


ORIGINAL ARTICLE

Can speakers of different languages be saying the same thing? Influences of non-native language exposure and explicit comparison on children's language awareness

Dolly P. Rojo^{1*}, Catharine H. Echols² and Zenzi M. Griffin²

¹Mount Saint Mary's University, Los Angeles, USA and ²The University of Texas, Austin, USA

*Corresponding author. Email: drojo@msmu.edu

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Abstract

Language awareness (LA)—an understanding of the communicative functions and conventions of language—could benefit monolingual children as they navigate their increasingly multilingual world. To evaluate how non-native language exposure influences English-speaking children's understanding that different languages can convey equivalent information, 63 5–7-year-olds compared utterances in English and Lithuanian (unfamiliar to all participants). Half of the children also compared English utterances to Spanish (a widely spoken language in their community—94% of children had some past exposure), whereas the other half compared English utterances to Tagalog (unfamiliar to all participants). Children in the Spanish condition were significantly more likely than those in the Tagalog condition to agree that a Lithuanian and an English speaker could be saying the same thing. We argue that children's experience with Spanish as a community language, coupled with explicit questioning about commonalities between languages, served to scaffold an understanding of LA.

Keywords: children; metalinguistic; language awareness

As children develop, they gain an ability not only to produce and understand language but also to reflect on it. This metalinguistic awareness enables children to distinguish the structure of language from its meaning and thus can be valuable for the learning of new languages (Lasagabaster, 2001) and of literacy skills (e.g., Tunmer et al., 1988; Yelland et al., 1993). Bilingualism appears to promote metalinguistic awareness (e.g., Bialystok, 1988; Bialystok & Barac, 2012; Cummins, 1978; Galambos & Goldin-Meadow, 1990). It may do so because bilingual children use two linguistic systems that describe the same content, which may help them to recognize the arbitrariness of linguistic forms (e.g., words), as well as to understand that the structure of language is separate from its meaning (Bialystok, 1988). Having exposure to a second language, even without full proficiency, also appears

to promote metalinguistic skills such as the recognition that, when speakers of different languages describe the same object with different labels, both labels refer to that single object (Ahkhtar *et al.*, 2012; Rojo & Echols, 2018).

In the current study, we focus on one particular aspect of metalinguistic awareness: language awareness (LA). LA has been defined as “having or gaining explicit knowledge about and skill in reflecting on” languages and is considered to be useful both for advancing capabilities in a first language and in promoting second language learning (James, 1999, p. 102). Explicit LA is evidenced when children verbally explain their understanding of the communicative functions and conventions of language (Atagi & Sandhofer, 2020). One example of this is in asking children, directly, what language(s) they speak (Akhtar *et al.*, 2012; Atagi & Sandhofer, 2020).

We argue that an aspect of LA is also evident in one’s understanding that speakers of different languages can convey the same information (e.g., an English speaker can use English words to convey the same message that a Spanish speaker conveys using Spanish words). This variant of LA might be especially apparent in bilingual children because they constantly use different linguistic systems to convey the same conceptual content. Given the evidence that functionally monolingual children with exposure to other languages can acquire some of the metalinguistic advantages of bilingualism (Ahkhtar *et al.*, 2012; Atagi & Sanderhofer, 2020; Rojo & Echols, 2017, 2018), it seems plausible that, in this population, exposure also could promote recognition that speakers of different languages can convey the same information.

Bialystok (1988) argued that bilingual children’s advantages on metalinguistic tasks are due to their opportunity to recognize that two linguistic systems describe the same conceptual structure. Perhaps, then, for children with more limited exposure to a second language, such as children living in a community in which another language is widely spoken, encouraging explicit comparison between the languages might promote this awareness. Indeed, there is evidence of effects of explicit comparison in other conceptual domains, such as categorization (Gentner & Namy, 1999) and mathematical problem-solving (Rittle-Johnson & Star, 2007), as well as in the language domain (e.g., Childers *et al.*, 2014). Moreover, research on language learning by adults suggests that, though implicit learning through exposure can result in successful second language (L2) learning, explicit knowledge promotes learning, and asking learners to reflect on their knowledge leads to increased explicit knowledge (Monaghan *et al.*, 2019).

Influences of multilingual environments on metalinguistic skills

Experience with multiple languages has been linked to several metalinguistic skills. Bilingual children demonstrate a heightened appreciation that words are arbitrary and do not have an inherent association with a specific object (e.g., Bialystok, 1987; Cummins, 1978; Yelland *et al.*, 1993). The understanding that labels are arbitrary is important for recognizing that a single object can be called many things, both within a single language and across various languages; bilingual children tend to demonstrate this understanding more readily than monolingual children (e.g., Akhtar *et al.*, 2012; Au & Glusman, 1990; Byers-Heinlein *et al.*, 2014; Byers-Heinlein &

Werker, 2009; Davidson & Tell, 2005; Houston-Price et al., 2010; Kalashnikova et al., 2015). Bilingualism has also been associated with separating form from meaning at the syntactic level, with bilingual children showing advantages in recognizing that a grammatically well-formed sentence that makes no sense is nonetheless a correct sentence (Bialystok & Barac, 2012).

Recent research suggests that children who have exposure to multiple languages, even if they are proficient only in one, gain some metalinguistic advantages. Rojo and Echols (2018) showed that greater exposure to a non-native language was associated with children's willingness to accept more than one label, across both their native language and a language in which they were not fluent. Similarly, Ahkter et al. (2012) have shown that exposure to two or more languages is associated with 3–4-year-olds' willingness to endorse a foreign label. Hearing a second language also has been associated with other metalinguistic skills, such as the ability to identify and assign labels to languages (Akhtar et al., 2012; Atagi & Sandhofer, 2020). These findings raise the question of whether non-native language exposure might promote a broader set of metalinguistic skills, including LA.

The potential influence of explicit comparison

For children who are acquiring two languages, metalinguistic advantages may derive from their frequent opportunities to observe that the same content is conveyed in different forms across languages (Bialystok, 1988). Children who have more limited exposure to a second language, and are proficient in only a single language, will have fewer opportunities to identify the common meaning across different forms. For these children, explicit discussions or questions that call attention to languages and the relations among them might be important for achieving metalinguistic skills. An environment in which multiple languages are being spoken around the child may provide opportunities for these kinds of explicit discussions of language. Indeed, Atagi and Sandhofer (2020) proposed that parents' conversations about language might have contributed to the language labeling advantage exhibited by children from homes in which bilingual speech was heard, as parents often reported having such explicit discussions.

