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EMPIRICAL STUDY

Early Language Environments Predict Aspects of Explicit Language Awareness Development

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Although language awareness is typically defined as the explicit understanding of language's functions and conventions, much evidence on the influence of diverse language environments on language awareness has shown implicit understandings of language. In contrast, this study examined whether exposure to linguistic diversity predicted monolingual children's explicit language awareness. We examined four aspects of children's explicit language awareness: ability to label languages, understanding of the communicative consequences of speaking different languages, understanding of labeling conventions, and awareness of their language environment. Participants were monolingual 3- to 5-year-olds ($N = 81$) who were from (a) a relatively linguistically homogenous community, (b) a relatively linguistically diverse community, or (c) a bilingual household in a relatively linguistically diverse community. Results suggest that community linguistic diversity and home bilingual exposure predict children's explicit language labeling and understanding of labeling conventions but not other aspects of language

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awareness. These findings provide insight into the role of early language environments in explicit language awareness development.

Keywords language awareness; home bilingual exposure; linguistic diversity; language environments

Introduction

Much empirical research on how language awareness develops in young children has focused on their *implicit* understanding of the communicative functions and conventions of language (e.g., Clark, 1978; Edelsky, 1977; Gleason, 1977; Menjivar & Akhtar, 2017; Rojo & Echols, 2018; Sachs & Devin, 1976; Shatz & Gelman, 1973; cf. Akhtar, Menjivar, Hoicka, & Sabbagh, 2012; Slobin, 1978). However, formalized definitions of language awareness typically emphasize the *explicit* and *conscious* knowledge of the functions and conventions of language, including how people use and learn language (e.g., for reviews, see Cots & Garrett, 2017; Finkbeiner & White, 2017; Garrett & James, 1992). Additionally, despite a rapidly globalizing world population in which contact between speakers of different languages is increasing, the role of early language environments in language awareness development has been examined mainly in functionally bilingual or emergent bilingual children (e.g., Akhtar et al., 2012; Bailey & Osipova, 2016; Byers-Heinlein, Chen, & Xu, 2014; Comeau, Genesee, & Mendelson, 2007; Diesendruck, 2005; Genesee, Boivin, & Nicoladis, 1996; Montanari, 2009; Nicoladis, 1998; Petitto et al., 2001) and less commonly in functionally monolingual children (e.g., Afshordi, Sullivan, & Markson, 2018; Rojo & Echols, 2018; Slobin, 1978). Moreover, in the United States, where the present study was conducted, dual-language immersion schools are becoming increasingly popular among bilingual and monolingual families alike (e.g., American Academy of Arts and Sciences Commission on Language Learning, 2017; Steele et al., 2017). This suggests that there is a pressing need to understand how different early language environments may predict language awareness development in all children, including those who are functionally monolingual.

The present study thus asked how early language environments might predict monolingual children's explicit language awareness, particularly their awareness of how people use language. More specifically, we examined language awareness in three distinct groups of children who would typically be considered functionally monolingual but who were growing up in different language environments.

Background Literature

Implicit Versus Explicit Language Awareness

Knowledge is frequently divided into implicit and explicit knowledge types (for a review on implicit and explicit knowledge as they relate to language, see Ellis, 2008, and Suzuki & DeKeyser, 2017). Implicit knowledge is typically demonstrated when prior experiences facilitate how an individual performs on a task, presumably without conscious recollection of those prior experiences (e.g., Schacter, 1987). For instance, on the classic "wug test" (Berko, 1958), an English-speaking child's ability to pluralize a novel word by adding *-s* to it demonstrates implicit knowledge of pluralization rules in English. In contrast, explicit knowledge typically requires the conscious recollection of prior experiences or knowledge and is often demonstrated by the ability to verbalize and explain knowledge. In the example of the "wug test," if an English-speaking child is able to explain that adding *-s* means that there are more than one, that child is understood to demonstrate explicit knowledge of English pluralization.

In the domain of language awareness, there is also a distinction between implicit and explicit knowledge. Many studies have provided evidence of children's implicit awareness of language—typically, a *behavioral demonstration* of children's understanding of the communicative functions and conventions of language. One example of implicit language awareness comes from Shatz and Gelman (1973), in which semi-naturalistic speech data showed that 4-year-old children use shorter, simpler sentences when talking to 2-year-olds than when talking to 4-year-old peers or adults. Relatedly, another example of implicit language awareness comes from semi-naturalistic speech data with bilingual 2- and 3-year-olds (Comeau et al., 2007), in which young bilingual children have been shown to repair communication breakdowns by matching their language choice to that of their interlocutor (e.g., by choosing to speak French if their interlocutor is speaking French).

However, comparatively few studies have provided evidence of children's explicit awareness of language—that is, evidence in which children verbally explain their understanding of the communicative functions and conventions of language. A prime example of explicit language awareness in children comes from Akhtar et al. (2012), in which children were asked to name the language they spoke. Although some children provided examples of words in their language (e.g., "plaster," "radish," "uno, dos, tres"), other children mentioned the name of their language (e.g., "English," "Spanish") in their responses, demonstrating more explicit awareness of the language they spoke. Given that implicit and explicit language awareness are inextricably tied to the tasks used to

measure them, the present study aimed to examine language awareness by using tasks that provide evidence of more explicit language awareness than much of the literature thus far has provided.

Development of Early Language Awareness

Young children demonstrate implicit early language awareness skills even before they reach school age. Infants as young as 12 months of age have shown an understanding that languages—both those familiar and those unfamiliar to them—communicate information (Vouloumanos, 2018), suggesting that even infants have a basic, implicit understanding of how people use language. Moreover, by 4 years of age, monolingual children understand that shared languages are a necessary aspect of successful communicative interactions (Afshordi et al., 2018). Accordingly, studies have found that preschool-age children can judge and adjust their own language to be appropriate for their interlocutor (e.g., Clark, 1978; Edelsky, 1977; Gleason, 1977; Sachs & Devin, 1976; Shatz & Gelman, 1973), pointing to the idea that young children have an implicit understanding of how language can be modulated to communicate information.

Moreover, researchers have found that children's language awareness—in specific areas such as phonology, grammatical structures and syntax, and concept of word—is associated with other language and communicative skills, such as literacy skills and vocabulary development (e.g., Bowey, 1986; Smith & Tager-Flusberg, 1982; Wood & Terrell, 1998). Thus, by preschool age, children have a foundational implicit understanding of the communicative functions and conventions of language. Moreover, these studies demonstrate that young children begin to develop various aspects of language awareness during the preschool years and that they can adjust their language use according to social and linguistic cues.

Language Awareness Development in Diverse Language Environments

Evidence from children growing up in diverse language environments suggests that language awareness development may be modulated by different kinds of experiences with language. Two kinds of early language environments in particular have received attention in studies of language awareness, largely in bilingual populations. The first kind involves exposure to community linguistic diversity, that is, incidental exposure to many languages over many instances in everyday life (e.g., Akhtar et al., 2012; Slobin, 1978). The second kind involves home bilingual exposure, that is, being exposed to two or more languages in everyday life, particularly in the home (e.g., Akhtar et al., 2012; Byers-Heinlein et al., 2014; Comeau et al., 2007; Diesendruck, 2005; Genesee et al., 1996;

Nicoladis, 1998; Petitto et al., 2001; Rojo & Echols, 2018; for evidence from multilingual children, see Bailey & Osipova, 2016; Montanari, 2009).

Exposure to Community Linguistic Diversity

Evidence from studies on monolingual children growing up in linguistically diverse communities suggests that exposure to community linguistic diversity may shape children's implicit language awareness. For instance, exposure to neighborhood linguistic diversity has been shown to affect social learning in infants as young as 19 months of age (Howard, Carrazza, & Woodward, 2014): Monolingual infants from more linguistically diverse neighborhoods—as indexed by census data—demonstrated greater openness to imitating speakers of foreign languages than infants from less linguistically diverse neighborhoods, suggesting that even incidental exposure to linguistic diversity in the community can affect social cognitive development in young monolingual infants. Similarly, some evidence suggests that exposure to foreign languages (i.e., those a child does not speak) helps monolingual children develop an implicit understanding of the conventions of language (e.g., Dąbrowska & Street, 2006; Levelt, Sinclair, & Jarvella, 1978). The most comprehensive study of the effects of foreign language experience on monolingual children's development of language awareness is a case study of a monolingual English-speaking child named Heida who had extensive foreign language experience for approximately 1 year between the ages of 33 and 47 months (Slobin, 1978). Heida developed a keen understanding of labeling conventions: that an object label is distinct from the object concept (e.g., that the label "ball" is distinct from the spherical object that one can throw). Exposure to community linguistic diversity may thus facilitate language awareness development in monolingual children by providing an experience that helps children to compare and contrast the features of different languages and to become more flexible in their understanding of language.

More recent studies have found that exposure to a linguistically diverse home environment may shape children's language awareness, particularly in the dimension of language learning. For instance, Akhtar et al. (2012) found that monolingual English-speaking children who had exposure to—but no functional fluency in—a foreign language were more able to learn foreign words from a foreign language speaker than their monolingual and bilingual peers. Moreover, Rojo and Echols (2018) found that the amount of foreign language exposure that children received—but not children's fluency in foreign languages or the number of foreign languages children were exposed to—predicted children's willingness to accept multiple labels for one object. Thus, exposure to linguistic diversity via foreign language experience may shape children's

understanding of labeling conventions and learning of labels, even when children do not speak the foreign language they are exposed to.

