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CORRELATION BETWEEN COMMUNICATIVE FUNCTIONS OF MOTHERS AND PRESCHOOLERS OF DIFFERENT RACIAL AND INCOME GROUPS

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ABSTRACT

While language differences by gender, race/ethnicity, and socioeconomic status (SES) have been identified, the domain of pragmatics, specifically, communicative functions (CF) has been understudied. Hence, the purpose of this study was to investigate mothers' CF use with African American, European American, and Latino American boys and girls of middle and low SES. CFs were coded from each dyads' (N=95) learning and play interaction from the National Center for Early Development and Learning's (NCEDL, 2005) study of Family and Social Environments (Aikens, Coleman, & Bryant, 2008). Demographic factors were correlated with talkativeness, and *Directing* and *Mother Directing*, *Responding*, and *Projecting* were important predictors. Gender predicted child *Self-maintaining* and *Predicting,* and limited child demographic predictors suggest that they might not affect CFs as directly as mother CFs. Identification of associations among mother demographics and CFs can enhance comprehension of home communication styles for researchers and clinicians to better understand referral decision-making based on pragmatic indices for diverse preschoolers.

KEY WORDS: preschool, mothers, pragmatics, culture, socioeconomic status.

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Culturally and linguistically diverse (CLD) children, especially boys from minority racial/ethnic[1] groups and low socioeconomic status (SES) homes have disproportionately high rates of academic and social difficulties, culminating in an early emerging achievement gap (Barbarin, 2013; Jensen, 2009; Owens, 2016). The cumulative risk of these demographic features (Gutman, Sameroff, & Cole, 2003) also predicts increased *misidentification* for learning and socio-emotional problems (Artiles, 2011; Morrier & Gallagher, 2012; Wyatt, 1999), sometimes due to incongruence between socialization through parenting style versus classroom style (Barbarin, Downer, Odom, & Head, 2010; Nungesser & Watkins, 2005). Conversely, girl gender, higher SES, and a larger vocabulary in early childhood has predicted better behavior and academic outcomes (Morgan, Farkas, Hillemeier, Hammer, & Maczuga, 2015). Researchers' focus on deficient vocabulary as the reason for the achievement gap is supported by the "word gap" (i.e., low-income children being exposed to 30 million fewer words than higher-income peers prior to age 3; Hart & Risley, 1995) literature. Although less exposure to language can indeed have an effect on child language development, a perceived lexical deficit alone may not carry over into other domains pertinent to learning, such as, syntactical complexity or functional language (Baugh, 2017; Garcia & Otheguy, 2017). Further, the achievement gap persists despite efforts to close the word gap (Avineri, et al., 2015; Rothschild, 2016), while understudied domains like pragmatics can also impact the school experience (Hyter, Rivers, & DeJarnette, 2015). Therefore, additional study of pragmatics is in order.

Academics and Pragmatics

Pragmatics entails the use of non-verbal communicative intent and verbal utterances in social contexts that include prosody, joint attention, intonation, turn-taking, commenting, and responding to questions (Ninio & Snow, 1996). Pragmatic skills like presupposition correlate with vocabulary, communicative competence, and metalinguistic skills, eventually supporting written and oral language comprehension (Carpendale & Lewis, 2006; Hoff, 2003; Hyter et al., 2015; Troia, 2011). Moreover, pragmatic competency is required to ask and answer questions, through which children gather knowledge and teachers assess that knowledge (Ryder & Leinonen, 2003). Altogether, insufficient pragmatic competence can lead to persistent social isolation, academic failure, and often presents as behavioral maladjustment, especially if the child does not reply to teachers as anticipated (Barbarin, 2013; Morrier & Gallagher, 2012; Timler, Vogler-Elias, & McGill, 2007). Communicative functions (CF) are a subcategory of pragmatics and defined as reasons for communicating. CFs that diverge from discourse expected in schools have been misconstrued as behavioral deficits (Delpit, 1995) but not often cited as a source of disproportionality (Nungesser & Watkins, 2005). Hence, this study aims to contribute to the scant data on the influence of mother CF use on CLD preschoolers' CFs at school entry.

Reasons for Teacher Referrals for Services

Some children have difficulty in school because they must adapt socio-cultural rules for language learned at home to a potentially conflicting school socialization style (Gillam, 2005; Halliday, 2002; Heath, 1982). For instance, Hart and Risley (2003) showed that adults in low SES homes tended to direct fewer words to their children than middle SES adults but Hall (1989) posits that a reduced quantity of words would be characteristic of a high-context culture where gestures might supplement verbal messages. Mainstream American schools are based on low-context cultures, suggesting that home-school incongruence might negatively impact academic success when CLD children from high-context homes' communication style is pathologized (Barbarin et al., 2010; Nungesser & Watkins, 2005). Failure to consider the relationship between home language and school

[1] Race is defined as groups of people with similar physical and biological traits considered significant by society, resulting in people treating others differently because of said traits (e.g., skin color). Ethnicity is shared cultural heritage characterized by traditions and perspectives that distinguish one group from another. While racial traits are inherited, ethnic traits are learned. As race/ethnicity is self-reported in the current study and entities such as the American Anthropological Association (AAA) have identified difficulty in objectively separating race from ethnicity in large data collection efforts, consolidation of the two categories has been suggested to be more meaningful to Americans (AAA, 1997).

pragmatic expectations may explain why some teachers refer CLD students for services more often. Although teachers agree that aspects of the home contribute to social competence and behaviors, they may be unaware of or underestimate the influence of the mothers' language on child interactions (Cole, Zahn-Waxler, Fox, Usher, & Welsh, 1996; Nungesser & Watkins, 2005).

Therefore, children's language reflecting parental language (Becker, 1994; Hall, 1989) formed the conceptual framework of this study. If a mother modeled certain CFs, it was anticipated that the child would also produce the same CFs more so than children whose mothers did not use these CFs as readily. This analysis adds another layer of inquiry into cultural relationships to CFs because the transactional nature of language is tied to the dyads' cultural patterns, with the goal of teaching the child to be competent communicators in their own culture (Ochs & Schieffelin, 1984; Rogoff, Mistry, Goncu, & Moiser, 1993).

Operationalization and Hierarchy of Communicative Functions

The few studies on CFs have varied on conceptualization where they have been coded at the interaction context, utterance, or social interaction levels (Chapman, 1981; Goffman, 1976; Ninio, Snow, Pan, & Rollins, 1994, Ninio & Snow, 1996; Pinnell, 2002; Searle, 1975), thereby hindering generalization. Joan Tough's (1984) codes are unique to mother-child CF interaction analyses in that they were designed for those older than 3 years old through adulthood, with codes representing what speakers think as they talk. No published norms of CF development exist, however, and most studies have only included middle SES, European American (EA), Standard American English speakers, with only a few describing CFs of CLD mother-child dyads (Blake, 1993; Hammer & Weiss, 1999; Pellegrini, Brody, & Stoneman, 1987).

