

10-26-2017

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Original Citation

Kasambira Fannin, D., Barbarin, O. A., & Crais, E. R. (in press). Communicative Function use of preschoolers and mothers from differing racial and socioeconomic groups. *Language Speech and Hearing Services in Schools*.

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Communicative Function Use of Preschoolers and Mothers from Differing Racial and

Socioeconomic Groups

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This research was supported in part by grants from the U.S. Department of Education and
the Foundation for Child Development.

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Abstract

Purpose: This study explores whether communicative function (CF: reasons for communicating) use differs by socioeconomic status (SES), race/ethnicity, or gender among preschoolers and their mothers.

Method: Mother-preschooler dyads ($N=95$) from the National Center for Early Development and Learning's (NCEDL, 2005) study of Family and Social Environments were observed during one structured learning and free play interaction. CFs were coded by trained independent raters.

Results: Children used all CFs at similar rates but those from low SES homes produced fewer utterances and less Reasoning, while boys used less Self-maintaining and more Predicting.

African American (AA) mothers produced more Directing and less Responding than European American (EA) and Latino American (LA) mothers, and LA mothers produced more utterances than EA mothers. Mothers from low SES homes did more Directing and less Responding.

Conclusion: Mothers exhibited more socio-cultural differences in CFs than children; this suggests that maternal demographic characteristics may influence CF production more than child demographics at school entry. Children from low SES homes talking less and boys producing less Self-maintaining coincided with patterns previously detected in pragmatic literature. Overall, preschoolers from racial/ethnic minority and low SES homes were not less deft with CF usage, which may inform how their pragmatic skills are described.

Communicative Function Use of Preschoolers and Mothers from Differing Racial and
Socioeconomic Groups

Introduction

Previous studies have linked children from racial/ethnic¹ minority and low socioeconomic status (SES) (a combined measure of social position based on income, occupation, and education [Bradley, Corwyn, McAdoo, & Coll, 2001]) groups to poorer language, cognitive, and social development (Gutman, Sameroff, & Cole, 2003). Boys within these groups have been especially vulnerable to poor development across multiple domains, *inter alia*, social difficulties and sub-optimal achievement in reading and math (Barbarin, 2013; Jensen, 2009; Morgan, Farkas, Hillemeier, Hammer, & Maczuga, 2015; Owens, 2016). National conversations about the “30 million-word gap” (i.e., children of low SES being exposed to 30 million fewer words than higher SES peers before age 3; Hart & Risley, 2003) have fueled concern about development of children who are racial/ethnic minorities and from low-SES homes (Hart & Risley, 2003; Morgan et al., 2015). Though gender, racial/ethnic, and SES differences in word knowledge have garnered a great deal of attention, focus on the ‘word gap’ causing academic difficulty has been challenged as either too simplistic or overstated (Avineri et al., 2015; Rothschild, 2016). Further, Hall (1989) posits that a reduced quantity of words in racial/ethnic minority and low SES homes would be characteristic of a high-context culture where other ways to express communicative functions (CF) like gestures might supplement the verbal messages. Therefore, other domains, such as pragmatics, could influence achievement, but

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, ethnicity is 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).

have been understudied in culturally and linguistically diverse (CLD) children (Hyter, Rivers, & DeJarnette, 2015). While some have reported racial/ethnic and SES differences in vocabulary by school entry, this study examines a pragmatic aspect of language: communicative functions (i.e., reasons for communicating), by testing for demographic differences.

Pragmatics and the Preschool Experience

Pragmatics is the language domain concerned with the use of utterances and is correlated with metalinguistic skills, communicative competence, word learning, and presupposition (Ninio & Snow, 1996). These skills relate to academic success as they facilitate interpretation of social cues from others, which is integral to comprehension of oral and later written language (Carpendale & Lewis, 2006; Troia, 2011; Vazquez, Delisle, & Saylor, 2013; Westby, 2012). Accordingly, pragmatic deficits may be linked to academic failure, especially if the child does not respond to teachers as expected, setting the stage for future academic challenges (Barbarin, 2013; Troia, 2011). Moreover, by preschool, children prefer more responsive peers and pragmatic incompetence contributes to social isolation, eventually manifesting as behavioral maladjustment (Timler, Vogler-Elias, & McGill, 2007).