Home Bilingual Exposure

Evidence from studies of bilingual children suggests that speaking two (or more) languages may also help children to develop a precocious understanding and awareness of others' language backgrounds and of the consequences of these backgrounds for communication (e.g., Byers-Heinlein et al., 2014; Comeau et al., 2007; Diesendruck, 2005; Fan, Liberman, Keysar, & Kinzler, 2015; Genesee et al., 1996; Nicoladis, 1998; Petitto et al., 2001; for evidence from trilingual children, see Montanari, 2009). Young bilingual children demonstrate a basic understanding of the communicative consequences of language background: the idea that speakers who speak different languages may not understand each other. Bilingual children as young as 1 year of age are able to identify and use the language appropriate for different interlocutors (e.g., Comeau et al., 2007; Nicoladis, 1998; Petitto et al., 2001), and by 2 years of age they are also able to judge an interlocutor's proficiency in shared languages (Genesee et al., 1996). Furthermore, 2-year-old bilingual children demonstrate an implicit understanding of labeling conventions across languages: Bilingual children—but not monolingual children—are able to understand that a speaker has knowledge of words particular to that speaker's native language but not of words from a different language (Byers-Heinlein et al., 2014).

Similarly, 3-year-old bilingual children are able to understand that bilingual speakers speak two languages whereas monolingual speakers speak one language (Diesendruck, 2005). Additionally, preschool-age bilingual children can identify other bilingual speakers as also having the experience of speaking two languages, even when the bilingual preschoolers do not speak the same two languages as the bilingual speakers (Atagi, Goldenberg, & Sandhofer, 2016). Moreover, compared to monolingual children lacking exposure to other languages, both bilingual and functionally monolingual children with exposure to other language(s) are better able to use perspective-taking to understand what a speaker is referring to (Fan et al., 2015). Such studies have demonstrated that bilingualism facilitates children's development of various conventional aspects of language awareness by allowing children to develop an implicit understanding and awareness of others' language knowledge, as well as of the communicative consequences of language background.

There is also evidence to suggest that both exposure to linguistic diversity and bilingualism may help children develop an explicit, metacognitive understanding of their own language background. For instance, parents have

reported bilingual (and multilingual) children to have expressed an understanding of their own bilingualism and even a desire to learn other languages (Bailey & Osipova, 2016). Moreover, researchers have found that children who are exposed to linguistic diversity and/or are bilingual are better able to label their language(s) than monolingual children. Akhtar et al. (2012) asked the question "What language do you speak?" of English-speaking preschool-age children who were monolingual, bilingual, or bilingually exposed (bilingually exposed children being those who had weekly exposure to, but did not fluently speak, two languages). Whereas only 19% of monolingual children were able to correctly answer the question, approximately half of the bilingual and bilingually exposed children were able to correctly identify and label at least one of the languages that they spoke. Nonetheless, when children were shown videos of two individuals—one speaking English and one speaking "Nordish"—and asked to identify who spoke "their language," approximately 70% of monolingual, bilingual, and bilingually exposed children could identify the English speaker as the individual who spoke "their language." Altogether, these findings suggest that children are able to demonstrate an implicit understanding that an individual speaks the same language as they do, but that extensive experience with two or more languages may additionally allow children to demonstrate a more explicit understanding of their own language background and to identify the language that they speak.

The Present Study

Though extant research provides much evidence that exposure to community linguistic diversity and home bilingual exposure facilitate children's development of implicit language awareness, far less research has provided evidence for children's explicit and conscious knowledge of language. Moreover, it remains unclear whether these two types of early language environment have different consequences for the development of explicit language awareness. In the present study we thus asked whether community linguistic diversity and home bilingual exposure differentially predicted the development of explicit language awareness in functionally monolingual children. We examined different conventional aspects of language awareness in monolingual children from relatively linguistically diverse versus linguistically homogenous communities in the United States, as well as children who had home bilingual exposure.

Specifically, we examined the following aspects of children's explicit language awareness: (a) ability to identify and label their own and their parents' language(s); (b) understanding that speakers who speak different languages may not understand each other (i.e., the communicative consequences of

language background); (c) understanding that object labels are distinct from object concepts and that speakers of different languages use different object labels to name objects (i.e., labeling conventions); and (d) awareness of their language environment, particularly awareness of whether different languages are spoken in their preschool classroom.

We expected different outcomes for the different aspects of language awareness we examined. First, we expected language labeling ability to be affected by both community linguistic diversity and home bilingual exposure. Specifically, given that Akhtar et al. (2012) found that monolingual children with regular exposure to a foreign language were able to explicitly identify the language they spoke, we also expected monolingual children with exposure to community linguistic diversity and monolingual children with home bilingual exposure to be more accurate in their explicit language labeling abilities than monolingual children without exposure to linguistic diversity. Second, we also expected children's explicit understanding of the communicative consequences of speaking different languages to be affected by both community linguistic diversity and home bilingual exposure, given that bilingual and monolingual children with exposure to other language(s) have been found to demonstrate enhanced communicative skills in comparison with monolingual children with no exposure to another language (Fan et al., 2015).

Third, we expected community linguistic diversity and bilingual exposure to differentially affect children's understanding of labeling conventions and their awareness of their language environment. We expected explicit understanding of labeling conventions to be particularly affected by home bilingual exposure; 2-year-old bilinguals who speak English and another language have demonstrated an implicit understanding that Mandarin speakers do not know English labels, whereas 2-year-old English-speaking monolinguals have not demonstrated such an understanding (Byers-Heinlein et al., 2014). In contrast, we expected children's awareness of their language environment to be particularly affected by community linguistic diversity, given that linguistically diverse environments provide opportunities for children to compare and contrast their native language to other languages (e.g., Dąbrowska & Street, 2006; Levelt et al., 1978; Slobin, 1978).

Method

Participants

The participants were 3- to 5-year-old children ($N = 81$) attending preschools in relatively linguistically homogenous and linguistically diverse communities in the United States.

Data Collection Sites

We selected two counties in the United States as data collection sites based on U.S. census data. The first data collection site was Walworth County, Wisconsin, a relatively linguistically homogenous county in southeast Wisconsin where less than 10% of the population speaks a non-English language (U.S. Census Bureau, 2015). The second data collection site was Los Angeles County, California, a relatively linguistically diverse county in Southern California where approximately 40% of the population speaks a non-English language (U.S. Census Bureau, 2015).

We recruited participants from five private preschools in Walworth County, Wisconsin, and 14 private preschools in Los Angeles County, California. Preschool directors and/or teachers at the preschools in Walworth County reported (in an interview as described below) that an average of 4.01% ($SD = 8.94\%$) of children spoke a non-English language at home and 0.3% ($SD = 0.67\%$) of children spoke that non-English language at preschool. Moreover, 0.05% ($SD = 0.11\%$) of Walworth County preschool teachers and staff spoke a non-English language. In contrast, preschool directors and/or teachers at Los Angeles County preschools reported that 23.18% ($SD = 20.48\%$) of children spoke a non-English language at home, and 3.27% ($SD = 6.39\%$) of children spoke that non-English language at preschool. Additionally, 48.40% ($SD = 32.84\%$) of Los Angeles County preschool teachers and staff spoke a non-English language.

Participant Characteristics

We recruited three groups of participants: (a) monolingual English-speaking children residing in Walworth County (i.e., "Walworth County monolinguals," $n = 38$), (b) monolingual English-speaking children residing in Los Angeles County (i.e., "Los Angeles County monolinguals," $n = 23$), and (c) children residing in Los Angeles County who were functionally monolingual in English but were exposed to one or more other languages in the home (i.e., "Los Angeles County home overhearers," $n = 20$). The monolinguals and home overhearers residing in Los Angeles County came from the same preschools.

The two groups of monolinguals and the group of home overhearers differed in their amounts of English use and home English exposure. (Data were elicited via a parent questionnaire described below.) Monolingual participants spoke only English and were exposed only to English at home. All home overhearers spoke English 90%–100% of a typical day and were exposed to at least one non-English language in the home. Of the 20 home overhearers, parents reported that 14 children spoke English 98%–100% of the day, four children spoke English

95% of the day, and two children spoke English 90% of the day. Additionally for the home overhearers, parents reported that 11 were exposed to one non-English language in the home, five were exposed to two non-English languages in the home, and four were exposed to three or four non-English languages in the home. We grouped all home overhearers together, regardless of how many non-English languages they heard in the home, because previous research has found that the number of languages to which monolingual children are exposed does not predict their awareness of the communicative functions and conventions of language (e.g., Rojo & Echols, 2018; but see Stavans, 2015, for a discussion of how multilingual exposure may impact other aspects of language awareness such as literacy).

Home overhearers were exposed to the following non-English languages at home: Arabic ($n = 1$), Chinese ($n = 4$), Hebrew ($n = 1$), Hindi ($n = 2$), Japanese ($n = 1$), Korean ($n = 2$), Malayalam ($n = 1$), Mandarin ($n = 3$), Tagalog ($n = 3$), Tamil ($n = 1$), and Vietnamese ($n = 1$). Notably, because of the way that stimuli were constructed, children who were exposed to Spanish or French at home were not recruited for the study, and none of the children included in this study were exposed to Spanish or French at home. Table 1 provides descriptive statistics about the three groups of participants, with parent-reported information regarding the children's age, English use, and English exposure, and the typical number of hours during which children consumed non-English media in a week, as well as the linguistic diversity of the children's neighborhood, as indexed by census data about the percentage of non-English speakers in the children's home zip codes (U.S. Census Bureau, 2015).

