e.g., Fernández Fuertes and Liceras, 2010; Lingwall Odio, 2018; Sera, 1992; Silva-Corvalán, 2014; Silva-Corvalán and Montanari, 2008). In addition to the monolingual use of *ser/estar*, Sera (1992) also investigated the production of copulas *ser* and *estar* among 52 Spanish/English bilingual children aged 3;6 to 4;9. Results from an elicited production task testing adjectives and locatives (objects and events) showed target response 70% of the time with adjectives. As far as adverbial locatives were concerned, the children selected *estar* between 90% and 100% of the time. With event locatives, however, the percentage of *ser* use ranged from 15% to 28%. The overextension of *estar* with event locatives was overwhelmingly used among the bilingual children.

Silva-Corvalán and Montanari (2008) examined the development of copula distinctions longitudinally in a bilingual child from the age of 18 months to 3 years. The data for the study came from a large corpus consisting of regular observations of the child, audio recordings of his interactions, and detailed notes taken by the investigator. The study found early production of both copula verbs at around the age of 3;0. Furthermore, the stages of development observed in the study closely correlated with those of monolingual children. The researchers argue for the autonomous development of both Spanish and English with a slight delay in the acquisition of *estar* that they attribute to contact with English. They posit the importance of input frequency from adult caretakers as crucial in child bilingual development.

Recently, Lingwall Odio (2018) examined the knowledge that Spanish monolingual children and Spanish/English bilingual children have of *ser* + *DP* strings (e.g., *Juan es profesor* ''John is a professor'') and *estar* + ADJECTIVE strings (e.g., *El café está caliente* ''The coffee is hot'') via a ternary AJT (Task 1) and a forced choice AJT (Task 2). Task 1 tested 43 monolingual children (M = 8;0) and 25 bilingual children (M = 9;0), while Task 2 tested 57 monolingual children (M = 7;6) and 34 bilingual children (M = 9;0). Results showed that both bilingual and monolingual children rejected the misuse of the copulas. However, the bilingual children were more accepting of copula *ser* in adjectival contexts where *estar* was typically preferred. The age-based group results showed differences in the rates of acceptance of *ser* but not of *estar* between the younger and older bilingual children. However, the differences between the younger and the older children were not significant. The author argued that *ser* is likely to be acquired first, and that *estar* emerges later.

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The acquisition of copula verbs in Spanish has also been recently investigated among bilingual and trilingual children in contact with German, French, Italian and Catalan (e.g., Arnaus Gil et al., 2018; Arnaus Gil, 2013; Arnaus Gil and Müller, 2015; Cuza and Guijarro-Fuentes, 2017). For example, Arnaus Gil (2013) examined multilingual children from Germany and found overextension of *estar* as well as early omission of *ser* in both the younger bilingual and the trilingual children. She argues for differences in the processing of predicative adjectives as the leading factor for the delays in the acquisition of copula distinctions in Spanish. More recently, Arnaus Gil et al. (2018) investigated whether *ser* and *estar* are subject to acquisition delays in bilingual and trilingual children (Spanish-Catalan-German/French). In two separate studies, the authors investigated the use of the Spanish copulas with adjectives that can be used with either copulas depending on the discourse. The first study examined the spontaneous production of one bilingual child (Spanish/French) and three trilingual children (Spanish/Catalan/German and Spanish/French/Italian) longitudinally. The results showed delays evidenced in significant omission of copula *ser* in *ser*-required contexts. The trilingual children who acquire Spanish together with Catalan (a language that has a similar grammatical system to Spanish) showed much more delay compared to bilingual and trilingual children exposed to languages with one copula system (French, Italian). The authors argue that the delay in the children who acquire Catalan as well as Spanish stem from crosslinguistic interference in language production and syntactic complexity. The second study was a cross-sectional study with 72 bilingual, trilingual and multilingual children who resided in Germany or Spain. The authors elicited copula verbs using stories about four different animals in which permanent and temporal adjectives were used. Results showed that in general, *estar*-contexts were easier to acquire than *ser*-contexts. There was no statistical correlation found between performance and receptive vocabulary, language dominance, proficiency, language combination or age. Only the trilingual children who acquired Spanish as well as another dual copula language (Catalan/Portuguese) showed an advantage in *ser*-favored contexts. The authors argue that this could be due to better attention control, faster decision making, and more experience with the monitoring of different languages.

Cuza and Guijarro-Fuentes (2017) investigated the acquisition of the Spanish copulas among Spanish/Catalan bilingual children and adults. Specifically, they examined the use of the copula in locative adverbs, stage-level predicates, and event locatives. In Catalan, both copulas are possible with locatives and stage-level adjectives, in contrast with Spanish where *estar* is highly favored. In both languages, however, copula *ser* is required with event locatives. Results from an elicited production task showed overextension of *estar* in Catalan locatives and with event locatives among the bilingual children but not among the bilingual adults. In Spanish, as expected, both the bilingual children and the adults showed high use of copula *estar* with locatives and adjectives. However, with event locatives, the bilingual children overextended *estar* significantly in both Spanish and Catalan, while the adults showed high use of *ser*, as expected. Unexpectedly, the Spanish monolingual children serving as the baseline group for Spanish also overextended *estar* considerably with event locatives (e.g., *La fiesta *está en el rancho* ''The party is at the ranch''). This suggests a role for cognitive maturation in children's interpretation of *estar* to locate events.

In regard to the acquisition of Spanish copulas among adult heritage speakers of Spanish, Valenzuela et al. (2015) examined the intuition and comprehension of eventive and stative passives among heritage speakers born in the U.S. and Canada, and the extent to which multilingualism among the Canadian heritage speakers (English, French and Spanish) played a role in competence outcomes. This is, to our knowledge, the first study dealing with copula use among adult heritage speakers of Spanish. Results showed *estar* overextension among the U.S. heritage speakers as well as indeterminant understanding of *ser* with adjectives. By contrast, the Canadian group matched the control group's performance on all types of items and on both tasks. The authors argue that this was not completely unexpected, as the Canadian group had acquired both English and French from an early age and they are part of a society that supports bilingual development. The researchers argue for the effects of simultaneously learning another Romance language (French) while acquiring Spanish, and for the influence of community language environments on the development of the heritage language. No other study to our knowledge has examined the acquisition of copula verbs among Spanish heritage speakers. We aim to fill this gap in the current study.

To summarize, previous work has found divergences in the target use of copula *estar* in Spanish (e.g., omission and overextension to *ser*-favored adjectival contexts) among monolingual children (e.g., Sera, 1992; Schmitt and Miller, 2007; Schmitt et al., 2004), bilingual children (e.g., Sera, 1992; Silva-Corvalán and Montanari, 2008) and trilingual/multilingual children (e.g., Arnaus Gil, 2013; Arnaus Gil and Müller, 2015; Arnaus Gil et al., 2018). Schmitt and colleagues have concluded that monolingual children as young as 5;0 years of age have difficulty in conceptualizing the temporal domain, and they do not yet distinguish copula use categorically through the implicatures of the discourse. Bilingual children on the other hand appear to be affected by crosslinguistic influence, leading to delays in the target processing of predicative adjectives (e.g., Arnaus Gil, 2013; Silva-Corvalán and Montanari, 2008). Regarding the use of *ser* with eventive predicates, previous work also shows significant overextension of *estar* among bilingual children (e.g., Cuza and Guijarro-Fuentes, 2017; Sera, 1992; Silva-Corvalán and Montanari, 2008). However, in this particular context, monolingual Spanish children have also shown significant *estar* overextension, as shown by Cuza and Guijarro-Fuentes (2017). This suggests a role for cognitive maturation. Apart from the study by Valenzuela et al. (2015), no previous work to our

knowledge has investigated copula verbs use among adult heritage speakers of Spanish born and raised in the U.S. We contribute to previous work by filling this gap in the literature.

3.2. Research questions and hypotheses

Considering previous research on the development of the Spanish copulas, we examine the extent to which child and adult heritage speakers of Spanish born in the U.S. have knowledge of the semantic distribution of copula verbs in adjectival contexts and event locatives. Furthermore, we investigate the role of language dominance and patterns of language use in copula realization. Specifically, we expect the child and adult heritage speakers to overextend *estar* to *ser*-favored adjectival contexts and to event locatives given limited exposure and use of the minority language, and language dominance (e.g., Arnaus Gil, 2013; Sera, 1992; Silva-Corvalán and Montanari, 2008). We hypothesize the following:

H1. Child and adult heritage speakers will overextend *estar* to adjectival contexts where *ser* is favored (e.g., Arnaus Gil, 2013). However, they will not show any asymmetries with stage-level predicates in which *estar* is favored.

H2. Child and adult heritage speakers will overextend *estar* to event locatives in which *ser* is favored, as shown in recent research with bilingual children and L2 learners (e.g., Pérez-Leroux et al., 2010; Sera, 1992; Silva-Corvalán and Montanari, 2008).

H3. There will be a relationship between target performance and the heritage speakers' patterns of language activation and language ability in Spanish (Putnam and Sánchez, 2013; Sánchez, 2019). Particularly, we expect the adult heritage speakers to show less divergence with target copula use compared to the child heritage speakers due to higher patterns of language activation and use during their lifespan and higher level of language ability in the minority language.