Theoretical Framework

Due to differences in values, beliefs, and motivations for communication, pragmatic discourse styles vary across and within racial/ethnic, gender and SES groups (Hall, 1989; Hyter et al., 2015; Qi, Kaiser, Milan, & Hancock, 2006). The relationship between expressive language and cognitive development is characterized by production of more complex language representing increasingly complex ideas; at the same time, young children can have stronger receptive than expressive language (Bredenkamp & Copple, 2009). Development of linguistic

structures follows a similar pattern worldwide (e.g., cooing to babbling to single words, etc.) (Paradis, Genesee, & Crago, 2011), but *when* they emerge can differ across cultures.

Hence, the question of whether CF use at age 4 varies by socio-cultural factors is grounded in cognitive, linguistic, developmental, and sociocultural theory.

Vygotsky's seminal theory that cognitive and linguistic development is socially constructed and scaffolded by adults (Berk & Winsler, 1995) reinforces study of development within the child's social and cultural contexts (Bredekamp & Copple, 2009; Castro, García, & Markos, 2013). Social interaction with primary caregivers, siblings, or daycare providers at home and, later, school, is especially important for the very young (0-3), though these places (home vs. school) may have different communication rules (Barbarin, 2013; Hall, 1989; Qi et al., 2006; Riojas, 1996). As a result, some parents' early teaching and play styles are more valued and aligned with mainstream U.S. school methods (e.g., asking questions, formal structure, adult-directed) while others have different methods (e.g., child-directed, more demonstration than description, fewer questions) (Bredekamp & Copple, 2009). This prompts inquiry into whether cultural features of language domains other than vocabulary (e.g., CFs) relate to school success, informing those who study whether we are designing schools with only one kind of preschooler in mind and incorrectly labeling those who do not fit the mainstream model of behavior as "underachieving" or "unprepared" (Gillam, 2005; Hosp, 2017).

Study of CFs can provide a framework for examining influences of maternal language on children because mothers are the primary teachers in early childhood and their language input can vary, affecting pragmatic and social understanding acquisition (Kloth, Janssen, Kraaimaat, & Bruten, 1998; Vernon-Feagans, Bratsch-Hines, & The Family Life Project Key Investigators,

2013; Tough, 1984; Westby, 2012). The transactional model of development (Snow, 1994) is also represented when parents provide input in the form of CFs in response to the child's CFs.

Defining CFs

Disagreements on how to conceptualize CFs and limited samples have challenged research in this area (Ninio, Snow, Pan, & Rollins, 1994). Despite knowledge that the setting of utterances can affect the meaning of an interaction (Goffman, 1976), CF taxonomies at the utterance level (Searle, 1975) have not always accounted for the context of social interaction (Ninio & Snow, 1996). To address this, the current study analyzes CFs during play and learning, reflecting contexts common to preschool age. Per Ninio et al. (1994), Tough's (1977) CF codes are comprehensive and appropriate for early language acquisition stages through adulthood (which is advantageous for the coding of mothers) and others (Hwa-Froelich, Kasambira, & Moleski, 2007; Stockman, 1996) have adapted Tough's system for low SES children who were African American (AA). While Tough (1984) provided an important foundation for CF research on preschoolers, no frequency-based normative data were published. Frequency data could help establish the amount and type expected at particular ages and, in due course, when their absence might suggest risk of a disorder. Hence, analysis of CFs in later preschool is still needed.

Hierarchies of CF development. Social cognition scholars (Carpendale & Lewis, 2006; Pears & Moses, 2003) have expanded Piaget's work to support the idea of a developmental pattern for social language and understanding. CFs develop from simpler, directing functions to more complex, heuristic ones that inform or gather information (Carpenter, Mastergeorge, & Coggins, 1983; Ryder & Leinonen, 2003; Westby, 2012). Later emerging CFs are not as developed in preschoolers because they are still in an egocentric stage, constraining their ability to take others' perspectives, which is needed for later emerging CFs like Projecting (Greene &

Burleson, 2003; Lucariello, Hudson, Fivush & Bauer, 2004). Answers to the question of whether hierarchical development of CFs differs by socio-cultural factors, however, are still inadequate.

Factors influencing CF use. Adult-child interaction (versus peer) represents a distinct social context in which CF use has meaning, which is a crucial consideration when evaluating a speaker's intent and understanding reasons for use or non-use of particular CFs (Labov, 1969; 1979; Ninio & Snow, 1996). In addition to communicative partner, researchers should consider other influences on communication style like race/ethnicity and SES, as people who are AA and Latino Americans (LA) in the U.S. occupy a higher proportion of lower SES positions.