We examined socioeconomic variables of the three groups of participants relative to the demographics of the community in which they resided. The majority of participants in the three groups were from households with annual incomes that were greater than the median income for their zip code (U.S. Census Bureau, 2015), according to chi-square tests: Walworth County monolinguals, $\chi^2(2, n = 32) = 15.063, p = .001$; Los Angeles County monolinguals, $\chi^2(2, n = 18) = 12.333, p = .002$; home overhearers, $\chi^2(2, n = 13) = 8.000, p = .018$). Additionally, for all three groups of participants, the average parent had an associate's (2-years postsecondary education) or bachelor's degree. Parents self-identified the highest level of education completed by selecting from the following categories: some elementary school (coded as 1), elementary school (coded as 2), some middle school (coded as 3), middle school (coded as 4), some high school (coded as 5), high school diploma or GED (coded as 6), professional certificate(s) or technical degree(s) (coded as 7), some college (coded as 8), associate's degree(s) (coded as 9), bachelor's degree(s) (coded as 10), and

Table 1 Statistics about the three groups of participants

Characteristic	W. mono. ($n = 38$) M (SD)	LA mono. ($n = 23$) M (SD)	LA over. ($n = 20$) M (SD)	F	df	p
Age in years	4.23 (0.76)	4.06 (0.64)	4.16 (0.58)	0.458	2,79	.634
English use per day	100% (0.00%)	100% (0.00%)	97.67% (3.26%)	14.746	2,76	<.001
Home English exposure per day	100% (0.00%)	100% (0.00%)	81.04% (23.42%)	19.279	2,76	<.001
Non-English media consumed in hr/wk	0.41 (0.67)	1.48 (1.91)	2.43 (3.46)	6.700	2,80	.002
Non-English speakers in neighborhood[a]	9.06% (4.69%)	38.52% (13.19%)	39.00% (10.88%)	94.700	2,75	<.001

Note. W. mono. = Walworth County monolinguals; LA mono. = Los Angeles County monolinguals; LA over. = Los Angeles County home overhearers.

[a]Based on census data.

master's or doctoral degree(s) (coded as 11). Because educational attainment was measured in this categorical manner, nonparametric tests were used to compare educational attainment among the three groups. A Kruskal–Wallis H test revealed that the three groups significantly differed in their levels of educational attainment, $\chi^2(2, n = 80) = 14.127, p < .001$. Follow-up Mann–Whitney U tests were conducted with Bonferroni corrections for multiple comparisons (i.e., p must be less than .0167). Home overhearers' parents ($M = 10.50$, $SD = 0.61$) did not differ in educational attainment from the Los Angeles County monolingual children's parents ($M = 9.87$, $SD = 1.52$; Mann–Whitney $U = 185.50$, $z = -1.188$, $p = .24$). Moreover, Los Angeles County monolinguals' parents and Walworth County monolinguals' parents ($M = 9.14$, $SD = 1.69$) also did not differ in educational attainment (Mann–Whitney $U = 285.00$, $z = -2.218$, $p = .027$). However, the home overhearers' parents had significantly higher educational attainment than did the Walworth County monolingual children's parents (Mann–Whitney $U = 161.00$, $z = -3.660$, $p < .001$).

Materials

Participants completed three tasks that measured different aspects of explicit language awareness: (a) an interview that measured language labeling abilities and awareness of classroom language environment (Language Interview), (b) a video task that measured understanding of the communicative consequences of language (Communicative Consequences task), and (c) another video task that measured understanding of labeling conventions (Labeling Conventions task). In addition, parents completed a questionnaire about their child's language experiences and family environment, and preschool teachers or directors answered questions about the preschool's linguistic environment.

Language Interview

The Language Interview was composed of two parts: (a) language label elicitation (Questions 1–4) and (b) awareness of classroom language environment (Questions 5–7). The seven questions asked in this interview were inspired by and intended to build upon the explicit language awareness questions asked by Akhtar et al. (2012). All participants were asked the seven questions in the same order as they appear below.

Language label elicitation questions. The purpose of the first three questions was to assess children's ability to explicitly talk about languages and to elicit language labels (e.g., "English," "Spanish") from children. Participants were first asked, (1) "What language do you speak?" (which was identical to a question used by Akhtar et al., 2012), followed by (2) "What language does your

[Caregiver 1] speak?" and (3) "What language does your [Caregiver 2] speak?" (typically, "What language does your mom speak?" and "What language does your dad speak?," respectively). The first question assessed children's ability to identify, name, and talk about their own language(s), whereas the next two questions assessed children's ability to identify, name, and talk about others'—specifically, their primary caregivers'—language(s). Although information for up to three primary caregivers was asked about on parent questionnaires, most children were reported to have only two primary caregivers (frequently, their parents). Thus, children were only asked about the language(s) of the first two primary caregivers.

The fourth question was intended to elicit further information about participants' responses to the first question, particularly when those responses were nonsensical. Participants were asked, (4) "Does everyone else in your class speak [child's response to first question] like you?" Thus, if the participant's response to the first question ("What language do you speak?") was "English," then this fourth question became "Does everyone else in your class speak English like you?" If a participant responded "dog" to the first question, then the fourth question became "Does everyone else in your class speak dog like you?" Regardless of the participant's answer, this question was followed up by asking, "How can you tell?"

Awareness of classroom language environment questions. These three questions assessed children's explicit awareness of their classroom language environment—specifically, of their classmates' language backgrounds. Participants were asked, (5) "Does anyone in your class speak English?" and (6) "Does everyone in your class speak English?," followed by (7) "Does anyone in your class speak a language other than English?" Regardless of participants' answers, each of these questions was followed up by asking, "How can you tell?" The fifth and sixth questions examined children's awareness of their classmates' language backgrounds, as well as their understanding of the word and concept "English." The seventh question examined children's awareness of the languages being spoken around them by their peers in the classroom. Though the distinction between *anyone* and *everyone* may seem difficult for preschool-age children, the words *any* and *every* are acquired by 30 months of age by 54% and 33% of English monolinguals, respectively (Fenson et al., 1994).

Communicative Consequences Task

This task assessed children's explicit understanding of the communicative consequences of speaking different languages—that is, that speakers who speak

different languages may not understand each other. Participants were shown six videos: Two of the videos featured a woman speaking in English, a familiar language that all participants spoke; another two videos featured a different woman speaking in Spanish, a comparably less familiar language that was the second most common language in each of the communities in which the participants resided (U.S. Census Bureau, 2015); and the remaining two videos featured yet another different woman speaking in French, an unfamiliar language that was far less common than English or Spanish in each of the communities in which the participants resided, with less than 1% of the communities' populations speaking French (U.S. Census Bureau, 2015).

In each video, the speaker said three sentences about one of six topics (e.g., books at the library, eating snacks) in English, Spanish, or French. After viewing each video, children were asked the same three questions about each video. First, children were asked, "What was she talking about?" to examine participants' awareness of whether or not they could understand different language speakers talking in English, Spanish, or French. Then, to measure participants' understanding of the communicative consequences of speaking different languages, experimenters explicitly told children about a speaker's language background (e.g., "She only speaks French and doesn't speak English") and then asked them, "If you talk to her, will she know what you said?" For familiar language speaker videos, an affirmative "yes" response was the only accurate response, whereas for unfamiliar language speaker videos, a "no" response was the only accurate response. This question was followed up with, "How can you tell?" to elicit more information about children's reasoning for their answer to the previous question.

All speakers in the videos were portrayed as monolingual speakers of English, Spanish, or French; however, all speakers were actually fluent in English and Spanish or in English and French. Each video was an average of 11.29 s in length ($SD = 2.65$ s), and participants spent approximately 3–5 min in total on this task. We created four random orders of the six videos, such that (a) the three speakers/languages appeared once each in the first three videos and once each in the last three videos (e.g., English, Spanish, French, Spanish, English, French) and (b) each speaker talked about a different topic within each random order (e.g., books at the library, eating snacks). See Appendix S1 in the Supporting Information online for example trials of the task and Appendix S2 in the Supporting Information online for the English, Spanish, and French scripts.

Labeling Conventions Task

This task measured children's explicit understanding of labeling conventions. The task had two parts: (a) training trials, in which participants learned how to respond on this task, and (b) test trials, in which participants' understanding of labeling conventions was measured.

Training trials. Before watching the videos, participants received three training trials to learn how to respond in a nonverbal, forced-choice manner on this task (Gordon & McGregor, 2014; see Appendix S3 in the Supporting Information online). During training trials, participants were shown a picture of a common object (e.g., a cup) on a computer screen and asked about what the object is called (e.g., "Do you call this a cup or something else?"). Participants were trained to respond to this question by pointing to one of two large dots on a piece of paper; each dot represented one of the answers (e.g., "a cup"), which was counterbalanced across trials and across participants. At the point of asking participants about what the object is called, experimenters pointed to the corresponding dot at the same time as saying the object label (e.g., "a cup") and "something else." This forced-choice manner of response has been found to help elicit responses from children (e.g., Gordon & McGregor, 2014) and reduce memory demands in the task by adding visual–spatial supports.