Social cognitive researchers have expanded Piaget's (1959) theory of a developmental pattern for social understanding and language, though, to agree that CFs develop from lower level, directing functions to more complex heuristic functions (Bruner, 1986; Carpendale, 2006; Carpenter, Mastergeorge, & Coggins, 1983; Greene & Burleson, 2003; Hudson & Fivush, 1991; Lucariello, Hudson, Fivush, & Bauer, 2004; Owens, 2012; Pears & Moses, 2003; Tough, 1984; Westby, 2012). Yet, little research exists on whether this hierarchy is the same across cultures, despite evidence that a) adult language input differs across racial/ethnic and SES groups (Hall, 1989; Hart & Risley, 2003; Hyter et al., 2015; Leaper & Smith, 2004; Qi, Kaiser, Milan, & Hancock, 2006) and; b) infants develop better facility with later emerging CFs with the help of adult scaffolding (Lucariello et al., 2004). Knowing that language development, social understanding, emergent literacy, and school readiness are directly influenced by adult-child interactions and the quality of home language (Vernon-Feagans, Bratch-Hines, & The Family Life Project Key Investigators, 2013), it is hypothesized that child CFs should be affected similarly by mother socialization methods like modeling and prompting.

Theoretical and Conceptual Framework

Inquiry into how CF use is influenced by mother CFs is grounded in Vygotsky's theory that cognitive and linguistic development is socially constructed and scaffolded by adults (Berk & Winsler, 1995), and the idea that language development is best understood with consideration for cultural and social contexts (Bredekamp & Copple, 2009; Castro, García, & Markos, 2013). The transactional model of development is also pertinent as increased complex expressive language represents the child's complex ideas, while proficiency in processing others' communicative input (receptive language) requires cognitive skills to form accurate responses (Becker, 1994; Bredemkamp & Copple, 2009; McLean & Snyder-McLean, 1999; Snow, 1994). Yet, although the expressive language and cognitive development link manifests itself similarly across cultures, emergence of specific linguistic structures can differ (Paradis, Genesee, & Crago, 2011), possibly due to home language input. Teaching academic language through play at home is considered developmentally appropriate at age 4, but not all caregivers' early teaching and play methods match with subsequent school styles (Bredekamp & Copple, 2009). Therefore, the study of how cultural characteristics of language domains beyond vocabulary (e.g., CFs) might relate to academic achievement is still needed and could help clarify whether the design of school systems contribute to disproportionality (Gillam, 2005; Hosp, 2017). This proposed association between achievement and CF usage (grounded in Developmental Theory) that varies by communicative partner or cultural background (Sociocultural Theory) (Bredekamp & Copple, 2009)

drives justification to examine language development across cultures.

Factors Influencing Communicative Function Use

Because mothers are the primary caregivers in early childhood, the quantity, complexity, and variety of their language influences the child's language, vocabulary, and literacy skills (Rowe, 2012; Tamis-LeMonda, Bornstein, & Baumwell, 2001), even where a mother may interact differently based on the child's gender (Barbarin & Jean-Baptiste, 2013; Blake, 1993; Hammer & Weiss, 1999; Kloth, Janssen, Kraaimaat, & Brutten, 1998; Pellegrini et al., 1987; Sperry, 1991). Race/ethnicity and SES have also been linked to interactions, resulting in different discourse styles (Hall, 1989; Hyter et al., 2015; Leaper & Smith, 2004; Qi, Kaiser, Milan, & Hancock, 2006), and these variations are artifacts of differences in values, beliefs, and motivations for communication (Chen, 2011; Ochs & Schieffelin, 1984).

Categories of maternal styles have been formed with "maternal responsivity" typified by increased, prompt, and appropriate responses contingent to child communicative acts. Responsive and sensitive styles have shown positive effects on child behavior outcomes (Gardner, Ward, Burton, & Wilson, 2003; Mesman, van Ijzendoorn, & Bakermans-Kranenburg, 2012) while Harsh parenting styles (which have been associated with specific racial/ethnic minorities and lower SES groups) characterized by more directive language predict poorer outcomes in some domains of language development (Brady-Smith et al., 2013; Coolahan, McWayne, Fantuzzo, & Grim, 2002; Flynn & Masur, 2007; Paavola, Kunnar, & Moilanen, 2005). Among 72 African American (AA) dyads that were low SES (Roberts, Jurgens, & Burchinal, 2005), however, mothers were responsive during storybook reading and; Blake (1993) described AA dyads as engaging each other or maintaining conversation. Fuligni and Brooks-Gunn's (2013) review of multicultural parenting found that styles do not always affect children similarly across cultures, to where directiveness has been a positive factor in some studies of Latino American (LA) and AA dyads. In fact, some have distinguished Directive mothering (i.e., moderate sensitivity and negativity, with directive behavior) from Harsh mothering (i.e., forceful and very negative in declaring their agenda for play) (Brady-Smith et al., 2013); but Harsh mothering might be coded as Directive in other studies, thereby lowering the quality of what is categorized as directive. For these reasons, investigation of CFs like *Directing* and *Responding* across cultures may better inform the influence of mother CFs on CLD children.

Research Questions

Accordingly, this investigation was intended to augment data on preschool pragmatics, namely CFs, through a) consideration of the interlocutor (mother) versus a teacher or peer and; b) account of poverty level, race/ethnicity, and gender, using the following research questions:

1) What demographic factors and mother CFs predict children's CFs?
2) What is the correlation between demographic factors, mothers' CF use, and children's CF use during interactions?

Methods

This study draws from the Family and Social Environments study (Aikens et al., 2008), a 511-family subset of the National Center for Early Development and Learning (NCEDL, 2005) Multistate Study of Prekindergarten sample (N=960) randomly selected from five states (Georgia, New York, California, Illinois, and Ohio). Twenty-five interviewers contacted families via postcards and made follow-up, scripted phone calls to discuss the study, obtain verbal consent, and schedule home visits[2], with 296 families providing written consent.

Participants

Interactions of 95 English-speaking (primary non-English speakers were excluded) EA, AA, and LA custodial mother-child dyads that had complete data at the time of analysis were coded. 51% (n= 48) had incomes less than or equal to 150% of the federal poverty guideline (NCEDL variable name: Poor), which was $32,107 for a household of five (USDHHS, 2001), qualifying them for state supported Pre-K programs. Due to inclusion criteria constraints on data available at the time, the distribution

[2] See Aikens, Coleman, and Barbarin (2008) for information on the Family supplement to the NCEDL study.

was slightly imbalanced with 35% AA (60% Poor, 40% Non-Poor), 37% EA (46% Poor, 54% Non-Poor), and 28% LA (35% Poor, 65% Non-Poor), with boys at 46% of the sample. Mothers' mean educational level was 12.9 years, with 41% with a high school diploma as their highest level and 17% not having graduated from high school. All children were 4 years old and met the criteria for kindergarten eligibility for the next year. The average age was 53.86 months (*SE* = 0.2, range 48.12-59.60 months).

Procedures

Interviewers asked mothers to a) teach the child how to complete a maze on an Etch-a-Sketch toy; b) teach the child how to solve a block puzzle and; c) play with animal puppets. Dyads were videotaped in their homes during this interaction (NICHD, 2003) for up to 30 minutes (Mean duration of 15.14 minutes [*SD*= 3.98]) with the two learning tasks designed to be challenging for a 54-month-old to complete without assistance. Videos were transcribed and copied into Microsoft Excel 2000 for coding.