Parental communication styles and CFs. Some communication styles have been described using a CF framework of Reporting, Reasoning, Responses, and Directing (Hammer & Weiss, 1999; Kloth et al. 1998; Pellegrini, Brody, & Stoneman, 1987). Barbarin and Jean-Baptiste (2013) found Explaining, Expanding, and Supporting within the style of 'dialogic practices' to be positively linked to child language, and the CFs of Reporting, Reasoning and Responding parallel those discourse strategies. Researchers have established a hierarchy of communication where a lower level, more authoritarian style is characterized by verbalizations that inhibit, interrupt, or fail to respond to the child's communication, resulting in less variance in the child's language. Meanwhile, a higher level, more responsive and sensitive style positively influences child language, vocabulary, and literacy (Paavola, Kunnar, & Moilanen, 2005; Rowe, 2012; Tamis-LeMonda et al., 2001), possibly affecting CF acquisition (Pears & Moses, 2003).

Racial/ethnic minorities and CFs. The aforementioned authoritarian style has been called Active-Restrictive (Coolahan, McWayne, Fantuzzo, & Grim, 2002; Flynn & Masur, 2007) and has been ascribed to certain racial and SES groups, suggesting a socio-cultural influence on child-directed communication (Fulgini & Brooks-Gunn, 2013; Green, 2002; Hall, 1989; Hart &

Risley, 2003; Terrell & Terrell, 1996). Stockman and Hwa-Froelich et al.'s work also showed that children who were AA enrolled in Head Start might differ in CF frequency from Tough's (1984) mostly European American (EA) sample. Yet, Riojas-Cortez (2000) found no racial/ethnic differences in language during free play in Mexican American preschoolers.

Socioeconomic status and CFs. Hammer and Weiss (1999) also found similar CF use between children who were AA and EA regardless of SES, but did find AA, low SES versus middle SES mothers' language goals and play to differ. Tough (1977) also found SES differences: at age 3, later emerging CFs like Reasoning, Projecting, and Imagining occurred less in the low SES group and at age 5, the low SES group talked less and with less cognitive complexity than the high SES group. Peters (1983), however, found no difference in CF types or total number of utterances by SES for children who were AA (N=8), and all children generated more utterances with mothers than with strangers. Labov (1969; 1979) and Tizard and Hughes (1984) take exception to conclusions that children from lower SES homes use less complex language, and this coincides with Middleton's (1992) deduction that low SES homes yield ample functional language and these environments do not automatically give rise to deficient language.

Gender and CF use. Girls tend to develop social skills and language earlier than boys and engage in more advanced creative play and language arts activities that require various CFs (Tonyan & Howes, 2003). Some of this reflects socialization patterns like parents using more casual language with girls (Pellegrini et al., 1987) and a more explaining style with boys (Kloth et al., 1998), or middle SES mothers who were AA (N=14) socializing sons into a more solo narrative style but daughters into a collaborative style (Sperry, 1991). Leaper, Tenenbaum, and Shaffer's (1999) meta-analysis and Middleton (1992) provide reasonable evidence of gender differences in some CF use among children who were also from low SES and AA homes.

Expected Findings and Research Questions

The dearth of previous CF research of CLD 4-year-olds and mothers limits the ability to establish firm hypotheses. When considering gender, however, it is hypothesized that girls will use more varied and advanced CFs than boys (Leaper & Smith, 2004; Middleton, 1992; Tonyan & Howes, 2003). Though studies indicate that some language domains (e.g., lexicon) may differ by SES (Hart & Risley, 2003; Hoff, 2006) others lead to the expectation that racial/ethnic and SES differences in early childhood language *use* may be apparent but minimal (Brady-Smith et al., 2013; Hall, 1989; Hammer & Weiss, 1999; Roberts, Jurgens, & Burchinal, 2005; Tizard & Hughes, 1984). Per Damico and Damico (1993):

As with individuals from the mainstream culture, CLD students employ their language systems and their social skills to establish themselves in their cultural contexts. Within their homes, neighborhoods, and spheres of exposure, these students socialize, learn, and develop their unique identities in ways similar to their mainstream peers. While there is variation in the ways that these students interact and employ their social skills in the different cultures, the basic intentions and goals are much the same. (p. 237)