Of the three training trials, the first two trials had questions in which the object label was in the question (e.g., a cup was shown and the question was, "Do you call this a cup or something else?"), such that the correct response would be the object label; the third trial had a question in which the name of the object was not in the question (e.g., a cookie was shown and the question was, "Do you call this a shoe or something else?"), such that the correct response would be "something else." If participants responded incorrectly on any of the training trials, they were provided with corrective feedback and were given another opportunity to respond; participants were given as many opportunities to respond as it took to get the correct response.

Test trials. After the training trials, participants were shown six videos of a speaker labeling different familiar objects (e.g., a fish, a spoon) in English, Spanish, or French, and then asked questions about what that speaker might call the object. As in the training trials, participants were asked to respond using the two dots by pointing to the dot that corresponded with their answer. Participants viewed a total of six videos—two videos of each language, featuring a different speaker for each language. In each video, the speaker first established her language background by saying a sentence in her language (e.g., "We're going to have so much fun playing this game!"), and the speaker then labeled the object three times, 5 s apart. Each video was thus an average of 23.60 s in

Table 2 Object labels presented in the Labeling Conventions task

English	Spanish	French
Dog	El perro	Le chien
Fish	El pescado	Le poisson
Hat	El sombrero	Le chapeau
Spoon	La cuchara	La cuillère
Sock	El calcetín	La chausette
Tree	El árbol	L'arbre

length ($SD = 0.57$ s). As in the Communicative Consequences task, all speakers were portrayed in the videos as monolingual speakers of English, Spanish, or French, but were actually fluent in English and Spanish or in English and French. Additionally, all objects presented in the videos were those with labels that are learned early and commonly known by 30-month-old monolingual English-speaking children (Fenson et al., 1994). We created four quasi-random orders of the six videos, such that (a) the three speakers/languages appeared once each in the first three videos and once each in the last three videos and (b) each speaker presented a different object within each random order (e.g., a fish, a spoon). See Appendix S4 in the Supporting Information online for example trials of the task and Table 2 for the object labels in English, Spanish, and French.

Parent Questionnaire

Parents were asked to complete a questionnaire about children's language experiences and family environment. We used information from the questionnaire in three ways. First, we used information about the child's language experiences (e.g., languages spoken by the child, languages spoken in the home, percentage of daily use of each language by the child) to assess children's exposure to non-English languages and to categorize children as being from a monolingual home or as having home bilingual exposure. Second, we used information on language and socioeconomic status (e.g., parent education, net annual household income, home zip code) to ensure that the groups of participants differed only on relevant language features and were similar on other social characteristics. Third, we used language information provided by parents (e.g., languages spoken by parents) to code participants' responses to questions in the Language Interview. See Appendix S5 in the Supporting Information online for the questionnaire.

Preschool Interview

Preschool teachers or directors were asked questions about the linguistic environment of the preschool. An experimenter asked preschool teachers or directors how many children were enrolled at the preschool; what proportion of the children spoke a language other than English; whether there were any children who did not speak English; how many teachers were employed at the preschool; and what proportion of the teachers spoke a language other than English. All teachers and directors provided estimations when answering each of these interview questions; no records about students or staff at the preschools were obtained.

Procedure

We randomly assigned participants to one of four quasi-random orders of the videos in the Communicative Consequences task and the Labeling Conventions task. To control for the possibility that the Language Interview might prime participants' responses during the Communicative Consequences task and Labeling Conventions task, we also randomly assigned participants to complete the interview or the two video tasks first. Thus, half the participants completed the Language Interview before the Communicative Consequences task and Labeling Conventions task, and the other half completed the Communicative Consequences task and Labeling Conventions task before the Language Interview. Because the Labeling Conventions task demonstrated to participants that speakers of different languages communicate differently—information that would be expected to affect performance on the Communicative Consequences task—the Communicative Consequences task always preceded the Labeling Conventions task. Experimenters audio-recorded, transcribed, and coded participants' responses on all three tasks. To determine the reliability of transcriptions and coding, 15% of the data ($n = 12$) were randomly selected, transcribed, and coded by an independent experimenter; we provide intercoder reliability for each task with the results.

Parents were asked to complete the questionnaire when they provided consent for their child's participation in the study. Preschool teachers or directors were asked the preschool interview questions on the day that experimenters visited the preschool for data collection.

Results

The goal of the present study was to examine whether early language environments predict aspects of explicit language awareness development. Specifically, to understand how exposure to linguistic diversity influences explicit language

awareness, we compared explicit language awareness in monolingual children growing up in a relatively linguistically diverse community (Los Angeles County) versus a relatively linguistically homogenous community (Walworth County). Additionally, to examine how home exposure to multiple languages may shape explicit language awareness, we compared explicit language awareness in home overhearers versus monolingual children growing up in a relatively linguistically diverse community.

A number of notes should be made regarding the following analyses. First, we found no order effects between the participants who completed the Language Interview before the experimental tasks (i.e., the Communicative Consequences and Labeling Conventions tasks) versus those who completed the experimental tasks before the interview (all ps $> .05$; for exact p values, see Appendix S6 in the Supporting Information online). Second, in the analyses of the Communicative Consequences and Labeling Conventions tasks, we compared the different language videos as familiar (English) versus unfamiliar (Spanish, French) language speaker videos. Although Spanish was more common than French in both Los Angeles County and Walworth County, Spanish and French were more unfamiliar relative to English. Moreover, participants' responses to Spanish versus French speaker videos did not differ on either task (all ps $>$ .05; for exact p values, see Appendix S7 in the Supporting Information online). Third, age was not significantly correlated with performance on any of the language awareness measures for any of the groups of participants (all ps $>$ .05; for exact p values, see Appendix S8 in the Supporting Information online).

Fourth, we used nonparametric tests (e.g., Kruskal–Wallis test, Mann–Whitney U) for all analyses where parametric test assumptions (e.g., normality, homogeneity of variance) were not met. In instances where we used nonparametric tests, we note the reasons for using these tests. Fifth, although we grouped all the home overhearers together—regardless of whether they had home exposure to one non-English language ($n = 11$) or two or more non-English languages ($n = 9$)—we initially examined whether these two subgroups of participants differed in performance across all the tasks. Due to the small sample sizes of these two subgroups, we carried out Mann–Whitney U tests, which revealed that participants in these two subgroups did not significantly differ in performance on any of the tasks (all ps $> .05$; for exact p values, see Appendix S9 in the Supporting Information online). Sixth, although we report descriptive statistics for all tasks in the text, we also report these statistics in a summary table (Table 3) for ease of comparison.

Table 3 Summary of descriptive statistics of percentage accuracy data for all tasks, separated by task, condition, and language background group

Tasks	Walworth County monolinguals *M* (*SD*)	Los Angeles County monolinguals *M* (*SD*)	Los Angeles County home overhearers *M* (*SD*)
Language labeling			
Own language	15.79 (36.95)	30.43 (47.05)	35.00 (48.94)
Parents' language(s)	14.47 (34.70)	39.13 (49.90)	50.00 (45.88)
Understanding different language speakers			
Familiar language	84.21 (36.95)	78.26 (58.05)	72.50 (41.28)
Unfamiliar languages	71.71 (41.98)	60.87 (45.12)	63.75 (34.86)
Understanding of communicative consequences			
Familiar language	69.74 (45.83)	73.91 (44.90)	60.00 (47.57)
Unfamiliar languages	43.42 (42.98)	39.13 (42.52)	40.00 (42.48)
Labeling conventions			
Familiar language	87.84 (38.02)	97.83 (28.12)	92.50 (31.26)
Unfamiliar languages	35.14 (43.08)	38.04 (29.79)	20.00 (34.03)
Awareness of language environment	48.25 (36.10)	63.77 (38.81)	58.33 (38.81)

Examining the Similar Roles of Community Linguistic Diversity and Home Bilingual Exposure

We expected both community linguistic diversity and home bilingual exposure to predict explicit language awareness in the domains of language labeling and understanding of communicative consequences.

Language Labeling

Children's ability to identify and label their own language(s) and their parents' language(s) were measured with the questions, "What language do you speak?" and "What language does your [caregiver 1/caregiver 2] speak?" Responses to these questions were scored for accuracy according to information provided by parents on the parent questionnaire about the child's and parents' language backgrounds. There was 97.22% agreement between two independent experimenters' transcriptions of these responses, and the experimenters' scoring of these responses had strong agreement (Cohen's $\kappa = .87$). Figure 1 shows participants' accuracy when responding to these questions about (a) their own language and (b) their parents' language(s).