Development of coding system. A taxonomy was adapted from Tough's (1984) system. Broad codes were divided into cognitive distinctions that provide a more robust description of CFs, identifying variations in communicative intent (Hwa-Froelich et al., 2007). As Tough's system does not include "*Responding*," which was frequently observed in Stockman (1996) and Hwa-Froelich et al.'s (2007) samples of AA children from low SES homes, it was added, culminating in seven major categories (See Table 1): *Responding*: providing nonverbal/verbal replies; *Self-maintaining*: communicating needs; *Directing*: guiding/controlling others' actions; *Reporting*: referencing an activity or reflecting on an event; *Reasoning*: explaining a process; *Predicting*: using language to anticipate or get others to anticipate events; and *Projecting*: expressing how others might feel. Five codes were mutually exclusive, with one code per utterance, except in one case where double coding was allowed for *Directing* and *Reasoning* when participants reasoned with directive language (exemplifying the complication of assigning one CF per utterance [Llinares & Pastrana, 2013]). For example, "Make sure you look first to see if you can go that way" was coded as both "*Directing*: Guiding or Controlling the Listener's Actions" and "*Reasoning*: Explaining a Process."

Training and reliability. The first author trained four research assistants (RAs) (two EA, one AA, one Asian American) to transcribe while watching videos. Interrater reliability was calculated on 15% of the sample with random checks performed to ensure $\geq$ 90% reliability. Transcripts were segmented into Communication Units (C-Units), which are independent clauses with modifiers (Loban, 1976). Craig, Washington, and Thompson-Porter (1998) segmented into C-Units to allow single words (e.g., "yeah," "oh," "no") and other nonclausal verbalizations to serve as utterances, if in response to the adult. Hereafter, C-Units will be called "Utterances". One RA was trained to code by reviewing the taxonomy and practicing on non-study interactions. When disagreements arose in transcription and coding, RAs and the first author discussed differences for consensus. Intraclass Correlation Coefficient (ICC) estimates and their 95% confidence intervals were calculated using SPSS statistical package version 24 (IBM, 2016) based on a mean-rating (k = 3), absolute agreement, 2-way mixed effects model. Interrater agreement was calculated on 20%, yielding an ICC of .907 for all codes combined (excellent), with its 95% confidence interval ranging between .720 and .961. The ICC for child codes was .692, nearing acceptable reliability of .700, and ICC for mothers' codes was .934 (excellent). It is possible that diverging ICC for the children versus mothers reflected a developmental difference in language used by four-year-olds, resulting in a systematic effect on rater agreement. As mothers' language is more developed than preschoolers', their samples may be considered more stable and similar across mothers than language samples of preschoolers.

Measure. *Parent questionnaire (NCEDL 2005)*. Race/ethnicity (AA, LA, EA, Asian/Indian, and Other), income, and gender were gathered via parental self-report.

Table 1. Communicative Function Code Definitions.

		Major Code	Subcode	Example
Earlier Emerging	13-15 mo. (Carpenter, Mastergeorge, & Coggins, 1983) 10-12 mo. (Ninio & Snow, 1996)	Responding	Verbal or nonverbal reply or response to questions	"Yes" or nodding of head in response
			Positive reinforcement or encouragement in response to action	"Good job!"
	10-12 mo. (Ninio & Snow, 1996)		Verbal imitation of another's utterance	Child: "Yipee!" Mom: "Yipee!"
			Responses used to maintain the interaction or indicate understanding	"Uh-huh", or "Okay", or "I hear you"
	8-9 mo. (Carpenter, et al., 1983)	Self-maintaining	Communicating to meet the speaker's needs to protect territory, property, or interests	"This is my space!" or "I want some ice cream."
			Criticizing others	"You're always acting silly."
	10-12 mo. (Ninio & Snow, 1996)		Expressing emotions	"I'm sad."
	10-12 mo. (Ninio & Snow, 1996)		Collaborating in actions with others including negotiating of presence and negotiating mutual attention	"Can I play?" or "Look at this."
	10-15 mo. (Bates, Camaioni & Volterra, 1975) 10-14 mo. (Ninio & Snow (1996) 3:6-5:7 for *indirect* Requests for Action (Garvey, 1975)	Directing	Guiding or controlling the listener's actions	"Turn it." or "Stop!"
	9-10 mo. (Carpenter, et al. 1983) 32 mo. (Ninio & Snow, 1996)		Guiding one's own actions	"I go this way."
	16-36 mo. (USDHHS, 2015)		Requesting information	"How do I do it?"
	10-15 mo. (Dore, 1975) 8-36 mo. (USDHHS, 2015)	Reporting	Labeling	"That's a dog."
	9-13 mo. (Carpenter, et al., 1983)		Reference to details	"The lion is brown."

	9-13 mo. (Carpenter, et al., 1983)		Reference to an activity, incident, or reflection on an event Reference to sequence	"I went to the park." or "She keeps coming in here." "One, two, three…" or "First he sits, stands, then last he walks."
Later Emerging	after 32 mo. (Ninio & Snow, 1996) 48-60 mo. (USDHHS, 2015)	Reasoning	Expressing cause-effect or dependent relationships	"When you turn this knob, it goes up."
	48-60 mo. (USDHHS, 2015)		Explaining a process	"So you have to go left to get to the circle."
			Justifying actions or behaviors	"I shook it because it was messed up."
	48-60 mo. (USDHHS, 2015)		Making comparisons	"It looks like that block."
	48-60 mo. (USDHHS, 2015)		Questioning to scaffold and promote understanding	"What shape do you think goes there?"
	16-36 mo. (USDHHS, 2015)		Identifying a problem	"It's too big for that."
	16-36 mo. (USDHHS, 2015)		Identifying a solution to a problem	"Smaller one can fit."
	3-5 years old (Hudson, Shapiro, & Sosa, 1995; Hudson & Fivush, 1991; Lucariello, Hudson, & Fivush, 2004) 16-36 mo. (USDHHS, 2015; Ninio & Snow, 1996)	Predicting	Using language to anticipate events or to get another person to anticipate events	"I'm going to have stew for dinner." or "We're going to play with puppets later."
	36 mo. 48-60 mo. (USDHHS, 2015)	Projecting	Expressing how others might feel or describing situations not experienced by the speaker	"That must make you sad" or "Giraffes must get scared of lions."
	25-30 mo. social pretend play scripts (Bretherton 1984; Gearhart 1983; Howes, Unger, & Matheson, 1992; Nelson & Seidman 1984) 16-36 mo. (USDHHS, 2015)	Imagining	Using language in the process or act of pretending	"Roar! I'm Mr. Lion and am eating you!"

Stepwise multiple linear regression models with 16 predictors (seven mother CFs, *Mother Total Utterances*, gender, AA mothers, EA mothers, LA mothers, AA children, EA children, LA children, and poverty), and dependent variables of seven child CF frequencies and *Child Total Utterances* were conducted. Two stepwise multiple linear regressions with 11 predictors (*Early* and *Late Emerging Mother* CFs, *Mother Total Utterances*, gender, AA mothers, EA mothers, LA mothers, AA children, EA children, LA children, and poverty), and dependent variables of *Child Total Utterances*, *Early Emerging Child* CFs, and *Late Emerging Child* CFs were run.

