

## **The Role of Parent's Occupation and Education in Children's Metalinguistic Skills**

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This experimental study tests whether parent's occupation and education play a role in children's metalinguistic skills. Specifically, we assess children's violation of mutual exclusivity, language awareness, and also their curiosity to learn vocabulary in a non-native language. Using data from an unpublished dissertation study, we assessed these associations for fifty English-speaking 4- to 6-year-old children and their parents. These children watched videos in which an English, Russian, or Tagalog speaker read stories aloud, across a period of 2 weeks. Children were tested before and after this video training on their willingness to endorse both English and Tagalog labels for novel objects, their language awareness, and their willingness to learn vocabulary in Tagalog (a language that was not familiar to them). Although we did not find any association between parent occupation and the metalinguistic skills that we assessed, we did find evidence that parent's level of education may influence children's interest in learning a second language. We briefly discuss the implications of these findings for children's development more broadly.

Evidence has shown the value of parent's investment in their children's cognitive outcomes. For example, the Department for Education and Skills reports that parental interest in children's schooling has led 11- to 16-year-old children to progress 15-17% more in mathematics and reading than those with less parental interest (Feinstein & Symons, 1999). Eight-year-old children's test scores have also increased as a result of parent's interest in their schooling (e.g., being involved in school activities) at earlier ages (Douglas, 1964). Despite this and other evidence that parent involvement can impact children's development, there remain questions about the influence that parents might have on their children's metalinguistic skills (i.e., the awareness and control of the linguistic aspects of language, such as the ability to reflect on our language skills; Tunmer et al., 1988). Even less research exists on the impact that parent's demographics, such as parent education and occupation, may have on these metalinguistic skills. In the current study, we focus on the role of parent education and occupation on children's willingness to accept that two labels from different languages can be used to refer to a single object, their interest in learning vocabulary from a non-native speaker, and their understanding that speakers of two languages might be saying the same thing.

### **The Role of the Parent in Developing Social Skills**

An important factor when thinking about child development is to consider parent's involvement in children's social and emotional skills, as these skills create a path towards academic success (e.g., Roy & Giraldo-Garcia, 2018). Lareau (2011) argues that children from more disadvantaged families (e.g., children from lower SES families) lack a sense of "entitlement" that middle-class students often demonstrate, thus putting at risk greater interpersonal skill disparities between these two groups of children. Evidence suggests that a sense of entitlement

promotes more confidence in children to interact, ask questions, and to speak to adults (e.g., Roy & Giraldo-Garcia, 2018), which are all important qualities for success in the academic setting. Roy and Giraldo-Garcia (2018) argue that at-home conversations between children and parents about school is essential for academic achievement because these conversations serve as a model of communication for building healthier social relationships. Parents who engage in these conversations with their children are also able to tend to children's social and emotional needs, as well as their academic needs, by spending quality time together and engaging in educational activities (e.g., reading together). This may positively impact children's language outcomes (e.g., Gershoff et al., 2007) and literacy (Dickinson & Tabors, 2001). In Winsler (2014), English-learning children who were socially and emotionally competent, and who had stronger interpersonal skills with adults, were more likely to develop strong English language skills than children who lacked these interpersonal skills. Additionally, Spanish-speaking children with strong interpersonal traits were also able to develop the proper language skills to attain proficiency in a second language.

### **The Role of the Parent in Developing Children's School Readiness**

Parental investment can be seen both as the amount of time that parents dedicate to their children's learning experiences, as well as the amount of money they spend on educational resources. Parental investment in the form of time and money, however, might be affected by the occupation a parent has. Parents who have access to books (e.g., parents in educational occupations or parents who can afford to purchase books for the home) and who have time to spend with their children (e.g., stay at home parents, parents with more flexible work hours) are able to read to

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their children, which positively impacts their literacy and reading abilities. However, parents with busy occupations (e.g., healthcare, legal, business occupations) might be unable to spend this time to read and engage with their children.

In addition to parent's role in building social skills, Meuwissen and Carlson (2018) state the importance of fathers in supporting children's ability to be more autonomous, specifically, in children's school readiness. A father's role differs from the mother's role in that fathers tend to have more physical interaction with their children, which has been seen to decrease behavioral issues, improve social relationships, and increase socioemotional capabilities (Dumont & Paquette, 2013; Fletcher et al., 2013; Lamb, 2004). The father's role is important to consider given that support for children's ability to be autonomous influences children's social and emotional well-being, which has led to an increase in language skills (Meuwissen & Carlson, 2018). Thus, it is important to consider both mother's and father's impact on children's school readiness as both have been seen to impact various aspects of children's development.