We follow recent work by Sánchez and colleagues in considering individual patterns of language activation and use as one of the main factors affecting the extent of morphosyntactic shifts in heritage language grammars (e.g., Perez-Cortes et al., 2019; Putnam and Sánchez, 2013; Sánchez, 2019). Sánchez (2019) argues that the extent to which heritage speakers have differential access to the linguistic features of their two languages will depend on their patterns of language activation or proficiency. Within this approach, the grammatical features of both languages are stored in the mind of the bilingual speaker in the form of *bilingual alignments* and available in memory for retrieval depending on the level of activation of each language or linguistic ability. Sánchez defines *bilingual alignments* as the ''units that encompass information from different language components'' (Sánchez, 2019, p. 20). These alignments are subject to reorganization/restructuring in the bilingual continuum depending on the patterns of language activation that better align with one of the bilingual's two languages. Rather than accounting for heritage speakers' variability in terms of representational deficits (e.g., Montrul, 2014, 2008; Polinsky, 2011), Sánchez's approach accounts for heritage language variability as a dynamic byproduct of real-time linguistic processing and access to the lexicon in bilinguals.

Following this approach, we predict child and adult heritage speakers with limited exposure to Spanish to show higher degrees of divergences with copula use in adjectival contexts and with event locatives *vis-à-vis* heritage speakers with overall more use of the language. Furthermore, crosslinguistic influence effects and the context of copula use (e.g., predicative adjectives vs. eventive locatives) might play a major role. The lack of a dual copula system in English might lead to crosslinguistic influence effects in Spanish. The copula *to be* in English encompasses all the semantic selectional features encoded separately by *ser* and *estar* in Spanish, and this might lead to developmental delays in target copula use. The sub-use of copula *ser* with events might also be more difficult to acquire given that copula *ser* selection is constrained by the target interpretation of the eventive subject, as proposed by Camacho (2012). This sensitivity to the eventive features of the subject NP might be subject to developmental delays in both monolingual and bilingual children (e.g., Cuza and Guijarro-Fuentes, 2017; Sera, 1992; Silva-Corvalán and Montanari, 2008). Furthermore, this sub-use of copula *ser* is possibly less frequent in day-to-day interaction than other more canonical uses of *ser* (e.g., with adjectival predicates, to express profession, nationality). In the sections below, we present the study, results, and discussion.

4. The study

4.1. Participants

Sixteen (n = 16) child heritage speakers of Spanish (henceforward CHS) born and raised in the U.S., sixteen (n = 16) monolingual children from Mexico, nineteen (n = 19) adult heritage speakers of Spanish (henceforward AHS), and twenty (n = 20) monolingual adults from Mexico participated in the study. All the participants in the U.S. and Mexico completed the necessary consent and assent forms as required by research ethics regulations.

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Table 2
Summary of participants' information.

	Age range	Mean age	SD	Language dominance	Patterns of language use
Child heritage speakers (*n* = 16)	7;5–13;7	9.74	1.77	50% Balanced 25% SPAN 25% ENG	Home: 94% SPAN, 6% BOTH School: 87% ENG, 13% SPAN Friends: 87% ENG, 13% SPAN
Monolingual children (*n* = 16)	7;2–13;0	9.66	1.56	SPAN Monolingual	100% SPAN (Mexico)
Adult heritage speakers (*n* = 19)	18–22	19.5	1.31	DELE test: 41/50	Home: 53% SPAN, 26% BOTH, 21% ENG School: 95% ENG, 5% BOTH Social Situations: 100% ENG
Monolingual adults (*n* = 20)	18–28	21	2.3	SPAN monolinguals	Home: 100% SPAN School: 95% SPAN, 5% ENG Social Situations: 90% SPAN; 10 ENG

The CHS (age range 7;5–13;7; *M* = 9.74, *SD* = 1.77) were born and raised in the US and exposed to both Spanish and English from birth. A child background questionnaire (adapted from Paradis et al., 2007) elicited information on the children's and parents' bilingual language fluency as well as patterns of language exposure and use at home and other language background information. The parents were born in Mexico and spoke Spanish at home with their children as the home language. The CHS attended English-only public schools and were exposed to English through siblings, peers, and TV.[1] However, they also attended an after-school Spanish program of one hour a week where they were taught how to read and write in Spanish. Regarding patterns of language use, 94% of the children were reported speaking mostly Spanish with their parents at home while 6% were reported speaking both. At school and with friends, 87% of the children were reported speaking ''mostly English'' and 13% were reported speaking ''mostly Spanish''. Regarding language use with their siblings, all of the CHS were reported speaking English except one who was reported speaking both languages and another who was reported speaking Spanish. Overall, they were reported using Spanish only with their parents. The use of Spanish with friends (13%), at school (13%) and with siblings (11%) was minimum. When asked in which language they felt more comfortable in, 68% of the CHS reported feeling equally comfortable in both languages and 32% reported feeling more comfortable in English.

Language dominance ratings in both languages were obtained via parental reports, following previous research using this method (e.g., Cuza and Pérez-Tattam, 2016; Gutiérrez-Clellen and Kreiter, 2003; Paradis et al., 2007; Pirvulescu et al., 2014). The parents were asked to assess the language dominance of their children in both languages based on scalar ratings of fluency. The scalar ratings were *not fluent (1), somewhat fluent (2), very fluent (3) and completely fluent (4).* Regarding Spanish, the parents rated 8/16 (50%) of the children as ''very fluent'', 4/16 (25%) as ''completely fluent'', and 4/16 (25%) as ''somewhat fluent''. Regarding English, 10/16 (62%) children were rated as ''very fluent'', 4/16 (25%) as completely fluent, and 2/16 (13%) as ''somewhat fluent''. We calculated the language dominance score per child using a balanced score (e.g., Pirvulescu et al., 2014). That is, we subtracted the numerical fluency scores given to English from the ones given to Spanish. Scores in the range of −1 to −4 were considered as English dominant, 0 scores were considered as balanced, and scores between 1 and 4 were considered as Spanish dominant. Following this method, 8/16 (50%) of the children were considered balanced, 4/16 (25%) were considered Spanish-dominant, and 4/16 (25%) were considered English-dominant (see Table 2).

The monolingual children (age range, 7;2–13;0; *M* = 9.66, *SD* = 1.56) served as baseline group to evaluate the extent to which the CHS have acquired *ser* vs. *estar* distinctions. They were all born and raised in Mexico and were tested in Guanajuato and Querétaro using the snowball method of recruitment. Given that all the children were monolingual speakers of Spanish born and raised in Mexico, there were no differences in terms of exposure to Spanish or language dominance (see Table 2).

The AHS (age range, 18–22; *M* = 19.5; *SD* = 1.31) were Spanish heritage speakers enrolled at a major research university in the American Midwest. They were born and raised in the US (except for three who came to the US at or before 5;0 years of age), and they had been exposed to both Spanish and English during early childhood. The participants' parents were native speakers of Spanish, except for one. Most participants (89%) had visited Spanish-speaking countries almost every year, and 82% reported visiting Mexico every year or almost every year. As for their patterns of language use at home, 53% of the speakers reported speaking ''Spanish only'' or ''Mostly Spanish'', 26% reported speaking ''Equal English and Spanish'', and 21% reported speaking ''Slightly more English''. At school, 84% reported speaking ''English

[1] There were 4 sibling pairs in the sample.

only'' or ''Mostly English'', 11% reported speaking ''Slightly more English'' and 5% reported speaking ''Equal English and Spanish''. In social situations, 53% reported speaking ''English only'' or ''Mostly English'', and 47% reported speaking ''Slightly more English''. At work, 63% reported speaking ''English only'' or ''Mostly English'', 11% reported speaking ''Slightly more English'', 5% reported speaking ''Equal English and Spanish'', and 21% reported speaking ''Slightly more Spanish''.

In addition to reporting patterns of language exposure at home, school, work and social situations, the AHS were asked to report their frequency of Spanish language use (output) and exposure (input) in various contexts. Regarding language usage, they were asked to report how frequently they used Spanish with their partners, over the phone, for chatting, and for texting. Regarding language exposure, they were asked to report how frequently they listened to the radio in Spanish, watched TV in Spanish, and read in Spanish (printed material or online). The Likert scale included 5 descriptors: *very frequently, frequently, not much, rarely* and *never.* Following previous research in heritage language bilingualism and L2 acquisition, the heritage speakers took the *Diploma de Español como Lengua Extranjera* (DELE) test as an independent measure of proficiency (e.g., Duffield and White, 1999; Montrul, 2004; Montrul and Slabakova, 2003). Their mean score was 41/50 (advanced proficiency) (score range, 30–48; *SD* = 4.76). Additionally, they were asked to self-report their proficiency in Spanish and English in the four language skills (speaking, reading, writing and listening) using a scale ranging from *0 (null)* to *4 (excellent).* The average score for Spanish was 2.95/4 (*good*) and the average score for English was 3.89/4 (excellent).