To account for smaller, uneven groups once categorized by race/ethnicity, gender, and poverty level, nonparametric (Dallal, 2000), Spearman's correlations ($p \leq .05$) between the *Child Early Emerging* and *Child Late Emerging* CFs, *Child Total Utterances*, and potential correlates comprised of the frequency of all seven mother CFs, demographics, and *Mother Total Utterances*, were run. The alpha value for significance was set at the $\leq .05$ level. The term 'talkativeness' (Leaper & Smith, 2004) refers to *Total Utterance* variables for both mothers and children. All race/ethnicity was measured by the frequency of mothers who were of each racial/ethnic group (AA, EA, LA); child gender was coded as 1=girl, 0=boy, Poor was coded as 1=yes, 0=no; and each CF was measured as the frequency of the CF.

Results

To ensure that language samples were comparable, the total amount of seconds spent in a) each interaction; b) the block task; c) the maze task and; d) free play served as dependent variables in three, Independent Samples Median tests with race/ethnicity, gender, and poverty as independent variables. There were no significant duration differences by group, so entire interactions were included in the analysis.

Mother CF Predictors of Child CFs

Descriptive statistics for a) the frequencies of all seven child CFs disaggregated by poverty, race/ethnicity, and gender are presented in Table 2 and; b) mothers' CF frequencies are shown in Table 3. *Responding* and *Reporting* occurred most often for children, and *Directing* and *Reasoning* were most common for mothers. As illustrated by the aforementioned right skewed distribution of *Projecting* and *Predicting*, both occurred the least for dyads.

Predictors of *Child Responding*. The first regression showed that *Child Total Utterances* and *Mother Directing* $F(2, 92)= 60{,}541$, $p < .001$, with an $R^2_{adj} = .559$, accounted for 56% of the variance. The predicted proportion of *Child Responding* was equal to -.056 +.107 (*Mother Directing*) + .401 (*Child Total Utterances*). Table 4 summarizes the regression models.

Predictors of *Child Self-maintaining*. *Child Total Utterances* and gender produced $F(2, 92)= 31.349$, $p < .001$, with an $R^2_{adj} = .392$, accounting for 39% of the variance. The predicted proportion of *Child Self-maintaining* equaled -.441 + .401 (gender) + .239 (*Child Total Utterances*).

Predictors of *Child Directing*. The regression indicated that *Child Total Utterances* and *Mother Reporting* produced $F(2, 92)= 116.878$, $p < .001$, with an $R^2_{adj} = .711$, accounting for 71% of the variance. The predicted proportion of *Child Directing* was equal to .167 - .151 (*Mother Reporting*) + .555 (*Child Total Utterances*).

Predictors of *Child Reporting*. *Child Total Utterances* and *Mother Reporting* produced $F(2, 92)= 74.465$, $p < .001$, with an $R^2_{adj} = .610$, accounting for 61% of the variance. The predicted proportion of *Child Reasoning* was equal to .007 + .153 (*Mother Reporting*) + .429 (*Child Total Utterances*).

Predictors of *Child Reasoning*. *Child Total Utterances*, *Mother Directing*, and *Mother Reasoning* produced $F(3, 91)= 795.503$, $p < .001$, with an $R^2_{adj} = .751$, accounting for 75% of the variance. The predicted proportion of *Child Reasoning* was equal to -.843 + 211 (*Mother Reasoning*) - .343 (*Mother Directing*) + .591 (*Child Total Utterances*).

Table 2. Descriptives of Frequencies of Child Communicative Functions by Race/Ethnicity, Poverty, and Gender.

Communicative Function		European American				African American						Latino	
		Poor		Non Poor		Poor		Non Poor		Poor			
		Girls (*n*= 9)	Boys (*n*= 9)	Girls (*n*= 7)	Boys (*n*= 10)	Girls (*n*= 11)	Boys (*n*= 9)	Girls (*n*= 9)	Boys (*n*= 6)	Girls (*n*= 6)	Boys (*n*= 7)	Girls (*n*= 6)	Boys (*n*= 6)
Self-Maintaining	M	2.33	2.40	2.61	1.61	1.92	1.53	2.21	1.71	2.17	1.72	2.62	2.17
	(SD)	*(0.62)*	*(1.19)*	*(0.86)*	*(0.85)*	*(0.75)*	*(1.46)*	*(0.85)*	*(1.39)*	*(0.93)*	*(0.68)*	*(0.94)*	*(0.93)*
Directing		3.91	4.24	5.57	4.51	4.52	4.20	4.55	4.30	3.63	5.30	5.16	3.63
		(1.07)	*(1.63)*	*(1.30)*	*(1.84)*	*(1.34)*	*(1.59)*	*(1.24)*	*(1.60)*	*(1.34)*	*(1.69)*	*(1.63)*	*(1.34)*
Reporting		4.25	4.39	6.25	4.91	4.88	4.82	4.82	4.91	4.91	5.20	5.64	5.87
		(1.18)	*(1.41)*	*(1.04)*	*(1.24)*	*(1.57)*	*(1.25)*	*(0.70)*	*(1.83)*	*(1.17)*	*(2.26)*	*(1.56)*	*(1.30)*
Reasoning		2.70	2.72	4.89	2.97	2.88	2.40	3.00	2.67	2.07	3.37	3.48	4.03
		(1.78)	*(2.01)*	*(2.19)*	*(1.48)*	*(1.26)*	*(1.51)*	*(1.00)*	*(1.82)*	*(1.70)*	*(1.93)*	*(0.93)*	*(1.03)*
Predicting		0.27	1.00	0.97	1.14	1.24	1.02	1.27	0.70	0.28	0.97	0.60	1.33
		(0.54)	*(0.71)*	*(0.71)*	*(0.53)*	*(1.19)*	*(0.84)*	*(1.13)*	*(1.33)*	*(0.63)*	*(0.52)*	*(0.52)*	*(0.28)*
Projecting		0.00	0.43	0.34	0.00	0.25	0.11	0.50	0.20	0.65	0.40	0.27	0.17
		(0.00)	*(0.53)*	*(0.73)*	*(0.00)*	*(0.58)*	*(0.33)*	*(0.84)*	*(0.53)*	*(0.99)*	*(0.64)*	*(0.54)*	*(0.41)*
Responding		4.83	5.25	5.78	4.60	5.13	4.98	4.54	5.25	4.24	4.97	5.60	5.37
		(1.51)	*(1.93)*	*(1.37)*	*(0.48)*	*(1.73)*	*(1.68)*	*(1.29)*	*(1.83)*	*(1.14)*	*(1.16)*	*(1.34)*	*(0.97)*

Note. M = Mean, SD = Standard Deviation.

Table 3. Descriptives of Frequency of Mother Communicative Functions by Race/Ethnicity and Poverty.

