INFLUENCE OF CAREGIVER RESPONSIVITY ON TODDLER COMMUNICATION

by

VICTORIA T. ESHELMAN

(Under the Direction of Rebecca Lieberman-Betz)

ABSTRACT

Infants' communication development is dependent on how caregivers respond to their behaviors throughout the day (Breazeal & Scassellati, 2000). A novel peer-coaching model was implemented in three Early Head Start classrooms at an Early Learning Center in the Southeastern United States. The peer-coaching model was developed to (a) increase frequency of appropriate infant/toddler teacher responses to children in their classroom, (b) increase engagement of children, and (c) support social-emotional development of infants and toddlers. This study documented toddlers' communication with their teachers during the sessions with the highest and lowest adult responsivity rates to examine whether toddler communication co-varied with teacher responsivity. Results of this descriptive study suggest that child communication acts do increase as their teachers' rate of responsive acts increase. This is an important finding to support the need for future research regarding best practices in increasing quality communication between toddlers and caregivers in a childcare setting.

INDEX WORDS: toddler, communication, peer-coaching model, Early Head Start, responsivity

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B.A., Georgia State University, 2004

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF ARTS

ATHENS, GEORGIA

2019

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May 2019

DEDICATION

To Faran and Rhodes, my little inspirations for striving to make the world of early childhood education a better place. While this study will not impact you directly today, I hope that it provides insight into a better future for your children and your children's children.

ACKNOWLEDGEMENTS

I would like to express my sincere thanks to my major professor, Dr. Rebecca Lieberman-Betz of the College of Education at the University of Georgia. Dr. Lieberman-Betz's unwavering support of me throughout my master's degree helped keep me focused and push forward even on the hardest of days.

Cara Goldberg thank you for being the most patient and dedicated reliability coder a girl could ask for.

I would also like to thank Dr. Cynthia O. Vail of the College of Education at the University of Georgia whose passion for all-things related to special education ignited my own enthusiasm.

Dr. Jennifer Brown of the College of Education also provided me support during my thesis by shaping the trajectory of my project from her participation on the primary study as well as serving as a member of my committee and providing valuable feedback and guidance.

Lisa McEwen, you got me through the GRE and look at me now!

I appreciate all of the caregivers and students that allowed the taping of their classroom goings-on during the study as well as impacting little minds for the better each and every day.

To my husband, Jason, without his encouragement and ability to have more confidence in me than I have in myself, none of this would have been possible.

Mom and Dad, I did it! None of it would have been possible without the solid foundation and work ethic you instilled in me from the very beginning. I owe you everything, and I hope you know how much I appreciate all of the sacrifices you have made for me throughout my life.

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CHAPTER 1

INTRODUCTION

Approximately twenty million children ages birth to four years old are currently living in the United States, with almost fifteen million children under six years of age potentially needing childcare outside of the home (Child Care Aware of America, 2017). Many aspects contribute to a high-quality childcare environment, but it can be argued that quality interactions between caregivers and children are the most important (Helmerhorst, Riksen-Walraven, Vermeer, Fukkink, & Tavecchino, 2014). The significance of interactions to early development was studied as early as 1978 when educational theorist Lev Vygotsky found that children who worked in tandem with another peer or caregiver had greater social interaction and cognitive development. Vygotsky theorized that children's learning occurs within a Zone of Proximal Development, wherein a caregiver or more competent peer scaffolds children's learning through collaborative and interactive experiences. In addition, studies such as Hart and Risley (1995) support Vygotsky's theory, demonstrating that a child learns from those who are around them - no matter how rich or weak the interaction. By being sensitive and expanding on a child's communication initiations and encouraging joint attention, a caregiver can enhance a child's repertoire of both verbal and physical behaviors even from the first days of life (Taylor, 2015).

Based on the knowledge that quality childcare and improved verbal developmental outcomes hinge on enhanced child-caregiver interactions, it is concerning that a majority of the current published research focuses on elementary age and above child-teacher interactions, with

limited research pertaining to toddler-teacher interactions. Additionally, there is a void in research examining the verbal and observable physical responses toddlers exhibit to their classroom caregivers, and there are even fewer empirical articles examining strategies to enrich the toddler-teacher interaction in early care and education programs (Moreno, Green, & Koehn, 2015). Because there is limited research that makes definitive causal connections between high-quality childcare and children's communication outcomes, it is imperative that researchers examine the strategies early educators use to shape communication development (Patten & Ricks, 2000). The short-term goal of this study is to contribute to the limited research on the verbal and physical engagement of toddlers with their teachers by examining whether varying levels of responsivity of early educators impact the social and communicative engagement of children within their care. The long-term goal is to build evidence that early educators' responsivity to the children in their care impacts the children's engagement and communication in order to enhance best practices regarding reciprocity and engagement in the early childhood classroom.

Conducting empirical studies examining interventions that support teacher responsivity, as well as the downstream effects on child communication and social behavior, is an important step in supporting the wellbeing of infants and toddlers attending early childhood classrooms. One role of early educators is to find consistent ways to maintain quality engagement and high levels of reciprocity with the children in their care. However, creating a new culture within childcare centers around positive caregiving practices is a lot more challenging than it sounds, even with research already documenting positive outcomes for children of sensitive and engaging caregivers (Vu, Hustedt, Pinder, & Han, 2015). This is troubling since children are

spending more and more time with non-custodial caregivers and it is the education, values, and beliefs of the caregivers that are shaping young minds and preparing them for school (Sheridan, Edwards, Marvin, & Knoche, 2009). To contribute to our understanding of how adult-child interactions support early development, and how early care providers can increase their responsiveness to infants and toddlers in their care, this study aims to address the question of whether the rate of children's gestures, vocalizations, one and multi-word utterances, and single signed words vary based on the rate of adult responsiveness.

CHAPTER 2

LITERATURE REVIEW

I. The Impact of Caregiver-Child Interactions on Child Development

Children learn at an early age how to communicate with others in different situations, and it is caregiver reciprocity that helps shape children's appropriate responses within that interactive context, as well as in future interactions. Modeling appropriate behavior such as waiting for a child to finish their question or statement before responding is just one way that caregivers can help children learn strategies to become good citizens and patient listeners (Ostrosky & Jung, n.d.). By following a child's lead and expanding on their vocalization or gestures, a teacher has the power to open up a whole new world of communicative capabilities for the children in their care. It is important for children to learn how to interact with others at a young age to help shape their interpersonal skills for the future. Children who have attentive caregivers early in life are more likely to conduct and express themselves in socially appropriate ways (Taylor, 2015). Children's early relationships with their caregivers can even predict developmental outcomes, such that improvements to caregiver-child relationships can result in positive outcomes both for the child and for the family (Vu, Hustedt, Pinder & Han, 2015).

Lev Vygotsky believed that a child's environment and interactions with others within their everyday environment shape the child's future thinking and learning (Williford, Vick Whittaker, Vitiello & Downer, 2013). Others agree with Vygotsky's theory and believe that children's language development evolves through reciprocal interactions with their parents and a

communal environment in general (Tamis-LeMonda, Kuchirko & Song, 2014; Hart & Risley, 1995). Each communicative interaction in a naturalistic environment between a young child and caregiver presents an opportunity to evolve from a basic healthy connection into a positive relationship, which may translate into higher achievement in later life. Gestures, vocalizations, and one- and multi-word utterances are ways young children communicate, and when they have parents that respond or react or expand on those cues, the child begins to learn labels for objects and more about the world around them (Tamis-LeMonda, Kuchirko, & Song, 2014).

Responsive caregivers assess a child's level of communication and then scaffold communication strategies to help improve the child's ability to communicate. In that regard, responsive caregivers routinely respond to children in their care in a timely, meaningful, and contingent manner, providing children an opportunity to practice their communication skills throughout the day. Responding to children's requests or need for help, imitating children's physical actions and vocalizations/communication attempts, and engaging children by describing what they are experiencing are some ways adults demonstrate responsiveness to the children in their care.

Previous studies have examined associations between parent responsivity and child social-communication behaviors, providing empirical support for the importance of adult responsivity to child development (Giramaletto, 1988). The intervention *It Takes Two to Talk*, the Hanen Program for Parents of Children with Language Delays, is one evidence-based program that supports parent's acquisition of responsive behaviors that promote children's communication and language development. The program helps parents understand their child's communication style and the level at which the child is currently communicating so the parents

can expand and begin to model language during already familiar daily routines. Three randomized controlled intervention studies have examined *It Takes Two to Talk* with children under the age of four and their mothers. In the first two studies, the mothers (N = 52) of children ages 14 – 62 months who took part in the *It Takes Two to Talk* intervention became more responsive by connecting and communicating better with their children; the mother-child interactions were more balanced, frequent, and longer; and parents reported improved family relationships. Authors reported that the children were more assertive, responsive, and able to take more verbal and non-verbal turns (Girolametto, 1988; Tannock, Girolametto, & Siegel, 1992). Additionally, Girolametto, Pearce and Weitzman (1996) conducted a pilot randomized group design study of the Hanen program with 16 mothers and their 23-33 month-old children with severely delayed language development. After the treatment, the mothers assigned to the Hanen intervention used simpler language when communicating with their toddlers, and focused on the repetition of certain words or sounds as a foundation for building their children's vocabulary as compared to mothers in the control group. In addition, although the children in the control group improved due to maturation at the post treatment measurement period, the children in the experimental group showed increased ability to interact and take turns with their mothers, had vocabularies twice as large as the control group, used multi-word sentences, used target words in several ways, used more speech sounds, and had increased their use of symbolic play gestures. Most notably, aggressive/destructive behaviors were also reduced in children assigned to the experimental group in comparison with the control group. The study demonstrates that teaching parents to employ an interactive model of language intervention by focusing on responsivity and

language learning is beneficial to young children with language delays (Girolametto, Pearce & Weitzman, 1996).