The monolingual adults (*n* = 20; age range 18–28; *M* = 21.0; *SD* = 2.3) were native speakers of Spanish enrolled at a public university in Guanajuato, Mexico. The majority of them (70%) were from Guanajuato and the rest (30%) were from other areas of Mexico including Mexico City, Aguascalientes, Sonora, San Luis Potosí, Tijuana and Tamaulipas. The participants had been exposed to Spanish from birth, and their parents were also native speakers of Spanish. Spanish was the language of instruction in primary school, high school and college. In terms of patterns of language use, most of the participants reported using Spanish at home (100%), school (95%) and in social situations (90%). Table 2 summarizes the participants' information:

4.2. Tasks and procedures

Copula use with adjectival predicates was elicited via a production task adapted from Schmitt and Miller (2007). The participants were presented with two images on a computer screen and a preamble followed by a question. They were also presented with an adjective in parenthesis and were instructed to use it in their response. The preamble and the prompt were read out loud by the investigators. The target response was a sentence including one of the two copulas depending on the given discourse, as in (2) below:

(2) **Adjectival predicate (Stage-level predicate, ESTAR-favored context)** (*adapted from* Schmitt and Miller, 2007)
Preamble: *A Homer no le gusta hacer dieta pero hoy tomó unas pastillas mágicas que por un breve momento lo cambiaron.* ''Homer does not like to be on a diet, but today he took some magic pills that for a brief moment changed him.''
(Here is an image of Homer looking very fat next to a can full of magic pills and next to it is an image of Homer looking very skinny)
(*flaco* ''skinny'')
Prompt: *¿Qué pasa ahora con Homer?* ''What's going on with Homer now?''
Expected response*: Homer* ***está flaco*** ''Homer is skinny''

In (2), *estar* is favored because Homer had gone from being fat to being skinny temporarily. In *ser*-favored contexts, the children were presented with an inherent property of the subject, and therefore *ser* was favored, as in (3) below:

(2) **Adjectival predicates (Individual-level predicate, SER-favored context)**
Preamble: *El toro no pudo pasar por la reja pero la Pantera Rosa sí.* ''The bull couldn't go through the gate bars but the Pink Panther did.''
(Here is an image of a bull trying to go through a gate and an image of the Pink Panther on the other side of the gate)
(flaca, ''skinny'')
Prompt: *¿Por qué pudo pasar la Pantera Rosa?*
''Why was the Pink Panther able to go through?''
Expected response: *Porque la Pantera Rosa* ***es flaca***.
''Because the Pink Panther is skinny.''

In (3), copula *ser* was preferred because being skinny is a permanent attribute of the Pink Panther, which is why he was able to go through the gate bars, but the bull could not. Following a similar procedure, we elicited copula use with event locatives (Cuza and Guijarro-Fuentes, 2017):

(4) **Event locatives (SER-required context)**
Preamble: *Hoy se casa una amiga de Dora y ella quiere ir a su boda pero no sabe dónde y te pregunta.* ''One of Dora's best friends is getting married today. Dora wants to go to the wedding but she doesn't know where it is and she asks you. . .''
(*Here is an image of a couple getting married next to a boat*)
(*barco* ''ship'')
Prompt: *Díle a Dora dónde.* ''Tell Dora where.''
Expected response: *La boda* ***es en un barco*** ''The wedding is on a boat.''

In these contexts, we aimed to elicit the use of copula *ser* to indicate an event location. The preamble referred to an event that was going to take place (a wedding in example 4) but Dora (the fictional character of the story), did not know the location of the event. The participant was then asked to tell Dora 'where'. This condition did not include a question in the prompt, because we wanted the participants to produce a complete sentence while saying where the event was going to occur. We omitted the copula *ser* in the preamble and the prompt to avoid priming the response.[2]

The items were randomized and counterbalanced across the participants to control for presentation effects, and two versions of the tasks were created (version A and B). All of the items were read out loud by the investigators and were accompanied by visual cues (images) to help the participants comprehend the task. The task consisted of 19 experimental items, 2 training items, and 10 distractors for a total of 31 items. The experimental items included 10 variable contexts where the participants had to produce either *ser* or *estar* depending on the preamble (5 *ser*-favored and 5 *estar*-favored), 4 non-variable contexts where only *ser* or *estar* was grammatically possible (e.g., *La ventana está abierta* ''The window is open'' or *Justin Bieber es cantante* ''Justin Bieber is a singer''), and 5 event locatives where *ser* is usually favored. For the purpose of the present study, we discuss only the results from the variable contexts and the event locatives.[3] The variable contexts included gradable, scalar adjectives like *gordo* (''fat''), *flaco* (''skinny''), *guapo* (''good looking''), *alto* (''tall''), and *limpio* (''clean''). The participants were tested individually in a quiet room at their school, home or the public library. The responses were digitally recorded and later transcribed for analysis. In what follows, we discuss the results of the study.

5. The results

5.1. Experiment 1: Ser/Estar production in adjectival predicates

In experiment 1, we examined copula production with adjectives. The dependent variable for the model was obtained by coding each participant's answer using the following scheme: production of the favored copula was coded as 1, and the production of the disfavored copula was coded as 0. Cases in which the participant produced a verb other than *ser* or *estar* were discarded for the purpose of this analysis. The significance threshold was set at .05.

We implemented a generalized linear model (GLM) in the R software (Version 3.6.2 of the R system for Windows). Given the binary nature of the dependent variable, we followed a binomial probit distribution in the analysis. The rest of the model was specified with Group as the independent variable (Child Heritage Speakers, Monolingual Children, Adult Heritage Speakers, Monolingual Adults) and response as the dependent variable. A logit link was used to relate the mean of the dependent variable to the independent variables fixed, therefore modeling the log of odds of producing *ser* or *estar.* Data collected from adjectival predicates with *estar*-favored contexts and *ser*-favored contexts were analyzed separately using the model described.

5.1.1. Estar-favored contexts

As predicted, results from the *estar*-favored contexts (stage-level predicates) showed high use of copula *estar* among the Child Heritage Speakers, the Monolingual Children and the Adult Heritage Speakers (around the 70% range of target use). The Monolingual Adults, however, showed only 58% of target use given a higher use of copula *ser* (23%) and ''other'' (19%) structures. As we discuss shortly, this was due to an item effect. These results are shown in Fig. 1:

[2] Some may argue that the omission of the copula made the preamble and the prompt sound a bit odd prescriptively speaking, due to the absence of the verb. Although this might be true, it did not affect the implementation of the task. The participants understood what they were required to do given the overall discourse and the training provided.

[3] The number of non-variable items was too low for us to run a reliable statistical analysis. We were interested primarily in variable contexts.

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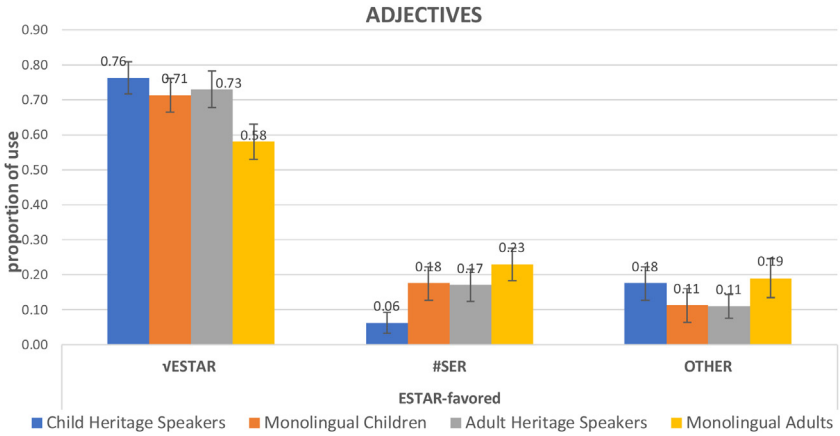

Fig. 1. Proportion of copula *estar*, *ser* and *other* structures use in *estar*-favored adjectival contexts.

Results of the GLM showed that there is no significant difference between groups in the use of *estar* in *estar*-favored contexts, $\chi^2(4, 303) = 515.77$. We followed up on these results by conducting a post hoc pairwise comparison analysis to determine where the differences lie between the groups in their probability of using copula *estar*. The post hoc analysis compared the fitted probabilities (obtained from fitting the GLM model) of using copula *estar* for pairs of groups. We adjusted the results for multiple comparison using the Kruskal–Wallis multiple tests adjustment method in the R Software (Version 3.6.2 of the R system for Windows). No significant group differences were found between the Adult Heritage Speakers and the Monolingual Children, ($X_k^2 = 0.0502$, $p = .822$); between the Child Heritage Speakers and the Monolingual Children, ($X_k^2 = 3.199$, $p = .073$) and between the Adult Heritage Speakers and the Monolingual Adults, ($X_k^2 = 3.726$, $p = .053$). There were significant differences between the Child Heritage Speakers and the Adult Heritage Speakers, ($X_k^2 = 4.181$, $p = .040$); between the Monolingual Adults and the Child Heritage Speakers, ($X_k^2 = 13.594$, $p < .000$), and between the Monolingual Children and the Monolingual Adults ($X_k^2 = 4.108$, $p = .040$). The CHS showed a higher fitted probability of *estar* use than the other three groups. However, as revealed by the post hoc analysis, their divergences were only significantly different from the Monolingual Adults, as summarized in Table 3.

