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ARTICLES

Can You Say It Another Way? Cognitive Factors in Bilingual Children's Pragmatic Language Skills

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Pragmatic differentiation in bilinguals is the ability to use two languages appropriately with different speakers. Although some sensitivity emerges by 2 years, the effects of context on these skills and their relation to other developing metacognitive capacities have not been examined. The current study compared the language use of 28 bilingual children (aged 2;7 to 3;10 and 4;1 to 4;11) across two tasks. All children were bilingual in English and Marathi, an Indian language. Theory of mind measures were included to assess whether developing cognitive capacities relate to pragmatic language ability. Results indicated that pragmatic differentiation is not an all-or-none ability but one which develops during the preschool years and varies based on the conversational context. This development is also related to metacognitive abilities which emerge during this time.

With an ever-growing bilingual population in the United States, the study of language awareness in young children is of increasing importance. How do children become sensitive to the need to accommodate to other speakers,

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and to what extent does this ability reflect broader cognitive abilities? How successfully do bilingual children vary their language use as a function of speaker and context? Although these questions have been the focus of much research, questions remain regarding the conditions and factors that affect children's pragmatic language use during the preschool years. We examined these emerging capacities in English- and Marathi-speaking bilingual children by looking at how they use language in pragmatically appropriate ways across distinct contexts as well as how their language use relates to their metalinguistic awareness and theory of mind.

Pragmatic language ability can be observed in both monolingual and bilingual speakers. Monolingual children as young as 4 years old adjust their speech according to their addressee, using simpler sentences when speaking to younger children than when speaking with adults (Shatz & Gelman, 1973). These pragmatic modifications are even more dramatic in bilingual speakers who switch *between* languages to accommodate their audience. Thus, the bilingual context provides a valuable window into the development of pragmatic language ability and its relationship to other developing metacognitive abilities.

Bilingual children show early sensitivity to the differences between their languages: syntactically, lexically, and phonologically (Mehler et al., 1988; Paradis & Genesee, 1996; Pearson, Fernandez, & Oller, 1995). The ability to differentiate the sounds or lexicons of two input languages is different, however, from *pragmatic* differentiation, defined as bilingual children's ability to use their two languages appropriately with interlocutors who speak different languages. Bilingual children have shown an early capacity to engage in this skill (DeHouwer, 1990; Deuchar & Quay, 1999; Koppe & Meisel, 1995; Nicoladis & Genesee, 1996; Quay, 2008). Nicoladis and Genesee conducted a longitudinal analysis of pragmatic differentiation in four bilingual children from age 1;7 to 3;0 years. The children were recorded interacting in free play with their parents. The parents each had a dominant language of either French or English and used that language primarily with the child. Each child's language use was analyzed relative to his or her language proficiency in the languages; that is, pragmatic differentiation was measured by examining how much children accommodated their language use to each parent, taking into account the child's dominant language. The children showed early differentiation in this context, with the first demonstration of this capacity ranging from 1;9 to 2;4.

These studies provide important evidence about bilingual children's early sensitivity to language context but also raise the question of how children would perform with unfamiliar interlocutors, rather than their own parents. A child may learn, for example, that she should speak one language with one familiar individual and another language with another familiar individual

but not yet have figured out which language to use in a novel situation. In one of the few extant studies on children's pragmatic differentiation with unfamiliar others, Genesee, Boivin, and Nicoladis (1996) studied four English-French bilingual children's language accommodation to strangers, relative to the children's language dominance. Three of the four children (M age = 2;2 years) made accommodations to the stranger by using relatively more of the stranger's language during the free play sessions than they would normally; only one child used a majority of the stranger's language during her free play session. Thus, 2-year-olds are capable of using the context-appropriate language more or less relative to their normal language production; however, this leaves open the question of why children do not consistently produce the "appropriate" language the majority of the time.

One possibility is that children do not always have the same vocabulary in both languages. Nicoladis and Secco (2000) found that the majority of a Portuguese- and English-speaking bilingual child's code mixing (e.g., use of both languages in what should be a Portuguese-only context) could be accounted for by a lack of translation equivalents; that is, the child used an English word when he did not yet know the word in Portuguese. A second possibility is that children may have trouble accessing the appropriate lexical items. Bilingual adults have been shown to be slower at lexical retrieval, even in their dominant language, than their monolingual counterparts (Gollan, Montoya, Fennema-Notestine, & Morris, 2005), and there is some evidence that bilingual children have difficulty with retrieval during picture naming as well (Oller, Pearson, & Cobo-Lewis, 2007).

A third possibility, which we examine here, is that children may not realize that a complete switch is appropriate, due to limitations in their metacognitive understanding of the nature of knowing a language. Children may not reason about the extent of the accommodation that must be made to communicate with someone who does not speak a particular language. What resources might help children to realize the profound limitations of another person who does not know a language and to make the effort to completely switch their language? Children's developing cognitive abilities (such as metalinguistic skills and theory of mind) may contribute to their pragmatic language skills. Prior research shows that bilingual children's ability to repair communication breakdowns by translating, after being prompted by an experimenter, increases with age (Comeau & Genesee, 2001; Comeau, Genesee, & Mendelson, 2007). However, it is unclear exactly what age-related developments contribute to these changes. In this study, we examine the relationship between metacognitive skills, specifically metalinguistic awareness and theory of mind, and pragmatic language ability in the context of bilingual children's pragmatic differentiation of their two languages.