Additionally, Hart and Risley (1995) studied how children's vocabulary development correlated with language input of their parents. Families of differing socioeconomic status (SES) with toddlers between the ages of seven months and 36 months were observed in their houses for a total of 1,300 hours of home visits, videotapes, and interviews. While every family had similar routines, the total number of words children were exposed to by four years of age varied drastically based on the family's SES. Hart and Risley found that "the socioeconomic status of the children's families could account for 42% of the variance in the children's rates of vocabulary growth ($r = .65$), 40% of the variance of their vocabulary use ($r = .63$), and 29% of the variance in their IQ test scores ($r = .54$) when they were 3 years old," (p.158).

Hart and Risley's (1995) study demonstrated that the quantity of parental/caregiver talk positively influenced children's vocabulary trajectory in the coming years, and the quantity of parental/caregiver word counts was directly related to SES. It is important to note that 86% to 96% of a child's vocabulary comes directly from words that the child is exposed to in the home. In addition, responding to the child in appropriate ways, whether modeling language by rephrasing or recasting, parental response to the child was more prevalent in the higher SES families than in the lower SES or working class groups. The larger the lexicon of a parent, the more words the child hears, which then leads to the observation of how a myriad of words fit together in context. Hart and Risley label this Language Diversity and their data show that the amount a parent talks is strongly related to the child's vocabulary knowledge and use. Children of families with higher SES heard 30 million more words by age three than from the same age

children living in poverty. Hart and Risley found that children on welfare heard approximately 616 words per hour, children from working class families heard 1,251 words per hour, and children from professional families heard 2,153 words per hour.

In addition to Language Diversity, Hart and Risley (1995) also noted adjacency conditions such as the Feedback Tone, Symbolic Emphasis, Guidance Style, and Responsiveness of each parent-child interaction in order to examine the sequence of responses and categorize the utterances. This method allowed for turn taking to be divided into categories such as initiations, responses and floorholding utterances, which indicated that not all parents from a certain SES responded to their children in the same way- each had their own interaction styles. However, no matter the interaction style of the parents, it was still the SES that predicted the amount of words a child heard over the course of an hour, day, month, and year. A follow-up study was done with 29 of the original 42 families of the now 9 and 10 year old children to investigate how the original study predicted the children's performances in grade school. The analysis showed that quantity of parent talk in the first three years of life was a significant predictor of vocabulary growth, language skill, and reading comprehension by third grade.

Suskind et al. (2016) looked at 18-, 30-, and 42-month-old children and their parents in a small randomized controlled trial to examine whether three responsive strategies (called the "3T strategies"; "Talk More, Tune In, and Take Turns") increased the quantity and quality of the parent-child conversations. There were 11 children in the control group and 12 children in the experimental group. The parent-focused intervention consisted of eight modules based on behavior change literature and provided strategies to help parents increase a child's vocabulary (Talk More), explore children's interests and respond to the individual child through

conversational turns and joint attention activities (Tune In), and strengthen positive child-parent interactions (Turn Taking). The researchers hypothesized that by enhancing the adult's quantity and quality of language in the home, the children's vocabulary would see positive effects. In the lab, the parent and child word types significantly increased over one week post-intervention, but results were less evident four months post-intervention. During intervention in the home, conversational turn counts and child vocalization counts increased, but were non-existent post-intervention. Overall, the results showed that increasing the quantity and quality of adult vocabulary led to increases in the number of child utterances and the mean length of the utterances. The intervention increased the number of conversational turns between parent and child, the diversity and quantity of the parents' vocabulary, and the amount the parents interacted with their children overall. However, as the intervention drew to a close, the adults did not continue to use the 3T strategies, and so the subsequent progress in the children's language diminished, even though the experimental group's word types still remained marginally higher than the control group.

With all of this in mind, it has become apparent that higher levels of parental engagement support a child's mental processes from birth and beyond (Tamis-LeMonda, Kuchirko & Song, 2014). Educating parents on strategies to enhance and expand their children's vocabularies can have a long-term positive impact on development of the child. Therefore, understanding the responsiveness of other significant adults in a child's life has the potential to impact an important component of supporting early development and later academic/social success of a child. As the frequency of children placed in early care settings for a significant portion of their day has

increased in response to societal needs, examining infant/toddler teacher practices, and their impact on child behavior, is an integral area of this study.

a. Young Children and Early Education Classrooms

Society is experiencing a shift in maternal responsibilities as women are returning to the workforce and children are more frequently being cared for by non-custodial adults in childcare centers (Cohn, Livingston, & Wang, 2014). As demonstrated above, research on parental responsiveness to children is extensive but, even with the rising number of children in childcare, there is a lack of research on non-parental interactions with children (Rhyner, Guenther, Pizur-Barnekow, Cashin, & Chavie, 2013). Based on research that demonstrates quality caregiver interaction is of the utmost importance starting at birth, lack of current knowledge in this area is a concern. Additional studies are needed to examine caregiver interactions and responsiveness in early care and education settings. These studies will determine the extent to which early care providers are responding beyond the basic child cues of hunger or a wet diaper to include more complex interactions from which to build a solid foundation for the child's communication and social development. Additionally, work is needed to determine how best to increase caregivers' responsivity to infants and toddlers in their classrooms, and how changes in caregiver responsivity impact child behaviors within interactions.

b. Quality of Childcare Classrooms

Quality of childcare centers and their effects on children's development has become a concern as fewer women are staying at home with their young children. The National Resource Center for Health and Safety in Child Care and Early Education has adopted Caring for Our Children, 3rd Edition, (CFOC3), which contains 686 national standards that represent the best

evidence, expertise, and safety procedures that should be followed in today's early care and education settings. With the guidance of the CFOC3, certain areas are emphasized such as child/teacher ratio, teacher qualifications, and working environments, as well as how these areas impact the children in the teachers' care and are readily assessed for best possible practices (Patten & Ricks, 2000). Though the authors do state that while these areas are extremely important to a child's development, a center that is of higher or lower quality does not always predict the type of long-term outcome a child will experience. However, they do not directly measure the quality of the interactions between teacher and child and how it relates to child outcomes, making it difficult for Patton and Ricks to draw conclusions from these data about how quality interactions between early care providers and young children may in fact predict child outcomes.

The National Institute of Child Health and Human Development (NICHD) Study of Early Child Care convened a team to conduct a study that followed 1,364 children from one month of age in 1991 until 9th grade in 2007 to study how various childcare settings impacted developmental outcomes. The study took place in 10 different childcare locations across the United States and focused on how differing childcare environments impact various aspects of children's long-term development. The study examined the relationship between childcare quality and children's cognitive and language development, children's relationships with their mothers, and the children's self-control, compliance and problem behaviors, as well as peer relations and overall physical health (https://www.nichd.nih.gov/research/supported/seccyd/Pages/overview.aspx). Outcomes for low-income versus affluent families, minority versus white non-Hispanic children, and previous

versus current childcare experiences were analyzed. It was found that the factors that have the most impact on development include mother-child relationship and family characteristics rather than childcare factors, but some characteristics of the childcare center such as low caregiver to child ratio and experiences gained while at the childcare center do contribute, though at a low level in regard to the overall child outcomes. Most importantly, the study noted that the quality of childcare within the first three years of a child's life is a direct indicator of a child's later cognitive function and language ability. The higher the quality of childcare (including more positive language stimulation and interaction between the child and provider), the greater the child's language abilities at 15, 25, and 36 months, the better the child's cognitive development at age two, and the more school readiness the child showed at age three (https://www.nichd.nih.gov/research/supported/seccyd/Pages/overview.aspx). However, Peth-Pierce (1998) found that childcare experiences do not fully indicate school readiness for children from varying SES; details such as family income, maternal vocabulary, quality of home environment, and maternal cognitive stimulation were also strong predictors of a child's cognitive development at 15, 24, and 36 months of age and of language development at 36 months. However, it must be taken into account that higher SES parents lean toward, and can afford to pick and choose between childcare centers until they find a higher quality center which complements their family life including, but not limited to, the higher level of language reflected in the home. Either way, it is clear that an important focus of early care programs should be on supporting the family and the early educators with strategies to engage in highly responsive interactions with their infants and toddlers. While the childcare teachers are not taking the place

of parents, it must be noted that children are spending more time in childcare at a younger and younger age during the time when language, interaction, and development are most important.

c. Child Outcomes and Early Educator Responsivity

Ostroksy and Jung (n.d.) emphasize that certain strategies that teachers employ such as modeling, setting limits, and positive redirection, help build mutual respect between a child and his/her caregiver. However, before a well-defined shift in best practices at the infant/toddler level can be developed, there must be clear expectations established as to what early care providers require for such a high level of care in terms of time and resources (Moreno, Green & Koehn, 2015). Over time, early care providers become attuned to a child's needs while in their care and have support for the time and resources required to attend to every individual need, interest, learning style, and ability (Ostrosky & Jung, n.d.). The responsive environments early educators create foster and encourage the growth of a child's communication development. Even though it is apparent that parents armed with linguistic strategies increase their child's responsivity rates and enhance language development, there is a lack of experimental research that focuses on interventions and strategies to help support teachers in their quest to build their students' foundational knowledge. The same experimental research should follow the students in childcare centers to see the impact in the long run, even though the need to promote the language learning environment of preschool classrooms is well documented in the literature (Cabell et al., 2011; Dickinson et al., 2008; Dickinson & Tabors, 2001; Justice, Mashburn, Hamre, & Pianta, 2008; Pence, Justice, Wiggins, 2008).