Regarding language dominance within the CHS, all of the balanced bilingual children (8/8) used *estar* in 80% of the cases or more, as expected. In addition, the majority of the Spanish dominant children (3/4) and the English dominant children (3/4) used *estar* in 60% of the cases or more. The remaining Spanish dominant and English dominant children showed 60% of use of ‘‘other’’ structures. In sum, the use of copula *ser* among the CHS was very low (0.06%).

To summarize, the CHS and the AHS showed target-like behavior in their use of *estar* in *estar*-favored contexts (stage-level predicates), as expected. This was consistent with the results of the monolingual children. However, the monolingual adults showed much lower levels of *estar* use compared to the other groups, due to an item effect. The child heritage speakers had target-like responses in their use of copula *estar* in *estar*-favored contexts regardless of their language dominance.

In order to examine whether the behavior observed at the group level was consistent with what the participants did at the individual level, we conducted an individual analysis on the use of *estar* in *estar*-favored contexts. For this analysis, we present the number of participants who selected the expected copula verb in each context out of 5 trials. Participants producing the expected copula 4–5 times were considered as *high users*; those using the expected copula 3 times were considered as *medium users*; those in the 1–2 range were considered *low users*, and those who did not use the expected copula at all were considered *zero users*. As shown in Table 4, 12/16 CHS were in the *high user* range, 2/16 in the *medium-user* range, and 2/16 in the *low-user* range. The CHS in the *low* range did not overextend *ser*. Their use of *estar* was low because they produced three instances of ‘other’ structures each.[4] One of the children in the medium-user range did overextend *ser*, using it twice. Regarding the monolingual children, 8/16 were in the *high user* range, 6/16 were in the *medium user* range and 2/16 were in the *low-user range.* Three of the children in the *medium user* range overextended *ser* twice. The other two, produced ‘‘other’’ structures twice. Regarding the AHS, 89% of the participants were high user or medium users. The Monolingual Adults showed lower use of *estar* compared to the other groups, with only 20% of them using it 4 to 5 times. This is represented in Table 4.

[4] For the individual analysis we report the total number of *ser* or *estar* use per participant across the four ranges we have established. This number is affected by the production of ‘other’ structures.

Table 3
Results of the GLM model with logit link and Binomial response variable (modeling the production of *estar* for adjectival predicate with *estar*-favored context).

Fixed effect terms	Estimate	SE	*t* (df)	*p*
Group-Adult Heritage Speakers	0.8252	0.0718	11.480	<0.0001
Group-Child Heritage Speakers	1	0.1000	12.911	<0.0001
Group-Monolingual Adults	0.3732	0.0661	5.644	<0.0001
Group-Monolingual Children	0.8073	0.0779	10.359	<0.0001

Overall model Chi test result: $\chi^2(4, 303) = 515.77$, *p*_value < 0.0001
Tukey–Kramer pairwise comparison post hoc analysis

Comparison groups	Fitted probability for production of Estar (SE)	*p*
Child heritage speakers vs. monolingual children	1.00 (0.10) vs. 0.80 (0.07)	0.0736
Adult heritage speakers vs. monolingual adults	0.82 (0.07) vs. 0.37 (0.07)	0.0535
Adult heritage speakers vs. monolingual children	0.82 (0.07) vs. 0.80 (0.07)	0.8228
Child heritage speakers vs. adult heritage speakers	1.00 (0.10) vs. 0.82 (0.13)	0.0408
Child heritage speakers vs. monolingual adults	1.00 (0.10) vs. 0.37 (0.07)	0.0002
Monolingual children vs. monolingual adults	0.80 (0.07) vs. 0.37 (0.07)	0.0408

Table 4
Individual analysis: stage-level predicates (*estar*-favored contexts).

Group		Stage-level predicates: ESTAR-favored contexts			
		Number of target copulas/5	Number of participants		
			ESTAR	SER	OTHER
Child heritage speakers (*n* = 16)	*High user*	4–5	12/16 (75%)	0/16 (0%)	0/16 (0%)
	Medium user	3	2/16 (13%)	0/16 (0%)	2/16 (12%)
	Low user	1–2	2/16 (13%)	4/16 (25%)	8/16 (50%)
	Zero user	0	0/16 (0%)	12/16(75%)	6/16 (38%)
Monolingual children (*n* = 16)	*High user*	4–5	8/16 (50%)	0/16 (0%)	0/16 (0%)
	Medium user	3	6/16 (38%)	1/16 (6%)	1/16 (6%)
	Low user	1–2	2/16 (12%)	8/16 (50%)	4/16 (25%)
	Zero user	0	0/16 (0%)	7/16 (44%)	11/16 (69%)
Adult heritage speakers (*n* = 19)	*High user*	4–5	9/19 (47%)	0/19 (0%)	0/19 (0%)
	Medium user	3	8/19 (42%)	2/19(11%)	0/19 (0%)
	Low user	1–2	2/19 (11%)	8/19 (42%)	7/19 (37%)
	Zero user	0	0/19 (0%)	9/19 (47%)	12/19 (63%)
Monolingual adults (*n* = 20)	*High user*	4–5	4/20 (20%)	0/20 (0%)	1/20 (5%)
	Medium user	3	8/20 (40%)	1/20 (5%)	2/20 (10%)
	Low user	1–2	8/20 (40%)	11/20(55%)	7/20 (35%)
	Zero user	0	0/20 (0%)	8/20 (40%)	10/20 (50%)

A closer look at the monolingual data reveals that there was an item effect with the token *Julia está guapa* ''Julia is pretty'', which affected the use of *estar* in *estar*-favored contexts among the monolingual children and the monolingual adults. This item was meant to imply a change of state from being ugly to being pretty but many of the participants used *ser* or another verb or expression to imply a change of state (e.g., *Julia* ***se ve*** *más guapa* ''Julia looks prettier''; *Julia* ***se volvió*** *guapa* or *Julia* ***se puso*** *guapa* ''Julia became pretty''). Furthermore, the monolingual adults who used *ser* with this item coerced the aspectual interpretation by means of the adverbial modifier '*ahora*' (''now'') rather than using copula *estar*, as in *Julia* ***ahora*** *es guapa* ''Julia is now pretty''. Some of the child heritage speakers also used false cognates in Spanish, as in *Julia se tornó guapa* (''Julia turned pretty'') or *Julia se hizo guapa* (''Julia became pretty'') instead of copula *estar*. None of them coerced the aspectual interpretation using an adverbial phrase, as in the case of the monolingual adults. These results confirm H1, which predicted that the child and adult heritage speakers would not show divergences in their use of *estar* in *estar*-favored adjectival contexts.

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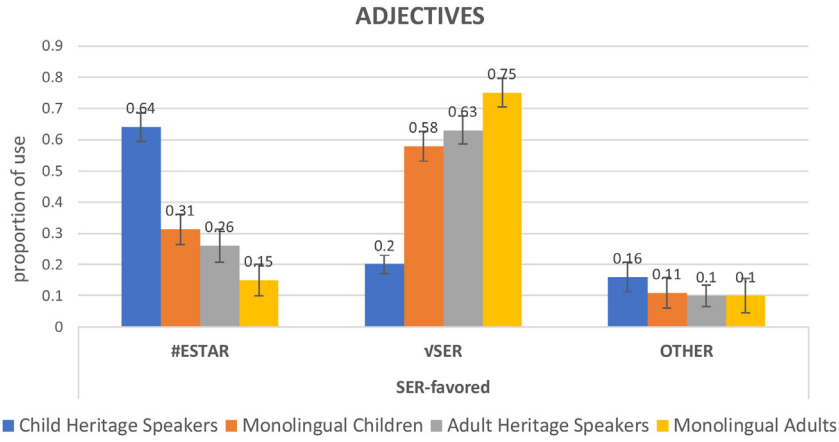

Fig. 2. Proportion of copula *ser, estar*, and *other* structures use in *ser*-favored adjectival contexts.

Table 5
Results of the GLM model with logit link and binomial response variable (modeling the production of *ser* for adjectival predicates with *ser*-favored contexts).