Past research in other areas suggests that encouraging children to compare entities, events, or solutions enhances their learning. Children's problem-solving is improved when they are prompted to describe the similar structures that underlie superficially different problems (Brown et al., 1986). Asking them to compare problem solutions strengthens their procedural knowledge and flexibility in mathematics (Rittle-Johnson & Star, 2007). Tasks that induce children to engage in explicit comparison enhance transfer of knowledge to new contexts (Hoyos & Gentner, 2017). Comparison helps children to disregard misleading perceptual similarities in categorization tasks, enabling them to focus instead on deeper conceptual similarities (Gentner & Namy, 1999). In the domain of language development, sentences that foster comparison of object properties, or events, promote word learning (Childers et al., 2014; Waxman & Klibanoff, 2000). Given these findings, it is plausible that overt comments and questions, such as those calling attention to the common

meanings of sentences spoken in different languages, could promote metalinguistic skills and, specifically, LA.

In our research, we (a) explore the influences of non-native language exposure on children's LA and (b) assess the possibility that explicit queries about shared meanings between speakers of different languages might help children with limited exposure to a second language to achieve LA. We test these questions in a study in which 5–7-year-old children are asked to make judgments about the content of speech produced by speakers of different languages.

Pilot study

In an unpublished pilot version of the current study, we assessed possible influences of non-English exposure on children's LA. Fifty-one English-speaking children ($M = 6;6$ years, $SD = 10$ months, $range = 5;2$ to $7;11$ years) participated. Parents reported children's previous non-English language exposure from sources such as parents, teachers, peers, extended family, and babysitters in typical hours per week ($range = 0$ to 36.2 h). Children heard recordings of the same passage, from a children's short story, read in Russian, Spanish, and English, by a female native speaker of each language. The order of the languages was randomly determined for each child. After each recording was played, children responded to 3 open-ended questions: (1) "What is happening in that sound?" (2) "Is someone saying something?" and, if yes to 2 and (3) "What made you think that someone was saying something?"

Children who expressed recognition that the non-English speakers were speaking (i.e., a yes to question 2) and further explained that they heard someone speaking, described what they thought the speaker was saying, or otherwise responded with an understanding that the vocalizations were intended to convey meaning earned higher LA scores than children who did not. See Table 1 below for coding system.

Children could achieve a maximum of 1 point for responses to English and a maximum of 3 each for Spanish and Russian, for a maximum total of 7 points. A linear regression with LA scores (range 0 to 7) as the dependent variable, and age (in months) and non-English exposure (in parent-reported hours per week) as predictor variables suggested that children whose parents reported higher exposure to non-English languages exhibited greater LA in their answers. Greater non-English exposure predicted a higher LA score ($\beta = .05$, $p = .04$). Age was not significant ($\beta = .03$, ns). The overall model fit was $R^2 = .10$, $F(2, 48) = 2.61$, $p = .08$. Additionally, there were non-significant order effects that suggested children might be using rudimentary knowledge of Spanish as a scaffold for recognizing that the Russian speaker could be saying the same thing as the English speaker. For example, some children who heard Spanish before Russian were able to understand one or two words in the Spanish utterances (e.g., the word "azul"—the word for blue in Spanish—in a story about the blue sea) and stated to the experimenter that perhaps the Russian speaker also could be saying the word "blue." These children tended to score higher in LA than children who did not hear Spanish before Russian. This anecdotal evidence suggests that children were learning LA as they were exposed to samples of different languages and questioned about them. The main study

Table 1. Coding system for language awareness measure of pilot study

	0	1	2	3
English	I don't know, or incoherent or no response	Child identified that audio is English (or retells parts of the story heard in the audio)	–	–
Russian or Spanish	I don't know, or incoherent or no response	Child stated that the audio is another language (e.g., "It's Spanish!")	Child stated that the audio consists of someone telling a story in another language, or describing the day/the weather in another language OR Stated that audio is words in another language and child further describes their own skills in a foreign language (e.g., "I can speak some words in Spanish too!")	Child states that the story is the same story as the other female speaker (i.e., English) (e.g., "Hey! That's exactly what the other one was saying!")

was designed to explicitly test the possibility of such a learning effect using a more quantitative scoring system.

Main study

For the current study, we built on the pilot study to assess the possibility that prior experience with non-English languages benefits 5–7-year-old English-speaking children in their understanding that speech in other languages can convey information comparable to speech in English. Our expectation is that most children ultimately will achieve LA, but that exposure to non-English languages facilitates its acquisition. Consequently, we targeted an age group during which such facilitation might be observed. In past research on children's metalinguistic skills, children in the 5 to 7 age range who were bilingual or had multilingual exposure outperformed monolingual children with limited exposure to other languages (Bialystok, 1988; Dautel & Kinzler, 2018; Galambos & Goldin-Meadow, 1990; Sutherland & Cimpian, 2015).

Furthermore, we sought to more systematically assess the possibility that explicit questioning could assist children in scaffolding from their modest environmental exposure to Spanish to infer that speech in an unfamiliar language could be communicating information similar to speech in English. We did this in two ways: First, we devised a sequence of questions that encouraged increasingly explicit comparisons between children's native language (English) and two non-native languages. The questions consisted of yes-no questions that indirectly or directly compared the speech in English to an unfamiliar language, Lithuanian, to elicit responses about whether the speakers could be conveying similar information (or were filler

questions, eliciting a “no” response, to counteract development of a “yes” bias). We associated each language with a different female speaker to facilitate reference to the utterances in each language. For example, a child might hear Emily say in English, “Wow, I really hate carrots!” and Leena says the same information in Lithuanian, “Oi, aš tikrai nemėgstu morkų!” A child who responded “yes” to the question, “Could Emily and Leena be saying the same thing?” would earn points for LA.

Secondly, in a between-subjects manipulation, half of the children answered two questions about utterances in Spanish (a language to which nearly all children had some past exposure) at the start of the study and two questions towards the end of the study, whereas the other half of children answered the same questions about utterances in an unfamiliar language (Tagalog). Thus, children randomly assigned to the Spanish condition heard utterances from Sonia (Spanish), Emily (English), and Leena (Lithuanian), whereas those in the Tagalog condition heard translation equivalents spoken by Tala (Tagalog), Emily (English), and Leena (Lithuanian). Aside from the Spanish-Tagalog language manipulation, utterances and questions were presented in the identical languages and order for all participants to allow us to assess the possibility that children might be learning LA through repeated and increasingly explicit questions about language comparisons.

Spanish is heard frequently in the Texas community in which this study took place, with 22% of residents speaking Spanish at home (Ryan, 2013). Tagalog is far less common (spoken by approximately 0.2% of residents), and Lithuanian is very rare (spoken by approximately 0.005% of residents; U.S. Census Bureau, 2015). Because nearly all children in the community have at least minimal exposure to Spanish, many children in the Spanish condition could have the opportunity to figure out, during the task, that both the English and Spanish speaker were saying the same thing and thus infer that the Lithuanian speaker might also be conveying similar information. In contrast, because it would be a novel language for the children, Tagalog could not serve as a scaffold in this way, and thus, the explicit questioning would be less effective in promoting LA in the Tagalog condition.