One important aspect of developing metacognitive understanding is metalinguistic awareness. Metalinguistic skills encompass the knowledge, ability, and awareness that allow one to link the abstract nature of language to actual language use (Bialystok, 2001). These skills, demonstrated by behaviors such as comments on others' language use and requests for translations, have been seen in bilingual children as young as age 2;5 years (Kapetangianni & Shatz, 2006) and develop over time (Koppe & Meisel, 1995). Indeed, bilingual experience appears to enhance children's metalinguistic abilities compared with monolingual experience (Bialystok, 1988; Cummins, 1978; Galambos & Goldin-Meadow, 1990; Rosenblum & Pinker, 1983).

Another important metacognitive development during the preschool years occurs in theory of mind, or the nature of children's understanding of other people and their knowledge states (Shatz, 1994; Wellman, 1992). This understanding affects children's interpretation of others' actions and intentions and may also contribute to the realm of language use. Bilingual children have shown enhanced theory of mind on some tasks, compared with monolingual children (Goetz, 2003; Kovács, 2009). Although some studies suggest that the bilingual experience of switching between languages may enhance performance on various metalinguistic and theory of mind tasks (as compared with monolingual children), the causal influence may also go in the other direction. Preschool-aged bilingual children's developing metalinguistic and theory of mind capacities may affect their pragmatic differentiation skills by allowing children to consider the linguistic knowledge and needs of others, which may be different from their own. This relationship has not been examined before within a bilingual population; however, assessing children's theory of mind along with their responsiveness to pragmatic cues, might illuminate the extent to which a relationship exists between these two capacities. Indeed, this would be a first step in examining whether developing metacognitive capacities, such as language awareness, theory of mind, or a combination of the two, might have a positive influence on bilingual children's ability to perform well on language-switching tasks.

THE PRESENT STUDY

The present study examines the following issues: 1) bilingual children's pragmatic differentiation skills in a free-language choice context; 2) the children's pragmatic differentiation when a specific word in a specific language is requested; and 3) the relationship between children's ability to

produce words in the appropriate language and their concurrent metalinguistic awareness and theory of mind skills.

To address these issues, we examined one bilingual population, speakers of English and Marathi, an Indo-Aryan language primarily spoken in the Maharashtra state of India by nearly 96 million people (Wali, 2005). Children's pragmatic differentiation was assessed in two contexts: free play and object naming. The free play task uses the methodology of previous studies, in which children conversed with an unfamiliar adult speaker of one of their two languages with otherwise no constraints on the conversation. In contrast to prior studies, the task involves interactions with speakers of both languages (English and Marathi), thus enabling us to examine children's ability to switch languages from one speaker to the next. Based on past research findings where children demonstrated an early capacity to differentiate languages in natural conversation, we hypothesized that children would successfully differentiate their languages (use more of the appropriate language with each speaker) on this task.

The object naming task is designed to provide a more demanding test of pragmatic differentiation. Accordingly, in this task: a) minimal cues are provided as to the experimenter's language knowledge, in contrast to the free play task in which children hear continuous conversation from the experimenter; b) correct performance requires that children produce particular target words in the appropriate language (i.e., labels for the objects that are presented) and not merely produce *any* conversational turn in the appropriate language; and c) as in the free play task, children receive the task twice, once each with a speaker of English and a speaker of Marathi, so that the second session requires actively *switching* from one language to another. This task controlled for children's knowledge of translation equivalents, as children knew translation equivalents for every word tested. Thus, if Nicoladis and Secco (2000) are correct in their assumption that children can select languages appropriately as long as they know the words in both languages, children should succeed on the task. However, we predicted that the additional demands of the object naming task would lead to worse performance as compared with the free play task. By including two age groups, we examined the development of these skills.

We also examine the extent to which there is a relationship between pragmatic differentiation and metacognitive capacities; we included measures of social cognition (theory of mind scale) and metalinguistic awareness (language check). The theory of mind and language check measures allowed us to test the hypothesis that children's responsiveness to pragmatic cues in the primary tasks relates positively with their developing metacognitive capacities.

METHOD

Participants

Participants were bilingual children who speak English and Marathi. The younger age group included 14 children (nine girls) ranging from 2;7 to 3;10 years of age ($M = 3;2$). The older age group included 14 children (four girls) ranging from 4;1 to 4;11 years of age ($M = 4;6$). Three additional children were not included in the study: Two children (younger) did not meet the criterion for bilingual ability (see next section), and one child (older) refused to participate. Twenty-six of the children were tested in a Marathi-speaking household; two were tested in a research lab.