Parent's level of education also influences the skills that parents wish to see in their children. According to Bornstein (1995), parent's education is critical to the activities that parents encourage, as well as the attitudes, beliefs, and values that parents advocate. For instance, parents with a college education may be more aware of resources that can assist their children's language development. Additionally, the National Institute for Literacy (1997) has found that children's literacy was associated with parent's literacy: parents who struggled with reading were more likely to have children who also struggled with literacy than parents who did not themselves struggle. Less educated parents might also struggle to provide the necessary resources such as homework assistance simply because the course material is unfamiliar to them. Additionally, less educated parents might also struggle to allocate resources like tutoring programs or other study tools (e.g., summer programs) to assist their children's academic performance.

Indeed, Hartas (2011) has shown that mothers with higher levels of education had children that surpassed children of mothers with lesser education in all the following skills: personal, social, emotional, communication, language, and literacy. In addition, maternal education had a more significant effect on children's communication, language, and literacy skills than personal, social, and emotional skills.

### **The Role of the Parent in Developing Children's Language Skills**

Moreover, previous research supports the notion that parent investment in the home is related to early linguistic and emergent literacy (Dickinson & Tabors, 2001). Parent investment (e.g., buying resources, spending time at home with child, and assisting child with assignments) might

shape a child's learning perspective and interest. For example, Dickinson and Tabors (2001), observed parents as they spoke to their children during playtime, reading time, and mealtime and found that the way parents spoke to children, during these activities, promoted further children's interest to learn more. Accessibility to printed material (e.g., books) has also been shown to impact children's future learning experiences because parents are more likely to read to their children.

How much time parents invest in their children's academics is also influenced by their occupation (which as a result, impacts their income and amount of time available to spend with their children). It could be the case that children in low-income households have parents with occupations that require parents to devote most of their time to work, which might lead to less time at home (with their children). In contrast, parents in higher-income households might have occupations that pay more which also provides the opportunity to purchase books and teaching materials for the home and might require less work time. One other possible factor that might explain the differences in children's cognitive outcomes is that parents in specific occupations (e.g., teaching occupations) are more likely to assist their children. We explore this question in the current study.

### **The Role of the Parent in Developing Children's Metalinguistic Skills**

Metalinguistic skills are generally related to children's language awareness skills, their curiosity to learn vocabulary in a non-native language, and their ability to violate mutual exclusivity. In Rojo and Echols (2018), children who were exposed to non-native languages prior to the study were more likely to understand that a single object can have more than one label, across different languages (i.e., they violated mutual exclusivity across languages). As the children's primary source of language exposure, parents can determine which languages that children are exposed to. Likewise, parents make the choice of whether to enroll their children in bilingual education or not. This gives parents complete control of which languages their children learn as well as the time in life when children will hear these languages. This further grants parents major influence in the development of children's metalinguistic skills.

Parents who encourage bilingualism by exposing children to multiple languages, are more likely to have children that are willing to violate mutual exclusivity; that is, to map more than one label to a single referent (e.g., Kalashnikova et al., 2015; Davidson & Tell, 2005). Violation of mutual exclusivity is essential to learning a secondary language given that a strong adherence to it could make it more difficult for children to learn because, across languages, more than one label must be associated with a single object. Additionally, parent involvement is essential in assessing the child's interest in learning a second language as it allows them to plan for enrollment in dual language programs. Prior to enrolling children in bilingual

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education, Rojo and Echols (2018) suggest that parents should consider helping their children to understand (1) that non-native speakers have communicative intent, possibly by exposing them to videos of non-native speakers and engaging in conversation about what these speakers are doing, or by exposing them to other-language speaking friends who the children can interact with, and that (2) labels are arbitrary. These skills are essential for appreciating, and learning from, a non-native speaker.

### The Current Study

In the dissertation study for which the data of the current study, and other data, were collected, Rojo (2018) failed to find an effect of community language experience on children's metalinguistic skills. We focus the current paper, however, on the role of parent in association with these metalinguistic skills (not analyzed in Rojo, 2018). The goal of the current paper was to expand on past research of parental involvement by focusing on the role of parent's education and occupations on children's language awareness, violation of mutual exclusivity, and also their interest in learning vocabulary from non-native speakers. Also, due to limited research on this topic, we assessed the impact that age at which children began hearing a second language may have on their language awareness, willingness to endorse labels in both a native and non-native language, and exposure to a non-native language.