Summary of predictions

To summarize, we predicted that children with more non-English experience prior to participating in the study would express greater LA than children with little to no foreign language experience. Because Spanish is widely spoken in the community in which the study took place, many children have some experience with this language. We predicted that children assigned to the Spanish condition would show greater LA than children assigned to the Tagalog condition. Specifically, for children with at least some limited knowledge of Spanish, comparison questions could lead to a recognition that the Spanish speaker might be saying the same thing as the English speaker. As we saw in the pilot study, even knowing one or two words in Spanish could enable children, when directed to make comparisons, to infer that both speakers were describing similar content. Building on that recognition (an opportunity that would be absent for children in Tagalog condition) additional questions could encourage children to consider that the Lithuanian speaker also could be saying the same thing. Moreover, this account would predict increased evidence of LA as children progressed through the task, particularly given the

increasingly explicit questions. Because past research has shown that older children (e.g., 7-year-olds) express greater metalinguistic skills than younger children (e.g., 5-year-olds; Sutherland & Cimpian, 2015), we also hypothesized that older children would outperform younger children for evidence of LA.

Method

Participants

Sixty-three English-speaking parent-child dyads participated in this study. Children were, on average, 6;2 years old ($SD = 9$ months, $range = 5;1$ to $7;11$ years). Thirty-three of the children were female; 30 were male. Families were from a southwestern city in the United States, and the racial/ethnic makeup was as follows: 6% Asian, 10% Black or African-American, 59% White or European, 22% Mixed, and 3% preferred not to answer; additionally, 27% of children were identified as Hispanic. The sample was primarily monolingual (English-fluent); 9 participants were reported by parents to have at least modest comprehension (“mostly understand when spoken to, but often misunderstands words or phrases” or “understands this language very well”) in a language other than English. For 7 out of these 9 children, this modest comprehension was of Spanish. Despite their limited fluency in Spanish, 94% of children had some exposure to Spanish; no parents reported exposure either to Tagalog or Lithuanian. More information about the children’s language background is provided in Results, in the section titled “Summary of language exposure and proficiency.”

Materials and procedure

The language exposure assessment tool (LEAT)

Children’s language experience was assessed using the Language Exposure Assessment Tool (LEAT; DeAnda et al., 2016). This is a formalized measure of language exposure over the lifetime that addresses all sources of language exposure (e.g., parents, peers, teachers, extended family, other caretakers). In our study, the LEAT was administered and scored according to instructions from DeAnda et al. Parents were asked detailed questions about their children’s language exposure, beginning with a list of all sources of language exposure (i.e., people in the child’s life) and then more detailed questions about the hours per day, days per week, and period of life that these individuals exposed the children to their different languages. This phone interview was administered with the parent prior to a lab visit by both parent and child.

The language background questionnaire for parents

This is a modified version of a language background form used in Rojo and Echols (2018). At the lab visit, parents were provided with a copy of this form to report the child’s current experience and proficiency in English. Additional copies of the form were provided to the parent to report each additional language the child was currently exposed to; languages to which a child had been exposed in the past but no

longer heard were not inquired about on this questionnaire, as this was already accounted for in the LEAT. For each language, the questionnaire asked for the child's age of first exposure to the language, the percentage of instruction, if any, in the language, and the child's proficiency on a 5-point scale for speaking (or signing, if a sign language) and understanding; this scale began with an option for "Does not Understand (or speak, for Speaking proficiency) this language when it is spoken" to "understands (or speaks, for Speaking proficiency) some isolated words" all the way up to option 5 "Understands this language very well (Speaks this language fluently)."

LA utterances

Twelve original utterances were created for this study. Utterances contained vocabulary that was simple enough for the target age range to comprehend. Six of these were translated into Lithuanian and 3 into both Spanish and Tagalog. Utterances were 5 to 25 words in length. Utterances in Spanish intentionally included high-frequency words to increase the likelihood that Spanish-experienced children might recognize words, while trying to exclude cognates. One Spanish-English cognate was unintentionally included in the penultimate utterance, "diferente"/"different."

A female native speaker of Lithuanian and of Tagalog translated the English utterances for their respective languages. These translators also produced the utterances that children heard. The Spanish phrases were created by one of our authors (a native Spanish speaker) and were recorded by a different (non-Author) native Spanish speaker. An English-native speaker recorded the English utterances. A Snowball microphone, by Blue Inc., was used to record all utterances. The Audacity application on a Macintosh computer was used for recordings and calibration. All audio was calibrated to be 70 dB in volume. Stimuli were compiled into one playlist and played using iTunes on a Macintosh computer.

LA questionnaire

This questionnaire was created for this study. For the purposes of question-phrasing, the Lithuanian speaker was given the name Leena, the English speaker Emily, the Tagalog speaker Tala, and the Spanish speaker Sonia. All characters were female. There were two versions of the questionnaire, one for the Spanish Condition and one for the Tagalog Condition. The only difference between the two conditions was whether children heard 3 utterances in Spanish or Tagalog before being asked in English about what Sonia or Tala might have said. Children were randomly assigned to the 2 conditions. All children were asked the same questions about English and Lithuanian utterances. Table 2 contains all utterances and questions, including the researcher's instructions to the child.

All questions were phrased for a "yes" or "no" response, followed by a prompt to indicate how sure the child was about their yes/no response ("Very Sure," "A Little Sure," or "Not Sure"). Children could respond verbally or indicate their response by pointing to one of three items (having received training on how to use these images). Figure 1 shows these images, wherein the leftmost line diagram represents "Very Sure," the middle "Somewhat Sure," and the rightmost "Not Sure."