Conducting empirical studies is imperative to help identify best practices for increasing child-caregiver reciprocity naturally throughout the day. Ostrosky and Jung (n.d.) state that simple routines such as greeting children getting off the bus, listening and making eye contact with children, getting down on the child's level in one-on-one interactions while speaking in pleasant tones, as well as attending to their basic needs can help solidify child/caregiver relationships.

Studies have been conducted to examine the effects of early educators' high level engagement with the children in their care. Modeling, as well as scaffolding, are convenient ways for caregivers to enhance child development. Cabell and colleagues (2011) investigated the effects of preschoolers' language and literacy development before and after teachers participated in a yearlong responsivity education intervention to increase responsivity to their students. The randomized controlled trial included a control group that continued daily routines and the intervention group that received the responsivity education. In this study, responsivity education refers to training adults, including parents and educators (e.g., childcare providers), to increase their capacity to be conversationally responsive partners with children. The teacher responsivity training included methods to encourage increasing children's mean length of utterance and overall engagement during school hours. Cabell et al. (2011) found that while there was little to no main effect on children's language skills across the board, the intervention proved beneficial for children that were already on a higher verbal level. For those children, the intervention seemingly had a positive impact on the children's print-concept knowledge and vocabulary development. The study concluded that teacher responsivity education is important in theory,

but, in order to support language and literacy development for students, much more empirical research is needed.

Justice, Mashburn, Pence, and Wiggins (2008) examined the impact of Bunce's (1995) Language-Focused Curriculum, which provides teachers with tools to recognize natural opportunities for teacher directed development of preschoolers' language and communication. Fourteen teachers and 196 children were randomly assigned to treatment or control groups. The teachers in the treatment group were taught to use Language Stimulation Techniques (LSTs) that included responsive strategies including open ended questions, recasts, and models at a fall and winter workshop and then were supported with daily lesson plans and materials to increase responsivity throughout specific activities. The control group continued with normal lesson plans. A language sample from each child was taken in the fall and again in the spring. At the end of the year, the children's language samples were analyzed for expressive language skills such as percent complex utterances, rate of noun use, number of different words, and upper bound index, and then compared to the language samples from the fall. From the comparison, it was evident the children's language level in the fall, the students' SES, and the students' attendance at school were determining factors in an uptick in students' language growth. This study found that quality regular language focused curriculum (based on attendance) for at-risk children can have a positive effect on accelerated expressive language growth in the prekindergarten classroom. This finding is important and shows that by supporting classroom teachers with language intervention techniques, the teachers have the tools to encourage language growth within the classroom, setting the foundation for children at a younger age.

Friedmann and Woods (2015) used a situated coaching program to integrate strategies to increase communication within the natural sequence of the day. Part C providers coached teachers regarding strategies for communication, using demonstration, observation techniques coupled with feedback sessions, and teacher reflections. Of the three children that took part in the study, one had a global developmental delay, one had cerebral palsy, and one had autism. All three averaged about one communication act per minute in the baseline assessment. The coaching program was associated with a marked increase in the engagement of the teachers (more so in play than caregiving activities) which, in turn, was associated with increases in all three children's rates of communication. Two of the children showed immediate communication improvements with the onset of the intervention and a third showed moderate gains about half-way through, with continued improvement. The teachers were reevaluated three months post-intervention and it was found they were actively maintaining the integration of the intervention strategies. This smaller study is important because it shows collaborative coaching and incorporating communication strategies into classroom routines can impact communication levels in children with developmental delays.

A subsequent study was conducted by Romano and Woods (2017) to expand and further investigate the coaching methods in high poverty settings to support child communication. The single-case multiple baseline design in which three Early Head Start (EHS) teachers with children who received Part C services in their classrooms held joint planning sessions with interventionists to strategize how to embed responsive strategies in one-on-one play and caregiving routines with toddlers with communication delays. The dependent variable was the teacher's percentage of use of a responsive communication model. The EHS teachers used the

strategies within intervention and maintenance during play routines and caregiving routines, and the toddlers' communication rates were found to increase during both. Romano and Woods found that visual analysis of the data showed a positive, functional relation between the coaching intervention and teacher strategy use. It was observed that the children experienced positive impacts on their communication during intervention including mean words per minute, rate of communication, and acts per minute throughout both routines. This study used a similar coaching approach to Friedman and Wood's 2015 study, but was able to further improve the quality of language input to the target child through the teachers' use of responsiveness strategies through language models, expansions and imitations, which allowed for further communication growth by the children in their care.

II. Skills of and Professional Development for Early Childhood Teachers

Ostrosky and Jung (n.d.) made a crucial point when they said that "In early childhood settings, each moment that teachers and children interact with one another is an opportunity to develop positive relationships," (p. 2). Consequently, the quality of these interactions hinges on the education, whether formal or informal, of the adults teaching in the early education classrooms. Since early educators' pre-service education, experience, and instructional methods are three indicators of a child's learning while in the childcare center as well as the child's readiness for school (Sheridan, Edwards, Marvin, & Knoche, 2009), early childhood educator's pre-service and professional development coursework should ensure encouragement of and strategies for interactions that are rich with language learning and provide techniques for encouraging reciprocity between teachers and children (Cabell et al., 2011). Unfortunately, fine-tuning continuing education classes might not be enough to improve the skills, add to the

professional education of the teacher, or aid the children in school readiness. Other factors such as low wages, lack of benefits, and inability to leave the classroom to attend continuing education classes also impact the teachers' classroom performance (Ullrich, Hamm & Schochet, 2017). However, for parents, teachers, speech-pathologists, and children alike, it is of the utmost importance to examine avenues to increase quality language instruction (Cabell et al., 2011). Research supports that higher quality childcare centers have teachers that are paid well, feel valued, and are educated; however, in the current climate, early educators do not have the respect they deserve nor are they compensated or supported in the ways that are needed to educate the children, and the future leaders of our country (Ullrich, Hamm & Schochet, 2017, online).

III. Peer-Coaching Responsive Behaviors in the Classroom

The current study is focused on examining toddler's communication with their teacher and is complementary to a primary study that included the implementation of a novel peer-coaching model to examine the means by which teachers can provide peer coaching to each other in order to support their students' early socio-emotional and communication development by increasing appropriate responsive behaviors and engagement. The study was implemented with a diverse sample of teachers and children in three Early Head Start classrooms at an Early Learning Center in the Southeastern United States. The current study uses the same video footage from the primary study to observe and code the toddlers' communication behaviors with their teachers during the sessions with the highest and lowest adult responsivity rates. This study adds to the primary study by examining the association between teacher responsivity and toddler communication. While no therapeutic effects of peer coaching on teacher responsivity behaviors were detected, the current study aims to indicate whether the children's communication levels

co-varied with the teachers' rate of responsivity. It was hypothesized that children would communicate less with teachers during sessions with low adult responsivity, and communicate more with teachers during sessions with high adult responsivity.

CHAPTER 3

RESEARCH METHOD

I. Overview

Direct observational methods were used to examine the influence of teacher responsivity on toddler communication. The coding scheme was adapted from the Early Communication Indicator (ECI; Luze et al., 2001) and measured the frequency of children's gestures, vocalizations, and single- and multi-word utterances. Video of the teachers' highest and lowest total responsivity sessions were coded to derive the rate of toddler communication turns during 10-minute video sessions of classroom activities and routines.

II. Participants

This study included a sample of toddlers attending Early Head Start at an early learning center in the Southeastern United States. Participants were selected as part of a primary study implementing an intervention to increase childcare providers' responsivity through peer coaching. As can be seen from the descriptions below, teachers and children provided a diverse sample of individuals for the current study.

TABLE 1. CLASSROOM DEMOGRAPHICS

Demographics for the three Early Head Start classrooms

Class	Children in Class*	Documented Delays/Services	Teacher	Race	Languages Spoken	Education
1	8 students 34-41 months 4m/4f 8B	1 IEP; 1 child with glasses	Tiffani	Black	English	Associates Degree
			Esther	White	English	Associates Degree
2	8 students 5m/3f 25-35 months 7B/1 WH	1 child received Part C as infant; 1 child's mother has special needs	Michelle	Black	English	Bachelor's Degree
			Wendy	Black	English	Associates Degree
3	8 students 3m/5f 22-35 months 7B/1BR	1 SDD; 2 Part C**	Nancy	White	English	Bachelor's Degree
			Ingrid	Filipino	English and Filipino	Associates Degree

Note: *all students list English as their primary language; **one student receives physical and occupational therapy and another for overall developmental delay

Classroom 1, taught by Tiffani and Esther, consisted of eight students - four boys and four girls. The children's ages ranged between 34 months and 41 months. All the children in the class were Black/African American and spoke English as their primary language. One child had an Individualized Education Program (IEP) and one child wore glasses. The children had been in the classroom with Tiffani and Esther since they started attending the center.