Some evidence suggests that children of parents who are teachers also perform better academically than children whose parents are not teachers (e.g., children of fathers who taught at third level or mothers at second level had higher reading ability tests scores than children whose parents were not teachers; Denny, 2005). For this reason, and given their experience (and likely, skill) in working with children, we predicted that parents with occupations in which they must engage with children (e.g., teachers) would be associated with children's increased language awareness, willingness to endorse labels in both a native and non-native language, and interest in learning a non-native language. We also predicted that parents with occupations that are more time-flexible (e.g., stay at home parents) would be associated to children's increased language awareness and willingness to endorse labels in both a native and non-native language, given the opportunity to spend more time with their children and possibly engage them in learning (e.g., reading to/with their children). Additionally, we predicted that parents in occupations in which they must interact with ethnically diverse populations (e.g., business, finance, health care) would possess greater cultural awareness. The Center for Advanced Research of Language Acquisition (2011) argues that cultural awareness can be learned through socialization. Because culture and language are often inseparable (Cakir, 2006), we predicted that these culturally aware parents would promote children's interest in learning a second language.

Given that parents with higher educations have been shown to demonstrate greater investment in their children's cognitive development (Bornstein, 1995), we also predicted that parents with at least a college education would be associated with children's interest in learning vocabulary in a non-native language and also children's metalinguistic skills. Finally, given past research (e.g., Hartas, 2011) that suggests that a mother's role influences children's communication, language, and literacy skills, we also predicted that mother's investment more so than father's, would be associated with increased language awareness, violation of mutual exclusivity, and interest in learning a non-native language.

Finally, given past findings (e.g., Sutherland & Cimpian, 2015), we also predicted that older children would possess greater metalinguistic skills compared to younger children.

## Method

### Participants

Fifty children were included in this study, 8 of whom did not return for their second visit (only data from first visit were included in analyses). The mean age was 5 years 3 months ( $SD = 7.8$  months). Fifty-seven percent were identified as females, the remaining were identified as males. Two percent of the children were identified by their parents as Asian American, 4% as Black or African American, 75% as White or European, 15% as Asian American. Seventeen percent of children were also identified as Hispanic. Due to experimenter error, for an additional 2 participants, demographic information was not obtained. Fifty-eight percent of children had less than 1% of non-English exposure in the last 3 years (range = 0 to 15% of non-English exposure), and only 6% had zero non-English exposure. Languages represented included Spanish, Japanese, Indonesian, Vietnamese, Mandarin, French, Korean, American Sign Language, Farsi, and Cantonese. None of the children had past experience with the non-English languages used in the study (Tagalog, Russian, or Lithuanian). Please see Table 3 for average number of languages each child was exposed to and L2 proficiency in understanding. An additional 2 children were excluded for being extremely distracted during participation.

### Materials and Measures

#### The Language Exposure Assessment Tool (LEAT).

The Language Exposure Assessment Tool (LEAT) is a formalized measure of exposure to various languages across the lifetime (DeAnda et al., 2016). Parents are asked questions about the hours, days, and periods of time during which their child received exposure in different languages throughout their lifetime. For purposes of this study, parents were asked all questions pertaining only to the most recent 3 years. The LEAT performs various calculations with these hours and periods of life that children heard their various languages. The final result is a set of proportions,

representative of children’s experience with different languages in the last 3 years. For example, an English-speaking child who heard Spanish for most of her life and less of Vietnamese might have LEAT proportions of 0.6 English, 0.3 Spanish, and 0.1 Vietnamese. For purposes of this study, the non-English proportions were summed. In the aforementioned example, the non-English proportion that would be included in analyses would be 0.4. (i.e., 0.3 + 0.1).

**Video Stimulus for Pre- and Posttest.** The format of the video stimuli was similar to Rojo and Echols (2018). Three familiar objects, as well as eight novel objects (four for the pretest video and four for the posttest video), were used. Novel objects were unfamiliar in shape and form but were colorful and engaging for the targeted age range (e.g., squishy, multicolored, spider-like object with bulbous arms). Two female speakers played the role of informants, “Beth” (the English-speaking informant) and “Jane” (the Tagalog-speaking informant). Both speakers were Tagalog-English bilingual, though each informant consistently spoke one language throughout the stimulus video, producing each of the 7 labels per visit (3 familiar, 4 novel). The onset language (i.e., which language was heard first), as well as the actress playing the role of Jane, was counterbalanced. Each speaker took turns labeling the objects, in their respective languages.