MacArthur communicative development inventory. The MacArthur Communicative Development Inventory (CDI) for preschoolers (Fenson, Dale, Reznick, & Bates, 1994) was originally developed in English. This measure was translated into Marathi for use in this study with the help of a native Marathi speaker who was raised in India and educated in Marathi. We calculated how many items children knew in each language using just the items which had translation equivalents on the measure (442 items). Using this measure of children's productive vocabulary in the two languages, we established a criterion that children had to meet to be included in the study. Specifically, we required that the ratio of one language to the other (in terms of number of words known on the MacArthur CDI) could not be greater than 3:1; that is, at least one-fourth of children's total vocabulary was required to be in their less-favored language. The average ratio of reported English:Marathi vocabulary knowledge, as measured by the MacArthur CDI, for the younger group was 1.19:1. The average ratio of reported English:Marathi vocabulary knowledge for the older group was 1.37:1.

Language background questionnaire. A parent questionnaire was created to assess the child's language environment at home and at child care. Parent background variables such as education and language use were gathered. Also, attitudes toward raising a bilingual child were assessed. The parents of the children had immigrated to the United States an average of 6.86 years before participating in the study. For both mothers and fathers, 92% had at least a college education. All the parents reported knowledge and use of both English and Marathi; 39% of the parents also reported knowledge of at least one other Indian language, most often Hindi. Seventy-one percent of children in the older age group and 43% of children in the younger age group attended English-speaking day care. All the parents indicated that it was very important to them for their children to know Marathi.

Design

This study was designed to assess how bilingual children differentiate and use their two languages across different contexts, object naming and free play. To assess this, children engaged in the two tasks, with each of two experimenters, a Caucasian female who spoke exclusively in English to them and an Indian female who spoke exclusively in Marathi to them. The between-subjects factor was age (older or younger). The within-subject factors were task (object naming or free play) and experimenter language (English or Marathi). The dependent variable was child's language use (English or Marathi).

Materials and Supplementary Measures

Object naming task. Parents completed a short assessment of their children's productive vocabulary for a set of 30 items in both English and Marathi (vocabulary checklist). Based on this parent report, 12 objects for which children knew both translation equivalents were used in the task so that children did indeed have a language choice to make when labeling.

Free play task. Materials for the free play task included a Fisher Price airplane set with three toy people and a Dora the Explorer shopping market set.

Language check. The language check measure was created to assess children's explicit awareness of the experimenters' language knowledge. It was administered in English by a third person (i.e., neither of the two primary experimenters) and occurred after the children's interactions with the experimenters were complete. For this task, the child was shown a photograph of each experimenter, one at a time, and was asked of each, "What language did [experimenter's name] speak?" If the child gave no response or said, "I don't know" to the initial open-ended question, the forced-choice question, "Did she speak [English or Marathi, counterbalanced order]?" was asked. Finally, the child was shown two pictures of familiar objects and was asked which label each speaker would use to name it (e.g., for a picture of a hat, "Would she call it *hat* or *topee*?"). Each child was given a language check score of 0 to 4 based on how many appropriate matches they made, for each language/speaker.

Theory of mind scale tasks. Finally, the first three tasks from Wellman and Liu's (2004) theory of mind scale were administered in English. *Diverse desire* assesses whether children understand that other people might have

desires opposite from their own. *Diverse belief* assesses whether children understand that other people might have beliefs opposite from their own, and *Knowledge access* assesses whether children understand that other people might not have access to the same information as they do (see Wellman & Liu for complete protocols). Tasks were coded as pass or fail, and children received a score from 0 to 3 based on how many tasks they passed.

Procedure

Children first received both object naming and free play tasks in one language, followed by both tasks in the other language. Whether the children experienced the English tasks first or the Marathi tasks first was counterbalanced across children. Children always received the object naming task before the free play task in a given language. Object naming was intended to be a more constrained task with minimal conversational feedback; this aspect of the task may have been compromised if children had experienced the unconstrained free play task first. The English-speaking experimenter was a Caucasian monolingual English speaker. The Marathi-speaking experimenter was an Indian bilingual Marathi/English speaker but only spoke Marathi throughout the research session (i.e., she acted as a monolingual Marathi speaker). The entire research session was videotaped and then transcribed for analysis.

Object naming. Children were asked to name objects (e.g., hat, dog, car) with each of two experimenters. One set of six prescreened objects (based on the vocabulary checklist) was used with the first experimenter, and a different set of six objects was used with the second experimenter. The procedure for the object naming task was very constrained, with each experimenter following a script in her respective language (see Table 1 for English and Marathi scripts). The first experimenter entered the room and said, "Hi, my name is [experimenter's name]. What's your name? We're going to play a game today. I'm going to show you some things, and I need you to help me by telling me what they are. Ready?" The purpose of this introduction was to establish the language of this speaker and provide positive evidence of the speaker's language. To maintain a naturalistic introduction, we avoided telling children explicitly what the experimenter's language knowledge was or what language they should use with her.