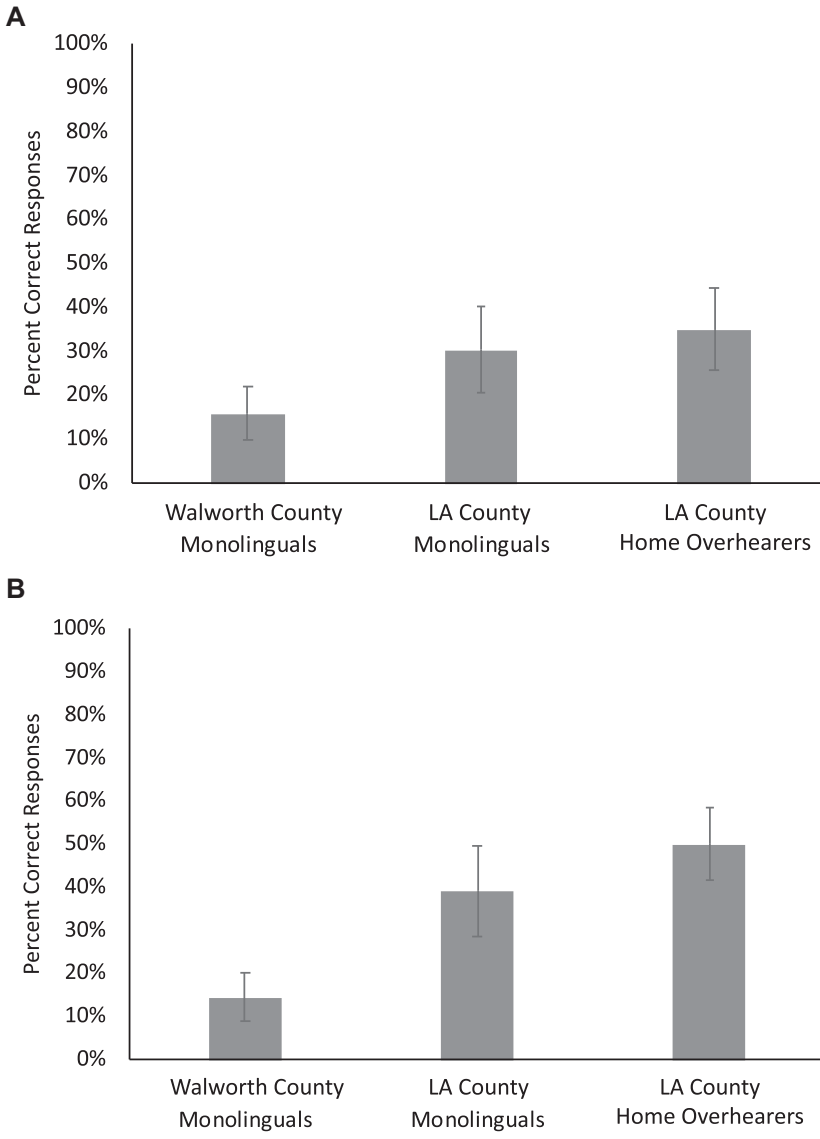

Figure 1 Participants' accuracy in identifying and labeling (A) their own language and (B) their parents' language(s) by language background group. Error bars reflect the standard error. LA = Los Angeles.

We conducted two Kruskal–Wallis tests to compare the accuracy of the three language background groups in naming (a) their own language and (b) their parents' language(s). We selected the nonparametric Kruskal–Wallis test because the three groups' data had similar distribution shapes but lacked normality; moreover, Levene's test revealed a lack of homogeneity of variance: own language, $F(2, 78) = 6.744$, $p = .002$; parents' language(s): $F(2, 78) = 10.136$, $p < .001$.

The three groups of participants did not differ in performance when naming their own language (i.e., English), $\chi^2(2, N = 81) = 3.131$, $p = .209$. Although the result was not statistically significant, home overhearers ($M = 35.00\%$, $SD = 48.94\%$, 95% CI [28.47, 61.19]) were numerically more accurate in naming their own language than Los Angeles County monolinguals ($M = 30.43\%$, $SD = 47.05\%$, 95% CI [12.06, 48.81]), who were in turn numerically more accurate in naming their own language than Walworth County monolinguals ($M = 15.79\%$, $SD = 36.95\%$, 95% CI [1.50, 30.08]).

In contrast, when asked about their parents' language(s), the three groups of participants did differ in their language labeling, $\chi^2(2, N = 81) = 10.559$, $p = .005$. We made pairwise comparisons with Bonferroni corrections (i.e., p must be less than 0.0125). The results revealed, as expected, that significantly more home overhearers ($M = 50.00\%$, $SD = 45.88\%$, 95% CI [39.54, 70.80]) were able to correctly identify their parents' language(s) than were Walworth County monolinguals ($M = 14.47\%$, $SD = 34.70\%$, 95% CI [0.82, 28.13]; Mann−Whitney $U = 218.00$, $z = -3.261$, $p = .001$), but that Los Angeles County monolinguals ($M = 39.13\%$, $SD = 49.90\%$, 95% CI [21.58, 56.68]) did not differ from home overhearers (Mann−Whitney $U = 200.00$, $z = -0.815$, $p = .415$) or Walworth County monolinguals (Mann−Whitney $U = 330.500$, $z = -2.119$, $p = .034$). Thus, exposure to more than one language in the home—but perhaps not exposure to community linguistic diversity—seemed to shape children's ability to identify and name others' language(s); however, neither community linguistic diversity nor home bilingual exposure significantly affected children's ability to label their own language.

Qualitative analyses. A qualitative examination of participants' responses provided further support to suggest that both community linguistic diversity and home bilingual exposure may affect children's ability to name languages. When participants' responses were categorized by type of response—regardless of its accuracy (Table 4)—the most common response provided by Walworth County monolinguals was to say "I don't know" (32 of 102 total responses) or to answer with a random word or phrase (e.g., "dinosaur"; 41 of 102 total responses). Interestingly, the most common response provided by Los Angeles

Table 4 Percentages of different types of response from participants when asked about what language they and their parents speak

	Self			Parents		
Response type	W. mono.	LA mono.	LA over.	W. mono.	LA mono.	LA over.
1. I don't know	41	32	37	26	20	13
2. Answer with random word or phrase	38	14	16	42	20	26
3. Name a language	19	55	47	22	50	58
4. Use language-related words	3	0	0	3	5	3

Note. W. mono. = Walworth County monolinguals; LA mono. = Los Angeles County monolinguals; LA over. = Los Angeles County home overhearers.

County monolinguals (34 of 66 total responses) and home overhearers (27 of 50 total responses) was naming a language. These results point to the role community linguistic diversity may play in children's language labeling abilities. Although community linguistic diversity did not affect the accuracy with which monolingual children named the language that they or their parents speak (i.e., English), more Los Angeles County monolinguals in this study labeled *a* language (e.g., Spanish) than did Walworth County monolinguals. Thus, whereas bilingual exposure at home benefitted children's ability to accurately label their and their parents' language(s), exposure to community linguistic diversity seemed to shape monolingual children's ability to more generally label and name languages.

Understanding of Communicative Consequences

Before examining participants' understanding of communicative consequences, we first examined participants' awareness of whether they could or could not understand different language speakers. This was assessed with the question "What was she talking about?" after participants viewed videos of speakers talking in English, Spanish, or French. For English (familiar language) speaker videos, responses that reflected any part of what the speaker said were considered accurate responses (e.g., "Butterfly" after the speaker talked about butterflies). In contrast, for Spanish and French (unfamiliar language) speaker videos, responses that indicated that the participant did not understand what the speaker said (e.g., "I don't know what she's saying") were

accurate responses because all participants had no home exposure to and no reported knowledge of Spanish or French. There was 94.44% agreement between two independent experimenters' transcriptions of these responses, and the experimenters' scoring of these responses had moderate agreement (Cohen's $\kappa = .75$). We used a three-by-two ANOVA with participants' language background (Walworth County monolinguals, Los Angeles County monolinguals, and Los Angeles County home overhearers) as a between-subjects variable and speaker language familiarity (familiar and unfamiliar language speakers) as a within-subjects variable to examine participants' comprehension of different language speakers. The ANOVA revealed a main effect of speaker language familiarity, $F(1, 78) = 4.263$, $p = .042$, $\eta_p^2 = .052$, such that participants' comprehension of familiar language speakers ($M = 79.63\%$, $SD = 44.57\%$, 95% CI [66.61, 85.75]) was significantly better than their comprehension of unfamiliar language speakers ($M = 66.67\%$, $SD = 41.08\%$, 95% CI [56.32, 73.73]). We found no main effect of participants' language background, $F(2, 78) = 0.744$, $p = .478$, $\eta_p^2 = .019$, and no interaction, $F(2, 78) = 0.139$, $p = .870$, $\eta_p^2 = .004$.

To measure participants' understanding of the communicative consequences of speaking different languages, experimenters asked them, "If you talk to her, will she know what you said?" For familiar language speaker videos, an affirmative "yes" response was the only accurate response, whereas for unfamiliar language speaker videos, a "no" response was the only accurate response. There was 95.83% agreement between two independent experimenters' transcriptions of these responses, and the experimenters' scoring of these responses had moderate agreement (Cohen's $\kappa = .72$). We used a three-by-two ANOVA with participants' language background (Walworth County monolinguals, Los Angeles County monolinguals, and Los Angeles County home overhearers) as a between-subjects variable and speaker language familiarity (familiar and unfamiliar language speakers) as a within-subjects variable to examine participants' understanding of the communicative consequences. The ANOVA revealed a main effect of language familiarity, $F(1, 78) = 11.761$, $p = .001$, $\eta_p^2 = .131$, such that accuracy was higher when children were asked about familiar language speakers ($M = 68.52\%$, $SD = 45.72\%$, 95% CI [60.85, 80.16]) than unfamiliar language speakers ($M = 41.36\%$, $SD = 42.24\%$, 95% CI [32.42, 50.59]). We found no main effect of children's language background, $F(2, 78) = 0.403$, $p = .670$, $\eta_p^2 = .010$, and no interaction, $F(2, 78) = 0.256$, $p = .775$, $\eta_p^2 = .007$.