**Labels.** For familiar objects, labels were cognates (words that sound the same in more than one language, e.g., *kendi* and *candy*) in Tagalog and English. Cognates were used only during familiarization trials (i.e., not for testing willingness to learn) so that monolingual children understood that the Tagalog speaker was labeling accurately. Tagalog was the language of choice for this study because it is a relatively uncommon language in the region. Indeed, in a sample from this region that was used in Rojo and Echols (2018) only 2 of 73 children had received exposure in Tagalog. In the current study, zero children had past experience with Tagalog. Novel object labels were constructed to be phonologically consistent with the pertinent language. See Table 1 for the labels used.

**Table 1**  
*WEB Measure Labels*

	<b>English Label</b>	<b>Tagalog Label</b>
Familiar	Candy	Kendi
	Tiger	Tigre
	Elephant	Elepante
Novel at Pretest	Blicket	Gatay
	Ketta	Soma
	Rompet	Kuso
	Casstey	Pabi
Novel at Posttest	Wibber	Maliri
	Bumber	Maa
	Lossit	Banay
	Shappy	Bipon

**Storybooks for Training (Exposure) Videos.** Five short storybooks, with colorful and engaging images, were selected for this study. Original storylines, targeted for the age range of this study (to be engaging and understood) were written and translated from English to Russian and Tagalog. Russian was selected as a stimulus language because it is not commonly spoken in the region (Ryan, 2013). None of the storybooks contained text, and each story was read in 10 minutes or less.

**Training (Exposure) Videos:** Four actresses, fluent in one of the three stimulus languages (English, Russian, Tagalog), were video-recorded reading these five stories aloud in an animated, child-directed manner. The Tagalog-speaking actress was different from the informants used in the pre- and posttest videos. All speakers were clearly conveying information about the images in the storybook: they often pointed to an object in the picture and then looked to the camera, clearly expressing communicative intent about objects or characters in the story.

In the treatment conditions (Russian and Tagalog), an English speaker first read a story aloud, after which the same story was read aloud by a non-English speaker (Russian or Tagalog). In the control condition, two different English speakers read the same story aloud, one after the other. The storytellers alternated looking to the camera and to the storybook, further making it clear that their words were about the images in the book. These are considered training videos because it was the goal that, having seen the English speaker reading the same story as was then read by a non-English speaker, children in the treatment conditions would begin to develop an understanding that non-native speakers have communicative intent and can communicate the same information as a native speaker. Table 2 displays the procedure for only one video; note that the same procedure was used in all 5 training videos for each condition.

**Table 2**  
*Procedure for one Training Video*

	<b>Condition</b>	<b>Procedure</b>
English	Control	1. English speaker reads story 2. Different English speaker reads the same story
Tagalog	Treatment 1	1. English speaker reads story 2. Tagalog speaker reads the same story
Russian	Treatment 2	1. English speaker reads story 2. Russian speaker reads the same story

**Language Awareness (LA) Measure.** This questionnaire included some of the questions used in Rojo, Griffin, and Echols (under review) to assess children’s multilingual awareness: their understanding that non-native speakers can communicate the same information as a native

speaker. Short phrases in English and also Lithuanian were heard; after each phrase was played, children were asked 8 questions about the phrases (either practice questions about superficial features such as the volume or speed of the speaker, or content; e.g., “Could *both* Emily and Leena be talking about a seashell? Yes, or No?”). After being asked a yes or no question for each phrase, children were asked about the certainty of their yes/no response (i.e., Very Sure, A little Sure, Not Sure). Phrasing of questions was similar to that used in Woolley, Borger, and Markman (2004).

**Interest in Learning (IIL) Questions.** This task includes two questions: (1) who children would like to learn additional vocabulary from, Jane or Beth, and (2) why (i.e., a prompt for an explanation of their first response on the IIL). The order of informant names in the first question was counterbalanced.