The first experimenter then introduced each object one by one, asking first, "What is this?" If the child provided a label in the wrong language (i.e., English in response to Marathi; Marathi in response to English), the

TABLE 1
English and Marathi Scripts for Object Naming and Free Play

	English	*Marathi*
Object Naming		
Introduction	Hi, my name is—. What's your name? We're going to play a game today. I'm going to show you some things, and I need you to help me by telling me what they are. Ready?	Maze nauv—ahe. Tuze nauv kai aahe? Apan aaj ek khel khelnar aahot. Me tula ghosti dhakhaunar ahe ani mala tuzi maadat pahije sangala, ki tya kai ahet. Tu tayar ahes?
Question	What is this?	He kai ahe?
First prompt	What?	Kai?
Second prompt	I don't know that word.	Mala tow shabda nahi maahiti.
Third prompt	Can you say it another way?	Hyala azoon kai mhanta yeil?
Transition	Okay, let's see what's next. I'm going to take out the next one.	Ha, dhusra kai aahe baghuya. Me pudze ghoshta kaadte.
Free Play		
Introduction	Now we can play together for a few minutes. I have a new toy here that I just got. Can you tell me how to play with it?	Atta apan thodya vel khelooya. Me naveen khel anla ahe. Mala sangtho/e kasa khelaya che?

experimenter responded with the ***first prompt*** indicating that she didn't understand: "What?" If the child again responded with the wrong language, the experimenter responded with the ***second prompt***, "I don't know that word." If the child then used the wrong language, the experimenter responded with the ***third prompt***, "Can you say it another way?" After these three prompts, regardless of the child's response (correct/incorrect word or language), the experimenter responded, "OK, let's see what's next. I'm going to take out the next one." Again, all of the experimenter's language use was in the appropriate language for that speaker (English or Marathi).

Free play. The free play task followed the object naming task in each language. For the free play task, the experimenter began the session by saying (in her appropriate language), "Now we can play together for a few minutes. I have a new toy here that I just got. Can you tell me how to play with it?" She then introduced one of the two toy play sets. Assignment of play set to language was counterbalanced across participants, such that each participant saw both play sets, one for the English session and one for the Marathi session. After the introduction, there were no further constraints on what the experimenter said, other than using the intended language exclusively while engaging the child during the 3-minute task. If the child used the wrong language during the conversation, the

experimenters were free to use their judgment and respond accordingly, sometimes asking the child to clarify and sometimes moving on. At the end of the first language session, the experimenter told the child that another friend was coming to play and then exited the room. The second experimenter then entered the room and followed the same script for her object naming and free play sessions.

Coding

Coding reliability was completed by two bilingual coders and was calculated using 20% of the data across both age groups.

Object naming task. We primarily coded the language of the label that the child provided during each language session, initially and after all prompts were provided. There was 100% agreement on the language of the labels. Additionally, we coded the number of prompts that were provided beyond the initial question (zero to three per trial), as well as any use of ambient language (all language other than labels, such as quantifiers [''a,'' ''the''] or other language used in response) and whether it was in the correct language (no ambient language, incorrect ambient language, correct ambient language, or both incorrect and correct ambient language). Reliability was conducted for the ambient language code (Kappa = .74; percent agreement = 86%).

Free play task. The utterances in the free play sessions were operationalized as continuous units of speech or thought without stops or interruptions; utterances consisted of words, phrases, sentences, or, rarely, multiple sentences. The primary goal of this coding, adapted from Muysken (2000), was to capture the nature of the language used by children with the experimenters during the free play task. Utterances were coded as ***Complete English*** (fully in English, with no Marathi, though proper names could be in either language); ***Complete Marathi*** (fully in Marathi, with no English; though English proper names or borrowed words with no Marathi translation could be included); ***English with Marathi Insertion*** (insertion of Marathi lexical items into English grammatical structure); ***Marathi with English Insertion*** (insertion of English lexical items into Marathi grammatical structure; e.g., ''Toy *eh ha*? [Is it a toy?]''); and ***Neutral*** (not identifiable as belonging to either language, e.g., ''hmm,'' ''umm,'' or proper nouns). All other utterances (e.g., alternations between the two grammatical structures, unintelligible speech), which constituted less than 5% of the overall speech, were coded as ''other.'' Reliability was conducted for this set of codes (Kappa = .93; percent agreement = 96%).

RESULTS

To address our research questions, we analyzed children's performance on the general cognitive measures, their pragmatic differentiation during the object naming task and its relationship with the metacognitive measures, their pragmatic differentiation during the free play task, and finally, a comparison between their performance on the object naming and free play tasks. Preliminary analyses were conducted with gender as a variable; however, because it was not found to be a significant factor, it was excluded from all subsequent analyses.