Fixed effect terms	Estimate	SE	*t* (df)	*p*
Group-adult heritage speakers	0.5642	0.0843	6.688	<0.0001
Group-child heritage speakers	0	0.0974	−6.878	<0.0001
Group-monolingual adults	1	0.0977	12.091	<0.0001
Group-monolingual children	0.4981	0.0911	5.465	<0.0001
Overall model Chi test result: $\chi^2(4, 303) = 515.77$, $p < .001$				

Comparison groups	Fitted probability for production of Ser (SE)	*p*
Child heritage speakers vs. monolingual children	0.00 (0.10) vs 0.49 (0.07)	<0.001
Adult heritage speakers vs. monolingual adults	0.56 (0.07) vs 1.00 (0.07)	0.011
Child heritage speakers vs. adult heritage speakers	0.00 (0.10) vs 0.56 (0.13)	<0.001
Child heritage speakers vs. monolingual adults	0.00 (0.10) vs 1.00 (0.07)	<0.001
Monolingual children vs. monolingual adults	0.49 (0.07) vs 1.00 (0.07)	0.012
Adult heritage speakers vs. monolingual children	0.56 (0.07) vs 0.49 (0.07)	0.960

5.1.2. Ser-favored contexts

Results from the *ser*-favored contexts (individual-level predicates) partly confirmed our expectations. The child heritage speakers showed high use of copula *estar* (64%) and low use of copula *ser* (20%). This contrasts with the results of the other groups who all showed much lower use of *estar* and higher use of *ser*, as was expected in these contexts. This overextension of *estar* to *ser*-favored contexts among the child heritage speakers suggests lack of sensitivity to the aspectual properties of *ser,* confirming previous work with bilingual children. These results are shown in Fig. 2:

The results showed significant differences between groups in the use of *ser* in *ser*-favored contexts, $\chi^2(4, 303) = 515.77$, $p < .001$. A post hoc analysis showed significant differences between the following groups: the Child Heritage Speakers and the Monolingual Children, $X_k^2 = 24.103$, $p < .001$; the Adult Heritage Speakers and the Monolingual Adults, $X_k^2 = 6.4423$, $p = .011$; the Child Heritage Speakers and the Adult Heritage Speakers, $X_k^2 = 26.596$, $p < .001$; the Child Heritage Speakers and the Monolingual Adults, $X_k^2 = 55.98$, $p < .001$ and between the Monolingual Children and the Monolingual Adults, $X_k^2 = 6.2659$, $p = .012$. In this context, the Adult Heritage Speakers did not behave significantly different from the Monolingual Children, $X_k^2 = 0.0025$, $p = .96$. This is summarized in Table 5:

To summarize, the CHS overextended *estar* in *ser*-favored contexts (individual-level predicates) significantly compared to the other groups. The AHS, however, showed higher use of *ser* compared to the CHS. However, they showed significant differences compared to the Monolingual Adults.

As in the case of stage-level predicates, we conducted an individual analysis to confirm the quantitative analysis. The individual analysis was conducted over 4 items rather than 5 given that there was an item effect with the item *Santa es*

Table 6
Individual analysis: individual-level predicates (SER-favored contexts).

Group		Individual-level predicates SER-favored contexts			
		Number of target copulas/4	Number of participants		
			ESTAR	SER	OTHER
Child heritage speakers (*n* = 16)	*High user*	3–4	9/16 (56%)	2/16 (13%)	0/16 (0%)
	Medium user	2	5/16 (31%)	1/16 (6%)	1/16 (6%)
	Low user	1	1/16 (6%)	5/16 (31%)	8/16 (50%)
	Zero user	0	1/16 (6%)	8/16 (50%)	7/16(44%)
Monolingual children (*n* = 16)	*High user*	3–4	3/16 (18%)	9/16 (56%)	0/16 (0%)
	Medium user	2	2/16 (13%)	3/16 (19%)	0/16 (0%)
	Low user	1	5/16 (31%)	1/16 (6%)	7/16 (44%)
	Zero user	0	6/16 (38%)	3/16 (19%)	9/16 (56%)
Adult heritage speakers (*n* = 19)	*High user*	3–4	0/19 (0%)	9/19 (47%)	0/19 (0%)
	Medium user	2	7/19 (37%)	7/19 (37%)	0/19 (%)
	Low user	1	6/19 (32%)	3/19 (16%)	8/19 (42%)
	Zero user	0	6/19 (32%)	0/19 (0%)	11/19 (58%)
Monolingual adults (*n* = 20)	*High user*	3–4	1/20 (5%)	17/20 (85%)	0/20 (0%)
	Medium user	2	1/20 (5%)	1/20 (5%)	0/20(0%)
	Low user	1	7/20 (35%)	1/20 (5%)	8/20 (40%)
	Zero user	0	11/20 (55%)	1/20(5%)	12/20 (60%)

gordo ''Santa is fat'', which affected all groups. The adjective *gordo* (''fat'') was not interpreted as an inherent characteristic of Santa Claus but something that could change. Given that most participants behaved in contrast to our expectations, the item was discarded from the individual and quantitative analyses. The results were consistent with the group data. Participants producing *estar* 3–4 times were considered as *high users*; those using *estar* 2 times were considered as *medium users*; those using *estar* 1 time were considered *low users,* and those who did not use *estar* at all were considered *zero users*. More than half of the CHS overextended copula *estar* in *ser*-favored contexts 3 to 4 times, compared to the monolingual children. Conversely, the CHS showed very low use of *ser* while the monolingual children did the opposite (they showed lower use of *estar* and higher use of *ser*). Regarding the AHS, most of them showed high or medium use of *ser* and low or zero use of *estar*. The group results and the individual data suggest no divergences with the use of copula *ser* in adjectival contexts where *ser* is favored, disconfirming H1. However, there was one specific item where 11/19 of the AHS overextended *estar* (e.g., *La pantera Rosa *está flaca* ''The Pink Panther is skinny''). Overall, however, we did not find overextension of *estar* with individual-level adjectives among the AHS. It seems as if the asymmetries that the CHS have with individual-level predicates are overcome in adulthood. These results are represented in Table 6.

As discussed earlier, the child heritage speakers were reported as speaking English mostly with siblings, friends, school and in social situations. Spanish was used mostly with the parents at home. There was not much variation regarding their exposure and usage of the Spanish language, as is normally the case with Spanish/English bilingual children in the U.S. Therefore, we examined whether there was a relationship between the reported language dominance and target use of *ser* in *ser*-favored contexts. Results from a GLM analysis measuring the association existing between language dominance and target-like use of *ser* with adjectival contexts showed a significant association ($z = -6.24$, $p < .001$). This suggests that the higher the dominance in Spanish was, the more target-like the children were in their use of *ser* with adjectives. However, a look at the individual results did not confirm this expectation. Results showed that the majority of the Spanish dominant children (3/4) showed low or zero use of *ser*. Only one of these 4 children showed high use of *ser.* In addition, only 1/8 of balanced bilingual children showed high use of *ser*. The remaining children, showed low, medium or zero use of *ser*. Finally, all of the English-dominant children (4/4) showed either low or zero use of copula *ser*. Therefore, Hypothesis 3 was not confirmed. In general, most of the bilingual children overextended copula *estar* in contexts where *ser* was favored, regardless of their reported language dominance.

As discussed earlier, the AHS reported speaking Spanish at home about 53% of the time and mostly English outside the home environment. To examine if there was a relationship between patterns of language use and target performance, we quantified other questions in the language questionnaire regarding language exposure and usage, and we established a composite score by participant and group. As discussed earlier, the additional measures of language usage included self-reports on how frequently the participants spoke Spanish with their partners, spoke Spanish over the phone, used Spanish for chatting, and used Spanish for texting. The additional measures for language exposure included how

frequently the participants listened to the radio in Spanish, watched TV in Spanish, and read in Spanish (printed material or online).[5] The scale used for usage and exposure was as follows: *very frequently*, *frequently*, *not much*, *rarely* and *never.* To obtain the average composite score, each descriptor was assigned a numerical value ranging from 1 (*very frequently*) to 5 (*never*). The average composite score regarding Spanish was 1.98 (*very frequently*). The context where most of the participants indicated using Spanish was for chatting (14/19 responded ''very frequently''). The average composite score for language exposure was 3.05 (*not much)*. The context that showed more exposure to Spanish was reading, where 9/19 reported reading Spanish ''very frequently'' or ''frequently''. Only 7/19 reported watching TV in Spanish ''very frequently'' or ''frequently'' and only 4/19 reported listening to the radio in Spanish ''very frequently'' or ''frequently''. Results from a GLM analysis measuring the association existing between language usage and exposure as covariables and the target use of *ser* in adjectival contexts showed a significant effect, $\chi^2(2, 66) = 63.45$, $p < .0001$. The patterns of language usage were more strongly associated with target response ($z = 5.381$, $p < .001$) than with the patterns of language exposure ($z = -2.669$; $p = .007$). This confirms H3.

To summarize, the results of Experiment 1 suggest protracted development among child heritage speakers of Spanish in their target use of copula *ser* in *ser*-favored contexts confirming previous work (e.g., Arnaus Gil, 2013; Arnaus Gil and Müller, 2015; Arnaus Gil et al., 2018; Schmitt and Miller, 2007). Spanish/English bilingual children as old as 13 years of age overextended copula *estar* to contexts where *ser* was favored (individual-level predicates). In contrast with recent work with Spanish/English bilingual children (e.g., Lingwall Odio, 2018), we did not find overextension of *ser* to *estar*-favored contexts, confirming what we predicted. This confirms H1. The AHS, however, did not show significant divergences compared with the monolingual children in any of the two contexts tested, disconfirming H1. They appear to have knowledge of copula *ser* and *estar* with adjectives. Thus, it appears as if the divergences that CHS have are overcome in adulthood. Therefore, H1 was only partially confirmed. H3, which predicted a relationship between target performance and language dominance among the child heritage speakers, was only partially confirmed. The divergences showed by the child heritage speakers with target-like use of *ser* in *ser*-favored contexts were not directly associated with reported language dominance.

The AHS, however, showed high patterns of language exposure and usage, and this was significantly associated with their target use of *ser*. Higher exposure to Spanish over their lifespan appears to help the AHS with their target copula use with adjectives. The fact that the divergences that the CHS showed with the use of *ser* are overcome in adulthood lend support to Putnam and Sánchez's (2013) proposal that heritage language grammars are not incomplete, as argued by Montrul and colleagues (e.g., Montrul, 2008). Rather, as argued more recently by Sánchez (2019), the divergences heritage speakers show might be the result of morphosyntactic shifts in their bilingual grammars motivated by their specific patterns of language activation, use, and language ability or dominance (e.g., Perez-Cortes et al., 2019; Putnam and Sánchez, 2013; Sánchez, 2019).