#### *Procedure*

Parents were contacted via email or phone; after parents agreed to participate, the LEAT was administered over the phone. After this, parents and children visited the lab for the pretest. At this first visit, parents completed demographic information (e.g., race/ethnicity, occupation, level of education, age, etc.) for one or both parents (if applicable), as well as demographic information about their children (e.g., age, race/ethnicity, etc.).

At this first visit, a researcher told children they would play a word game, and that friends Beth and Jane were there to teach them new words; in this way, it was explicit that the child must focus on the labeling aspect of the task. Children then watched the pretest video in which a Tagalog speaker and an English speaker labeled 3 familiar and 4 novel toys. Object labels were presented in isolation and also in context: speakers said “[*label*] This is a/an [*label*]. See this [*label*]? This is a/an [*label*]. [*Label*].” In between each of the objects, children were also asked to recall the labels that the two actresses taught. The objects were physically present during the time of recall (only the object in question was seen; the others were hidden). The researcher provided corrective feedback if the child provided an incorrect recall response. Recall was not evaluated statistically, but rather it was included in the design to ensure that the child was attentive to the video and had an opportunity to enunciate all labels before being asked to endorse them.

After asking children to recall the novel objects, researchers tested children’s willingness to endorse the Tagalog or English label, or both. For each trial, the question was asked twice, counterbalancing the order of the labels. An example sequence is “What do you think is the right name for this toy? [ENGLISH LABEL]? [TAGALOG LABEL]? Or both? What do you think is the right name for this toy? [TAGALOG LABEL]? [ENGLISH LABEL]? Or both?” Researchers’ intonation and body language were designed to avoid leading the child to any particular choice. Children were not given an opportunity to respond between

the counterbalanced questions (the researcher did not pause at any point during the question).

At the end of the first visit, parents were emailed 5 web links (i.e., URL), used to access the five Training (Exposure) Videos. Assignment of condition (systematic exposure to Tagalog, Russian, or English) was random. Parents were told not to allow children to pause or replay any of the videos, to play no more than one video per day (thus spreading out the exposure before the second visit), and to not address any questions the child might have (they were asked to say “I don’t know” or “When we go back in a few days, the researcher will answer all of your questions”). Parents were also asked to supervise the children as they watched the video, to ensure that children attended to the entirety of the video. Children watched the 5 videos before the second lab visit (i.e., posttest). A posttest visit was scheduled after six days and within 2 weeks of the first visit. Children who did not watch all five training videos were not invited for a posttest visit.

At posttest, children were again assessed on their willingness to endorse Tagalog and English novel labels for 4 new novel objects and were administered the IIL and MA Questionnaire. For the IIL, if children produced a response that was different from one of the two options offered (i.e., “Jane” or “Beth”) as part of the first question (e.g., “both”, “neither”, or something different) these responses were accepted and recorded.

Appendix A describes the whole study procedure; note that the actresses in the stimulus video were counterbalanced (half of the time, the Tagalog informant was presented first).

#### *Coding of Children’s Responses*

**Coding willingness to endorse both native and non-native labels (WEB).** Children scored 1 point for each of the four trials in which they endorsed both the Tagalog and English label of a novel object. These points were summed at each of the two test times (pre- and posttest); the range of scores was 0 to 4 for each of the two test times. This summed score is referred to as children’s WEB (willingness to endorse both labels).

**Coding LA Questionnaire.** Only 6 of the questions on the LA questionnaire assessed children’s multilingual awareness (understanding that the non-English speaker could be communicating the same information as the English speaker). Other questions set up the comparison between the two speakers. Thus, only those 6 questions were analyzed. Responses were coded using Woolley et al.’s (2004) method of scoring: children’s Yes/No responses are combined with their certainty responses, yielding a potential score of 1 through 6 (1: No, Very Sure, 2: No, A Little Sure, 3: No, Not Sure, 4: Yes, Not sure, 5: Yes, A Little Sure, 6: Yes, Very Sure). This scoring system was employed because it assigns greater points for an understanding that non-native speakers can communicate the same information as a native speaker (questions are phrased as “Could [non- English speaker] be saying the same thing as [the English

speaker]?”). A sum of these scores was used to assess children’s understanding that the Lithuanian speaker can communicate the same information as the English speaker.

### Results

For all children in this study, parents were heterosexual. Also, it was the case that for only 1 child, primary caretakers were grandparents; otherwise, mothers and fathers completed this study. For simplicity, we grouped mothers and grandmothers as Parent 1, and fathers and grandfathers as Parent 2.