Classroom 2, taught by Michelle and Wendy, consisted of eight students - five boys and three girls. The children's ages ranged between 25 months and 35 months. Seven of the children in the class were Black/African American, one was White Hispanic, and all spoke English as

their primary language. One of the children received Part C services as an infant and one child's mother had special needs. The children had been in the classroom with Michelle and Wendy since they started attending the center.

Classroom 3, taught by Nancy and Ingrid, consisted of eight students - three boys and five girls. The children's ages ranged from 22 months to 35 months. Seven children were Black and one child was bi-racial. All children spoke English as their primary language. One child had a significant developmental delay and attended a self-contained classroom upon turning 3 years of age. Two children received Part C services, one for physical and occupational therapy and one for overall developmental delay. The children had been in the classroom with Nancy and Ingrid since they started attending the center.

Participant consent for the primary peer-coaching study was obtained through a recruitment letter and consent form given to teachers to indicate their agreement to participate in the study. Subsequently, parents of children in the consenting teachers' classrooms were given a recruitment letter and consent form seeking permission for their child to participate. All teachers and infants/toddlers that have documented consent forms on file were included in the study. This study was approved by the University Institutional Review Board. All adult and child participants were given pseudonyms to protect their identity.

III. Setting

The study took place in three Early Head Start (EHS) classrooms housed in an early learning center in the Southeastern United States. The center is both federally and state funded. The center housed several of the county's lottery funded Pre-Kindergarten classrooms, federally funded Early Head Start and Head Start classrooms, collaborative general education-special

education preschool classrooms, and self-contained Preschool Special Education classrooms. The model of the center focused on the whole child and, to that end, there was an in-house health manager, safety manager, four education specialists, 100 slots for homebased EHS, a cafeteria and a gym. The EHS program followed a Continuity of Care model, in which a child started and remained with the same teacher dyad year after year until the child phased out of EHS. Continuity of Care is important for infant/toddler classrooms as the model provides a sense of safety and consistency for very young children while they are at school and away from their primary caregivers.

The three classrooms where the video-recordings took place were arranged to provide direct line of sight throughout to allow for optimal teacher-child interaction. All three classrooms had similar arrangements and materials. Each room had designated areas for large group activities with a rug and smart board. The manipulatives (blocks, puzzles) were kept on shelves around the large group rug. These low shelves helped section off the room into different areas and provided much needed storage. There was an area with tables for meals and table/writing activities. On the wall, the art supplies were visible, but put out of child reach on high shelves close to the tables. The dramatic play areas included a kitchen area with stove and sink, dress up clothes, menus from local restaurants, dolls with clothes, high chairs and cradles, and play food. The music and movement area had nursery rhymes printed and laminated on the walls. Musical instruments were kept in a plastic tub out of reach of the children. The nature and science area had information on the current unit theme, a live animal, a plant, magnifying glasses, goggles, and the lifecycle of a butterfly laminated on the wall. The reading area had a child-sized couch and chair and a bookshelf with a selection of children’s books. Daily schedules were prominently

displayed in each classroom, which included pictures with words for easy recognition by non-readers. The schedule included arrival, breakfast, centers/small group/good morning circle time, music/movement, outdoor learning, lunch, naptime, and end of day/leaving.

The teachers were most commonly observed sitting on the floor or in low chairs on the child's level. Objects in the classrooms were labeled in both English and Spanish (e.g., the door, the clock, blocks, refrigerator). Areas of the room were also labeled with the appropriate early learning and development standards such as "learning about letters" and "schedule displayed". A word list for each child was kept on a wall for easy access so teachers could add new words as children used them. The lists were broken up by month to show the progression of the children's expressive vocabulary. Information for parents including a calendar, curriculum schedules, and classroom news was kept on a bulletin board by the door close to the cubbies/coat racks for the children's belongings. There was a bathroom attached to the room as well as an adult sink area and a children's sink area outside the bathroom and close to the table area. When the children went outside for recess, all the children shared the same playground on the side of the building.

IV. Materials and Equipment

For this study, the video footage of the child-caregiver interactions from the primary peer coaching intervention study were coded using event recording. The materials and equipment used in this study were a computer, noise canceling headphones, Microsoft Excel, and an adaptation of the ECI.

V. Response Definitions and Recording Procedures

The sessions were filmed by a Special Education doctoral student in the EHS classroom. The teachers and children were asked to continue with normal routines and ignore the videographer as best they could. The three highest and three lowest teacher responsivity sessions were coded for each of the six teachers, resulting in six hours of coded child data. The highest and lowest teacher responsivity sessions were identified using the data collected in the primary peer-coaching study. Sessions that included whole group activities were excluded because it was not expected that children would exhibit typical communication levels during whole group instruction.

Frequency of verbal and non-verbal child social communication behaviors were coded based on the adapted ECI (Luze et al., 2001). Gestures, vocalizations, and single and multiword utterances were coded. The full coding scheme is attached as Appendix A. Gestures included physical movements in attempt to communicate with the focus teacher (communication partners). Vocalizations were defined as non-words or unintelligible verbal utterances voiced by the child to the focus teacher (e.g., a moo when playing with a toy cow with a caregiver). Single word utterances were defined as single words voiced by the child that were understood as single words and not as vocalizations, which included recognizable single words that may not be articulated perfectly but were understandable to the viewer as conventional words (e.g., apple, ball, baby). Multi-word utterances were defined as a string of two or more words voiced by the child that were understood as multi-word utterances and not single words or vocalizations (e.g., red ball, good job, more please). All data were coded during normal classroom activities that

included mealtimes, small group, centers, and one-on-one interactions, but not large group instruction.

VI. General Procedures

Child communication with their teachers was measured through direct observation during the video-recorded sessions with the highest and lowest teacher responsivity rates. During the video-recorded sessions, the total number of child communicative acts, the number of children present, and the type of communication act were coded.

VII. Research Design

Because child variables were not under experimental control, this study used a descriptive design to examine infant/toddler communication in the form of gestures, vocalizations, and one/multi-word responses to their caregivers during the caregivers' three most responsive and three least responsive videoed sessions and examined whether the responsivity rate of the child increased or decreased based on caregiver acts.

VIII. Interobserver Agreement

A master's student in the Department of Communication Sciences and Special Education was the primary coder of child communication acts. A reliability coder was trained by the primary coder to at least 70% agreement on three sessions. This level of agreement was considered acceptable because of the complexity of the coding scheme and context for observation (Cooper, Heron, & Heward, 2007). Once this level of interobserver agreement (IOA) was reached for three training files, the second observer coded one of the three lowest and one of the three highest responsivity rate sessions for each caregiver.

The reliability coder used a random number generator to identify one of the three high and three low files to code for agreement for each participant. This ensured at least 33% of low and high responsivity files were coded for agreement across all six teachers. If IOA on the selected file was 70% or above, the coding process moved on to the next set of three files. If IOA was below 70%, the primary and reliability coder consensus coded the video to identify a more accurate number of communication acts. Additionally, the reliability coder selected another session to code in the set of three (this occurred twice). If the IOA was above 70% on the second file, the secondary coder moved on to the next set of 3 files. If IOA was not above 70%, the file was consensus coded and the secondary observer coded the third video in the set (this occurred 3 times). If IOA was below 70% on the third file, it was consensus coded before the secondary observer moved on to the next set of files. Sessions were randomly selected by the second observer so the primary coder would remain blind to sessions coded for IOA. In the end, 56% (10/18) of sessions with the highest rate of teacher responsivity for each participant and 56% (10/18) with the lowest rate of teacher responsivity for each participant were coded for IOA. Point-by-point interobserver agreement was calculated by the number of agreements divided by the number of agreements + disagreements and multiplied by 100. A gross level of agreement was also calculated by dividing the smaller rate of communication acts by the larger rate of communication acts for each session coded for IOA.

CHAPTER 4

RESULTS

I. Interobserver Agreement

Total point-by-point interobserver agreement across all sessions ranged from 51.3%-83.4% with a mean of 69.042% (see Table 2).

TABLE 2: Mean IOA

Mean IOA for both the low and high sessions and overall mean for all six teachers.

Teacher	Mean IOA Low Sessions	Mean IOA High Session	Overall Mean IOA
Tiffani	70.40%	71.40%	70.90%
Esther	75%	67.75%*	71%
Michelle	51.30%**	72.37%**	61.84%
Wendy	73.60%	78.20%	75.90%
Nancy	73.90%	76.90%	75.40%
Ingrid	65.30%**	69.10%*	67.20%

Note: * two sessions were reliability coded, ** three sessions were reliability coded

Gross IOA was also calculated. The range for the gross IOA was 71.4-100 and the overall mean was 88.9 (see Table 3).

TABLE 3: Gross IOA Rate

Mean gross IOA rate for both the low and high sessions and overall mean for all six teachers.