5.2. Experiment 2: Copula production with event locatives

Experiment 2 examined the use copula verbs with event locatives, where *ser* is almost always favored in the native norm. As in the case of adjectives, we implemented a GLM to assess the use of *ser* and *estar* between groups with event locatives. The model was a binomial logistic regression with Group (Child Heritage Speakers, Monolingual Children, Adult Heritage Speakers, and Monolingual Adults) as the independent variable and response as the dependent variable. The response variable was the production of the required copula coded as 1 if the participant produced the required copula and as 0 if they produced the non-required copula. Cases in which participants produced something other than *ser* or *estar* were discarded.

Results showed overextension of *estar* (78%) to event locatives among the CHS and very limited use of *ser* (18%), as predicted. This contrasted with the results of the monolingual children, who showed higher use of *ser* (59%) and much lower use of *estar* (31%). The adult heritage speakers showed 43% of target use of *ser* while the monolingual adults' behavior showed a ceiling effect (96%). This is shown in Fig. 3:

The GLM procedure showed significant differences between groups in the use of *ser* with event locatives, $\chi^2(4, 336) = 717.14$, $p < .001$). A post hoc analysis examining the group probability of producing the copula *ser* showed significant differences between the following groups: Child Heritage Speakers and Monolingual Children, $X_k^2 = 26.113$, $p < .001$; Child Heritage Speakers and Adult Heritage Speakers, $X_k^2 = 8.9553$, $p = .002$; Adult Heritage Speakers and Monolingual Adults, $X_k^2 = 99.993$, $p < .001$; Adult Heritage Speakers and Monolingual Children, $X_k^2 = 6.4455$, $p = .011$; Adult Heritage Speakers and Monolingual Adults, $X_k^2 = 61.606$, $p < .001$; and between Monolingual Children and Monolingual Adults,

[5] Although these measures are not exhaustive, they provide us with additional information on language usage and exposure in addition to the languages spoken at home, school, work, and in social situations.

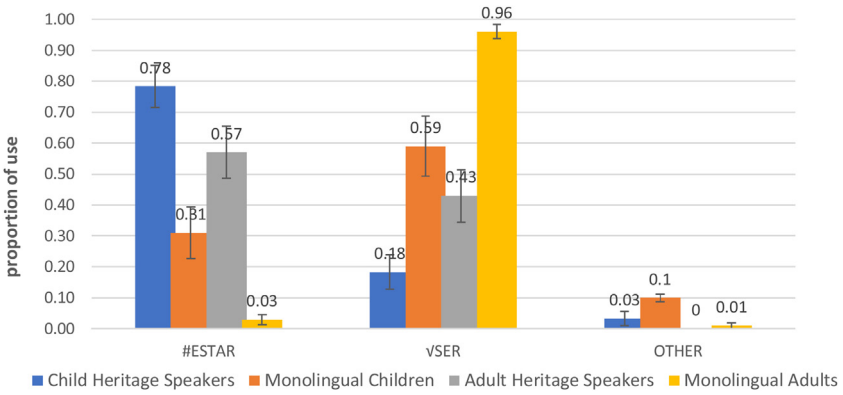

Fig. 3. Proportion of copula *ser, estar*, and *other* structures use in event locative constructions where copula *ser* is required.

Table 7
Results of the GLM Model with logit link and binomial response variable *(Modeling the production of Ser for event locatives)*.

Fixed effect terms	Estimate	SE	*t* (df)	*p*
Group-adult heritage speakers	−0.0924	0.0576	−1.606	0.108
Group-child heritage speakers	−0.7667	0.0735	−10.430	<0.0001
Group-monolingual adults	1.9031	0.1151	16.527	<0.0001
Group-monolingual children	0.4615	0.0718	6.425	<0.0001
Overall model Chi test result: $\chi^2(4, 336) = 717.14$, $p < .001$				
Kruskal–Wallis test pairwise comparison post hoc analysis				

Comparison groups	Fitted probability for production of Ser (SE)	*p*
Child heritage speakers vs. adult heritage Speakers	0.24 (0.07) vs. 0.46 (0.05)	0.002
Child heritage speakers vs. monolingual children	0.24 (0.07) vs. 0.66 (0.07)	<0.001
Child heritage speakers vs. monolingual adults	0.24 (0.07) vs. 0.96 (0.11)	<0.001
Adult heritage speakers vs. monolingual children	0.46 (0.05) vs. 0.66 (0.07)	0.011
Adult heritage speakers vs. monolingual adults	0.46 (0.05) vs. 0.96 (0.11)	<0.001
Monolingual children vs monolingual adults	0.66 (0.07) vs. 0.96 (0.11)	<0.001

$X_k^2 = 29.134$, $p < .001$. As predicted, the two experimental groups showed overextension of *estar* to event locatives where *ser* is required. This is summarized in Table 7.

These results confirm previous research documenting overextension of *estar* to event locative constructions among Spanish monolingual children (Sera, 1992), Spanish/Catalan bilingual children (e.g., Cuza and Guijarro-Fuentes, 2017), and adult L2 learners of Spanish (e.g., Pérez-Leroux et al., 2010; Perpiñán et al., 2020). In order to examine whether this behavior was also present at the individual level, we conducted an individual analysis using the same criteria outlined before with adjectives. The results are represented in Table 8:

As shown in Table 8, the majority of the child heritage speakers (69%) overextended copula *estar* with events, and showed very low (38%) or zero (50%) use of copula *ser*. This contrasts sharply with the results of the monolingual children who behaved on the opposite end of the spectrum. There was one item in which 13/16 of the CHS categorically selected *estar* instead of *ser* (*La fiesta *está en casa de los Simpsons* "The party is at the Simpsons"), compared to 2/16 of the monolingual children. A similar item causing difficulty to the bilingual speakers was *La carrera de caballos es en Texas* "*The horse race is in Texas*" in which 13/16 CHS selected *estar* compared to 5/16 monolingual children. In this context, the monolingual children also used other structures including *se hará* ("It will take place") or *se encuentra* ("It is located"). Interestingly, the CHS did not use any of these other possible constructions and used either *ser* or *estar.* Regarding the AHS, the individual data also confirmed the group results by documenting overextension of *estar* with event locatives.

As in the case of adjectives, we ran a GLM analysis measuring the relationship between the heritage children's language dominance scores and their target use of copula *ser* with events. Results showed a significant effect between language dominance and target use ($z = -9.028$; $p < .001$). Regarding the AHS, results from a GLM measuring the

Table 8
Individual analysis: Event locatives (SER-required context).

Group		Event locatives: SER-required			
		Number of target copulas/5	Number of participants		
			ESTAR	SER	OTHER
Child heritage speakers (n = 16)	*High user*	4–5	11/16 (69%)	0/16 (0%)	0/16 (0%)
	Medium user	3	2/16 (13%)	2/16 (12%)	0/16 (0%)
	Low user	1–2	3/16 (18%)	6/16 (38%)	1/16 (6%)
	Zero user	0	0/16 (0%)	8/16 (50%)	15/16 (94%)
Monolingual children (n = 16)	*High user*	4–5	4/16 (25%)	7/16 (44%)	0/16 (0%)
	Medium user	3	0/16 (0%)	2/16 (12%)	1/16 (6%)
	Low user	1–2	5/16 (31%)	5/16 (31%)	3/16 (19%)
	Zero user	0	7/16 (44%)	2/16 (12%)	12/16 (75%)
Adult heritage speakers (n = 19)	*High user*	4–5	8/19 (42%)	6/19 (32%)	0/19 (0%)
	Medium user	3	2/19 (11%)	3/19 (16%)	0/19 (0%)
	Low user	1–2	6/19 (32%)	5/19 (26%)	0/19 (0%)
	Zero user	0	3/19 (16%)	5/19 (26%)	19/19(100%)
Monolingual adults (n = 20)	*High user*	4–5	0/20 (0%)	19/20 (95%)	0/20 (0%)
	Medium user	3	0/20 (0%)	1/20 (5%)	0/20 (0%)
	Low user	1–2	3/20 (15%)	0/20 (0%)	1/20 (5%)
	Zero user	0	17/20 (85%)	0/20 (0%)	19/20 (95%)

association existing between language usage and exposure as covariables and the target use of *ser* with events showed an overall significant association with target response, $\chi^2(2, 66) = 63.4532$, $p < .0001$. However, among these two covariables, only the patterns of language usage were significantly associated with the target response ($z = -2.888$, $p = .022$); the patterns of language exposure were not ($z = 1.039$; $p = .299$). This supports H3.

To sum up, both the individual and group data confirmed H2. CHS and AHS do not appear to have knowledge of copula *ser* use with event locatives leading to overextension of copula *estar*. In contrast with the use of copula *ser* with adjectives, the divergences that heritage speakers have during childhood do not appear to be overcome during adulthood. This sub-use of copula *ser* remains difficult to acquire among child and adult heritage speakers of Spanish. As in the case of adjectives, we found significant association between language dominance and target performance in the case of the CHS, and between reported patterns of language usage and target performance in the case of the AHS.