General Performance on Cognitive Measures

Background language measures. All of the child and adult participants were bilingual, and all of the parents reported using both English and Marathi with their children. There were some significant age group differences in knowledge of vocabulary items reported on the CDI; older children ($M = 419.29$, $SD = 24.00$) knew more English vocabulary items overall than younger children ($M = 310.64$, $SD = 105.06$), $t(26) = 3.77$, $p = .001$. There was no significant age difference in older ($M = 307.00$, $SD = 48.67$) and younger children's ($M = 261.93$, $SD = 95.74$) reported knowledge of Marathi vocabulary. However, older children ($M = 284.14$, $SD = 53.30$) knew more sets of translation equivalents in English and Marathi than younger children ($M = 203.21$, $SD = 97.89$), $t(26) = 2.72$, $p < .05$.

Language check. Children's language awareness was measured by the language check at the end of the session. This measure assessed children's explicit knowledge of the experimenters' language knowledge (i.e., whether each experimenter spoke English or Marathi). Out of a possible score of 4, older children scored significantly higher ($M = 3.21$, $SD = 1.12$) than younger children ($M = 1.79$, $SD = 1.37$) on this measure, $t(26) = 3.02$, $p < .01$. Further, the older children scored significantly above chance (2.0), $t(13) = 4.05$, $p = .001$, whereas the younger children's scores were not significantly different from chance.

Theory of mind. Children's social cognition was measured by three tasks from Wellman and Liu's (2004) theory of mind developmental scale. As expected, older children passed significantly more of the three tasks ($M = 2.29$, $SD = 0.73$) than younger children ($M = 0.79$, $SD = 0.58$), $t(26) = 6.04$, $p < .01$. Children's theory of mind scores were also significantly positively correlated with their age in months, $r = .62$, $p < .01$.

Pragmatic Differentiation during Object Naming

Initial sensitivity in labeling. Overall, although children responded significantly differently across sessions (more Marathi with the Marathi speaker than with the English speaker), these differences were slight, due to children's general preference for English. To assess whether children used their languages differentially across the two language sessions, we first focused on initial responses (before prompts): the number of English and Marathi labels provided in the English session and the number of English and Marathi labels provided in the Marathi session. The dependent variables of number of English and Marathi labels provided are not independent of one another, because children always provided one or the other language on each of the six trials. Therefore, for the analyses, we focused on one language only, keeping in mind that the results for the other language are identical (but inversely). The dependent variable in the analyses is the number of Marathi labels (out of six trials) provided initially in the two sessions. We conducted an analysis of variance (ANOVA) with the factors of language session (English, Marathi), age group (older, younger), and order of presentation (English → Marathi, Marathi → English). There was a significant main effect of session, $F(1, 24) = 10.50$, $p < .01$, with children using more Marathi labels initially in the Marathi session ($M = 1.29$, $SD = 1.63$) than in the English session ($M = 0.25$, $SD = 0.97$). There were no significant effects of age group or order.

When considering that chance performance would be three labels provided in each language, children were appropriately below chance in using Marathi in the English session ($p < .01$), but they were also significantly below chance in using Marathi in the Marathi session ($p < .01$). Thus, while children did show some initial sensitivity in their use of English and Marathi, there were strong differences in their performance in the two language sessions. Children's performance in the English session was almost at ceiling, with 25/28 children providing all six English labels after the first request. However, children's initial responses in the Marathi session were more variable, resulting in more prompts to switch languages (out of three) being provided per trial in the Marathi session ($M = 1.96$, $SD = 0.86$) than in the English session ($M = 0.11$, $SD = 0.42$), $t(27) = 9.51$, $p < .01$.

Responsiveness to prompts. Here we report children's labeling after prompts in the Marathi session only, because of children's near-ceiling performance in the English session (see previous section). Children's total number of Marathi labels after prompting ($M = 2.90$, $SD = 1.96$) was significantly higher than initially ($M = 1.29$, $SD = 1.63$), $t(27) = -4.95$, $p < .01$. However, even after prompts, children's performance on Marathi

was still not significantly different from chance. The proportion of trials where children received all three prompts but failed to switch languages was high: 58.1% for older children and 75.6% for younger children. We also calculated children's responsiveness to prompts by tallying the number of trials on which children did switch from English (incorrect) to Marathi (correct) after all needed prompts were provided. Older children switched languages on significantly more trials ($M = 2.37$, $SD = 1.81$) than younger children ($M = 0.86$, $SD = 1.29$), $t(26) = 2.55$, $p < .05$.

Ambient language use. We analyzed the ambient (non-labeling) language children produced in each session and whether it was in Marathi or in English. All ambient language used in the English session was in English. Of the trials in the Marathi naming session which included ambient language, the majority (71%) involved Marathi use. Note that this is in contrast to their labeling responses, in which the majority of labels were in English, even after prompting.

Individual response patterns—object naming. We characterized children's individual response patterns using a measure of how many children used more labels in English (than Marathi) in the English session *as well as* more labels in Marathi (than English) in the Marathi session. Using this method, 4 children (1 older) out of 28 (14%) were found to use this differentiating pattern in their initial labeling. After all prompts, 12 children (7 older) out of 28 (43%) were found to use this pattern. None of the children showed the reverse pattern (more Marathi in the English session and more English in the Marathi session) either initially or after prompts.