Teacher	Gross IOA Rate Low Sessions	Gross IOA Rate High Session	Overall Mean Gross IOA Rate
Tiffani	77%	95.8%	86.4%
Esther	76.4%	93.4%*	84.9%
Michelle	85.6%**	93.3%**	89.5%
Wendy	96.6%	88.8%	92.7%
Nancy	86.2%	91.3%	88.8%
Ingrid	88.3%**	94.1%*	91.2%

Note: * two sessions were reliability coded, ** three sessions were reliability coded

II. Primary Results

This study examined how children's communication acts co-varied with teachers' rate of responsive acts in three infant/toddler classrooms. A total of 2,881 children's gestures, vocalizations, and one and multi-word utterances were coded over the course of 36 ten-minute videos. Figures 1-6 below show the rate of children communication acts and the percentage of intervals containing an adult responsive acts in each of the three low and three high responsivity sessions. Overall, data show the rate of children's communication acts was higher during sessions where teachers demonstrated more responsive behaviors. The one exception was for Tiffani. While the graph shows her responsive acts increased, the children's communications acts

were relatively stable across high and low responsivity sessions, and perhaps slightly lower during sessions with higher teacher responsivity.

During Tiffani's low responsivity sessions 1, 2, and 3, 48%, 48%, and 44% of intervals, respectively, were coded for her teacher responsive acts. During those same sessions a rate of 8.4, 7.74, 8.4 child communication acts were coded across five, seven, and seven children. During Tiffani's high responsivity sessions 1, 2, and 3, 69%, 79%, and 81% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 6.9, 7.54, and 7.99 child communication acts were coded each across five children per session.

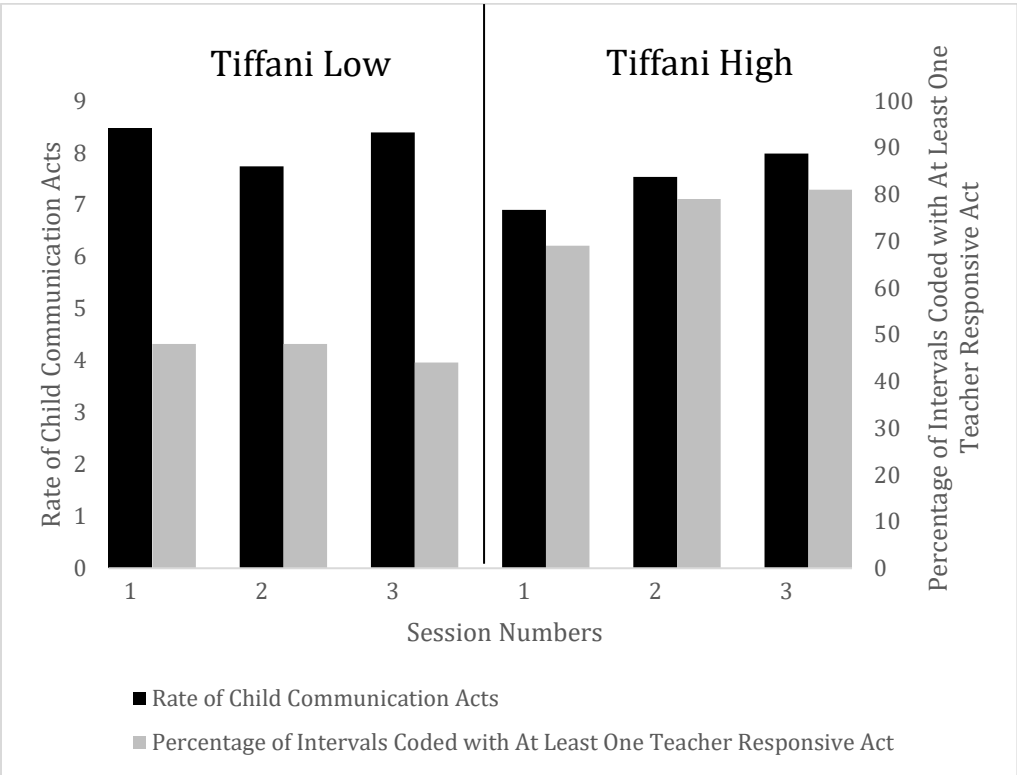

Figure 1. Tiffani's lowest and highest responsivity sessions. The black columns represent the number of children's communication acts including gestures, vocalizations, and one/multiword utterances and the gray columns represent the number of teacher responsive acts per video.

Next, during Esther's low responsivity sessions 1, 2, and 3, 13%, 18%, and 26% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 0.54, 1.9, 1.07 child communication acts were coded across three, three, and four children. During Esther's high responsivity sessions 1, 2, and 3, 70%, 73%, and 72% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 5, 4.34, and 4.18 child communication acts were coded across five, three, and two children.

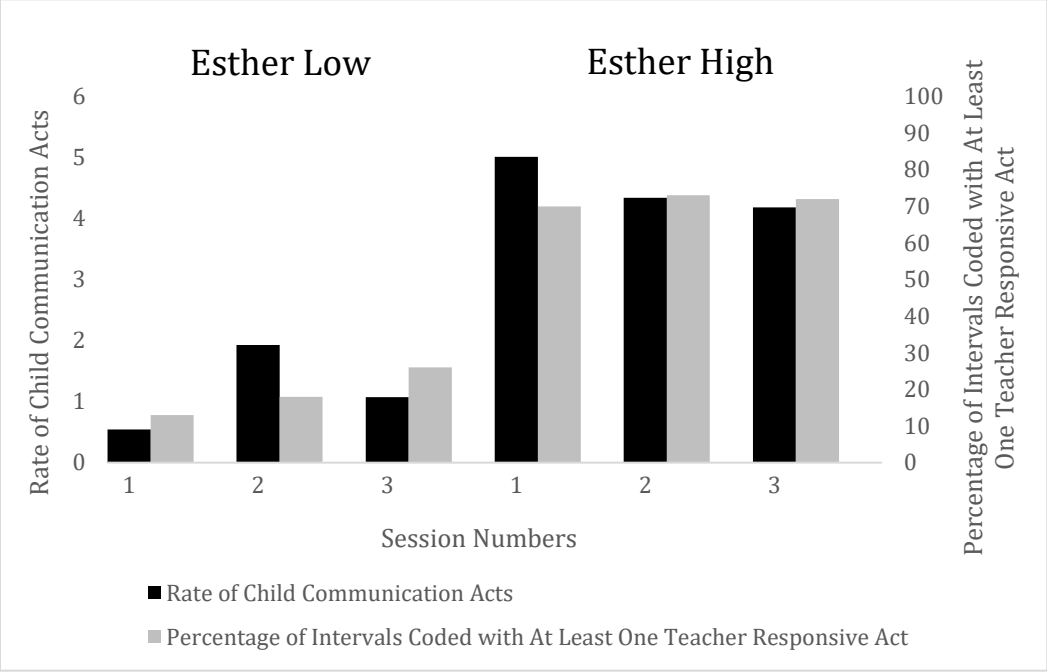

Figure 2. Esther's lowest and highest responsivity sessions. The black columns represent the number of children's communication acts including gestures, vocalizations, and one/multiword utterances and the gray columns represent the number of teacher responsive acts per video.

During Michelle's low responsivity sessions, 1, 2, and 3, 40%, 38%, and 39% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 11.88, 9.23, and 9.72 child communication acts were coded across eight, six, and eight children. During Michelle's high responsivity sessions, 1, 2, and 3, 72%, 70%, and 71% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 10.47, 15.51, and 16.65 child communication acts were coded across five, two and three children.

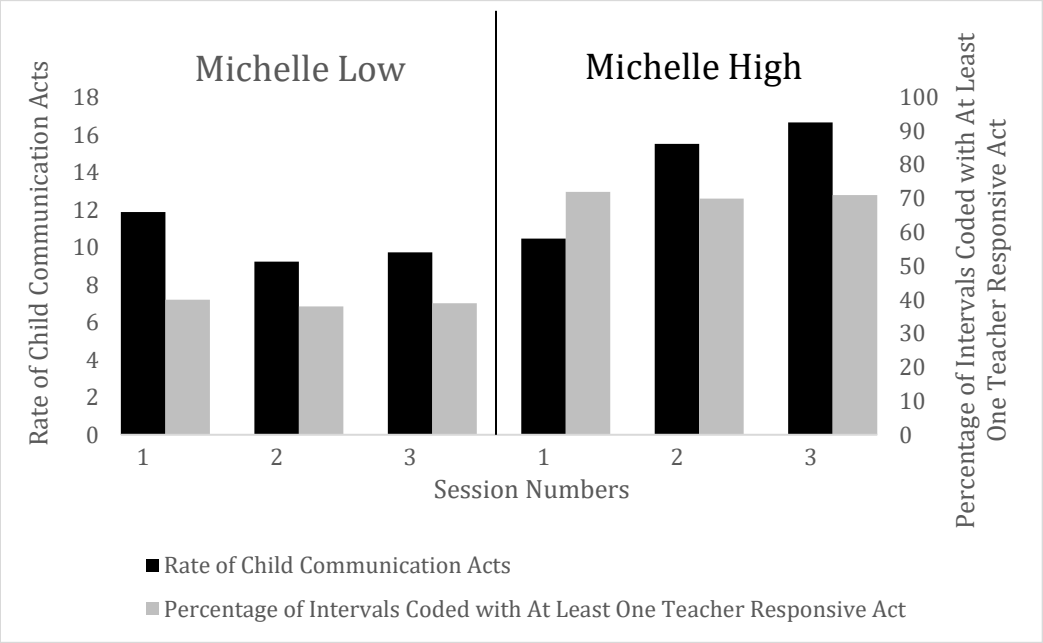

Figure 3. Michelle's lowest and highest responsivity sessions. The black columns represent the number of children's communication acts including gestures, vocalizations, and one/multiword utterances and the gray columns represent the number of teacher responsive acts per video.