6. Discussion and conclusions

The goal of the present study was to examine the production of copula verbs *ser* and *estar* among child and adult heritage speakers of Spanish born and raised in the U.S. Following previous work, we expected overextension of *estar* in adjectival contexts where *ser* is normally favored as well as with event locatives (e.g., Arnaus Gil, 2013; Sera, 1992; Silva-Corvalán and Montanari, 2008).

Regarding the use of *ser* with individual-level predicates, our results showed that CHS of Spanish are not sensitive to *ser/estar* distinctions and overextend copula *estar*. This confirms our expectations as well as recent work (e.g., Arnaus Gil et al., 2018; Arnaus Gil, 2013; Arnaus Gil and Müller, 2015; Silva-Corvalán and Montanari, 2008). It is clear from the results that the acquisition of copula *ser* with individual-level predicates is challenging for CHS, and that their strategy is to overgeneralize *estar*. Their proportion of *ser* use was very low, even among children as old as 13 years of age. It appears as if they are having difficulties coercing the aspectual meaning of the phrase, following Camacho's (2012) theoretical approach to copula *ser* and *estar* use. The AHS also showed significant divergences with the use of *ser* in *ser*-favored contexts compared to the monolingual adults. However, their differences were not very large (63% vs. 75%), and the individual data did not confirm the quantitative analysis at the group level. We have argued for protracted development in the acquisition of *ser* with individual-level predicates during childhood stemming from low levels of language dominance in Spanish and decreased patterns of language activation and use (e.g., Putnam and Sánchez, 2013). As discussed earlier, the child heritage speakers spoke English in most contexts and were reported to be more dominant in English. Their reported language dominance in Spanish was significantly correlated with their target use of *ser*, but a closer look at the individual data did not confirm major differences among the different language dominance groups. We have argued that limited exposure and usage of Spanish as well as low levels of language dominance cause their native Spanish grammar

to be more aligned with English as a dominant language leading to significant variability (Sánchez, 2019). However, the individual data from the AHS suggest that these asymmetries are not insurmountable, and that it is possible for these structures to be stabilized in the adult grammar. Although the AHS were significantly different from the monolingual adults, the individual data did not show major differences between the two groups. Thus, Hypothesis 1 was partially confirmed. This can be accounted for by their high use of Spanish, as reported in the language questionnaire, which was significantly associated with their higher use of copula *ser*. Thus, the asymmetries that the heritage speakers have with copula *ser* use with individual-level predicates appear to be fluid and dynamic depending on the speakers' specific patterns of language exposure, use and proficiency, as recently argued by Sánchez and colleagues (e.g., Perez-Cortes et al., 2019; Putnam and Sánchez, 2013; Sánchez, 2019).

In relation to copula *ser* with event locatives, the data confirmed H2 as well as previous work with Spanish/English bilingual children (e.g., Sera, 1992; Silva-Corvalán and Montanari, 2008) and adult L2 learners (Pérez-Leroux et al., 2010; Perpiñán et al., 2020). Both the child and the adult heritage speakers showed significant overextension of *estar* to event locatives where *ser* is typically favored, compared to monolingual children and monolingual adults respectively. The acquisition of *ser* to locate events appears to undergo protracted development in both child and adult heritage speakers. Regarding the CHS, the divergence may stem from low levels of language dominance as well as limited usage and exposure to Spanish. Their patterns of language exposure and use were limited to the home environment, decreasing their levels of language activation and use. Furthermore, young children might be affected by cognitive maturation factors in their processing of event locations. This is supported by results for the CHS and by recent work documenting significant overextension of *estar* to event locatives among monolingual Spanish children (Cuza and Guijarro-Fuentes, 2017). Furthermore, recent work by Arunachalam and He (2018) also shows that the semantic representation of event locatives is vulnerable to protracted development and dependent on language experience. As discussed by Hoff (2014), although the basics of language development are accomplished by the ages of 4–5, language development does not stop there (Hoff, 2014, p. 293). Mastering of phonological awareness, vocabulary, pragmatic knowledge, narrative development, and syntactic and semantic knowledge continue to develop during the school years (e.g., Anglin, 1993; Berman, 2007; Hoff and Shatz, 2007). Anglin (1993) found that derived words increased exponentially between third- and fifth-grade due to the development of derivational and inflectional morphology. Although the children in our study were not required to read the preamble to respond to the oral prompts, research suggests strong correlation between the development of literacy in the school years and oral language use (e.g., Hoff, 2014; Jisa, 2004). In the case of Spanish/English bilingual children born and raised in the US, the lack of literacy instruction in Spanish during the school years (e.g., Oller and Eilers, 2002), coupled with reduced language exposure and usage (e.g., Daskalaki et al., 2020; Hoff and Core, 2015; Thordardottir, 2011, 2017; Unsworth, 2016) may lead to stronger alignments with English lexical features and consequent protracted development of the child heritage grammar (see Sánchez, 2019).

Regarding the AHS, their use of copula *ser* with events was significantly different than that of the adult monolingual speakers (43% vs. 96%) but this appears to be an improvement compared to the CHS (43% vs. 18% respectively). This might be accounted for by the monolingual speakers' higher patterns of language use, which was significantly associated with target response. This sub-use of copula *ser* does not follow the regular patterns of *ser* use in Spanish, and heritage speakers may not be exposed to enough experience with this structure until later on in life.

In sum, we have found no sensitivity to the aspectual meanings of copula *ser* with individual-level adjectives and event locatives among child heritage speakers of Spanish born and raised in the U.S. Furthermore, the data showed significant divergences among the AHS regarding copula *ser* use with event locatives. We have argued for protracted development of copula *ser*, stemming from low patterns of language activation and use: proficiency in the case of the AHS, and cognitive maturation in the case of the bilingual children. The results add support to current acquisition research arguing for a pivotal role for language ability, activation and use in the extent of morphosyntactic shifts in child and adult heritage grammars (e.g., Perez-Cortes et al., 2019; Putnam and Sánchez, 2013; Sánchez, 2019). The overextension of *estar* with events among the monolingual children provides conflicting evidence in relation to theoretical accounts for copula *ser* selection with event locatives in Spanish. However, as discussed earlier, it is possible that the development of this sub-use of *ser* is constrained by maturational factors (Arunachalam and He, 2018) since the monolingual adults behaved in a target-like manner. As argued by Camacho, *estar* is the default copula with locative prepositional phrases, and it is the interpretation of the eventive subject that leads to *ser* selection. It is possible that Spanish-speaking children (bilingual and monolingual) start with the default option and only later on, via exposure to experience, become sensitive to the eventive properties of the subject, leading to the target selection of copula *ser.* The sensitivity to the eventive properties of the subject might be delayed in the case of bilingual children due to reduced exposure and use of Spanish as a minority language as well as bilingual effects. Future research would benefit from examining more cases of non-variable contexts. This could add additional information as to whether child and adult heritage speakers of Spanish also overextend *estar* in these contexts.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Anglin, J.M., 1993. Vocabulary development: a morphological analysis. Monogr. Soc. Res. Child Dev. 58 (10, Serial No. 238).

Arnaus Gil, L., 2013. La selección copulativa y auxiliar: las lenguas romances (español - italiano - catalán - francés) y el alemán en contacto. Su adquisición en niños bilingües y trilingües. Narr Verlag, Tübingen.

Arnaus Gil, L., Müller, N., 2015. The acquisition of Spanish in a bilingual and a trilingual L1 setting. In: Judy, T., Perpiñán, S. (Eds.), The Acquisition of Spanish in Understudied Language Pairings. John Benjamins Publishing, Amsterdam, pp. 135–168.

Arnaus Gil, L., Jiménez Gaspar, A., Müller, N., 2018. The acquisition of Spanish SER and ESTAR in bilingual and trilingual children: Delay and enhancement. In: Language Acquisition and Contact in the Iberian Peninsula. De Gruyter Mouton, Berlin pp. 1–34.

Arunachalam, S., He, A.X., 2018. Children's acquisition of nouns that denote events. In: Bertolini, A.B., Kaplan, M.J. (Eds.), Proceedings of the 42nd Annual Boston University Conference on Language Development. Cascadilla Press, Somerville, MA, pp. 29–44.

Berman, R.A., 2007. Developing linguistic knowledge and language use during adolescence. In: Hoff, E., Shatz, M. (Eds.), Blackwell Handbook of Language Development. Blackwell, Oxford, UK, pp. 347–367.

Bruhn de Garavito, J., Valenzuela, E., 2008. Eventive and stative passives in Spanish L2 acquisition: a matter of aspect. Bilingualism: Lang. Cogn. 11 (3), 323–336.

Camacho, J., 2012. *Ser* and *estar*: the individual/stage-level distinction and aspectual predication. In: Hualde, J., Olarrea, A., O'Rourke, E. (Eds.), The Handbook of Hispanic Linguistics. Blackwell Publishing Ltd, Oxford, pp. 453–476.

Carlson, G., 1977. Reference to Kinds in English. Unpublished Doctoral Dissertation. University of Massachusetts.