#### *Parent Education and Occupation, and Children’s Interest in Learning Language (IIL)*

**Mother’s Education and IIL.** To examine the relation between parent education and interest in learning vocabulary in a non-native language (IIL), two Chi-square Tests of Independence were performed: (1) mother’s level of education (high school diploma, some college, 4-year college degree, or graduate degree) and IIL score (1, 2, or 3), and (2) father’s level of education (high school diploma, some college, 4-year college degree, or graduate degree) and IIL score (1, 2, or 3). There was a small (though not statistically significant pattern) in mother’s education and IIL,  $X^2(6, N = 58) = 10.78, p = .09$ . Please see Table 3 for average IIL score. Children of mothers with some college education were more likely to score IIL 3 than expected by chance; children of mothers with a 4-year college degree were more likely to score IIL 1 than expected by chance, and fewer children of mothers with a 4 year college degree were more likely to score IIL 3 than expected by chance; children of mothers with a graduate degree were more likely to score IIL 2 than expected by chance.

**Table 3**  
*Descriptive Statistics*

	<i>M</i>	<i>SD</i>
Interest in Learning ( <i>n</i> = 67)	2.00	0.64
Language Awareness ( <i>n</i> = 58)	17.50	4.64
L2 Onset ( <i>n</i> = 38)	28.58	20.95
Change in WEB Score ( <i>n</i> = 67)	-1.03	3.90
L2 Proficiency of Understanding ( <i>n</i> = 39)	1.33	0.77
Number of Languages ( <i>n</i> = 67)	2.90	1.33
L2 Proficiency of Speaking ( <i>n</i> = 39)	1.10	0.72

Note: L2 = Language 2

**Father’s education and IIL.** The relation between levels of education of father and IIL were significantly related  $X^2(8, N = 56) = 18.18, p = .02$ . Children of fathers with a high school degree were more likely to score IIL 2 than expected by chance; children of fathers with some college education were more likely to score IIL 3 than expected by chance; children of father with a 4-year college degree were more likely to score IIL 2 than expected by chance; more children of father with a graduate degree were likely to score IIL 1 and fewer children of father with a graduate degree were likely to score IIL 3 than expected by chance.

**Parent Occupation and IIL.** The relation between parent occupation and the child’s interest in learning a non-native language was assessed using two Chi-square Tests of Independence. There was no significant relation between mother’s occupation and children’s IIL score (1, 2, 3),  $X^2(18, N = 58) = 15.15, p = .65$ . Moreover, we assessed the relation between father’s occupation and children’s IIL score (1, 2, 3). The relation between these variables was not significant  $X^2(18, N = 58) = 15.31, p = .64$ .

#### *Language Awareness, Language 2 onset, Violation of mutual exclusivity, and Age*

To assess the potential influence of age at which children first heard their second language (i.e., non-English language) on exposure to a non-native language (number of languages child was exposed to), we ran a correlational analysis wherein variable 1 was Language 2 onset (L2 onset) and variable 2 was the number of languages exposed to. There was no significant relation between these two variables,  $r(36) = .19, p = .26$ . Please see Table 3 for average L2 onset.

We also ran a correlational analysis to test the potential relation between child L2 onset, as variable 1 and willingness to endorse labels from both a native and non-native language (change in WEB score), as variable 2. A small (though not statistically significant) pattern was found:  $r(36) = -.24, p = .15$ . Please see Table 3 for average WEB score.

To assess the potential relation between children’s language awareness (LA) and the onset of children’s language-2 exposure, we ran a correlational analysis in which variable 1 was LA score (sum of questions 5, 7, 9, 11 on 11 item LA assessment) and variable 2 was age, in months, at which children began hearing their second language. We found that higher LA score tended to be associated with the age at which children began hearing their second language (i.e., L2 onset),  $r(56) = .30, p = .09$ . Please see Table 3 for average LA score.