During Wendy's low responsivity sessions, 1, 2, and 3, 42, 47, and 44% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 7.2, 11.43, and 8.95, child communication acts were coded across six, six, and seven children. During

Wendy's high responsivity sessions, 1, 2, and 3, 73%, 71% and 81% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 12.18, 11.03, and 13.73 child communication acts each across seven, five, and four children.

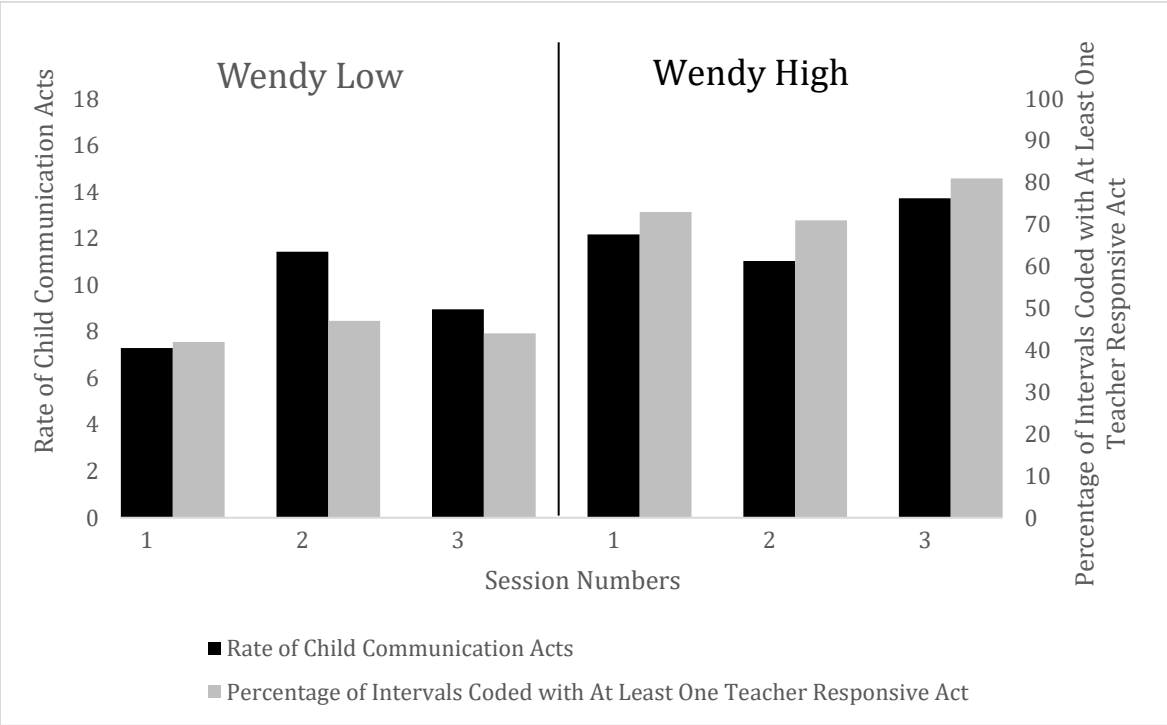

Figure 4. Wendy's lowest and highest responsivity sessions. The black columns represent the number of children's communication acts including gestures, vocalizations, and one/multiword utterances and the gray columns represent the number of teacher responsive acts per video.

During Nancy's low responsivity sessions, 1, 2, and 3, 8%, 10%, and 23% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 3.34, 6.53, and 1.52 child communication acts were coded across seven, five, and four children. During Nancy's high responsivity sessions, 1, 2, and 3, 77, 76, 87% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 7.48, 10.03, and 6.67 child communication acts each across four, four, and one child.

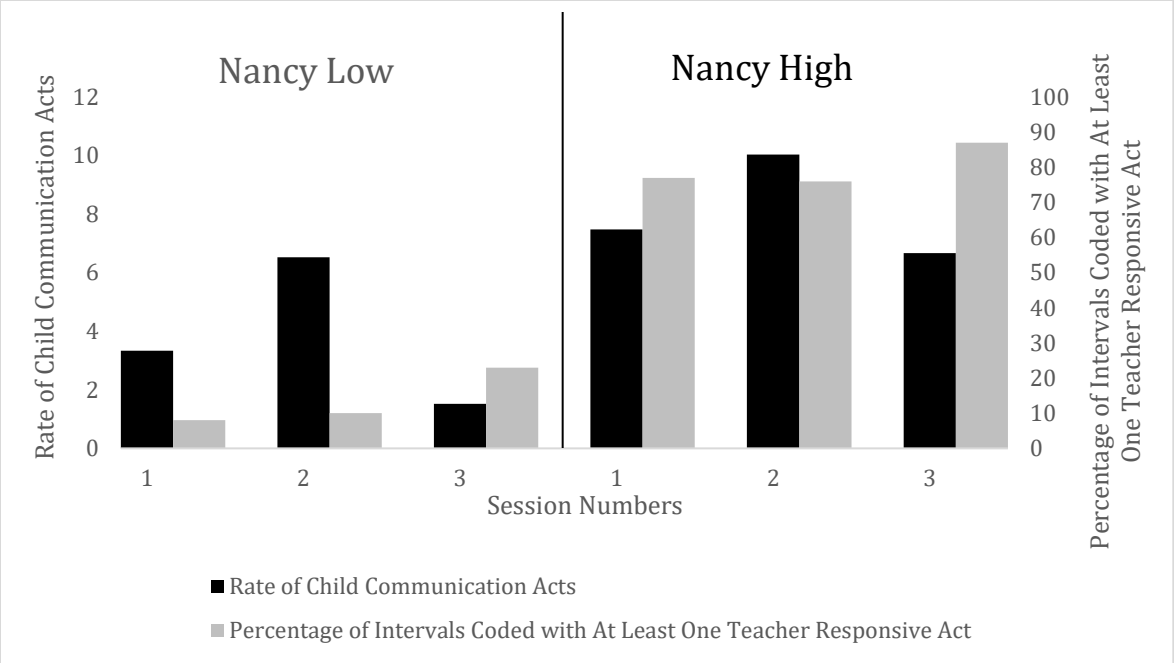

Figure 5. Nancy's lowest and highest responsivity sessions. The black columns represent the number of children's communication acts including gestures, vocalizations, and one/multiword utterances and the gray columns represent the number of teacher responsive acts per video.

During Ingrid's low responsivity sessions, 1, 2, and 3, 27%, 30%, and 44% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 3.22, 3.12, and 5.93 child communication acts were coded across six, five, seven children. During Ingrid's high responsivity sessions, 1, 2, and 3, 81%, 94%, and 88% of intervals, respectively, were coded for teacher responsive acts. During those same sessions a rate of 6.57, 7.16, and 9.72 child communication acts each across five, four, and four children.

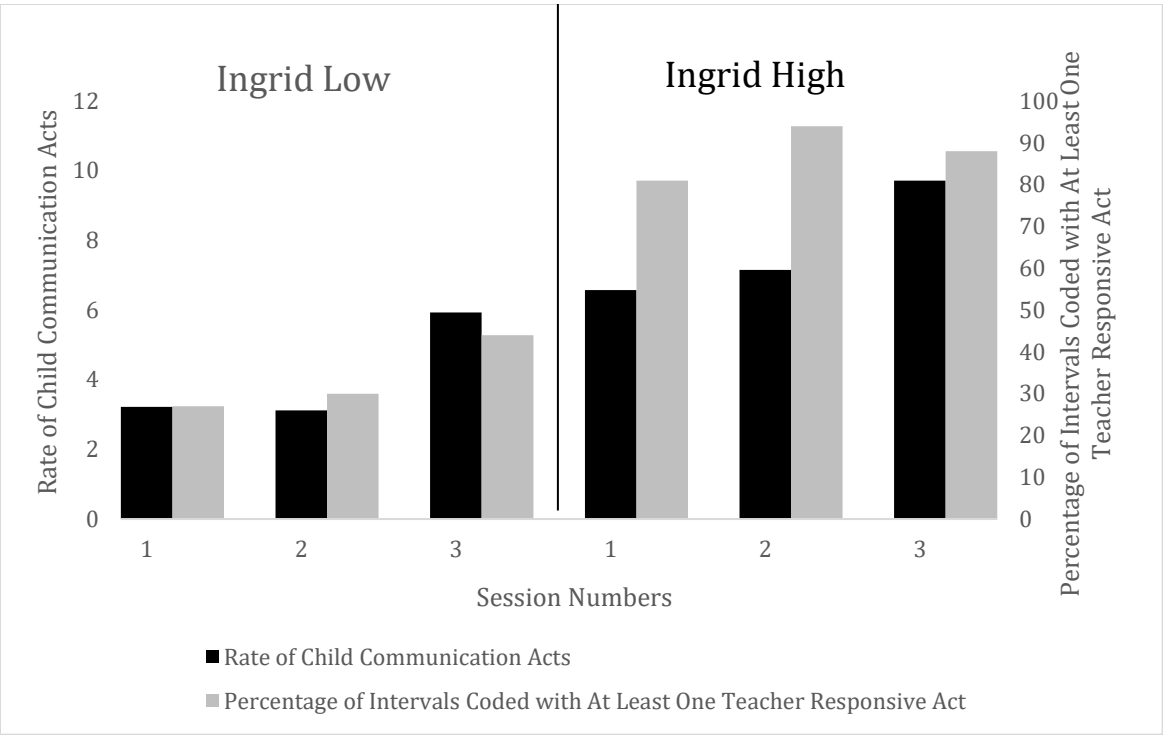

Figure 6. Ingrid's lowest and highest responsivity sessions. The black columns represent the number of children's communication acts including gestures, vocalizations, and one/multiword utterances and the gray columns represent the number of teacher responsive acts per video.