Cuza, A., Guijarro-Fuentes, P., 2017. Semantic redistribution of copula Ser/Estar in Catalan/Spanish bilingual children and adults. In: La Mendola, M., Scott, J. (Eds.), Proceedings for 41st Boston University Conference in Language Development (BUCLD). Cascadilla Press Cascadilla Press, Somerville, MA, pp. 186–198.

Cuza, A., Miller, L., 2015. The protracted acquisition of past tense aspectual values in child heritage Spanish. In: Klassen, R., Liceras, J., Valenzuela, E. (Eds.), Hispanic Linguistics at the Crossroad: Theoretical Linguistics, Language Acquisition and Language Contact. John Benjamins, Amsterdam, pp. 211–230.

Cuza, A., Pérez-Tattam, R., 2016. Grammatical gender selection and phrasal word order in child heritage Spanish: a feature reassembly approach. Bilingualism: Lang. Cogn. 19, 50–68.

Cuza, A., Pérez-Tattam, R., Barajas, E., Miller, L., Sadowski, C., 2013. The development of tense and aspect morphology in child and adult heritage Spanish: implications for heritage language pedagogy. In: Schwieter, John (Ed.), Innovative Research and Practices in Second Language Acquisition and Bilingualism. John Benjamins, Amsterdam, pp. 193–220.

Daskalaki, E., Blom, E., Chondrogianni, V., Paradis, J., 2020. Effects of parental input quality in child heritage language acquisition. J. Child Lang. 1–28.

Demonte, V., Masullo, P., 1999. La predicación: los complementos predicativos. In: Bosque, I., Demonte, V. (Eds.), Gramática descriptiva de la lengua española, Vol. 2. Espasa, Madrid, pp. 2461–2523.

Diesing, M., 1992. Indefinites. MIT Press, Cambridge, MA.

Duffield, N., White, L., 1999. Assessing L2 knowledge of Spanish clitic placement: convergent methodologies. Second Lang. Res. 15, 133–160.

Fernández Fuertes, R., Liceras, J., 2010. Copula omission in the English developing grammar of English/Spanish bilingual children. Int. J. Bilingual Educ. Bilingualism 13, 525–551.

Fernández-Leborans, M., 1995. Las construcciones con el verbo estar: aspectos sintácticos y semánticos. Verba 22, 253–284.

Geeslin, K., 2002. The acquisition of Spanish copula choice and its relationship to language change. Stud. Second Lang. Acquis. 24 (3), 419–450.

Gutiérrez-Clellen, V.F., Kreiter, J., 2003. Understanding child bilingual acquisition using parent and teacher reports. Appl. Psycholinguist. 24 (2), 267–288.

Hoff, E., 2014. Language Development, 5th ed. Wadsworth Cengage Learning, Belmont, CA.

Hoff, E., Core, C., 2015. Input and language development in bilingually developing children. Semin. Speech Lang. 34 (2), 215–226.

Hoff, E., Shatz, M., 2007. Blackwell Handbooks of Developmental Psychology. Blackwell Handbook of Language Development. Blackwell Publishing.

Holtheuer, C., 2011. The distribution of 'ser' and 'estar' with adjectives: a critical survey. Rev. Signos: Est. Lingüíst. 44 (75), 33–47.

Holtheuer, C., 2013. El uso del input en la adquisición de las copulas *ser* and *estar* con adjetivos en el español infantil. RLA: Rev. Lingüíst. Teórica Aplicada 52 (2), 29.

Jisa, H., 2004. Growing into academic French. In: Berman, H. (Ed.), Language Development Across Childhood and Adolescence. John Benjamins, Philadelphia, pp. 135–161.

Leonetti, M., Pérez-Jiménez, I., Gumiel-Molina, S., 2015. Ser and Estar: Outstanding Questions. John Benjamins, Amsterdam.

Lingwall Odio, A., 2018. Grammatical Acceptability Among Spanish-English Bilingual Children: The Acquisition of ser and estar. Unpublished Doctoral Dissertation. Rutgers University.

Maienborn, C., 2005. A discourse-based account of Spanish *ser/estar*. Linguistics 43, 155–180.

Montrul, S., 2002. Incomplete acquisition and attrition of Spanish tense/aspect distinction in adult bilinguals. Bilingualism: Lang. Cogn. 5, 39–68.

Montrul, S., 2004. Subject and object expression in Spanish heritage speakers: a case of morphosyntactic convergence. Bilingualism: Lang. Cogn. 7, 125–142.

Montrul, S., 2008. Incomplete Acquisition in Bilingualism: Re-Examining the Age Factor. John Benjamins.

Montrul, S., 2014. Structural changes in Spanish in the United States: differential object marking in Spanish heritage speakers across generations. Lingua 151, 177–196.

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Montrul, S., Slabakova, R., 2003. Competence similarities between native and near-native speakers. Stud. Second Lang. Acquis. 25, 351–398.
Oller, D.K., Eilers, R.E., 2002. Language and Literacy in Bilingual Children. Multilingual Matters, Clevedon.
Paradis, J., Nicoladis, E., Crago, M., 2007. French-English bilingual children's acquisition of past tense. In: Caunt-Nulton, H., Kulatilake, S., Woo, I. (Eds.), Proceedings of the 31st Annual Boston University Conference on Language Development. Cascadilla Proceedings Project, Somerville, MA, pp. 497–507.
Perez-Cortes, S., Putnam, M., Sánchez, L., 2019. Differential access: asymmetries in accessing features and building representations in heritage language grammars. Languages 4 (4), 81–134.
Pérez-Leroux, A.T., Álvarez, Y., Battersby, T., 2010. *Cuando era feliz, e indocumentado*: an aspectual approach to copula choice in L2 Spanish. In: Borgonovo, Claudia, et al. (Eds.), Selected Proceedings of the 12th Hispanic Linguistics Symposium. Cascadilla Proceedings Project, Somerville, MA, pp. 209–220.
Perpiñán, S., Marin, R., Moreno Villamar, I., 2020. The role of aspect in the acquisition of ser and estar in locative contexts by English-speaking learners of Spanish. Lang. Acquis. 27 (1), 35–67.
Pirvulescu, M., Roberge, Y., Thomas, D., Pérez-Leroux, A.T., Strik, N., 2014. Bilingual effects: exploring object omission in pronominal languages. Bilingualism: Lang. Cogn. 17, 495–510.
Polinsky, M., 2011. Reanalysis in adult heritage language: a case for attrition. Stud. Second Lang. Acquis. 33, 305–328.
Putnam, M., Sánchez, L., 2013. What's so incomplete about incomplete acquisition? A prolegomenon to modeling heritage language grammars. Linguist. Approach. Bilingualism 3, 478–508.
Sánchez, L., 2019. Bilingual Alignments. Languages 4 (4), 1–24.
Schmitt, C., Miller, K., 2007. Making discourse-dependent decisions: the case of the copulas *ser* and *estar* in Spanish. Lingua 117, 1907–1928.
Schmitt, C., Holtheuer, C., Miller, K., 2004. Acquisition of copulas *ser* and *estar* in Spanish: Learning lexico-semantics, syntax and discourse. In: Brugos, A., Micciulla, L., Smith, C.E. (Eds.), Proceedings of the 28 Annual Boston University Conference on Language Development. Cascadilla Proceedings Project, Somerville, MA, pp. 1–11.
Sera, M., 1992. To be or to be: use and acquisition of the Spanish copulas. J. Memory Lang. 31, 408–427.
Silva-Corvalán, C., 1986. Bilingualism and language change: the extension of *estar* in Los Angeles Spanish. Language 62, 587–608.
Silva-Corvalán, C., 2014. Bilingual Language Acquisition: Spanish and English in the First Six Years. Cambridge University Press, New York State, New York.
Silva-Corvalán, C., Montanari, S., 2008. The acquisition of *ser*, *estar* (and *be*) by a Spanish-English bilingual child: the early states. Bilingualism: Lang. Cogn. 11 (3), 341–360.
Thordardottir, E., 2011. The relationship between bilingual exposure and vocabulary development. Int. J. Bilingualism 15, 426–445.
Thordardottir, E., 2017. Amount trumps timing in bilingual vocabulary acquisition: effects of input in simultaneous and sequential school-age bilinguals. Int. J. Bilingualism 23, 236–255.
Unsworth, S., 2016. Quantity and quality of language input in bilingual language development. In: Nicoladis, E., Montanari, S. (Eds.), Lifespan Perspectives on Bilingualism. de Gruyter, Berlin, pp. 136–196.
Valenzuela, E., Iverson, M., Rothman, J., Borg, K., Pascual, Cabo, D., Pinto, M., 2015. Eventive and stative passives and copula selection in Canadian and American heritage speakers of Spanish. In: Pérez-Jimenez, I., Leonetti, M., Gumiel-Molina, S. (Eds.), New Perspectives on the Study of Ser and Estar. John Benjamins, Amsterdam/Philadelphia, pp. 267–292.
VanPatten, B., 1985. The acquisition of *ser* and *estar* by adult learners of Spanish: a preliminary investigation of transitional states of competence. Hispania 68 (2), 399–406.
Zagona, K., 2013. Ser and estar: Phrase structure and aspect. Cahiers Chronos 25, 303–327.

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