Qualitative analyses. Though children's familiarity with the language being spoken may be a primary factor affecting children's understanding of the

Table 5 Understanding of communicative consequences: Percentages of different types of response when asked about familiar and unfamiliar language speakers

	Familiar language speaker			Unfamiliar language speaker		
Response type	W. mono.	LA mono.	LA over.	W. mono.	LA mono.	LA over.
1. I don't know	61	42	44	62	43	52
2. Answer with random word or phrase	9	14	28	9	16	20
3. Name a language	12	8	19	12	20	25
4. Perceptual or functional explanation[a]	0	3	3	0	1	0
5. State talking to people[b]	4	11	0	3	11	2
6. State (not) understanding the speaker[c]	7	8	3	4	1	0

Note. W. mono. = Walworth County monolinguals; LA mono. = Los Angeles County monolinguals; LA over. = Los Angeles County home overhearers.
[a]Response Type 4 included responses such as "She's wearing red."
[b]Response Type 5 included responses such as "I can talk to her."
[c]For Response Type 6, children responded that they did *not* understand the speaker when asked about *un*familiar language speakers; when asked about familiar language speakers, children responded that they did indeed understand the speaker.

communicative consequences of speaking different languages, qualitative analyses of participants' responses to the follow-up question, "How can you tell?" also provided preliminary evidence that linguistic diversity and bilingual exposure may also play a role. When participants' responses were categorized by type of response—regardless of accuracy (Table 5)—the most common response among all participants was to say "I don't know" (206 of 387 total responses provided; Walworth County monolinguals: 109 of 176 total responses; Los Angeles County monolinguals: 47 of 110 total responses; home overhearers: 50 of 101 total responses) or to answer with a random word or phrase (e.g., "Because I like her," "That's how you do it"; 56 of 387 total responses provided; Walworth County monolinguals: 16 of 176 total responses; Los Angeles County monolinguals: 17 of 110 total responses; home overhearers: 23 of 101 total responses). These findings suggest that children may have difficulty explaining why they can or cannot communicate with speakers of familiar and unfamiliar languages. However, when participants did provide a relevant explanation, their patterns of responses differed by language background. When

asked about unfamiliar language speakers, 25% of responses (16 of 65 total responses) provided by home overhearers and 20% of responses (15 of 74 total responses) provided by Los Angeles County monolinguals named a language (e.g., "That's Spanish"), whereas only 12% of responses (14 of 119 total responses) provided by Walworth County monolinguals named a language. Such patterns of response suggest that, although community linguistic diversity and bilingual exposure may not be the predominant factors affecting children's understanding of communicative consequences, they may still play a role in children's development of this aspect of explicit language awareness.

Examining the Different Roles of Community Linguistic Diversity and Bilingual Exposure

We also expected community linguistic diversity and bilingual exposure to differentially predict two other aspects of explicit language awareness: understanding of labeling conventions and awareness of language environment.

Understanding of Labeling Conventions

Participants' explicit understanding of labeling conventions was assessed with the question "Do you think she calls that a [English label] or something else?" after participants viewed videos of speakers labeling objects in English, Spanish, or French. For familiar language speaker videos, accurate responses were those in which participants chose the English label, whereas for unfamiliar language speaker videos, accurate responses were those in which participants chose "something else." There was strong agreement between two independent experiments' scoring of these responses (Cohen's $\kappa = .86$), with the two experimenters' scoring matching on 93.06% of items. We used a three-by-two ANOVA with participants' language background (Walworth County monolinguals, Los Angeles County monolinguals, and Los Angeles County home overhearers) as a between-subject variable and speaker language familiarity (familiar and unfamiliar language speakers) as a within-subjects variable to examine participants' understanding of labeling conventions. The ANOVA revealed a main effect of speaker language familiarity, $F(1, 77) = 89.97$, $p < .001$, $\eta_p^2 = .539$, such that accuracy was higher when participants were asked about familiar language speakers ($M = 91.88\%$, $SD = 31.26\%$, 95% CI [85.60, 99.09]) than unfamiliar language speakers ($M = 32.19\%$, $SD = 40.21\%$, 95% CI [22.95, 40.20]). However, we found no main effect of participants' language background, $F(2, 77) = 1.463$, $p = .238$, $\eta_p^2 = .037$, and no interaction, $F(2, 77) = 0.806$, $p = .450$, $\eta_p^2 = .021$.

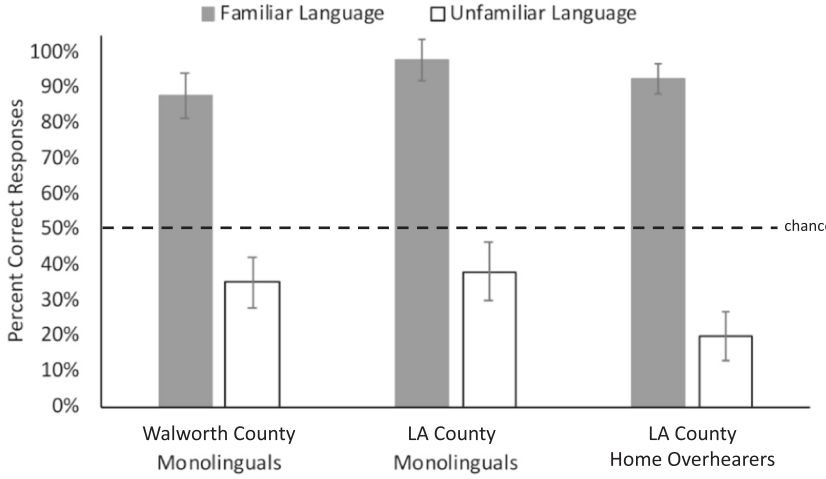

Figure 2 Participants' accuracy on the Labeling Conventions task by language background group. Error bars reflect the standard error. LA = Los Angeles.

All participants also demonstrated a systematic understanding of labeling conventions for the familiar language but not necessarily for the unfamiliar language (Figure 2). We performed *t*-test comparisons to chance (chance = 50%) with Bonferroni corrections for multiple comparisons (i.e., p must be less than 0.0083). The results revealed that all participants, when asked about familiar language speakers, responded at above chance rates that the familiar language speaker called objects by English labels: Walworth County monolinguals, $M_{difference\ from\ chance} = 37.84\%$, $t(36) = 6.05$, $p < .001$, Cohen's $d = 0.99$, 95% CI [25.16, 50.51]; Los Angeles County monolinguals, $M_{difference\ from\ chance} = 47.83\%$, $t(22) = 8.16$, $p < .001$, Cohen's $d = 1.70$, 95% CI [35.67, 59.98]; home overhearers, $M_{difference\ from\ chance} = 42.50\%$, $t(19) = 10.38$, $p < .001$, Cohen's $d = 2.32$, 95% CI [33.93, 51.07]. However, when participants were asked about unfamiliar language speakers, Walworth County and Los Angeles County monolinguals' response accuracy was at chance—Walworth County monolinguals, $M_{difference\ from\ chance} = -14.87\%$, $t(36) = -2.099$, $p = .043$, Cohen's $d = -0.34$, 95% CI [−29.23, −0.50]; Los Angeles County monolinguals, $M_{difference\ from\ chance} = -11.96\%$, $t(22) = -1.44$, $p = .164$, Cohen's $d = -0.30$, 95% CI [−29.16, 5.25]—such that monolinguals were as likely to respond that unfamiliar language speakers called objects by English labels as to respond with "something else." Surprisingly, home overhearers' response

accuracy was significantly below chance when asked about unfamiliar language speakers, $M_{difference\ from\ chance} = -30.00\%$, $t(19) = -3.94$, $p = .001$, Cohen's $d = -0.88$, 95% CI [−45.93, −14.07], such that home overhearers systematically responded that unfamiliar language speakers called objects by English labels. Thus, regardless of language background, all participants were correct in responding that the familiar language speaker called the object by the English label; however, home overhearers systematically responded that unfamiliar language speakers also called the object by the English label.

Awareness of Language Environment

Participants' explicit awareness of their classmates' language backgrounds was measured with the following three questions: "Does anyone in your class speak English?," "Does everyone in your class speak English?," and "Does anyone in your class speak a language other than English?" Responses to these questions were scored for accuracy according to information provided by preschool teachers or directors on the preschool interview. Answers to these three questions were averaged and turned into a percentage to create a composite accuracy score for awareness of classroom language environment. There was 97.22% agreement between two independent experimenters' transcriptions of these responses, and the experimenters' scoring of these responses had strong interrater reliability (Cohen's $\kappa = .87$). We used an ANOVA to compare Walworth County monolinguals', Los Angeles County monolinguals', and home overhearers' accuracy scores for awareness of classroom language environment. The ANOVA revealed no difference among the three language background groups, $F(2, 80) = 1.32$, $p = .273$, $\eta_p^2 = .033$. Walworth County monolinguals ($M = 48.25\%$, $SD = 36.10\%$, 95% CI [0.36, 0.61]), Los Angeles County monolinguals ($M = 63.77\%$, $SD = 38.81\%$, 95% CI [0.48, 0.79]), and home overhearers ($M = 58.33\%$, $SD = 38.81\%$, 95% CI [0.42, 0.75]) did not differ in their awareness of their classroom language environment. Thus, although numerically the Los Angeles County monolingual children showed greater awareness of their classroom language environment, followed by home overhearers then Walworth County monolinguals, their awareness did not statistically significantly differ by either community linguistic diversity or bilingual exposure.