Communicative Function		European American		African American		Latino American	
		Poor (*n*= 17)	Non Poor (*n*= 19)	Poor (*n*= 20)	Non Poor (*n*= 13)	Poor (*n*= 11)	Non Poor (*n*= 15)
Self-Maintaining	M	1.47	1.73	2.20	1.96	1.61	1.92
	(SD)	*(0.97)*	*(0.85)*	*(0.79)*	*(1.33)*	*(0.92)*	*(0.83)*
Directing		10.15	10.19	11.78	12.12	11.16	11.50
		(2.15)	*(2.09)*	*(2.30)*	*(2.05)*	*(2.20)*	*(1.41)*
Reporting		5.55	6.78	5.37	6.24	6.54	6.17
		(1.27)	*(1.33)*	*(1.64)*	*(0.96)*	*(1.18)*	*(0.85)*
Reasoning		8.51	9.62	10.04	10.49	9.48	10.62
		(2.52)	*(2.75)*	*(1.81)*	*(2.83)*	*(2.33)*	*(1.47)*
Predicting		1.56	2.13	1.74	2.07	1.83	2.01
		(1.02)	*(0.88)*	*(1.23)*	*(1.13)*	*(1.19)*	*(0.78)*
Projecting		1.12	0.92	1.02	1.09	1.14	1.12
		(0.86)	*(0.74)*	*(0.69)*	*(0.89)*	*(0.87)*	*(0.94)*
Responding		5.12	6.82	4.86	5.96	6.26	6.39
		(1.04)	*(1.00)*	*(1.66)*	*(1.29)*	*(1.28)*	*(1.37)*

Note. M = Mean, SD = Standard Deviation.

Table 4. Summary of Linear Regression Analysis for Mothers' CFs Predicting Child CFs (N=95).

Child CF	Predictor Variable	*B*	*β*	Sig.	95% CI *B* Lower	Upper
CRES	TotalCh	.410**	.698	.000	.328	.492
	MDIR	.107*	.163	.023	.015	.199
CDIR	TotalCh	.555**	.897	.000	.480	.631
	MREP	-.151*	-.136	.029	-.286	-.016
CSELF	TotalCh	.239**	.588	.000	.174	.305
	Gender	.401*	.205	.012	.088	.713
CREP	TotalCh	.429**	.714	.000	.344	.514
	MREP	.153*	.143	.048	.001	.305
CREA	TotalCh	.591**	.843	.000	.516	.667
	MDIR	-.343**	-.437	.000	-.471	-.214
	MREA	.211**	.296	.001	.092	.330
CPRE	MPRE	.394**	.486	.000	.250	.538
	TotalCh	.114**	.327	.000	.052	.177
	MREA	-.087**	-.245	.007	-.149	-.024
	MraceAA	.400**	.228	.007	.111	.688
	Gender	-.290*	-.173	.034	-.559	-.022
CPRO	TotalCh	.056**	.248	.013	.012	.101
	MPRE	.131**	.249	.012	.029	.234
	MPRO	.150*	.221	.021	.023	.277
TotalCh[1]	MREP	.590**	.331	.002	.226	.955
	MPRE	.515*	.222	.033	.042	.989
CEarly	TotalCh	1.748**	1.023	.000	1.619	1.878
	MEarly	.163**	.170	.003	.057	.270
	CLate	-.110**	-.095	.013	-.197	-.024
	TotalMo	-.159*	-.121	.029	-.301	-.016
CLate	TotalCh	1.874**	1.273	.000	1.288	2.459
	MLate	.548**	.677	.000	.428	.668
	TotalMo	-.567*	-.502	.000	-.731	-.403
	CEarly	-.512*	-.594	.004	-.858	-.166
TotalCh[2]	MLate	.238**	.433	.000	.136	.340

Predictors of *Child Predicting*. The best fitting model for *Child Predicting* involved *Mother Predicting*, *Child Total Utterances*, *Mother Reasoning*, AA *Mother*s, and gender $F(5, 89)= 13.190$, $p< .001$, with an $R^2_{adj} = .393$, accounting for 39% of the variance. The predicted proportion of *Child Predicting* equaled -.082 - .290 (gender) + .400 (AA *Mother*s) - .087 (*Mother Reasoning*) + .114 (*Child Total Utterances*) + .394 (*Mother Predicting*).

Predictors of *Child Projecting*. *Child Total Utterances*, *Mother Predicting*, and *Mother Projecting* predicted *Child Projecting* at $F(3, 91) = 11.470$, $p< .001$, with $R^2_{adj} = .250$, accounting for 25% of the variance, with the predicted proportion of *Child Projecting* equal to -.701 + .150 (*Mother Projecting*) + .131 (*Mother Predicting*) + .056 (*Child Total Utterances*).

Predictors of *Child Total Utterances*[1]. *Mother Reporting* and *Mother Predicting* produced $F(2, 92)= 13.323$, $p < .001$, with an $R^2_{adj} = .208$, accounting for 21% of the variance. The predicted frequency of *Child Total Utterances* was equal to 5.099 +.515 (*Mother Predicting*) + .590 (*Mother Reporting*).

Predictors of *Child Early Emerging* CFs. Descriptive statistics for frequencies for emergence of CFs and talkativeness are shown in Table 5. All mothers had more utterances than their children, and both mothers and children used a higher frequency of *Early Emerging* CFs than *Late Emerging* CFs.

The second regression showed that *Child Total Utterances*, *Mother Early Emerging*, *Child Late Emerging*, and *Mother Total Utterances* produced $F(4, 90)= 481.480$, $p < .001$, with an $R^2_{adj} = .953$, accounting for 95% of the variance. The predicted proportion of *Child Early Emerging* CFs was equal to -.239 - .159 (*Mother Total Utterances*) -.110 (*Child Late Emerging*) + .163 (*Mother Early Emerging*) + 1.748 (*Child Total Utterances*).

Predictors of *Child Late Emerging* CFs. *Child Total Utterances*, *Mother Late Emerging*, *Mother Total Utterances*, and *Child Early Emerging* produced $F(4, 90)= 97.823$, $p < .001$, with an $R^2_{adj} = .805$, accounting for 81% of the variance. The predicted proportion of *Child Late Emerging* CFs was equal to -.464 -.512 (*Child Early Emerging*) - .567 (*Mother Total Utterances*) + .548 (*Mother Late Emerging*) + 1.874 (*Child Total Utterances*).

Predictors of *Child Total Utterances*[2]. *Mother Late Emerging* CFs produced $F(1, 93)= 21.411$, $p < .001$, with an $R^2_{adj} = .178$, accounting for 18% of the variance. The predicted proportion of *Child Total Utterances* was equal to 5.107 +.238 (*Mother Late Emerging*).

Neither race/ethnicity or SES predicted individual child CFs and gender only predicted *Child Self-maintaining*. Hence, it is presumed that correlations, if any, between demographic variables and child CFs would be weak. Further, high degree, positive correlations between within-dyad race/ethnicity would be expected, as 99% of the dyads were of the same race/ethnicity, with a converse, negative relationship expected between each racial/ethnic group, as seen in the descriptive analyses of the same participants (Kasambira Fannin, Barbarin, & Crais, 2018). For this reason, correlations were conducted only between individual mother CFs and *Child Early* and *Late Emerging* CFs, and *Total Utterances* (See Table 6 for correlation matrix).

Demographics and CF type correlations. In examining the relationships between demographic factors and CFs, poverty was negatively correlated with *Child Total Utterances,* both *Child Early and Late Emerging* CFs to a small degree, *Mother Reporting* to a small degree, and *Mother Responding* to a medium degree. Mothers who were AA had small, negative correlation to *Mother Responding*, but also a medium, positive correlation with *Mother Directing*. Mothers who were EA were negatively correlated to a small degree with *Mother Reasoning* and *Total Mother Utterances,* while they had a medium, negative association with *Mother Directing.*

Mother-child CF correlations. All CF correlations were positive. For example, *Mother Responding* had medium correlations to *Child Total Utterances,* and *Child Early* and *Late Emerging* CFs. *Mother Self-maintaining* had a small correlation to *Child Total Utterances, Child Early Emerging CFs,* and a medium relationship with *Child Late Emerging* CFs. *Mother Directing* had a small correlation to *Child Total Utterances,* and a medium correlation to *Child Early Emerging* CFs. *Mother Reporting* had medium correlations to *Child Total*

Table 5. Descriptives of Talkativeness and Frequency of Early and Late Emerging Communicative Functions by Race/Ethnicity, Poverty, and Gender.