Table 2. LA Questionnaire. Emily = English Speaker, Tala = Tagalog speaker, Sonia = Spanish speaker, Leena = Lithuanian speaker. All non-English translations are also listed in English in brackets. Where there is no separation by condition (Spanish or Tagalog), this indicates that all children heard the same phrases, regardless of condition. The question numbers highlighted in gray are the ones that were scored for language awareness

Spanish Condition	Tagalog Condition
INITIAL EXPOSURE TO EITHER SPANISH OR TAGALOG	
<p>1 Let's start with hearing from my friend Sonia. Sonia: <i>Mi abuela tiene tres gatos en su casa. Me gusta jugar con ellos.</i> <i>[My grandma has three cats in her house. I like to play with them.]</i> Was she speaking in a loud voice? Yes or No? How sure are you that she was/was not speaking in a loud voice?</p>	<p>Let's start with hearing from my friend Tala. Tala: <i>May tatlong pusa ang lola ko sa kanyang bahay. Gusto kong naglalaro kasama sila.</i> <i>[My grandma has three cats in her house. I like to play with them.]</i> Was she speaking in a loud voice? Yes or No? How sure are you that she was/was not speaking in a loud voice?</p>
<p>2 Sonia: <i>El otro día, vi un chango en el zoológico, tenía una boca muy grande.</i> <i>[The other day, I saw a monkey at the zoo, it had a very big mouth.]</i> Was she speaking very fast? Yes or No? How sure are you that she was/was not speaking very fast?</p>	<p>Tala: <i>Noong isang araw may nakita akong unggoy sa su. Malaki ang kanyang bibig.</i> <i>[The other day, I saw a monkey at the zoo, it had a very big mouth.]</i> Was she speaking very fast? Yes or No? How sure are you that she was/was not speaking very fast?</p>
PRACTICE WITH ENGLISH SPEAKER ONLY	
<p>3 Now let's hear from my friend Emily. Emily : <i>My grandma bought me a sweater for my birthday. It's red and green, my favorite colors</i> Was Emily speaking in a loud voice? Yes or No? How sure are you that she was/was not speaking in a loud voice?</p>	
<p>4 Now I'm going to play you something else from Emily. Emily: <i>Today my daddy took me to the beach and we swam in the water. It was so much fun.</i> Did Emily say something about a tree? Yes or No? How sure are you that she did/did not say something about a tree?</p>	
<p>5 Emily: <i>Can I have a cookie?</i> Did Emily ask for something? Yes or No? How sure are you that she did/did not ask for something?</p>	
<p>6 Emily: <i>Tomorrow mommy and daddy are taking me to the zoo. I am excited to see the monkeys.</i> Was Emily talking about going to the zoo? Yes or No? How sure are you that Emily was/ was not talking about going to the zoo?</p>	
COMPARISON: ENGLISH TO LITHUANIAN	
<p>7 Now I'm going to play the sound of a different friend of mine. Her name is Leena. Are you ready to hear what she has to say? Leena: <i>Tėvelis ir mamytė rytoj ves mane į zoologijos sodą. Labai noriu pamatyti beždžiones.</i> <i>[Tomorrow mommy and daddy are taking me to the zoo. I am excited to see the monkeys.]</i> Could Leena be talking about going to the zoo? Yes or No? How sure are you that Leena could/could not talking about going to the zoo?</p>	
<p>8 Now let's listen to Emily again. Emily: <i>Can I have a puppy?</i></p>	

(Continued)

Table 2. (Continued)

Spanish Condition	Tagalog Condition
Did Emily say something about a train? Yes or No? How sure are you that she did/did not say something about a train?	
9 Let's listen to Leena now. Leena: <i>Ar galiu gauti šuniuką? [Can I have a puppy?]</i> Could Leena be saying something about a train? Yes or No? How sure are you that she could/could not say something about a train?	
10 And next is Emily again. Emily: <i>Please put your toys away!</i> Was Emily telling somebody to do something? Yes or No? How sure are you that Emily was/was not telling somebody to do something?	
11 And Leena now. Leena: <i>Prašau sutvarkyti savo žaislus! [Please put your toys away]</i> Could Leena also be telling somebody to do something? Yes or No? How sure are you that Leena was/was not telling somebody to do something?	
12 Now I'm going to ask you if Emily is talking about a cat, ready? Emily: <i>Wow, I really hate carrots!</i> Did Emily say something about a cat? Yes or No? How sure are you that Emily did/did not say something about a cat?	
13 And Leena now. Leena: <i>Oi, aš tikrai nemėgstu morkų! [Wow, I really hate carrots!]</i> Could Leena have said something about a cat? Yes or No? How sure are you that Leena did/did not say something about a cat?	
14 Emily next. Emily: <i>Can I have an ice cream cone?</i> Did Emily ask for something? Yes or No? How sure are you that Emily did/did not ask for something?	
15 And Leena next. Leena: <i>Ar galima gauti ledų vaflyje? [Can I have an ice cream cone?]</i> Could Leena have also been asking for something? Yes or No? How sure are you that Leena was/was not asking for something?	
16 Okay, now Emily. Emily: <i>There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.</i> Was Emily talking about a seashell? Yes or No? How sure are you that she was/was not talking about seashell?	
17 And Leena. Leena: <i>Kartą gyveno jūrų kriauklė kuri labai mėgo plaukioti. Ji išsiskyrė tuo, kad nemėgo gulėti smėlyje.</i> <i>[There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.]</i> Could both Emily and Leena be talking about a seashell? Yes or No? How sure are you that Emily and Leena were/were not both talking about a seashell?	
COMPARISON: ENGLISH TO SPANISH OR TAGALOG	
Spanish Condition	Tagalog Condition
18 You're doing great! Now, do you remember Sonia? We heard her speaking at the very beginning. Let's hear from her again:	You're doing great! Now, do you remember Tala? We heard her speaking at the very beginning. Let's hear from her again: Tala: <i>Noong isang araw may nakita akong</i>

(Continued)

Table 2. (Continued)

Spanish Condition	Tagalog Condition
<p>Sonia: <i>El otro día, vi un chango en el zoológico, tenía una boca muy grande.</i> <i>[The other day, I saw a monkey at the zoo, it had a very big mouth.]</i> And now let's hear Emily again. Emily: The other day, I saw a monkey at the zoo. It had a very big mouth. Do you think both Sonia and Emily could be talking about or saying the same thing? Yes or No? How sure are you that Sonia and Emily could be talking about or saying (or not saying) the same thing?</p>	<p><i>unggoy sa su. Malaki ang kanyang bibig.</i> <i>[The other day, I saw a monkey at the zoo, it had a very big mouth.]</i> And now let's hear Emily again. Emily: The other day, I saw a monkey at the zoo. It had a very big mouth. Do you think both Tala and Emily could be talking about or saying the same thing? Yes or No? How sure are you that Tala and Emily could be talking about or saying (or not saying) the same thing?</p>
<p>19 Let's hear Emily again. Emily: <i>There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.</i> Let's hear from Sonia again. Sonia: <i>Había una vez un concha marina que le gustaba nadar. Ella era muy diferente a las demás porque a ella no le gustaba estar en la arena.</i> <i>[There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.]</i> Could both Emily and Sonia be talking about a seashell? Yes or No? How sure are you that Sonia and Emily were/were not both talking about a seashell?</p>	<p>Let's hear Emily again. Emily: <i>There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.</i> Let's hear from Tala again. Tala: <i>Minsan isang panahon, may isang kabibi na napakahilig lumangoy. Kakaiba siya sa ibang kabibi dahil ayaw niyang nakahiga lang sa buhangin.</i> <i>[There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.]</i> Could both Emily and Tala be talking about a seashell? Yes or No? How sure are you that Sonia/Tal and Emily were/were not both talking about a seashell?</p>
<p>COMPARISON: ENGLISH TO LITHUANIAN</p>	
<p>20 Okay, let's hear from Emily one last time. Emily: <i>There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.</i> And now let's hear Leena again. Leena: <i>Kartą gyveno jūrų kriauklė kuri labai mėgo plaukioti. Ji išsiskyrė tuo, kad nemėgo gulėti smėlyje.</i> <i>[There once was a seashell that loved to swim. She was different from the others because she did not like to lie in the sand.]</i> Could both Emily and Leena be talking about a seashell? Yes or No? How sure are you that Emily and Leena were/were not both talking about a seashell?</p>	