The disagreement in expectations of pragmatic behavior by demographic group may be due to how earlier studies (Butterworth & Morissette, 1996; Goodwin, 1990; Halliday, 1975) usually examined prosody, rate of speech, gestures, or standard expressions—not CFs, and how the current CF codes differed from other taxonomies used with CLD preschoolers (Llinares & Pastrana, 2013; Riesco Bernier, 2007). Despite this variation in the thin corpus of relevant data, the overall picture is that there may be differences by race/ethnicity, poor/nonpoor SES, and gender. Without normative data, exploration of these factors is still warranted as they are cumulatively salient to low SES boys of color who are at the lowest end of the achievement gap

(Barbarin, 2013; Gutman et al., 2003). Accordingly, we explore child and mother CFs in the context of mother-child interaction with the following questions:

- 1) What is the relative proportion of child CFs and do proportions vary by race/ethnicity, poverty status, or gender?
- 2) What is the relative proportion of mother CFs and do proportions vary by race/ethnicity or poverty status?
- 3) What is the relative proportion of Late Emerging and Early Emerging child CFs and do proportions and overall talkativeness vary by race/ethnicity, poverty status, or gender?
- 4) What is the relative proportion of Late Emerging and Early Emerging mother CFs and do proportions and overall talkativeness vary by race/ethnicity and poverty status?

Methods

This study draws from the Family and Social Environments (Family) study, a 511 family subset of the randomly selected, National Center for Early Development and Learning (NCEDL, 2005) Multistate Study of Prekindergarten sample (N=960) 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 visits². Written consent was collected by interviewers during home visits to 296 families.

Participants

Analyses were conducted on 95 primarily English-speaking EA, AA, and LA custodial mother-child dyads that had complete data at the time of analysis. NCEDL inclusion criteria were a) children 4 years old, meeting the age criteria for Kindergarten eligibility for the next year (average age at fall assessment was 53.86 months [$SE = 0.21$]) and; b) no IEP. Families were

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

asked what language(s) was spoken, resulting in English being the most frequent (86%), Spanish next (26%), and other languages last (5%). NCEDL personnel had labeled the data for the primary language spoken during the interaction and this was verified by the current study's research assistants (RAs) when converting data to DVDs. The resulting distribution was 35% AA (60% poor, 40% non-poor), 37% EA (46% poor, 54% non-poor), and 28% LA (35% poor, 65% non-poor), with girls making up 54% of the sample. 49% (n= 46) came from non-poor homes. The mothers' Mean educational level in the NCEDL dataset was 12.9 years, with 41% reporting a high school diploma as their highest level and 17% not having graduated from high school.

Procedures

Dyads were videotaped during an interaction developed by the Early Childhood Research Network (NICHD, 2003) for a maximum of 30 minutes (Mean duration of 15.14 minutes [$SD=3.98$]). This interaction was considered a suitable language sample from which to capture functional language because it provided some structure to maintain consistency of data collection across subjects, yet allowed dyads flexibility to guide the interaction. Interactions included two tasks that are difficult for a 54-month-old to complete independently, and one task to prompt play (NICHD, 2003). Mothers were briefly instructed 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) engage in free play with animal puppets. Interactions were recorded with a SONY DCR-TRV530 video camera onto SONY Hi8 MP 8 mm cassettes. Cassettes were converted to DVDs with a Pinnacle Dazzle DVD recorder, and RAs viewed and transcribed interactions using Windows Media Player 9 Series, with the resultant transcripts copied into Microsoft Excel 2000 for coding.

Training and reliability. Four RAs (two EA, one AA, and one Asian American) were trained to transcribe. When disagreements arose, the RAs and first author discussed incongruities

for consensus. Once 90% agreement (word for word) was established on practice cases, RAs transcribed independently. Reliability was calculated on 15% of the sample with random checks performed to ensure that reliability remained $\geq 90\%$. Samples were segmented into Communication Units (C-Units), which are independent clauses with modifiers (Loban, 1976). As used by Craig, Washington, and Thompson-Porter (1998), the method of C-Unit segmentation allows single words (e.g., “oh,” “yeah,” “no”) and other nonclausal verbalizations to serve as utterances if they are in response to the adult. Hereafter, C-Units will be called “Utterances”. One RA was trained by reviewing the taxonomy and practicing on non-study interactions. Coding was done while watching DVDs and any discrepancies were discussed to improve agreement. Interclass 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. The first author coded the entire sample and interrater agreement was calculated on 20% of the sample, yielding an ICC of .907 (excellent reliability) for all codes combined, with its 95% confidence interval ranging between .720 and .961. The ICC for child codes was .692 (approaching acceptable reliability of .700) and ICC for mothers’ codes was .934 (excellent reliability).