CF		EA Children				AA Children				LA Children				Mothers			Mothers		
		Poor		Non Poor		Poor		Non Poor		Poor		Non Poor		Poor			Non Poor		
		Girls (*n*= 9)	Boys (*n*= 7)	Girls (*n*= 10)	Boys (*n*= 9)	Girls (*n*= 11)	Boys (*n*= 9)	Girls (*n*= 6)	Boys (*n*= 7)	Girls (*n*= 6)	Boys (*n*= 6)	Girls (*n*= 9)	Boys (*n*= 6)	EA (*n*= 16)	AA (*n*= 20)	LA (*n*= 12)	EA (*n*= 19)	AA (*n*= 13)	LA (*n*=15)
CLATE	M	7.28	9.46	12.18	8.56	9.55	8.28	11.26	9.36	7.57	10.38	10.29	10.93						
	(SD)	*(3.18)*	*(3.45)*	*(3.22)*	*(2.94)*	*(2.96)*	*(3.51)*	*(3.20)*	*(5.26)*	*(4.15)*	*(4.95)*	*(1.85)*	*(2.09)*						
CEARLY	*M*	15.33	16.29	20.21	15.61	16.46	15.53	16.13	16.17	14.86	17.19	19.03	18.81						
	(SD)	*(2.37)*	*(5.25)*	*(4.07)*	*(2.19)*	*(4.19)*	*(4.81)*	*(3.29)*	*(5.59)*	*(3.75)*	*(5.02)*	*(3.60)*	*(2.10)*						
TOTCH	*M*	8.63	9.21	11.84	9.14	9.43	8.92	9.14	9.28	8.23	9.94	10.74	10.85						
	(SD)	*(1.76)*	*(2.83)*	*(2.37)*	*(1.57)*	*(2.46)*	*(2.61)*	*(1.89)*	*(3.21)*	*(2.42)*	*(3.16)*	*(1.60)*	*(1.33)*						
MLATE	*M*													16.60	18.86	19.22	18.80	20.82	21.15
	(SD)													*(3.74)*	*(4.48)*	*(4.46)*	*(4.40)*	*(4.85)*	*(3.31)*
MEARLY	*M*													22.30	24.22	25.57	25.52	26.28	25.98
	(SD)													*(4.18)*	*(5.40)*	*(3.84)*	*(4.06)*	*(3.63)*	*(2.69)*
TOTMO	*M*													15.32	17.49	17.62	17.43	18.66	18.36
	(SD)													*(3.11)*	*(3.41)*	*(2.93)*	*(3.12)*	*(3.24)*	*(2.07)*

Note. M = Mean, SD = Standard Deviation, CF = Communicative Functions, CLATE = Child Frequency of Late Emerging CFs, MLATE = Mother Frequency of Late Emerging CFs, CEARLY = Child Frequency of Early Emerging CFs, MEARLY = Mother Frequency of Early Emerging CFs, TOTCH = Total Child Utterances, TOTMO = Total Mother Utterances.

Table 6. Spearman's Correlations between Mothers' and Children's Communicative Functions and Demographic Factors.

	TotalCh	TotalMo	EarlyCh	LateCh	MRES	MSELF	MDIR	MREP	MREA	MPRE	MPRO	Gender	Poor	MraceEA	MraceAA	MraceLA
TotalCh	1.000															
TotalMo	.380**	1.000														
EarlyCh	.970**	.418**	1.000													
LateCh	.757**	.244*	.719**	1.000												
MRES	.388**	.514**	.402**	.341**	1.000											
MSELF	.205*	.236*	.236*	.327**	.245*	1.000										
MDIR	.279**	.921**	.332**	.145	.265**	.144	1.000									
MREP	.420**	.699**	.457**	.345**	.577**	.214*	.542**	1.000								
MREA	.315**	.907**	.317**	.164	.345**	.143	.804**	.479**	1.000							
MPRE	.361**	.361**	.340**	.400**	.328**	.100	.239*	.453*	.277**	1.000						
MPRO	.260*	.256*	.272**	.274**	.299**	.295*	.178	.239*	.174	.251*	1.000					
Gender	.058	.023	.087	.035	-.047	-.142	.018	.066	.038	.041	-.160	1.000				
Poor	-.256*	-.192	-.231*	-.251*	-.389**	.008	-.050	-.263*	-.169	-.187	.040	.010	1.000			
MraceEA	.007	-.246*	-.009	-.018	.085	-.198	-.333**	.041	-.254*	.022	-.040	.029	-.052	1.000		
MraceAA	-.128	.129	-.135	-.068	-.268**	.188	.255*	-.161	.155	-.076	-.012	-.032	.147	-.570**	1.000	
MraceLA	.129	.130	.154	.093	.193	.015	.090	.127	.111	.057	.056	.002	-.101	-.479**	-.448**	1.000

Note: TotalCh= Total Child Utterances, TotalMo= Total Mother Utterances, EarlyCh = Child Early Emerging CFs, LateCh = Child Late Emerging CFs, MRES = Mother Responding, MSELF= Mother Self-Maintaining, MDIR= Mother Directing, MREP= Mother Reporting, MREA= Mother Reasoning, MPRE= Mother Predicting, MPRO= Mother Projecting, Gender = Child gender (girl=1, boy=0),
Poor = Is Family Poor (1=yes, 0=no), MraceAA= African American mothers, MraceEA= European American mothers, MraceLA= Latino American mothers, *p < .05, **p < .01.

Utterances and *Child Early* and *Late Emerging* CFs. *Mother Reasoning* had medium correlations to *Child Total Utterances* and *Child Early Emerging* CFs. *Mother Predicting* had medium correlations to *Child Total Utterances* and *Child Early* and *Late Emerging* CFs. *Mother Predicting* had small correlations with *Child Total Utterances* and *Child Early* and *Late Emerging* CFs.

Mother Total Utterance links to Child CFs. *Mother Total Utterances* had a medium, positive correlation with *Child Early Emerging* CFs, and a small correlation with *Child Late Emerging* CFs. *Child Total Utterances* positively correlated to all mother CFs, ranging from small to medium strengths.

In summary, demographics rarely predicted or correlated with child CFs. *Mother Reporting* had the strongest correlation with *Child Total Utterances, Early* Emerging CFs, and *Late Emerging* CFs. *Mother Responding* had the next strongest positive correlations to child CFs. *Mother Total Utterances* was correlated with both early and late emerging CFs but regression clarified that it negatively predicted the two child variables. *Mother Early Emerging* CFs positively predicted *Child Early Emerging* CFs, and *Mother Late Emerging* CFs predicted *Child Late Emerging* CFs. Yet, an inverse relationship occurred within the child where *Child Early Emerging* CFs negatively predicted *Child Late Emerging* CFs and *Child Late Emerging* negatively predicted *Child Early Emerging* CFs.