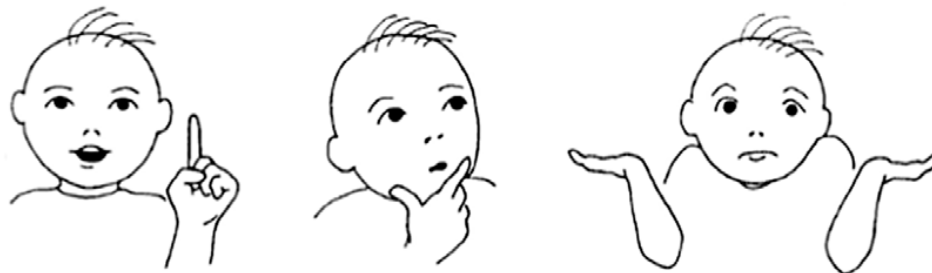


Fig. 1. Diagram used for LA Questionnaire certainty responses (from Woolley et al., 2004).

This Certainty Scale was developed by Woolley *et al.* (2004) to produce a Likert-like measure in a format suitable for young children; by combining the yes/no responses with the certainty responses, a 6-point scale is achieved ranging from “no, very sure” to “yes, very sure” with 4 points in between.

In order to provide children with some initial exposure to Tagalog or Spanish, without direct comparisons between languages, the questionnaire began with 2 non-content-based questions about what the Tagalog or Spanish speaker said. For the purpose of further accustoming children to the use of the Certainty Scale, the next 3 questions were about the quality or content of utterances produced only by the English speaker (e.g., “Did Emily say something about a tree?”). The following 12 questions alternated between unscored questions about the content of the English speaker’s utterance and scored LA-related questions on whether the Lithuanian utterances could have the same content. To guard against a “yes” bias, questions about English utterances were designed to elicit both yeses and nos. “Did Emily ask for something?” after “Can I have an ice cream cone?” is an example of a yes-eliciting question, whereas “Did Emily say something about a cat?” after “Wow, I really hate carrots!” is an example of a no-eliciting question. Across Questions 6 to 15, the language comparisons were indirect (e.g., “Was Emily talking about going to the zoo?” and then, after a sentence in Lithuanian, “Could Leena be talking about going to the zoo?”). Beginning with Question 17, the comparisons became more explicit, asking whether the English and Lithuanian, or the English and (depending on condition) the Spanish or Tagalog speakers, were talking about the same subject (e.g., “Could both Emily and Leena be talking about a seashell?”). Regardless of condition, the order of the questions on this questionnaire was always the same.

Coding

LEAT percentages

The LEAT yields proportions of exposure for each language children experienced throughout their lifetime (which we describe as percentages). For purposes of this study, we focused on the percentages of non-English exposure that each child experienced in her lifetime. For example, for a child with mostly English exposure but some Spanish and some Russian exposure, the LEAT might yield the following proportions: .72 English, .20 Spanish, and .08 Russian. Proportions for non-English languages were summed for a total, lifetime, non-English exposure proportion. Thus, this child’s non-English exposure would be 28% across her lifetime.

Coding of LA measure responses

Five questions of the LA Questionnaire (7, 11, 15, 17, and 20, highlighted in gray on Table 2) addressed children’s ability to show LA by comparing English to the utterances of the unfamiliar language, Lithuanian; therefore, only responses to these 5 questions were assessed. These questions asked whether the Lithuanian speaker could be talking about the same thing as the English speaker, in a relatively indirect way (e.g., “Could Leena have also been asking for something?” when the English

speaker had just previously asked for an ice cream cone) or in an explicit way (e.g., “Could *both* Emily and Leena talking about a seashell?”).

Following Woolley et al. (2004), children’s Yes or No responses for each of these 5 questions were combined with their certainty response, to form Likert-like scoring system with a potential score between 0 and 6: 1 represents “No, Very Sure,” 2 represents “No, A Little Sure,” 3 represents “No, Not sure,” 4 represents “Yes, Not Sure,” 5 represents “Yes, A Little Sure,” and 6 represents “Yes, Very Sure.” Zero represents a response of “I don’t know” or a lack of response; however, children in this study never omitted a response.

Results

Data analyses were conducted using R software packages lme (Bates et al., 2015), psych (Revelle, 2015), and car (Venables & Ripley, 2002). For all statistical analyses, respective assumptions were met, and examination of the residuals revealed no problems that would jeopardize the validity of the analysis.

Summary of language exposure and proficiency

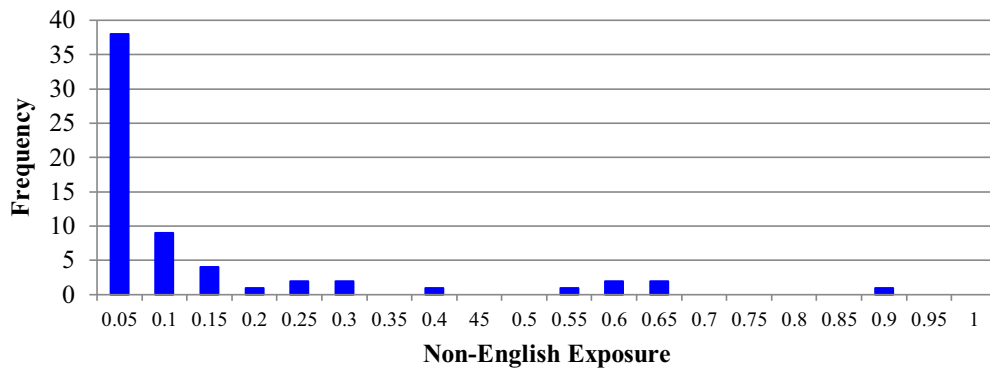
Across the whole sample, children received an average of 11.4% of non-English language exposure throughout their lifetime ($SD = 18.9\%$). Looking in more detail at Spanish experience, 94% of children had at least some Spanish exposure. Other languages that were represented in this sample were German, French, Tamil, Japanese, Igbo, Yoruba, Mandarin, Vietnamese, Uzbek, Marathi, Russian, and an unspecified patois. Neither Lithuanian nor Tagalog was listed as a language of past exposure for any of the participants. Results from the Language Background Questionnaire for Parents show that all children spoke English “very well” (8%) or fluently (92%). Additionally, 68% of children could speak at least some isolated words in Spanish. Twenty-nine out of the 63 (46%) children received at least some instruction in a non-English language. However, for the majority of these children ($n = 19$), non-English lessons accounted for 5% or less of total exposure.