In addition to examining the teacher's total responsive acts and children's total communicative acts for each individual low and high session, the average percentage of teacher responsiveness and the average child communication acts per minute were compared across low and high responsivity sessions. Because length of each session varied slightly, the average rate of children's communication acts was calculated by dividing the total number of child acts in the video by the actual length of the video in minutes.

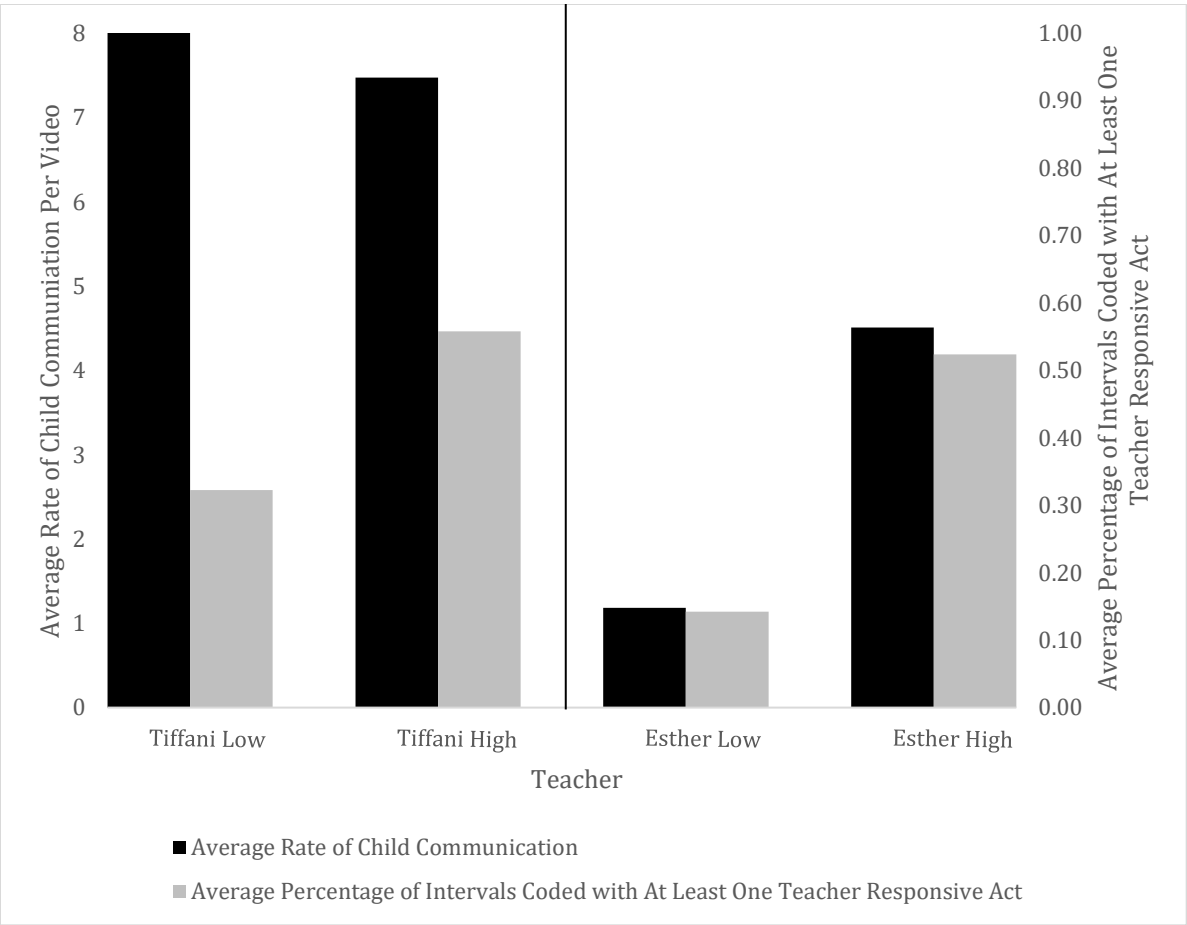

Figure 7. Average child communication acts per minute compared to average percentage of intervals with at least one teacher responsive act.

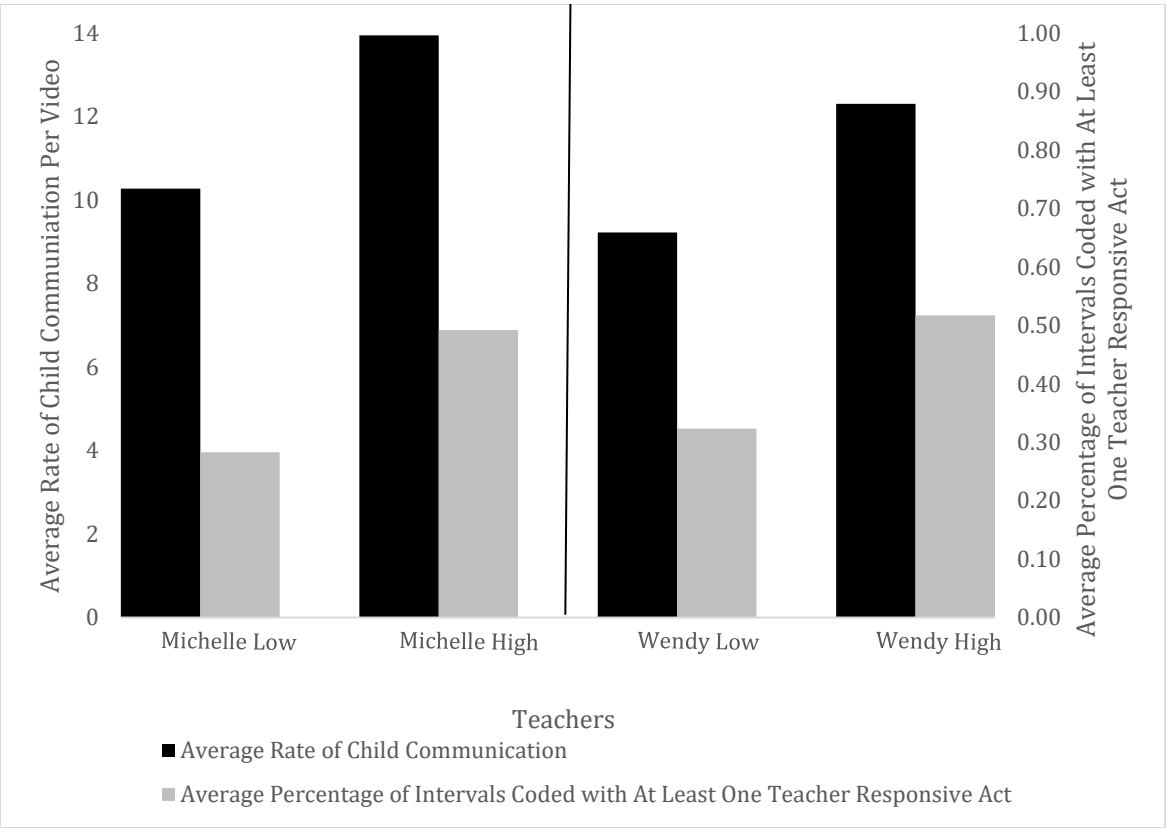

Figure 8. Average child communication acts per minute compared to average number of codable intervals with at least one teacher responsive act.

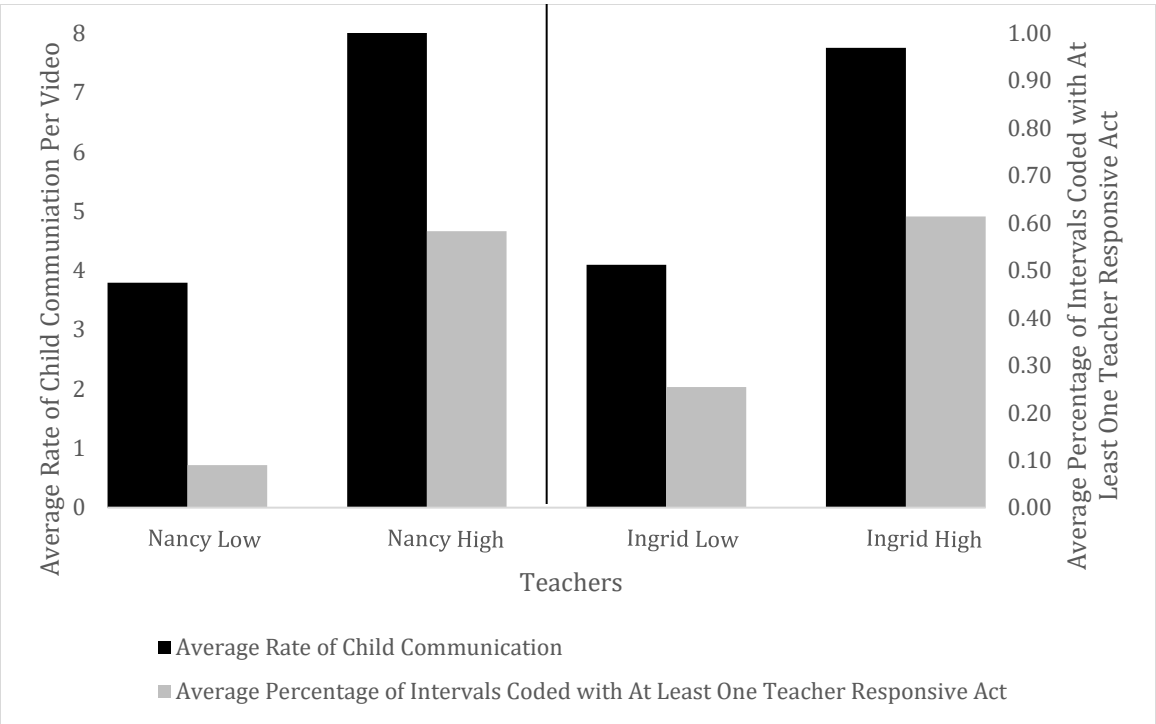

Figure 9. Average child communication acts per minute compared to average number of codable intervals with at least one teacher responsive act