Relationships Between Pragmatic Language Use and Metacognitive Measures

Responsiveness to prompts and language check. Children's responsiveness to prompts when labeling in Marathi was positively correlated with their metalinguistic awareness, as measured by the language check, $r = .51$, $p < .01$. We also conducted a regression analysis to determine if the correlation between children's responsiveness to prompts and their performance on the language check measure would hold up when controlling for age. In a stepwise regression, Model 1 containing age in months as the predictor variable for responsiveness to prompts was not a significant predictor of the variance, whereas Model 2, which also contained the predictor variable of language check score, explained a significant amount of the variance,

$F(2,25) = 4.57$, $p < .05$, with a significant change in R square (16%), $p < .05$. Thus, increased metalinguistic awareness of the experimenters' language knowledge was significantly associated with an increase in children's responsiveness to prompts to switch languages during object naming, even when controlling for age.

Responsiveness to prompts and theory of mind. Children's responsiveness to prompts when labeling in Marathi was positively correlated with their social cognition, as measured by the theory of mind scale, $r = .60$, $p < .01$. We conducted a regression analysis to determine if the correlation between children's responsiveness to prompts and their performance on the theory of mind scale would hold up when controlling for age. In a stepwise regression, Model 1 containing age in months as the predictor variable for responsiveness to prompts was not a significant predictor of the variance; whereas Model 2 which also contained the predictor variable of theory of mind score explained a significant amount of the variance, $F(2,25) = 14.66$, $p < .01$, with a significant change in R square (25.7%), $p < .01$. Thus, even when controlling for age effects, increased theory of mind was significantly associated with an increase in children's responsiveness to prompts to switch languages during object naming.

Finally, we conducted a regression analysis to determine the extent to which metalinguistic awareness and theory of mind contributed independently to children's responsiveness to switch languages at the experimenter's prompt. In a linear regression, age in months, theory of mind score, and language check score were entered as predictor variables for responsiveness to prompts. The overall model was significant, $R^2 = .439$, $p < .01$. Theory of mind was the only significant positive predictor of children's responsiveness, $\beta = .549$, $p < .05$, with language check showing a non-significant trend as a predictor of responsiveness, $\beta = .324$, $p = .08$.

Pragmatic Differentiation During Free Play

Sensitivity in conversational language use. Overall, in stark contrast to children's performance on the object naming task, children were able to accommodate to the languages of both interlocutors during free play by using primarily Marathi with the Marathi speaker and English with the English speaker. For the language factor, we report the results using the Marathi-Plus coding category, which included complete Marathi utterances (81%) as well as those utterances which were coded as Marathi with English insertions (19%), to be inclusive of all utterances with a Marathi structure. (We also conducted the analyses with only children's complete Marathi utterances to provide a more conservative test, and they resulted in the same

effects.) We report only complete English utterances, as children did not produce any English with Marathi insertions.

We conducted an overall ANOVA using the dependent variable of language produced (English, Marathi-Plus) and the factors of session (English, Marathi), age group (older, younger), and order (English → Marathi, Marathi → English). There was a significant main effect of language produced, $F(1,24) = 4.87$, $p < .05$, with children producing more English utterances ($M = 10.41$) than Marathi-Plus utterances ($M = 7.77$). In support of our primary hypothesis, there was a significant session X language-produced interaction, $F(1,24) = 54.54$, $p < .01$, with children producing more English utterances ($M = 16.61$, $SD = 10.24$) than Marathi-Plus ($M = 0.04$, $SD = 0.19$) in the English session, $p < .01$, and more Marathi-Plus utterances ($M = 15.50$, $SD = 10.51$) than English ($M = 4.21$, $SD = 4.60$) in the Marathi session, $p < .01$ (see Figure 1). There were no significant main effects or interactions of age group or order of presentation. Thus, children switched their predominant language completely as a function of session, demonstrating a flexibility which they did not show during the object naming sessions.

Individual response patterns—free play. Using a similar measure as for the object naming task, we characterized children's response patterns based on whether they differentiated their languages, producing more English utterances (than Marathi-Plus) in the English session *as well as* more Marathi-Plus utterances (than English) in the Marathi session. Using this measure, 22 children (12 older) out of 28 (79%) used their languages differentially. None of the children produced the reverse pattern.

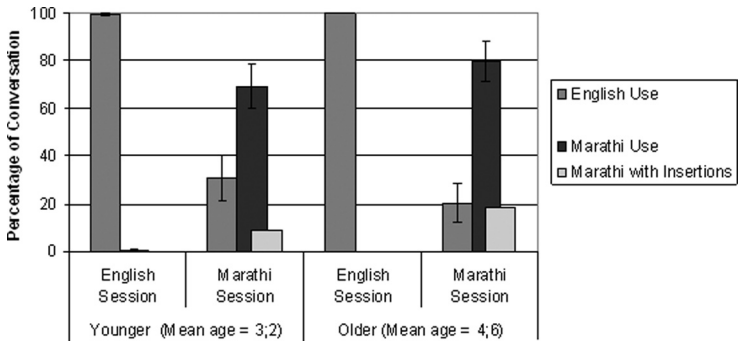

FIGURE 1 Percentage of younger and older children's conversation in English and Marathi (showing subset of Marathi with English insertion) for each session of free play.