Table 3 below shows additional information about children’s language background, organized by condition (Spanish or Tagalog). The two conditions did not differ significantly on any of these variables, suggesting that random assignment to condition produced similar groups with respect to age and language background. To examine the possibility that more recent time periods might be more predictive of the effect, we also examined correlations between lifetime exposure and exposure from only the most recent: (1) 1 year; (2) 2 years; and (3) 3 years. Children’s non-native language exposure at these different time periods was highly correlated (e.g., comparison of lifetime non-English language exposure and only recent 1-year non-English language exposure, $r(62) = .92$, $p < .01$) indicating both that children’s non-English exposure was not significantly different in more recent time periods and that the measure exhibited strong internal consistency.

The distribution of non-English exposure across children’s lifetime (based on LEAT percentages) was highly skewed. As Figure 2 shows, the majority of children in this sample received 5% or less of non-English exposure across their lifetime.

Table 3. Children’s language background, by condition

	Tagalog (<i>n</i> = 31)		Spanish (<i>n</i> = 32)	
	Mean	SD	Mean	SD
Age	77	9.89	76.97	10.33
# of Languages exposed to (including English)	3.84	1.61	3.31	1.69
% Non-English Exposure	19	15	14	22
Onset of Spanish Exposure (age in months)	18.47	21.17	19.17	23.22
% Spanish Only Exposure	5	13	8	19
# Children exposed to Spanish	29		30	
Proficiency in Understanding Spanish (scale 0 to 4)	1.47	1.07	1.63	1.10
Proficiency in Speaking Spanish (scale 0 to 4)	1.16	0.96	1.48	1.08

**Fig. 2.** Distribution of non-English exposure in the sample (.05 represents 5% or less of non-English exposure as reported in LEAT).

Assessment of children’s LA

Our effort to guard against a “yes” bias appears to have been successful. As mentioned, the LA Questionnaire included questions about English utterances that were designed to elicit both yeses and nos. Children readily discriminated the “no” from the “yes” responses, achieving certainty scores close to 1 (representative of a “no, very sure” response) for each of the items for which “no” was expected (Questions 4, 8 and 12). Moreover, the increase in certainty at the very end of the questionnaire cannot be due to a “yes” bias that emerges across questions, because the increase was observed only for the Spanish condition, whereas a “yes” bias, if present, would have appeared in both conditions.

A mixed effects model analysis was implemented to test the contributions of Condition and Question Item, along with past non-English language experience (LEAT percentage) and age (in months) to LA score, in predicting children’s LA. Mixed effects modeling was used because Question Item is a within-subjects variable. Age and past non-English exposure were included as independent predictors. Question item (of the 5 scored items) was treated as a within-subjects fixed

Table 4. Main analysis table of results

	β	Standard error (SE)	p
Intercept	1.91	1.03	0.07
Question Item	-0.006	0.04	0.88
Condition	-0.82	0.35	0.02*
Non-English Exposure	-0.28	0.69	0.69
Age	0.03	0.01	0.03*
Question Item x Condition	0.16	0.06	0.007**

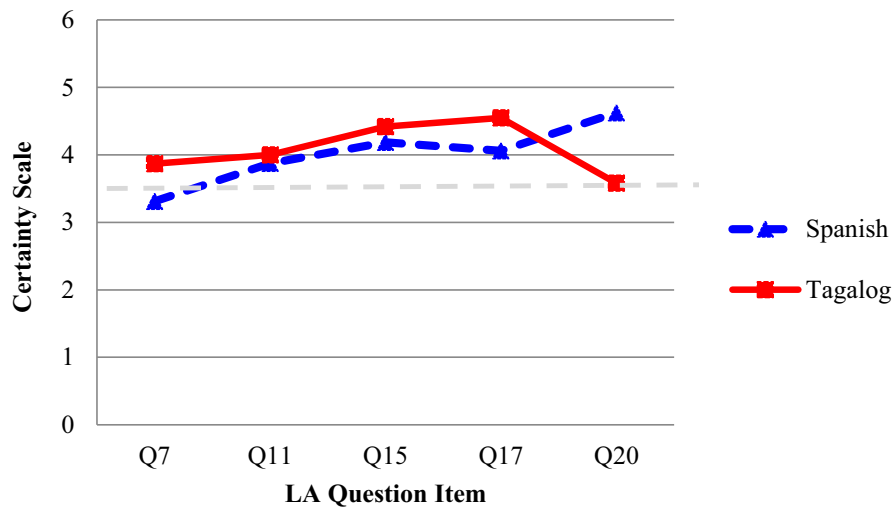
* $p < .05$.** $p < .01$.

Fig. 3. Mean responses for the 5 scored items of the LA questionnaire. Gray, dashed line represents a neutral response (i.e., between “not sure” yes or “not sure” no). A score of 1 on the y-axis represents “No, very sure,” whereas 6 represents “Yes, very sure.”

effect, and Condition (Tagalog or Spanish) was a between-subjects fixed effect. Subject was a random factor. The dependent variable was children’s scores on the 5 scored questions ($range = 0$ to 6 for each question) in which the English and Lithuanian speaker’s content are compared.¹

A significant effect of Condition was found; however, this is qualified by a significant interaction of Question item and Condition ($\beta = 0.16$, $SE = 0.06$, $p < .01$). A significant effect of age was also found ($\beta = 0.03$, $SE = 0.01$, $p = .03$), wherein older children expressed greater LA than did younger children. However, the effect of past non-English exposure failed to reach significance ($p > .05$). Please see Table 4, below, for complete results.

To interpret the interaction of Question item and Condition, two-tailed independent samples t tests comparing each of the 5 scored LA items across condition were conducted. Only the final question (Q20) differed significantly between the groups ($t(61) = 2.33$, $p = .02$). This pattern can be observed in Figure 3, which shows mean

Table 5. Post hoc analysis table of results

	β	Standard error (SE)	p
Intercept	0.51	1.13	0.65
Question Item	-0.03	0.11	0.77
Condition	1.29	0.61	0.04*
Spanish Proficiency (Understanding)	0.55	0.29	0.06
Age	0.04	0.01	0.0019**
Question Item x Condition	-0.29	0.16	0.07
Question Item x Spanish Proficiency (Understanding)	-0.09	0.07	0.23
Condition x Spanish Proficiency (Understanding)	-1.33	0.39	0.001**
Question Item x Condition x Spanish Proficiency (Understanding)	0.29	0.10	0.005**

* $p < .05$.** $p < .01$.

scores for each of the 5 scored questions of the LA questionnaire (i.e., the 5 questions used to assess LA). The two lines distinguish children in the Spanish condition from children in the Tagalog condition.