Development of coding system. Transcripts were analyzed using an adaptation of Tough’s (1984) coding system where broad codes are divided into cognitive distinctions that provide a more robust description of CFs, indicating variations in communicative intent (Hwa-Froelich et al., 2007). Because Tough’s system does not include “Responding,” which was often observed in Stockman (1996) and Hwa-Froelich et al.’s, (2007) studies of low-income AA preschoolers, it was added. Henceforth, CFs refer to eight major categories: *Responding*, *Self-maintaining*, *Directing*, *Reporting*, *Reasoning*, *Predicting*, *Projecting*, and *Imagining* (Stockman,

1996; Tough, 1984) (See Online Supplement Appendix A). Five of the codes were mutually exclusive with one code per utterance, except in two cases where double coding was allowed, reflecting the difficulty researchers have had assigning only one CF per utterance (Llinares & Pastrana, 2013). Specifically, coding of Directing and Reasoning together and Directing and Imagining together applied to multiple utterances, resulting in proportions that exceeded one. 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.” In the second instance, “You have to let me play, Mr. Lion” was coded as both “Directing-Collaboration-Negotiating Presence” and “Imagining”.

Measures. *Parent questionnaire (NCEDL, 2005).* Income, gender, and race/ethnicity were ascertained via parental self-report. Race/ethnicity categories included African American, Latino American, European American, Asian/Indian, and Other, with participants allowed to select one. In the states used in this sample, poor status is customarily defined as household income \leq 150% of the federal poverty guideline (\$32,107 for a family of four) to ascertain which families need state-supported Pre-K programs (USDHHS, 2001).

Analysis plan. The distributions of demographics were normal, and there were no missing data. Because CF counts were not normal, however, where 36 out of 95 children did not have Predicting and 77 did not use Projecting, a square root transformation was applied to smooth the skewed right distribution. Child Predicting and Projecting stayed skewed but remained in the analysis because they represent CFs that might be still emerging in 4-year-olds (Greene & Burleson, 2003). Due to uneven, smaller groups once subdivided by demographics, nonparametric (Dallal, 2000) Kruskal-Wallis tests were used with null hypotheses that there are no statistically significant differences between median proportions of CFs by demographics.

The alpha value for significance was set at the $\leq .05$ level. The eta squared (η^2) (non-parametric form of effect size) was calculated using chi-squared divided by N-1 ($\chi^2/N-1$). Using Cohen's effect size intervals, Lenhard and Lenhard (2016) interpret the magnitude of η^2 into intervals of: .004 to .059: small effect; .060 to .139: intermediate effect and; .140 and higher: strong effect. Effect sizes for follow up, Mann-Whitney U tests (Fritz, Morris, & Richler, 2011) were calculated as the correlation coefficient $r (Z/\sqrt{n})$ with 0.5 indicating a large effect, 0.3 as medium, and 0.1 as small. To control for variation in the total frequency of utterances or 'talkativeness' (Leaper & Smith, 2004), proportions³ of the CFs (e.g., frequency of Mother Self-maintaining/Total Mother Utterances) and Late and Early Emerging CFs were used.

Results

To verify that language samples were comparable, the total number of seconds spent in each interaction, duration of the block task, duration of the maze task, and duration of free play served as DVs in three Independent Samples Median tests with race/ethnicity, poverty status; and gender as IVs. As the tests showed no significant differences by group, the lengths of the interactions were considered comparable and used in their entirety.

Child Proportion of CFs by Socio-cultural Factors

Descriptive statistics for the proportion of all eight child CFs showed Child Imagining, Responding, and Reporting occurring most often, with Projecting and Predicting observed the least (See Online Supplemental Table 1). The Kruskal-Wallis revealed a significant difference in Child Reasoning by poverty, $\chi^2(1) = 3.862$, $p = .049$, $\eta^2 = .04$ (small effect), with a mean rank of 42.50 for children who were poor and 53.62 for those who were non-poor. Child Self-

³ It is possible to have a proportion over 1, due to double coding of Directing with Imagining or Directing with Reasoning. As Directing constituted the largest proportions for both children and mothers, proportions approached 1 when they were added to other CFs to make composite variables of Early Emerging CFs (Responding, Self-Maintaining, Reporting), and even more so for Late Emerging when Directing was double coded with Reasoning and Imagining. Online Supplemental Tables 1 and 2 show Descriptive proportions of individual CFs.