#### *Exposure to a Secondary Language*

Because we had this information, we were also curious to investigate whether the kind of non-English languages that parents spoke were associated with the type of job they had. Parents in our study spoke, in addition to English,

Burmese, Cantonese, Chinese, Farsi, French, Mandarin, Portuguese, Spanish and Tagalog. To assess the relation between parent's occupation and which non-native language they spoke (if at all), a Chi-square Test of Independence was also conducted, wherein parent occupation for mothers was variable 1, and the type of language (of the 9 languages listed above) was variable 2. Mother occupation tended to be associated with the type of language spoken,  $X^2(81, N=65) = 96.61, p = .11$ , wherein Spanish was the most common language spoken by parents with the following occupations: legal occupation, business/financial occupation, sales, education, stay-at-home parent, and an occupation in the arts. Fewer parents than expected in occupations in legal/finance, life/physical/social sciences, and engineer/technician occupation tended to be associated with speaking Chinese. Fewer parents than expected, in a healthcare occupation tended to be associated with Cantonese. Finally, fewer parents who were engineer/technician occupation than expected tended to be associated with Burmese. Father occupation was significantly associated with the type of non-English language spoken,  $X^2(81, N=98) = 152.16, p < .01$ , wherein parents in occupations of business/finance, life/physical/social sciences, healthcare, management, education, engineer/technician, or an occupation in the arts most commonly spoke Spanish.

### Discussion

Our findings suggest that father's education (though there is also a pattern—albeit not statistically significant—for mother's education as well) is associated with children's interest in learning a second language. Fathers with a high school degree had children who expressed interest in learning vocabulary from the Tagalog speaker, and children of fathers with some college education were more likely to want to learn from *both* the English and Tagalog speaker than was expected by chance. Children of fathers with a 4-year college degree were more likely to want to learn only from the English speaker (and not the Tagalog or both speakers), and children of fathers with a graduate degree were more likely to want to learn only from the Tagalog speaker than from only the English or both speakers. These patterns do not support our (in hindsight, simplified) prediction that children of parents with more education would express more interest in learning from a non-native speaker. Our results were more complex than we expected.

We believe it is possible that parents' degrees do not reflect the curiosity for learning they're promoting in their household. Perhaps parents with college or post-graduate education speak more than one language and/or intend to promote interest in learning more than one language (just as much as high-school-diploma and some-college parents) but have jobs that demand more time of them. This might yield less multilingual interaction with their children and/or the promotion of curiosity for learning of non-native languages.

We also suspect that, when it comes to promotion of curiosity for learning various languages, fathers may play a different role than mothers. There is evidence that a father's role is distinct from that of the mother's, in that it focuses on children's personal, social, and emotional autonomy support (which has been seen to increase language skills) while the mother's role focuses on academic autonomy support (Meuwissen & Carlson, 2018). Additionally, father's physical engagement with children (through play or physical activities) has the potential to improve social relationships, and increase socioemotional capabilities (Dumont & Paquette, 2013; Fletcher et al., 2013; Lamb, 2004). Therefore, we might consider that parent's social and emotional autonomy support is just as (if not more) essential (than support for academic skills) for promoting children's interest in learning various languages.

Additionally, given that we found that certain occupations (e.g., business/finance or healthcare) were associated with Spanish or Chinese, it might be interesting to explore this topic further: it might be the case that children become interested in learning particular languages, given their parents proficiency with these languages.

### Developmental patterns

Our results supported our prediction that older children are more likely to violate mutual exclusivity and is thus consistent with past findings that older children demonstrate stronger metalinguistic skills when compared to younger children (e.g., Sutherland & Cimpian, 2015). This should not be surprising given what we know about both brain and cognitive development, more broadly (i.e., children's brain and cognitive development is positively correlated with age).

We found that higher language awareness scores tended to be associated with hearing a non-English language at a later age. One potential explanation for this could be the fact that children do not engage with peers of different backgrounds (e.g., different race, ethnicity, and/or who speak a different language) until after they begin school. If children's primary source of exposure is their immediate family, and they do not hear different languages until they are consistently put in an environment where they would hear non-native languages (e.g., school) until later in life (e.g., school-age), then this would help to explain our finding. Indeed, Rojo and Echols (2018) shows evidence that 3-year-old children enrolled in preschool where various non-native languages are used, even if minimally (e.g., music lessons in French or games in Chinese), can learn some vocabulary in these non-English languages.

This might suggest that older children have a stronger ability to learn a secondary language than younger children, which is associated to metalinguistic skills. This would support the findings of our study, in that older children are expressing greater metalinguistic skills (e.g., language awareness) compared to younger children. Additionally, older children may possess stronger language awareness

skills if they are in the critical hypothesis period, as Lenneberg (1967) suggests.