Discussion

The positive prediction of *Mother Reporting, Reasoning, Predicting, and Projecting* suggests that preschoolers are receptive to copying adults' more complex CF models, which can be supported by developmental theory positing that caregivers are important teachers prior to school entry during naturalistic interactions that involve play (Becker, 1994; Bredekamp & Copple, 2009; Ochs & Scheiffelin, 1984; Rowe, 2012; Tamis-LeMonda et al., 2001), versus only didactic teaching situations.

Talkativeness. *Mother Total Utterances* had a medium, positive correlation with *Child Total Utterances*, medium correlation with *Child Early Emerging,* and small correlation with *Child Late Emerging* CFs. *Mother Total Utterances* also predicted *Child Late* and *Early Emerging* CFs, all of which are integral to preschool success, but these were negative predictions and a mother's increased talkativeness has been deemed characteristic of directive parenting (Brady-Smith et al., 2013; Coolahan et al., 2002; Flynn & Masur, 2007; Paavola et al., 2005). Hence, although talkative mothers were positively correlated to child CFs and child talkativeness, these were small to medium links and talkative mothers actually suppressed both early and late emerging CFs in children when considering prediction. *Child Total Utterances* positively predicted all child CFs, which makes sense that more talkative children would have more opportunity to demonstrate a wider variety of CFs and show more pro-active functional language than a quieter child.

CFs and demographics. *Child Self-maintaining* involves the crucial skill of self-expression of emotions; where a deficit could have lasting effects on socio-emotional development and ensuing academic success for boys (Barbarin, 2013; Cole et al., 1996; Owens, 2016), which is why it remains a concern. Gender predicted (along with *Child Total Utterances*) *Child Self-maintaining*, showing that boys were associated with a smaller amount of *Self-maintaining*, which coincided with other analyses of this dataset (Kasambira Fannin et al., 2018) and other research showing similar gender differences in *Self-maintaining* subcodes like expressing emotions (Cole et al., 1996; Leaper & Smith, 2004; Middleton, 1992). This finding would be consistent with other findings (Eisenberg et al., 2001) that parents' positive expression of emotions (*Self-maintaining*) were related to children's regulation or social functioning; while other factors within the boys, such as their overall social competency (Kasambira Fannin, Barbarin, & Crais, 2017), may have accounted for some of the variance between boys and girls.

The fact that gender and *Mother Reasoning* predicted *Child Predicting* negatively might call for a different type of analysis to, first, determine if there were differences in how mothers interacted with boys versus girls, and second, to see if any interaction style differences affected child CF use. If mothers of girls used *Predicting* less and *Reasoning* more than mothers of boys, this might explain the lower frequency of *Predicting* in girls to some degree. Essentially, mothers of boys may emerge as a distinct subgroup to be analyzed in future CF research; be it a t-test of mothers of boys versus mothers of girls, or a within group analysis of mothers of both genders determining whether the same mother interacts differently with her son than her daughter (Kloth et al., 1998; Sperry, 1991).

Mothers who were AA (along with *Mother Predicting* and *Child Total Utterances*) positively predicted *Child Predicting*, and this was the only demographic feature besides gender that predicted a child CF. Thus, mother characteristics appear to positively influence *Child Predicting* more than gender.

The next demographic feature of note was race/ethnicity. *Mother Directing* had a positive correlation with mothers who were AA, while they were negatively correlated with *Mother Responding,* which was confirmed by Kasambira Fannin et al. (2018) where dyads that were AA had a smaller proportion of *Responding* and more *Directing* than dyads that were EA and LA. *Directing* is more prevalent in an authoritarian or Active-Restrictive parenting style, which has been found to be a less responsive parenting style (Coolahan, et al., 2002). The increased use of *Directing* on the part of AA mothers supports previous research characterizing some non-EA parents as being more directive and authoritarian and vice versa, as evidenced by current results of *Mother Directing* and *Reasoning* being negatively correlated with EA dyads. However, more research has determined that SES may have a stronger influence on parenting style than race/ethnicity and that parents of the same race/ethnicity are not necessarily monolithic in their parenting styles (Coolahan et al., 2002). Further, some nuances of directive parenting styles have been found to be protective of AA children but not of EAs (Flynn & Masur, 2007). Thus, broad generalizations by race/ethnicity should be considered with caution (Baugh, 2017; Garcia & Otheguy, 2017) and approached in an emic way (Hyter et al., 2015). The current regression does not bring to bear any positive predictors involving EAs, LAs, or AAs for *Responding* or *Directing*, but the racial/ethnic and SES correlation to *Directing* and *Responding* is important to query into the most at-risk students (AA, low SES boys).

In contrast to other studies, mothers in the current study who were Poor were not linked with *Directing*, even in combination with AA race/ethnicity. Poverty did not predict any child CFs, but it was negatively correlated with *Child Total Utterances* (as seen in families of low SES by Hart and Risley [2003]), and *Child Early* and *Late Emerging* CFs. There was, however, a negative correlation between Poverty and *Mother Reporting* and *Mother Responding*; and mothers' responsiveness has been a consistent positive factor in child language development (Girolametto & Weitzman, 2002).

Important Mother CF predictors. When considering *Mother Responding,* Girolametto and Weitzman (2002) describe a strong relationship between center-based child care providers' responsiveness and variation in the preschoolers' language productivity. Researchers like Risley and Hart (2006) also support the strategy of using responsive language with preschoolers when extrapolating this idea to mother responsiveness in early childhood fostering quantity and quality of preschool child language. When using *Mother Responding* as an indicator of responsiveness in the current analysis, however, it should be noted that it did not predict any of the child CFs. So, it appears that these data do not prove that increased frequency of *Mother Responding* predicts desired CFs in children as previous studies (Beckwith & Rodning, 1996; Flynn & Masur, 2006; Paavola, et al., 2005; Tamis-LeMonda et al., 2001; Yoder & Warren, 2001) have found with language development in general. But, *Mother Responding* had a negative correlation with mothers who were AA and mothers who were Poor, so a line of inquiry into whether decreased *Responding* affects CF development might be indicated. *Mother Responding,* however, did not predict child performance on standardized measures of vocabulary, receptive and expressive language, or teacher ratings of social competence (Kasambira Fannin et al., 2017), so this negative correlation might be simply a language difference that does not explain those three child outcomes sometimes used to refer children at school entry.

Mother Directing's negative prediction of *Child Reasoning* follows the expectation that increased *Mother Directing* might suppress a later emerging child CF like *Reasoning*, but this being the only negative predictor and the lack of negative correlations between *Mother Directing* and child CFs shows that a directive style might not be so detrimental to child CF production. Still, child aptitude in *Reasoning* is essential in preschool settings (U.S. Department of Health and Human Services [USDHHS], 2011). For example, *Reasoning* involves the academic skills of analysis, comparing and contrasting, or expressing and understanding cause and effect relationships (Tough, 1984; USDHHS, 2015). *Reasoning* is also associated with more complex linguistic structures, facilitating a connection between oral language and the literate language used to learn (Hwa-Froelich et al., 2007). Current results suggest that use of *Reasoning* may be compromised for children who are AA if they are more

exposed to *Mother Directing* (reflected by *Mother Directing* being positively correlated with mothers who were AA). Despite *Mother Directing*'s negative predictive power for *Child Reasoning*, it correlated positively with *Child Early Emerging* CFs. That correlation could be attributed to the fact that a common type of *Mother Directing* was a Request for Information. *Mother*s often asked children questions, which resulted in child utterances in the form of *Responding* or *Reporting* (Kasambira Fannin et al., 2018).