Post hoc analyses

To test the possibility that knowledge of at least some Spanish words might promote the ability of children in the Spanish Condition to infer LA over the course of the LA measure, we conducted another mixed effects model analysis that included the proficiency measure for how well the child understands Spanish (a 5-point Likert scale response, from “does not understand this language when it is spoken” to “understands this language very well”) from the Language Background Questionnaire for Parents. The model included a three-way Condition, Spanish Proficiency, and Question Item interaction. As in the above mixed effects model analysis, past non-English language experience (LEAT percentage) and age were included as independent predictors. The dependent variable was children’s scores on the 5 (scored for LA) questions. Question item (of these 5 scored items) was treated as a within-subjects fixed effect, and Condition was between-subjects. A significant effect of Condition and a significant interaction of Condition and Spanish Proficiency were observed; however, these two findings are qualified by the significant 3-way interaction between Condition, Question Item, and Spanish Proficiency ($\beta = 0.29$, $SE = 0.10$, $p < .001$); children with higher Spanish proficiency performed better in the Spanish condition than those with lower proficiency, and the advantage for children in the Spanish over those in the Tagalog Condition on the last question was particularly large for children with higher Spanish proficiency. We also found a significant effect of age, with older children outperforming younger children ($\beta = 0.04$, $SE = 0.01$, $p < .002$). Please see Table 5 below, for complete results.

Discussion

In the current study, we examined three ways in which non-English language experience might promote LA, and, specifically, the awareness that non-native language speakers can express the same meaning as a native language speaker can. First, we tested whether children's pre-experimental non-English exposure alone, as measured by their LEAT percentage, would predict their LA score. It did not. Second, we tested whether questions asking children to compare languages during the task would increase their LA. Additionally, we tested whether hearing a language (Spanish) with which children had some environmental experience, rather than an unfamiliar language (Tagalog) with which children had no experience, increased their LA. What we found is that repeated questioning throughout the task in combination with hearing several items in Spanish promoted their LA: On later items of the questionnaire, children in the Spanish condition were more likely than children in the Tagalog condition to respond "yes" to a question about whether a Lithuanian speaker might be saying the same thing as an English speaker. In this study, we also examined a potential developmental effect for LA. We did find an effect: older children expressed greater LA than younger children, on the LA task.

It should be noted that the size of the boost that the children in the Spanish condition had over those in the Tagalog condition was relatively modest, amounting to less than 1 point on our 6-point scale. However, the Spanish advantage represents an average shift from "not at all sure" to "a little bit sure" that the two speakers could be saying the same thing, which we argue is an important transition for demonstrating LA.

Finally, we considered the possibility that, despite limited (according to parents) understanding of Spanish vocabulary, even some understanding of Spanish words would benefit children from the Spanish condition, in their LA. It did.

Past non-English exposure

Although evidence suggests that past multilingual exposure can promote children's metalinguistic skills (e.g., Akhtar et al., 2012; Atagi & Sandhofer, 2020), we did not find this effect in our study. The failure to find an effect of past non-English exposure on children's LA, as measured by the LEAT, might have been due to the limited distribution of exposure levels in this particular sample: the majority of children (84%) had less than 10% of non-English exposure across their lifetime (i.e., in their lives, English represented more than 90% of children's language experiences). As a result, it is likely that our sample did not contain enough variation in exposure levels to permit an adequate assessment of effects of general language experience. In future research, it would be valuable to address this limitation by recruiting a sample in which children with higher levels of non-English language exposure are better represented. Despite this limitation, our results reflected an influence of non-native language exposure on metalinguistic awareness. That children in the Spanish condition showed superior performance, compared to those in the Tagalog condition, at the end of the task, may indicate that community exposure to Spanish enabled these children to bootstrap into an inference of common meaning for an unfamiliar language. Influences of community exposure to a language on metalinguistic skills have

been suggested in other research (e.g., Atagi & Sandhofer, 2020). Our results are consistent with these past findings.

Scaffolding LA

A primary finding of this study is that English-speaking children who heard Spanish as part of the LA task showed an increase in LA by the end of the task whereas those in the Tagalog condition did not. This suggests that children in the Spanish condition were able to use Spanish to scaffold an understanding that a non-English speaker can convey the same information as a native speaker. We discuss two types of information that children might have been using to bootstrap their way into this understanding.

Community language exposure

Although past non-English experience, as measured by the LEAT, did not significantly predict LA in this study, 94% of the children had been exposed to some Spanish prior to participating in the study. We propose that these Spanish-exposed children were able to make use of their past Spanish experience to conclude that both the English and Spanish speakers were conveying the same information and then infer that the Lithuanian speaker could be saying the same thing as well.

One way that children could have used their past Spanish experience is to recognize particular words (e.g., “azul,” as in the pilot study, or other frequently used words in Spanish such as “día” [day] or “grande” [large]) to form the inference that the Spanish speaker was saying the same thing as the English speaker. Recall that high-frequency words were used in the Spanish utterances for just this reason.

Indeed, in our post hoc assessments, we found that children in the Spanish condition who knew even some Spanish vocabulary benefitted from this in their LA. We propose that even a limited vocabulary in a non-native language enabled children to recognize words in the Spanish sentences, then notice that they corresponded to words in the English sentences and thus infer that the two speakers were saying the same thing. Based on this inference, children then inferred that the Lithuanian speaker might also be saying the same thing.

Beyond recognizing particular words, children in the Spanish condition could also have benefited from prior experience with this language simply because the language sounded familiar to them. The familiarity might have led children to conclude that it was a real language, used to convey information. This realization could then lead to the broader insight that speakers of an unfamiliar language (in this case, Lithuanian) also could be conveying the same information. Despite having similar pre-experimental Spanish experience to children in the Spanish condition (as evidenced by Table 2 above), children in the Tagalog condition did not have this same opportunity for scaffolding LA: children who compared Tagalog and English did not have prior experience with Tagalog and so could not build on recognition of certain words or general familiarity with the language to infer that the Tagalog and English speakers were saying the same thing. As a result, these children were less likely to make inferences about what the Lithuanian speaker might be saying.