Maintaining differed by gender, $\chi^2(1) = 4.462, p = .035, \eta^2 = .05$ (small effect), with a mean rank of 41.57 for boys and 53.55 for girls. For Child Predicting, $\chi^2(1) = 3.982, p = .046, \eta^2 = .04$ (small effect), the mean rank was 53.91 for boys and 42.90 for girls.

Mother Proportion of CFs by Socio-cultural Factors

For Descriptive statistics of mother CFs, Directing and Reasoning occurred at the highest proportions with Projecting, Self-Maintaining and Predicting observed the least (See Online Supplemental Table 2). For race/ethnicity, the Kruskal-Wallis test showed a significant difference in Mother Directing, Mother Reporting, and Mother Responding (Table 1).

<Insert Table 1 Here>

Mann-Whitney U tests indicated that mothers who were AA had significantly more Directing and less Reporting and Responding than EAs and LAs (Tables 2 and 3). Mothers who were EA had significantly more Reporting than LAs (Table 4), and mothers who were LA had more Reporting than mothers who were AA (Table 2).

<Insert Tables 2, 3, and 4 Here>

The Kruskal-Wallis test for poverty showed a significant difference in the proportion of Mother Directing, $\chi^2(1) = 11.071, p = .001, \eta^2 = .12$ (medium effect) and; Mother Responding, $\chi^2(1) = 8.954, p = .003, \eta^2 = .10$ (medium effect). The Directing mean rank for those who were poor was 57.31 and 38.49 for mothers who were non-poor. Mothers who were poor had a Responding mean rank of 39.63, with non-poor at 56.55.

Emerging Child and Mother CFs by Socio-cultural Factors

Descriptive statistics for the proportion of Child Early and Late Emerging CFs disaggregated by race/ethnicity, poverty, and gender are shown in Table 5, and for mothers in

Table 6. Child Early Emerging CFs occurred more than Mother Early Emerging CFs, while Child Late Emerging CFs were less than Mother Late Emerging CFs.

<Insert Tables 5 and 6 Here>

For children, the Kruskal-Wallis test showed a significant difference by poverty for Total Child Utterances at $\chi^2(1) = 6.577, p = .010, \eta^2 = .07$ (medium effect), with the mean rank for children who were poor being 40.82 and non-poor being 55.33. For mothers, there was a significant difference by race/ethnicity for Total Mother Utterances, $\chi^2(2) = 8.029, p = .018, \eta^2 = .09$ (medium effect), and Mother Early Emerging CFs, $\chi^2(2) = 7.145, p = .028, \eta^2 = .08$ (medium effect). Mothers who were EA had a mean rank of 37.74, mothers who were AA had 52.06, and mothers who were LA had 56.33 for Total Mother Utterances. The mean rank for Mother Early Emerging CFs was 57.43 for mothers who were EA, 39.88 for mothers who were AA, and 45.70 for mothers who were LA. The Mann-Whitney U test showed that mothers who were EA had more Early Emerging CFs than mothers who were AA ($U = 385, p = .010, r = .26$) (medium effect), while Total Mother Utterances were significantly greater for mothers who were LA ($U = 293.5, p = .013, r = .26$) (medium effect) than mothers who were EA.

Discussion

Our findings of no racial/ethnic variation in CFs for children were consistent with others (Damico & Damico, 1992; Hammer & Weiss, 1999), while mothers' racial/ethnic differences were more in line with research identifying potential racial/ethnic differences in pragmatic behaviors (Green, 2002; Terrell & Terrell, 1996). Directing occurred the most for all mothers, but those who were AA and poor directed significantly more than others. In general, all children demonstrated all CFs with Imagining, Responding, and Reporting appearing most for children.

Projecting and Predicting were observed the least, commensurate with the notion that they are still emerging in 4-year-olds (Greene & Burleson, 2003; Lucariello et al., 2004).

Proportion of Child CFs by Race/ethnicity, Poverty, & Gender

Notably, children of color, who are at higher risk for academic failure (Hosp, 2017) and disproportionately referred for behavioral and special education services demonstrated Predicting and Projecting in proportions similar to those who were EA. Leaper et al. (1999) also failed to find racial/ethnic differences when their gender analysis was replicated with children who were AA and compared to their earlier study of children who were EA.

The only poverty difference for individual CFs was children who were poor having less Reasoning, consistent with Tough's (1977) data. Hammer and Weiss's (1999) work showing similar CF use between children who were AA and EA, regardless of whether they were from low or middle SES families, reinforces current findings of few poverty differences and refutes Tough's (1977) observation of less cognitive complexity in children from low SES homes.