Discussion

In this study we aimed to understand whether growing up in a relatively linguistically diverse community and/or having bilingual exposure in the home predicts different aspects of explicit language awareness development. The explicit language awareness skills of monolingual children from relatively

linguistically homogenous and linguistically diverse communities were compared to each other, as well as to those of functionally monolingual children who had exposure to two or more languages in the home. Our findings suggest that home bilingual exposure may predict language labeling and understanding of labeling conventions, whereas the effects of community linguistic diversity are largely present in the quality of young children's talk about language.

Overall, the present findings suggest that community linguistic diversity and home bilingual exposure predict certain conventional aspects of explicit language awareness but not others. Below we discuss the roles of community linguistic diversity and home bilingual exposure in language labeling, understanding of communicative consequences, understanding of labeling conventions, and awareness of language environment.

The Roles of Both Community Linguistic Diversity and Bilingual Exposure

Though we expected both community linguistic diversity and bilingual exposure to influence both (a) language labeling and (b) understanding of communicative consequences, our results only partially supported our predictions.

Language Labeling

Of all the dimensions of language awareness assessed in the present study, language labeling was the dimension for which previous research had already provided evidence for explicit skills. Our findings support previous research, which has found bilingual and bilingually exposed children to be more successful than monolingual children in correctly naming the language(s) they speak (Akhtar et al., 2012). Moreover, parent-report evidence has suggested that young bilingual (and multilingual) children not only may be aware of their own bilingualism but also express interest in learning more languages (Bailey & Osipova, 2016). The present findings thus extend previous findings about functionally bilingual (and multilingual) children by providing evidence that bilingual exposure in the home predicts functionally monolingual children's ability to label languages.

Both the quantitative and qualitative findings from the present study suggest that bilingual exposure in the home—and perhaps exposure to community linguistic diversity as well, though findings were not clear-cut—may shape language labeling abilities. One possible explanation for this result is that bilingual families may more frequently label languages in child-directed speech than do completely monolingual families. Bilingual families—by nature of being bilingual—may have more opportunities to talk about the different

languages in their home (e.g., "Mommy sometimes speaks in Japanese because Grandma speaks Japanese"). Indeed, eight out of the 20 home overhearers' parents (40%) reported having conversations about other languages with their children because of relatives and caregivers who speak a non-English language; in contrast, none of the Walworth County monolinguals' parents and two out of the 22 Los Angeles County monolinguals' parents (9%) reported having similar conversations. Relatedly, it is possible that linguistically diverse communities may also provide more opportunities for parents to explicitly label and talk about different languages than do relatively linguistically homogenous communities. Given that the likelihood of being exposed to speakers of different languages in linguistically homogenous communities is lower than in linguistically diverse communities, it would be reasonable for the topic of different languages to be less common in conversations among families living in linguistically homogenous communities than among those in linguistically diverse communities.

Understanding of Communicative Consequences

We found that—regardless of language background—children demonstrated an explicit awareness that they could understand speakers who spoke the same language as they did and that those speakers could in turn understand the children. However, the children may have been unsure whether the same was true of speakers of unfamiliar languages. Previous research has found that 4- and 5-year-old monolingual children can (implicitly) modify their own language use to be appropriate for their interlocutor (e.g., Clark, 1978; Shatz & Gelman, 1973), at least for the language that those monolingual children speak. Moreover, when monolingual 4-year-olds' concept of how communication works has been examined using a third-person task, they were found to understand that a language shared between speakers—regardless of whether the language is familiar or unfamiliar to the child—is necessary for communicative interactions (Afshordi et al., 2018). Such previous work suggests that young monolingual children have an implicit understanding of communicative consequences. Put together with the present study's use of a first-person task that assessed children's *explicit* understanding of their own ability to communicate with a speaker, the present results point to the possibility that monolingual children may develop an implicit concept of how communication works (Afshordi et al., 2018) *before* they are able to explicitly apply that concept to themselves for languages that are unfamiliar to them.

An unexpected finding was that the home overhearers in this study also demonstrated a better explicit understanding of communicative consequences

for familiar than for unfamiliar language speakers. Given that 3-year-old bilingual and trilingual children can (implicitly) use the language appropriate for different interlocutors (e.g., Comeau et al., 2007; Montanari, 2009; Nicoladis, 1998; Petitto et al., 2001), it is possible that bilingual exposure alone is not enough to shape children's explicit understanding of communicative consequences and that the experience of being an active bilingual speaker is necessary. Thus, when considered in the context of previous evidence on the implicit understanding of communicative consequences, our findings suggest that implicit skills likely precede explicit awareness and that active bilingualism may be necessary to shape explicit language awareness development in this domain.

The Different Roles of Community Linguistic Diversity and Home Bilingual Exposure

We also expected community linguistic diversity and bilingual exposure to differentially predict children's (a) understanding of labeling conventions and (b) awareness of their language environment. Specifically, we expected bilingual exposure to play a role in children's explicit understanding of labeling conventions, for which our results provide some support, whereas we expected community linguistic diversity to shape awareness of language environment, for which we did not find evidence.

Labeling Conventions

Children demonstrated explicit understanding of labeling conventions when presented with familiar language speakers, but this understanding did not extend to unfamiliar language speakers. In a previous study, 2-year-old English-speaking monolinguals were found not to demonstrate an implicit understanding that Mandarin speakers do not know English words (Byers-Heinlein et al., 2014). Given that finding, it is possible that the 3- and 4-year-old monolingual children in the current study also did not understand—implicitly or explicitly—that speakers of unfamiliar languages do not have knowledge of the English labels and instead call objects by different labels.

Interestingly, home overhearers in this study systematically responded that the unfamiliar language speaker called the object by the English label. Given that 2-year-old bilinguals who speak English and another language have been found to demonstrate an implicit understanding that Mandarin speakers do not know English labels (Byers-Heinlein et al., 2014), we expected preschool-age home overhearers to extend their understanding of labeling conventions to unfamiliar language speakers as well. However, because it was never explicitly stated in the present study's Labeling Conventions task that the unfamiliar

language speakers did not speak English, it is possible that the home overhearers in this study may have assumed that the unfamiliar language speakers were bilingual, much like the adults around them, and also spoke English (cf. Atagi et al., 2016). Indeed, there is evidence that home exposure to a non-English language predicts English-speaking 5-year-old monolinguals' willingness to accept multiple labels for an object (Rojo & Echols, 2018); if the home overhearers in this study assumed all of the speakers to be bilingual, their endorsement of the English label for unfamiliar language speakers is not unreasonable.

Another important contribution of the current study is that although prior evidence suggests that 3- and 4-year-old monolingual children with regular exposure to another language may be better able to implicitly learn foreign words from a foreign speaker than are their monolingual or bilingual peers (Akhtar et al., 2012), the present study used different methods and explicitly asked about what the speaker calls the object. Taken together with previous evidence on the implicit understanding of labeling conventions, our findings suggest that home bilingual exposure may shape monolingual children's explicit understanding as well.

Another possibility that must be considered is that our training trials may have impacted children's performance on the Labeling Conventions task. Although the focus of the training trials was to teach the children how to use the response dots, asking children what *they* call the object shown may have caused many of the children to continue to respond with what they call the object—rather than what the speaker calls the object—during the test trials. However, if the present findings were simply due to the effect of training trials, we would have expected all children—not just the home overhearers—to have systematically responded that the unfamiliar language speakers also call the object by the English label. Given that the monolingual groups showed chance performance on trials with unfamiliar language speakers, it is unlikely (but possible) that any effect of the training trials was limited to the home overhearers alone.

Awareness of Language Environment

Contrary to our hypotheses, children's explicit awareness of their classroom language environment did not differ by children's exposure to linguistic diversity or home bilingual exposure. However, it is unclear why children lacked explicit awareness of their classroom language environment. One possibility is that the children attending preschool in a linguistically diverse community simply did not have knowledge of the fact that some classmates spoke multiple languages. On the other hand, it is also possible that what language other

children spoke was simply irrelevant information for all children because they could communicate with everyone in their classes; this may have been especially true for the Walworth County monolinguals (see the discussion about monolingual children in Atagi et al., 2016).

Limitations and Alternative Interpretations

Although our findings generally suggest that home bilingual exposure and community linguistic diversity may predict certain aspects of explicit language awareness, there are some other possible interpretations that must be considered. First, we examined home bilingual exposure and community linguistic diversity as categorical grouping variables, rather than as continuous predictors. We did so because our measures of home bilingual exposure (i.e., number of non-English languages that children were exposed to at home and how much time they were exposed to those languages) and community linguistic diversity (i.e., census data indicating the proportion of multilinguals in the population of a child's zip code) were highly correlated, preventing us from examining these data continuously. However, such categorical analyses may have hindered us from understanding the impact of home bilingual exposure and community linguistic diversity on language awareness in a more nuanced fashion. For instance, categorical analyses do not allow us to understand the degree to which different measures of home bilingual exposure (e.g., number of non-English languages at home vs. amount of time each language is spoken in the home) may impact language awareness. Further research with a more diverse sample of functionally monolingual children—preferably including home overhearers in a relatively linguistically homogenous community (a difficult sample to find)—would allow for a more nuanced examination of the relation between early language environments and language awareness.