### Findings that were not statistically significant

Our results did not support our predictions regarding parent occupations and IIL. Parents who were teachers did not have children with higher IIL, WEB, or LA. Parents with time flexible occupations did not have children with higher IIL, WEB, or LA. Lastly, parents in culturally diverse occupations did not have children with higher IIL, WEB, or LA.

Although past literature shows that children of parents who are teachers perform better academically, it seems that parent occupation is not associated with the metalinguistic skills we assessed, particularly. Perhaps metalinguistic skills are qualitatively different from the skills that are promoted during parent-child engagement (e.g., reading skills when parents read to/with their children). Also, it is likely that parents with more time-flexible occupations spend more time with their children, however this time may not necessarily be focused on language skills or promotion of interest in multilingualism.

### General Discussion

Although we did not find any association between parent occupation and the metalinguistic skills that we assessed, we did find evidence that parent's level of education may influence children's interest in learning a second language. More broadly, we show that parent's education might play a role in children interest in learning more than one language, assuming their job allows for them to spend time at home with their children. This might be a product of parent's interest in exposing their children to more than one language. Indeed, here in the United States, bilingual education is on the rise (Ryan, 2013). By focusing on interpersonal skills and socioemotional well-being, fathers especially might promote their children's curiosity and/or motivation to practice new language skills, and thus children's engagement with ethnically diverse populations. For this reason, we believe it is in children's developmental interest for fathers to become engaged with their children's learning.

In addition to social skills, reading skills, and children's ability to be autonomous, we now show that parents may help to promote children's interest in a more multilingual world. Given evidence that bilingual children show greater metacognitive skills than monolingual children (e.g., Bialystok, 1987), and the sociopolitical state of the United States, in particular, we believe that parents may find it beneficial to consider these findings, in promoting a more diverse environment for their children.

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## PARENT OCCUPATION &amp; EDUCATION

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Appendix A

Study Procedure

<b>LEAT</b>	Parent is interviewed using LEAT, on phone.		
<b>Pretest</b> (First visit to lab)	Researcher: <i>Okay [name of child], today we are going to play a word game with my friends, Beth and Jane. I'm going to show you a little video where Beth and Jane will be teaching us new words. But first, let's learn a little more about them, are you ready?</i>		
	Stimulus Video is played: <ol style="list-style-type: none"> <li>1. English speaker introduces herself</li> <li>2. Tagalog speaker introduces herself</li> <li>3. Researcher pauses video to clarify that now the 2 characters will teach new words</li> <li>4. English speaker labels first familiar object</li> <li>5. Tagalog speaker labels first familiar object</li> <li>6. Researcher pauses video to ask child to recall familiar labels and corrects child if necessary</li> <li>7. Steps 3-6 repeated for second familiar object.</li> <li>8. English speaker labels first novel object</li> <li>9. Tagalog speaker labels first novel object</li> <li>10. Researcher pauses video to ask child to recall first novel label and corrects child if necessary</li> <li>11. Researcher asks child "What do <i>you</i> think is the right name for this toy? [English label]? [Tagalog label]? Or are both okay? [Tagalog label?]? [English label]? Or are both okay?"</li> <li>12. Steps 12-15 repeated for remaining 3 novel objects</li> </ol>		
<b>Training</b> (Videos played at home)	<b>Condition 1</b> (Control)	<b>Condition 2</b> (Treatment 1)	<b>Condition 3</b> (Treatment 2)
	Child watches 5 videos of: <ol style="list-style-type: none"> <li>1. English speaker reading story aloud (holding book up, frequently glancing to camera then back to book)</li> <li>2. Different English speaker reading story aloud (holding book up, frequently glancing to camera then back to book)</li> </ol>	Child watches 5 videos of: <ol style="list-style-type: none"> <li>1. English speaker reading story aloud (holding book up, frequently glancing to camera then back to book)</li> <li>2. Tagalog speaker reading story aloud (holding book up, frequently glancing to camera then back to book)</li> </ol>	Child watches 5 videos of: <ol style="list-style-type: none"> <li>1. English speaker reading story aloud (holding book up, frequently glancing to camera then back to book)</li> <li>2. Russian speaker reading story aloud (holding book up, frequently glancing to camera then back to book)</li> </ol>
<b>Posttest</b> (Second visit to lab)	<ol style="list-style-type: none"> <li>1. Same procedure as Pretest (similar stimulus video is played, with 4 different novel objects).</li> <li>2. Interest in Learning Question is asked</li> <li>3. MA Questionnaire is administered.</li> </ol>		