Comparison of Individual Patterns

We compared individual children's response to assess the relative difficulty of the two tasks directly, predicting that object naming would pose more difficulty than free play. When comparing children's performance on free play and *initial* object naming, 18 children (11 older) out of 28 showed the predicted pattern of differentiating on the free play task but not the object naming task, and 0 showed the reverse pattern (differentiation in object naming only). When comparing free play and object naming *after prompts*, we found that 11 children (5 older) followed the expected pattern (differentiation in free play only), and only 1 younger child followed the reverse pattern. Thus, children showed greater differentiation on the free play task than on the object naming task (both initially and after prompting), $ps < .01$, Sign Test.

DISCUSSION

In the present study, preschoolers show much competence in accommodating their language use to unfamiliar interlocutors but still have more to learn. Across the contexts examined, children demonstrated varying facility with using the pragmatically appropriate language. We briefly review the findings from each of the tasks.

Free Play Task

Children in both age groups performed very well in the free play task, which required using the appropriate language in conversation. Children made a complete switch between sessions and generated original statements in each language. Indeed, the current findings show several ways in which children demonstrate greater sensitivity than has been found in prior research. Specifically, whereas previous research found that younger children (M age = 2;2 years) accommodated by using *relatively* more of a speaker's language when in conversation (Genesee et al., 1996), in the present study, we see that this ability has become more sophisticated. First, children used the speaker's language the majority of the time (not just relatively more often)—that is, they spoke primarily English with the English speaker and primarily Marathi with the Marathi speaker. Second, children used their languages differentially with two *novel* interlocutors (not just familiar speakers with whom they had previously developed particular expectations), thereby revealing the breadth and generality of their understanding. Finally, the two free play tasks (English, Marathi) occurred within just a few minutes

of each other, demonstrating that the children had a strong command of their conversational abilities and could switch from one language to the other within a matter of moments. There were no age differences between the two groups, suggesting that these language differentiation skills are mostly in place by 3 years of age.

Object Naming Task

Object naming was more demanding than free play in that it required use of a particular word in each language, and the unfamiliar interlocutors provided minimal feedback. As predicted, in contrast to children's sophisticated performance on the free play task, they showed only partial capacity for pragmatic differentiation on the object naming task. Children labeled appropriately in the English session of object naming but had more difficulty using Marathi labels. In contrast to performance on the free play task where generating any talk in Marathi led to success, this task resulted in children's ability to use the correct ambient language but failure to produce the correct label. As discussed in the introduction, bilingual children may have difficulty with lexical access and production of specific words, which in this case were lexical items in Marathi, generally not the children's dominant language. The question we addressed was what factors contributed to children's ability to produce the requested words in the appropriate language. The interpretation we favor is that successful performance on the object naming task requires more advanced metacognitive understanding, because children must realize the extent of their conversational partner's lack of language knowledge. The strongest support for this interpretation is that higher responsiveness to prompts on the object naming task correlated with children's scores on both the theory of mind scale and the language check measure, even controlling for age. Both of these measures (theory of mind and language check) are metacognitive measures on which performance increases with age, suggesting that developing capacities affect success in pragmatic differentiation tasks.

Alternatively, children's continued production of English labels even after prompting might have been the result of their experiences with different language speakers. Children in our study generally have not encountered monolingual Marathi speakers. Most of the young Marathi speakers whom they have encountered in everyday life know English as well. Our Marathi experimenter also knew English, although she did not use or respond to English during the tasks. Thus, children might have assumed based on their experience that she, like others, knew English as well, which would be similar to the minority/majority language knowledge demonstrated by the children in Paradis and Nicoladis (2007). Nonetheless, children did

appropriately accommodate to her in the free play session, using primarily Marathi. A second common experience was that the children have encountered many monolingual English speakers, so that perhaps they have come to use English as a default strategy based on the majority of language use situations that they are in. However, this does not seem to be the case, as children in the older group (71% of whom attended English-speaking day care) were more responsive to prompts than children in the younger group (of whom 43% attended day care). If increased English-language schooling conditioned children to use English with all speakers, older children would have been less able to switch languages with the Marathi speaker, not more.

A second factor affecting children's willingness to overcome their difficulty in producing Marathi labels may have been whether they have come to believe that labels are most correctly provided in English, even when speaking Marathi, because this pattern (Marathi utterance with English noun insertions) is a common and acceptable way of combining the two languages in speech with other bilingual people in this community. This interpretation is unlikely, however, because children's performance in naming in Marathi improved with age. If the "correct" response were to provide English labels, then the children would have been doing this more as they got older, not less. Further, anecdotally, the parents and older siblings who were watching the task often commented afterward that they were surprised when the children did not switch languages, suggesting that the appropriate mature response was to label in Marathi with the Marathi experimenter.