Boys had a higher proportion of Predicting than girls, in contrast to Hwa-Froelich et al. (2007) who rarely observed Predicting. Hwa-Froelich et al. (2007) observed children during free play with peers, however, so those children did not have the same opportunity current participants did to demonstrate Predicting in response to adult prompts or scaffolding. Kloth et al., (1998) found mothers to use a more 'explaining' style with boys when scaffolding. This, coupled with Barbarin and Jean-Baptiste (2013) showing mother Explaining to positively relate to child language outcomes might suggest an association between mothers' increased explaining style with boys and their boys' increased Predicting, which is later emerging and more complex.

Conversely, boys used less Self-Maintaining, indicating that they may develop this CF later. Leaper and Smith (2004) found boys using more self-assertive speech while girls were

more talkative and used more affiliative speech, which included expression of emotions. Self-maintaining also included expression of emotions and Middleton (1992) also found girls to use more reporting of personal facts and feelings, which would be considered Self-maintaining. When preschoolers are limited in how they communicate their emotions, resolving conflicts and expressing wants and needs is more challenging (Cole, Zahn-Waxler, Fox, Usher, & Welsh, 1996), negatively affecting socio-emotional development and academic success years after preschool (Barbarin, 2013; Cole et al., 1996). These results raise the question of whether boys' higher referral rates for behavioral and socio-emotional problems might be attributable to lower amounts of Self-Maintaining, justifying further study (Cole et al., 1996; Gillam, 2005).

Proportion of Mother CFs by Race/ethnicity & Poverty

Although race/ethnicity did not play a role in children's CFs, it related to maternal language. The Active-Restrictive parenting style would correspond with mothers who are AA having significantly more Directing and less Responding than mothers who are EA and LA. This suggests that EA and LA interactions were more child-led than the dyads that were AA. Mothers who were EA had more Reporting than those who were AA and LA, but mothers who were LA had more Reporting than mothers who were AA. Thus, we accepted the hypothesis that there might be racial/ethnic differences in CF type for mothers and the differences were consistent with previous descriptions of parenting styles attributed to mothers who are AA (Coolahan, et al., 2002; Flynn & Masur, 2007; Fuligni & Brooks-Gunn, 2013).

Mothers who were poor being more directive and less responsive corresponded with Hart and Risley (2003) and Hoff (2006) showing that mothers from low SES homes used language to direct more than to elicit or maintain conversation. The two lowest income brackets (\$2500 and \$7500) constituted 15% of the sample and had a mixture of race/ethnicity, unlike studies cited by

Avineri et al. (2015) in which all participants using welfare benefits were AA, confounding race/ethnicity and SES. Thus, even with some disentanglement of race/ethnicity and SES, a pattern of increased directiveness and decreased responsiveness still appears.

Child Late & Early Emerging CFs & Talkativeness by Race/ethnicity, Poverty, & Gender

Based on Descriptives, children demonstrated more Early Emerging CFs than mothers, while mothers produced more Late Emerging CFs, which is developmentally appropriate. When being taught, children will be in the more 'responsive' role, characterized by earlier emerging CFs like Responding or Reporting. The analyses were not significant for demographic differences in children's Early or Late Emerging CFs, which is coherent with the scarce differences found in individual CFs. Tough (1977) found that children of low SES had fewer late emerging CFs, specifically, Reasoning, Projecting, and Imagining and, although children who were poor also had less Reasoning, there was no poverty difference in Early or Late child CFs.

Total Child Utterances (talkativeness), however, were susceptible to SES where children who were poor had fewer utterances. Thus, when considering the SES 'word gap' for children, these data still hold true to previous observations (Hart & Risley, 2003; Hoff, 2006; Morgan et al., 2015; Rowe, 2012; Tough, 1977) and support researchers' assertions that SES is a robust variable that is not simply indicating confounded racial/ethnic differences (Hoff, 2013; Jensen, 2009). Total Mother Utterances, however, were not affected by poverty, so the SES word gap in quantity (Hart & Risley, 2003) among adults was not realized in this sample, but mothers who were poor being more directive and less responsive corresponded with Hart and Risley (2003) and Hoff's (2006) work when considering quality of CFs. This suggests that, whether the quantity of mothers' language is higher or lower, children of low SES households might still have a smaller language output, showing that the quality of mother language input (CF types)

could be more important than the quantity at age 4 (Avineri et al., 2015).