Ideally, we could have further tested the role of past exposure to Spanish by including children with no exposure to Spanish. However, in the community in which this study was conducted, Spanish use is pervasive, such that nearly every child at times heard Spanish being spoken in stores, restaurants, parks, or other public places. Indeed, it is likely that the 6% of children whose parents reported no Spanish exposure actually had some minimal Spanish exposure in their communities that could not be captured by the LEAT. Anecdotal evidence suggests this to be true: during researcher-parent conversations, many parents mentioned that their children hear Spanish on the radio or in their neighborhood, from time to time. In research with similar populations, parents have reported difficulties in quantifying Spanish exposure from media sources (e.g., radio, TV) due in part to the sporadic nature of this kind of exposure (Rojo & Echols, 2018).

Influences of explicit comparisons

A second potential source of information builds on the first, accounting for the pattern of responses across questions. As can be seen in Figure 3, performance in the Spanish and Tagalog conditions is similar until the final questions of the task. Only in the later questions were children explicitly asked to compare the content of the English speaker's utterance to that of a non-English speaker: The initial Spanish or Tagalog questions (questions 1 and 2) were neither content-based nor did they prompt children to compare the non-English utterance to an English phrase. Similarly, Items 7 through 16 only indirectly prompted children to compare the English and Lithuanian speakers. It is not until question 17 that children are directly asked to compare the English utterance to a non-English utterance, and it is after this question that the two conditions begin to diverge. Being asked to explicitly compare Spanish and English speakers' utterances may have motivated children in that condition to use whatever knowledge of Spanish they had to recognize that both speakers might be saying the same thing.

The possibility that questions encouraging comparison between English and Spanish prompted the recognition that different languages can convey the same information is consistent with other evidence that explicitly reflecting on one's knowledge can promote learning (e.g., Chi et al., 1994; Siegler, 1995). By providing explicit descriptions or explanations, children can improve their performance on a variety of tasks, including not only problem-solving tasks (Brown et al., 1986; Calin-Jageman & Ratner, 2005; Hoyos & Gentner, 2017; Rittle-Johnson & Star, 2007; Siegler, 1995), but also word learning (Krogh-Jespersen & Echols, 2018) and metacognitive tasks (Amsterlaw & Wellman, 2006). Most of the children in our sample had some exposure to Spanish in their communities. This, we initially believed would lead to higher LA. However, for most of the children, Spanish exposure was minimal. Explicitly evaluating commonality between two languages may be especially important for developing LA when non-native language exposure is limited.

This proposal also aligns with work on L2 learning in older children and adults. A potentially applicable concept is that of input enhancement, which involves making relevant information salient so as to facilitate learning. The enhancement can be either external, as when a teacher highlights pertinent information to draw the learner's attention to it, or internal, as when a learner suddenly notices a pattern

in the input (Sharwood Smith, 1991). For those children in our study who had ample exposure to Spanish, commonalities across languages could attain internal salience, whereas the majority of participants (who had only modest Spanish exposure) would benefit from having that information made salient. The questions in our LA task that explicitly encouraged children to consider that the two speakers could be saying the same thing might have served this purpose of saliency. Consistent with this possibility, instructional practices explicitly targeting metalinguistic knowledge have been found to promote learning (Norris & Ortega, 2000), possibly because directing conscious attention to relevant linguistic information makes that information salient (Cintrón-Valentín & Ellis, 2016). Moreover, asking learners questions about their understanding has been shown to promote their explicit knowledge, as well as facilitate learning (Monaghan *et al.*, 2019).

We argue that our findings are best explained by incorporating both components: children's prior exposure to modest levels of Spanish and also explicit comparisons between the two languages. Children's past Spanish experiences likely helped them to make the inference that not only the Spanish but also the Lithuanian speaker could be saying the same thing as the English speaker; however, they made this inference only when asked explicit questions about whether the two speakers could be saying the same thing. Active comparison between languages may be an important mechanism for helping children to recognize that speakers of different languages could be providing similar information (*i.e.*, LA).

Implications

The findings of this study suggest that experience with non-native languages facilitates young children's understanding that different languages can convey the same information (*i.e.*, LA). The scaffolding that they used to build this understanding appears to have been their community experience with Spanish in combination with an explicit prompt to compare the languages they heard. These findings may have implications for teaching monolingual preschool-aged children that non-English language speakers can provide not only valuable information, but the same information as can be produced by a native speaker: It is possible that simply asking children to reflect on potential commonalities in utterances produced by speakers of different languages might promote those children's LA and thus facilitate the acquisition of this valuable metalinguistic skill. Additionally, our findings suggest that this may be effective only if children can build on inferences about commonalities between their native language and a language with which they have some familiarity.

It is likely that the need for direct comparison is necessary only when children have relatively modest exposure to a non-native language. As children gain greater exposure to the other language, their increasing vocabulary should enable them to recognize that the same content is available in both languages. Also, children may more frequently be in contexts in which two people are describing the same event in different languages. However, even with greater exposure it may be that direct questioning will help children to make not only the inference that the native and second language have the same content but also the broader inference required for full LA, that even an entirely unfamiliar language also can have that same content.

This research also may have broader implications for children's ability to acquire a second language: if it is the case that hearing a relatively small amount of a non-native language in their daily lives, along with engaging in active comparisons of the native and non-native languages, enables children to appreciate that non-English speakers have valuable information to provide, then these children may be more willing to learn a new language. Moreover, to the degree that non-native language exposure promotes the development of LA, this metalinguistic skill may further aid in children's acquisition of a new language.

This study adds to a growing literature documenting heterogeneity in the group of children who typically are considered monolingual (Akhtar et al., 2012; Rojo & Echols, 2018). Our findings suggest that knowing at least a few words in Spanish may be a meaningful distinction within a monolingual population which has implications for acquiring LA and, potentially, other linguistic and metalinguistic skills.

The findings from the current study have implications about the importance of multilingual environments: The suggestion that Spanish exposure might provide children with a valuable scaffold for recognizing that even unfamiliar languages can convey comparable information suggests that children's metalinguistic development may benefit from an environment in which there is a diversity of languages. Particularly given the increase in multilingualism in the United States (Ryan, 2013), a better understanding of the influences of exposure to non-English languages can help us to optimize children's willingness and ability to learn a second language. Moreover, given the association between metalinguistic awareness and literacy development (e.g., Tunnmer et al., 1988), this exposure also may be beneficial to those monolingual children who do not learn a second language. These observations are particularly timely, given the growing number of children in the United States who are monolingual speakers of languages other than English (Ryan, 2013) as well as recent increases in the number of parents who are enrolling their monolingual English-speaking children in bilingual educational programs (Steele et al., 2017).

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Conflict of Interest. The authors declare no conflicts of interest.

Authorship. The authors declare that this work is our own, original work and does not duplicate any other previously published work.

Ethical Standards. We further assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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