Second, it is possible that the differences we attributed to community linguistic diversity may in fact be due to differences in parent education or family household income. For all three groups of children, the average parent had an associate's or bachelor's degree, and the majority of children in the three groups came from households with annual incomes that were greater than the median income for their zip code. However, the parents of home overhearers in Los Angeles County had significantly higher educational attainment than parents in Walworth County; moreover, median incomes differed between the two counties as well, likely due to differences in the cost of living in each county (i.e., Los Angeles County has a high cost of living, relative to Walworth County). Thus, community linguistic diversity and these measures of socioeconomic status were related to demographic differences in data collection sites.

Third, it is possible that other variables that we did not measure may have affected our results. For instance, we did not obtain other measures of cognition (e.g., nonverbal IQ, executive function) or language (e.g., vocabulary) that may be related to language awareness. It is possible that such cognitive variables and language skills may moderate the relation between early language experience and explicit language awareness development. Indeed, it is not difficult to imagine that a child with a larger vocabulary may be better equipped to verbalize an explanation about their language awareness. Relatedly, we did not ask families to report the amount of time children spent at home with their family versus the amount of time they spent at preschool, where children may receive more explicit instruction about language than at home. We also did not ask families about whether the children had any siblings. Families reported household sizes ranging from two to eight individuals, so it is likely that some of these children had siblings or multiple adults living in their home. It is possible that such children may have had different input about language from children without siblings or multiple adults living in their home.

Fourth, for the tasks that required children to respond to speakers of English, Spanish, and French, we did not find differences in children's responses to speakers of Spanish and French, and thus, we grouped children's responses to these speakers as responses to speakers of unfamiliar languages. However, it is possible that selecting languages that are more distinct and distant than Spanish and French—for instance, Spanish and Finnish—may have yielded different responses from children. Future studies should examine the potential role not only of language (un)familiarity but also of language distance in children's explicit language awareness.

Future Directions

Combined with previous research, the findings of this study suggest that further research is needed to understand what types and duration of language experiences are necessary to shape the development of explicit language awareness. For example, it remains to be investigated the extent to which linguistically diverse communities provide children with an array of linguistic opportunities, including opportunities not only to hear other languages and meet speakers of different languages (Howard et al., 2014) but also to experience and/or observe variation in communicative events with speakers who vary in fluency. For example, linguistically diverse communities may provide opportunities for children to experience or observe communication with nonnative speakers of their native language, and in some cases, this communication may not be successful. Indeed, studies with adults find that social network size and heterogeneity affect

various aspects of language processing (e.g., Lev-Ari, 2016, 2018; Lev-Ari & Shao, 2017; Lev-Ari, Ho, & Keysar, 2018).

Given that community linguistic diversity affords many different linguistic opportunities, future research should examine which aspects of linguistic diversity (e.g., exposure to one vs. many speakers of another language, duration of exposure to speakers of another language) are relevant for children's development of different aspects of language awareness. Relatedly, future research is needed to examine the effects of bilingual exposure versus active bilingualism (e.g., opportunities to communicate with speakers of another language) on language awareness.

Implications

The present study has shed light on the ways in which linguistically diverse environments may shape monolingual children's language development. Although the importance of the quantity and quality of language input for lexical development has been well documented (e.g., Cartmill et al., 2013; Hart & Risley, 1995; Hurtado, Marchman, & Fernald, 2008; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991), there is still a need to understand what characteristics of the language environment—beyond direct language input—may predict language development more broadly. Moreover, there has been much discussion in recent literature in the field of bilingualism about the need to consider the multidimensionality of bilingualism in order to better understand the cognitive consequences of bilingualism (e.g., Abutalebi & Green, 2016; Bialystok, 2016; Green & Abutalebi, 2013; Kroll & Bialystok, 2013; Laine & Lehtonen, 2018; Luk & Bialystok, 2013; Surrain & Luk, 2019; Takahesu Tabori, Mech, & Atagi, 2018). For instance, there have been calls to treat bilingualism as a continuous variable (e.g., Luk & Bialystok, 2013), to examine the contexts of bilinguals' language use (e.g., Abutalebi & Green, 2016; Green & Abutalebi, 2013), and more generally, to consider the diversity in language experience that exists among bilinguals (e.g., Flores, Gürel, & Putnam, 2019; Ortega, 2019; Takahesu Tabori et al., 2018). Similarly, findings from this study—as well as those from others (e.g., Akhtar et al., 2012; Howard et al., 2014; Menjivar & Akhtar, 2017; Rojo & Echols, 2018)—suggest that monolinguals may not be a homogenous group either, much like bilinguals. In line with the call for studies on bilingualism to report and consider more language information about bilingual samples, future research may consider reporting and examining monolinguals' language environments as well.

Our findings, if replicated, could also have implications for dual-language immersion programs that enroll students from monolingual households. The

present study was conducted in the United States, where dual-language immersion schools are becoming more popular across the country, even among monolingual families (e.g., American Academy of Arts and Sciences Commission on Language Learning, 2017; Steele et al., 2017). However, little research has examined how exposure to linguistic diversity shapes explicit language awareness development in functionally monolingual children. Although the present study did not examine monolingual children attending dual-language immersion programs, the present findings provide some initial steps in understanding how exposure to linguistic diversity in the community and exposure to more than one language at home may have consequences for different dimensions of explicit language awareness development. In particular, our findings suggest that dual-language immersion programs may facilitate monolingual children's quality of talk about language and explicit understanding of labeling conventions, even before these children become fluent in the new language they are acquiring in their dual-language immersion program. Moreover, our findings—combined with evidence from previous research—suggest that educators should expect to see individual differences in children's language awareness development, depending on children's home and community language environments.

Conclusion

The present study examined two kinds of language experiences: (a) community linguistic diversity, that is, incidental exposure to many languages in different circumstances in everyday life; and (b) home bilingual exposure, that is, being exposed to two or more languages in everyday life in the home. Whereas previous literature has largely examined the roles played by these experiences in the implicit language awareness development of children who speak two or more languages, the present study examined whether these kinds of language experiences predict the explicit language awareness development of different groups of functionally monolingual children. Our findings suggest that home bilingual exposure may predict language labeling and understanding of labeling conventions, whereas familiarity with the specific language being spoken may be more critical to young children's understanding of the communicative consequences of language background. Moreover, the role played by community linguistic diversity can largely be seen in the quality (rather than accuracy) of young children's talk about language. These findings accord with previous research on the role of early language environments in bilingual and multilingual children's development of language awareness, and also build on previous evidence of young children's implicit language awareness by providing evidence of their explicit language awareness. Explicit language awareness development may

thus be one of the many components of language and cognitive development that is shaped by different early language environments.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1. Example Trials of the Communicative Consequences Task.
Appendix S2. Communicative Consequences Task Scripts.
Appendix S3. Training Trials of the Labeling Conventions Task.
Appendix S4. Example Test Trials of the Labeling Conventions Task.
Appendix S5. Parent Questionnaire.
Appendix S6. Statistical Check for Order Effects.
Appendix S7. Responses to Spanish vs. French Videos.
Appendix S8. Correlations between Children's Age and Task Performance.
Appendix S9. Statistical Comparisons of Home Overhearers with Exposure to One Non-English Language vs. Two or More Non-English Languages in the Home.

Appendix: Accessible Summary (also publicly available at https://oasis-database.org)

How Do Children From Different Language Environments Differ in Their Understanding of What Language Is?

What This Research Was About and Why It Is Important

Although the bilingual population in the United States is growing, little is known about how this increased linguistic diversity may shape how children learn about what language is and what it does (its communicative purpose). Moreover, some regions of the United States have much larger populations of individuals who speak non-English language(s) than other regions of the United States. How does growing up in these vastly different language environments shape children's understanding of what language is? In this study, we asked how children from different language environments differed in their understanding of language. We examined children from a region of the United States with a large population of individuals who speak non-English languages as well as a region with a relatively small population of individuals who speak non-English languages; we also compared children who had exposure to non-English language(s) at home to children who heard only English at home. Results from the study suggest that children growing up in linguistically diverse regions and children who were exposed to non-English languages at home differed in their understanding of language from children growing up in less linguistically diverse regions and who were exposed only to English at home.

What the Researchers Did

- Eighty-one children between 3 and 5 years of age participated. All children only spoke English, but differed in (a) where they resided in the United States (a region with a large population of individuals who speak non-English languages versus a region with a relatively small population of individuals who speak non-English languages) and (b) whether they heard only English in the home or heard both English and other language(s) in the home.
- Children completed a series of tasks that assessed their (a) ability to name language(s) (e.g., "English," "Spanish"), (b) understanding of the communicative functions of language (i.e., whether speakers of different languages can communicate with one another) and (c) understanding of labeling (e.g., whether speakers of different languages use the same words to label objects).

What the Researchers Found

- Children who heard English and other language(s) in the home were more able to name language(s) than children who heard only English in the home. Similarly, children who resided in a region with a large population of individuals who speak non-English languages were more able to name language(s) than children who resided in a region with a small population of non-English speakers.
- Children who heard English and other language(s) in the home also differed in their understanding of labeling in a language that was unfamiliar to them compared to children who heard only English in the home.

Things to Consider

- Exposure to multiple languages in the community and particularly at home was related to more understanding, including "explicit" understanding, of some aspects of language (i.e., children could talk about it).
- Further research is needed to understand what types and amounts of language experiences are necessary to shape children's explicit understanding of what language is and what it does (its communicative purpose).

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