Mother Late & Early Emerging CFs & Talkativeness by Race/ethnicity & Poverty

Mothers who were EA used more Early Emerging CFs than mothers who were AA, and it would be more developmentally appropriate to use earlier emerging language when teaching preschoolers. This, coupled with mothers who were EA producing more Responses and Reporting, and less Directing might indicate, again, that their interactions were more child-led.

Meanwhile, Total Mother Utterances were related to race/ethnicity only, where those who were LA had significantly more utterances than mothers who were EA. Previous studies have found mothers who were LA to produce less language due, in part, to their stronger association with low SES, lower educational levels, lower quantity of storybook reading, and fewer reading materials in the household (National Task Force on Early Childhood Education for Hispanics, 2007). The context of the current language sample, however, may have prompted mothers who were LA to use more utterances because they were instructed to teach 2/3 of the interaction (Fuligni & Brooks-Gunn, 2013; Paavola et al., 2005). During an interview with Margaret Talbot (2015), Catherine Snow describes the positive side of talkativeness where quantity has often been a proxy for quality, as exemplified by talkative parents having more grammatical variety and sophisticated vocabulary. Whereas, a less responsive, Active-Restrictive parenting style (Coolahan, et al., 2002; Flynn & Masur, 2007; Fuligni & Brooks-Gunn, 2013) has been characterized by more parent utterances (Paavola et al., 2005) and more often attributed to racial/ethnic minority parents during teaching. These contrary connotations of increased parental talking are why studying the use of language (CF) is so important, so as not to make inferences of quality based only on quantity (Hall, 1989). Future study of CFs and the activity type may better clarify the relationship between talkativeness and demographic factors.

Limitations

A drawback of this study was that only major categories from Tough's (1984) taxonomy were counted, but these broad frequency counts still provided direction for future study, such as gender analyses of Self-maintaining subcategories. The use of an existing dataset also limited the type of language sample which may have influenced CF production. For example, Responding was the second most common child CF where they were likely responding to the mothers' Directing/Reasoning utterances one would expect during teaching activities. Thus, future sequential analysis of CFs might elucidate whether preceding CFs affected responses. Even though all participants used only English during the interactions, seventeen percent of the sample also spoke Spanish in the home (14/27 LAs and 2/36 EAs), so the results can only be interpreted with certainty for English speaking families. Other NCEDL variables (e.g., educational level, household size) were not analyzed and may have explained more variance. Further limitations included participants being preschool attendees who may demonstrate CFs differently than those who are not in school and reduced group size due to subdivision of the sample by demographics. However, the sample included more diverse incomes and race/ethnicity than others (Hwa-Froelich et al., 2007; Riojas-Cortez, 2000; Stockman, 1996).

Conclusion

If Total Child Utterances represent quantity and Later Emerging CFs represent complexity, the lack of differences for Late Emerging CFs indicate that CLD children should be expected to demonstrate similar proportions of complex CFs, which is substantiated by Labov's assertion that minority preschoolers (who are often linked to low SES) do indeed use complex language (1969/1979). Unlike the dimension of word knowledge in which boys may have deficits (Hart & Risley, 2003), this study provides little support for the existence of gender

differences in the proportion of 4-year-olds' CFs during interactions with their mothers.

In summary, frequency, variety, and complexity of CF use is theoretically essential to communicative competence, and we must continue to study factors that affect its development, such as caregiver CF use. Clearly, it is important to understand 4-year-olds' CF use across diverse groups because, although the 'word gap' predicts negative academic effects long-term (Hart & Risley, 2003), other language domains like pragmatics are likely contributing to these effects (Avineri, 2015). In particular, identification of socio-cultural factors that affect pragmatics with consideration for interlocutors (supported by Vygotsky's theory that language development is always social and context-dependent and Labov's observation that minority children's language complexity depends on the listener) may bare reasons for disproportionality (Llinares & Pastrana, 2013; Gillam, 2005) and guide development of more accurate and inclusive appraisal of preschool behaviors.

Acknowledgments: This study was partially funded by the Royster Society of Fellows at the University of North Carolina, Chapel Hill: Caroline H. and Thomas Royster Five-Year Fellowship. The NCEDL Multi-State Study of Pre-Kindergarten was funded by the Office of Educational Research and Improvement in the U.S. Department of Education, with the Familial and Social Environments supplement funded by the Foundation for Child Development. We thank all participants, the RAs, Sierra Carter, Kathi Zung Lyons, and Shira Horowitz.

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