Age Group Differences

We might have expected age differences in children's performance on these tasks across the board, with older children outperforming younger children in each context. Instead, we found that both age groups performed well when accommodating during free play. We did, however, find age group differences in the object naming task, with older children being more responsive to prompts to switch languages. By examining an age group that was slightly older than those included in previous studies, we were able to detect which abilities are in place by the preschool years and which are not.

One insight that the older group may have had was an understanding of conventionality in language use. Diesendruck (2005) showed that preschool-aged children (mean age = 3;11 years) understand that speakers of a language generally know the common nouns used in that language. In our study, when the Marathi experimenter said she did not know the English word for the familiar object she was displaying, it may have acted as a clue to the child about her language knowledge, namely that

she probably did not know English at all. Older children may be more capable of making such inferences, which may be related to other developments also occurring at this age such as increases in theory of mind and metalinguistic understanding, discussed in the next section.

Relationship Between Pragmatic and Metacognitive Skills

One of the most important findings from this work was that children's pragmatic language understanding is related to their metacognitive understanding, even when controlling for participants' age. Children who were more responsive to prompts in the object naming task (i.e., made the effort to accommodate their conversational partner) scored higher on the theory of mind tasks, which assessed social cognition, and the language check task, which assessed children's explicit knowledge of the experimenters' language knowledge. The language check task did not predict responsiveness independent of theory of mind, suggesting that this metalinguistic knowledge may be a component of theory of mind or at least closely connected.

Although it is unclear from the present data what the exact relationship is between pragmatic differentiation and social cognition, we propose that increased metacognitive understanding contributes to children's ability to use their languages appropriately to communicate successfully. In particular, increased theory of mind might allow children to consider what it means for the Marathi experimenter's language ability when she says, ''I don't know that word'' in response to an English label; this skill would be a key mechanism for success in this task. From the present study, it seems that theory of mind development positively influences bilingual children's pragmatic skills in the preschool years rather than just the other way around. One way to begin to test this proposal would be to see whether there is any relationship between degree of bilingualism and theory of mind scores. In the present sample, theory of mind scores were not significantly correlated to the degree to which a child is a ''balanced'' bilingual (i.e., relatively equal in English and Marathi CDI vocabularies). Thus, increased theory of mind was not associated with increased knowledge of both languages, and being bilingual per se did not account for children's theory of mind abilities. Individual differences in bilingual children's theory of mind do seem to relate to their ability to respond appropriately when encountering a communication breakdown, such as that in our object naming task. However, more research is needed to assess the direction of causal influence.

More broadly, when considering prior studies that have found that bilingual children perform better on some theory of mind tasks compared with monolingual children (e.g., Goetz, 2003; Kovács, 2009), we speculate that the relationship between pragmatic language ability and social

cognition is likely to be bidirectional. It would thus be useful in future research to examine how cognitive changes affect bilingualism. Looking both across monolingual/bilingual populations and within bilingual populations allows researchers to examine bidirectional influences, with theory of mind possibly influencing bilingual children's ability to switch languages and this experience, in turn, influencing their theory of mind ability.

The finding of a relationship between theory of mind and pragmatic differentiation in bilingual children might also help to interpret other work on bilingual children's metalinguistic awareness. Perhaps studies that examine children's metalinguistic understanding (e.g., the word-referent relationship) would benefit from including theory of mind tasks as well (Rosenblum & Pinker, 1983). It may be that children who make more insightful comments on why names are flexible also have higher theory of mind understanding.

Remaining Issues and Conclusion

Many interesting questions related to this work remain. One issue to consider is how personal characteristics of the speaker might play into children's assumptions about language knowledge. In our study, the English speaker was Caucasian and the Marathi speaker was Indian, which may have provided an additional visual cue regarding their language use (compared with Caucasian English and French speakers in other studies). However, it seems that even if children used appearance as an initial cue, they mainly responded to the language used by the experimenter, based on their response to prompts in object naming and conversational feedback in free play. Nonetheless, this would be valuable to examine more directly in future research.

Finally, there may be important differences between growing up in a one-parent/one-language home versus a home with two bilingual parents who speak the same languages. It would therefore be interesting to directly examine the development of pragmatic differentiation and the related metacognitive skills, such as theory of mind, metalinguistic awareness, and cognitive flexibility, in both contexts. If a child is in a home with a high amount of language mixing, he/she might not have as much experience speaking with monolingual speakers of each of their languages. The present study shows that children in two-parent bilingual homes are adept at pragmatic differentiation in free play situations, but they may not have performed as well on the object naming task as a child from a one-parent/one-language home, who may have more experience making language choices in both languages.

In sum, this study shows that children's successful pragmatic differentiation in one context does not mean that they will be willing and able to

produce the appropriate language across contexts. Bilingual children's differentiation is also related to their metacognitive abilities, such as theory of mind, which emerge during the preschool years, suggesting that these skills are important for pragmatic language ability. We have provided a more complete picture of the pragmatic skills which preschool-aged bilingual children have in place and those which they may continue on to develop.

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