Rather, a more broad index of language like *Mother Late Emerging* CFs positively predicted *Child Total Utterances* so mothers' use of more complex CFs might augment child CF quantity. As expected, mothers' *Early* and *Late Emerging* CFs predicted *Child Early* and *Late Emerging* CFs, but the presence of *Child Late Emerging* CFs negatively predicted *Child Early Emerging* and vice versa. Perhaps this was a reflection of theoretical development where we should not see as much child *Early Emerging* language at the same time as *Late Emerging*. For example, as children move through toddlerhood, they prefer words to representational gestures (Capone & McGregor, 2004) and at age 4, we still expect to see gestures but want them coupled with verbalizations, with less use of gestures only as the child ages. In the case of CFs, a child must use *Directing*, *Self-maintaining*, *Responding*, and *Reporting* throughout the day, but when they learn more sophisticated CFs like *Reasoning*, *Predicting*, and *Projecting*, we associate preschool success with more facility with these later emerging CFs. Further analyses might answer whether the activity type contributed to the inverse relationship between child early and late emerging CFs where learning activities (2/3 if the interaction) were characterized by more early than late emerging CFs, or if there is a developmental expectation to replace less complex CFs with later emerging ones.

Continued refinement of pragmatic research has far reaching implications for preschool children who have been identified as at risk for academic difficulty. Cumulative risk models (Gutman et al., 2003) speculate that the race/ethnicity and SES of the homes should have correlated with or predicted CF usage, but only gender and mothers being AA partially predicted frequency of *Child Self-maintaining* and *Child Predicting*. Rather, it was mother talkativeness, *Mother Predicting*, *Mother Projecting*, and *Mother Directing* that predicted the child CF use. Poverty did correlate negatively to *Child Total Utterances*, *Mother Reporting*, and *Mother Responding*, which parallels other analyses of the same dataset (Kasambira Fannin et al., 2018) that found children who were Poor to be less talkative and mothers who were Poor and AA to use less *Responding* than Non-Poor, EA, and LA dyads. Hence, the data appear to be triangulated.

Limitations

One limitation was that other variables in the NCEDL database like household size or mother educational level were not analyzed, which may have explained more variance. Further, all children attended preschool and they may exhibit CF usage differently than those who do not. Subcategorization of the sample by demographic factors also reduced group sizes. However, the total sample size was larger than previous preschool pragmatic studies, and included different income and racial/ethnic groups.

Implications

The persistent achievement gap has driven research on potential causes, such as cultural influences on language development, but the domain of pragmatic development for CLD preschoolers has been not been investigated as often, even though it has implications for social and academic success (Hyter et al., 2015). This study addresses that breach in the literature by a) examining correlations between mother and child CFs and demographics and; b) identifying what mother CFs might predict preschoolers' CFs during home teaching and play interactions. This is of interest to speech-language pathologists and educators because knowledge of how CLD mothers contribute to language development might ultimately inform those devising strategies to sharpen referral accuracy and design appropriate intervention plans (Hammer & Weiss, 1999; van Kleeck, 1994).

When considering predictors of child CFs, mother's talkativeness suppressed both early and late emerging child CFs, while the child's talkativeness positively predicted child CFs. Thus, one could say less talkativeness on the mother's part can predict increased child talkativeness, which, in turn, positively predicts all child CFs required for classroom interactions and socialization (Hart & Risley, 2003). Indeed, it is typical for high context cultures like AA to have fewer words when communicating (Hall, 1989) and the results may be

showing simply a difference in interactions, rather than a deficit (Baugh, 2017; Hyter et al., 2015). Hence, SLPs and teachers might refrain from the assumption that a less talkative caregiver has a negative impact on child language. *Mother Predicting*, *Mother Projecting*, *Mother Reporting*, and *Mother Reasoning* were among the few mother CFs that positively predicted child CFs, and tend to be later emerging, bolstering existing data showing that applying pragmatic skills with an increased cognitive load (e.g., child response to indirect parental input) facilitates acquisition of more complex pragmatic skills (Becker, 1994), supporting advice for parents to increase the *quality* of language interactions in particular, not necessarily the quantity.

In-service training on how to support early language development has been found to be successful for preschool teachers (Dickinson & Caswell, 2007; Girolametto, Weitzman, & Greenberg, 2006). For example, teachers can set up the environment (e.g. provision of symbolic materials and dress up clothes for dramatic play) to create situations that elicit later emerging CFs like *Predicting* and *Projecting* (Pinnell, 2002). Thus, it stands to reason mothers might also be taught to facilitate CF development, with a focus on specific pragmatic skills at home to prepare their children for successful learning, and SLPs can do this by ensuring that caregivers are also provided the same symbolic play strategies for use at home with their children.

Talking with adults about future occurrences (*Prediction*) is the natural context in which preschoolers learn how to plan future events and understand future time. The modeling effect that emerged with *Prediction* supports findings that discussions of future events can facilitate development of children's explicit understanding of future time (Lucariello et al., 2004) and that modeling of *Predicting* can foretell a higher frequency of *Child Predicting*, which is encouraged in preschool settings (Hwa-Froelich et al., 2007). The same explanation can be used where *Mother Predicting* and *Mother Projecting* together were significant predictors of *Child Projecting*, which should be developed in the first few years of life (Callaghan et al., 2005), and is therefore an opportune time for mothers to purposefully model these later emerging CFs. This presents additional evidence that mothers should promote development of certain CFs by modeling or, at the least, providing indirect exposure to the CF (Becker, 1994; Hammer & Weiss, 1999). Again, SLPs can help promote parent education indirectly through in-services presented to teachers or daycare providers on what specific CFs parents can model; or if the SLP encounters a family as an Early Interventionist, they can emphasize the importance of modeling CFs that increase the child's cognitive load. In summary, *Mother Total Utterances* may positively relate to individual child CFs weakly, but a child's talkativeness was positive and strong for correlations and predictions of all child CFs. Thus, if choosing between providing adult models/language input or letting the child talk, the goal might be to allow a child to talk more during learning and play interactions.

Studies have also shown strong links among oral language and subsequent behavior and reading development (Barbarin & Jean-Baptiste, 2013; Vernon-Feagans et al., 2013). The current CFs are a form of oral language that can represent both behavior (e.g., *Self-maintaining*, *Directing*) and academic (e.g., *Reporting*, *Predicting*) skills that teachers use to refer children. Hence, additional data on how preschoolers and mothers use CFs before school entry might inform scientists about potential reasons for subsequent referral of particular students. That children's language is linked to parental language (Becker 1994; Hart & Risley, 2003) and the type of language stimulation affects the quality of children's communication skills is supported by differences in CFs related to social difficulty (e.g., *Self-maintaining*) experienced by low income, preschool boys of color. Though normative data are needed to draw conclusions, we would surmise that child race/ethnicity should not yet correlate to the CFs demonstrated at school entry as much as mother CF input, poverty, or gender might, as race/ethnicity did not correlate with or predict any child CFs. How mothers interact with different genders might also guide future inquiry into why boys of color, especially those from low SES households, are still disproportionately referred.

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