CHAPTER 5

DISCUSSION

While the impact of adult responsivity to improve children's communication development has been studied by many (Tamis-LeMonda, Kuchirko & Song, 2014; Hart & Risley, 1995; Vygotsky, 1978; Ostrosky & Jung, n.d.; Giramaletto, 1988), there are limited studies and even more limited data that support yet another, link to child communication outcomes – teacher responsivity in infant/toddler classrooms. The aim of this study was examine whether the rate of children's gestures, vocalizations, and one and multi-word utterances varied based on level of teacher responsiveness. Results of this descriptive analysis of data suggest that child communication acts do increase as their teachers' rate of responsive acts increase. When the teacher had a higher percentage of acts coded per video, the child, in turn, had a higher rate of communication acts within the same timeframe.

While somewhat limited methodologically, this study provides some preliminary information regarding the association between teachers' responsive acts and the communicative acts of children in their care. Based on what we know from parent-focused studies of child communication development, there are tools available to increase a child's lexicon that may be extended to infant/toddler teachers. From a societal level, as more and more children are spending time in daycare at a young age, we need to start providing caregivers of the tiniest, but possibly most important population, the time and resources to gain knowledge and learn best

practices to encourage and foster communication through responsive acts and high quality care throughout natural daily routines.

I. Limitations

Several limitations must be considered when interpreting results of this study. First, videos were recorded in the natural classroom setting; no sessions were arranged beforehand. This created challenges when coding due to the variability of activities and the movement and interactions between the teachers and children. For example, if the children were eating lunch, it was easier for the coder to hone in on more communication acts and to whom the child was communicating with rather than a video where there were eight children in the frame talking and playing in the kitchen center within close proximity to each other and to the teacher. Additionally, the videos were initially recorded to study the teachers' responsive acts to the children, so the children often had their backs to the camera, which limited reliable coding of verbal utterances. Next, microphones were not used, so the audio was not clear and coders often had trouble differentiating between vocalizations, one and multi-word utterances as well as which child was talking at any given time. One of the three classrooms was more chaotic, which often led to confusion between the primary and secondary coder as to who was communicating, whom the child was communicating with (teacher or another child), and determining the difference between vocalizations, single word and multiword utterances.

In addition, the caregivers and the children were cognizant of the video recording in progress and/or interventionists in the room. This could be a limitation because as Funamoto and Rinaldi (2014) note that parents may alter their responses, whether consciously or subconsciously, if they are aware someone is watching or someone will be analyzing the data

collected. The same is likely for the teachers, and possibly the children, within the classrooms. The recordings in this study took place around the same time of day, so a varied recording time to allow for different activities and even different energy levels of the caregiver and child would be interesting to observe, as well.

The generalization of findings of the present study to other caregivers, children, and facilities is limited because the study took place at one childcare center with a small sample of teachers and toddlers. The Continuity of Care model that the center employs may allow children to be more attached to their caregivers they have known since birth in ways children at other childcare centers that move to different classes with new teachers or that are in a center with high teacher turnover might not be. The higher staff to child ratios at the center also allot for more interaction between child and caregiver and more opportunities for caregivers to know, recognize and respond to each child and his/her needs. Additional research with a larger sample size from various childcare centers is needed to truly draw meaningful conclusions regarding child responsivity to their caregivers before, during, and after the peer intervention model.

II. Future Direction

Overall, studies such as this one that observe how teacher responses co-vary with children' communication acts are of vital importance to our understanding of how to support positive outcomes for future generations. As more and more children are in daycare earlier in life as well as for a greater amount of time during the day, caregivers are becoming stewards of language learning for our youngest and most malleable population.

Future research could be conducted in additional early childhood centers with caregivers that have differing amounts of teaching experience at the center and even in the particular room. A larger sample of children would be beneficial, as well as from different backgrounds, ethnicities, socio-economic statuses, abilities, and communication levels.

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APPENDICES

APPENDEX A

ADAPTED FROM THE EARLY COMMUNICATION INDICATOR

CHILD COMMUNICATION DEFINITIONS

General Guidelines for Coding Child Communication

- **Do not code any vocalization/utterance if you are unsure of whether the child spoke or not. You must see 50% of the child's face for 50% of the utterance to code as a vocalization/utterance**
- **Code only vocalizations or gestures that the child is clearly directing towards the observed teacher and that are communicative gestures.**
- **You can code any communication that the child directs towards the targeted teacher as long as part of the adult is within the frame of the camera. Do not code gestures if they are not directed towards caregiver and you are not sure of the purpose of the behavior**. *For example, if child is sitting by him/herself and is waving or pointing in the air.*
- **If a gesture continues for a long period of time** (*for example, the child may point to a picture for 10 seconds or more**)*** **code as two gestures only if the gesture is interrupted by the child moving hand or body and then the gesture is repeated** (*for example, the child may be pointing to a picture, may retract her hand and then point to the picture again. This counts as two gestures. If child doesn't move her hand at all, it counts as 1 gesture).*
- **Code as vocalization if child uses transcribable sounds (vocal folds vibrate) with clear function (request, protest, comment) even if there is some emotion (like excitement or happiness). Do not code if child is clearly upset or if the vocalization is just the child's excited or happy sounds.**

Use the following guidelines to identify gestures, vocalizations, words, signs, and multiword utterances.

Gestures: Gestures are defined as physical movements in attempt to communicate with another person (communication partners). Gestures can be imitative of the adult. If a gesture occurs in conjunction with a word, code both the gesture and the word. Gestures are not coded if ½ of the child's is not visible. If you can only see a hand or arm, do not code a gesture.

Gestures INCLUDE:

- Giving or handing objects to partners
- Pushing away or rejecting an object
- Reaching toward a partner or object the partner is holding and cannot get
- Pointing toward an object or partner
- Nodding or shaking the head or shrugging shoulders to indicate "yes" or "no" in response to a "yes" or "no question. Nodding or shaking the head or shrugging shoulders can be coded without an asked question, but must be clearly identifiable and pronounced with at least two obvious chin to chest movements or 2 obvious ear to shoulder movements.
- Showing an object by moving arm ½ way up and out from body and toward adult
- Waving at the adult
- Page turning that is forceful in nature (i.e. the teacher is still reading/referencing the page)

Gestures are NOT coded when the child:

- Reaching toward toys or objects that the partner is not holding, unless the gesture is accompanied by joint attention between the caregiver and child; therefore, directing communication
- Moving toys or objects in a way that does not involve interaction with the partner
- Making a physical movement that shows excitement or pleasure that is not in direct communication with the partner (e.g., waving arms)
- When caregiver gives direct instruction (i.e. "pick up that ball" or "can you do it")

Vocalizations: Vocalizations are non-word or unintelligible verbal utterances voiced by the child to a partner. Utterances that are coded as vocalizations are those that cannot be understood as single or multiple words. If a vocalization co-occurs in utterances in which single or multiple words are understood, the vocalization(s) should not be coded. An utterance ends when there has been a breath or a clear break of at least 1 second without vocalizations. Only code when you can see the child's face/mouth move and you can see 50% of the child's face. Only code vocalizations that are directed towards the focus teacher.

Vocalizations INCLUDE:

- Speech sounds such as /ba/, /k/, /do/, /gr/, /m/, etc.
- Laughing out loud or expressions of joy such as "yay!"
- Animal sounds (e.g., "moo")
- Motor sounds (e.g., "vroommm")
- Uh oh

Do NOT code the following as vocalizations:

- Crying/whining/screaming
- Abnormal vocalizations (like screeching)
- Sigh
- Lip smacks
- Tongue clicks
- Grunts
- Involuntary noises such as hiccups

Single Word: A single word utterance is a single word voiced by the child that is understood as a single word and not a vocalization. Recognizable single word that may not be articulated perfectly but is understandable to the viewer as a conventional word. At least 50% of the child word should be included to be coded as a single word. Coder should see at least 50% of the child's face.

Single Words INCLUDE:

- An utterance in which only one word is understandable
- Continuous repetition of a single word is coded once, unless word is separated by 3 seconds, or separated by a different word. If the string of single words can be segmented in this way, code as two or more single words.
- Compound words (e.g., mailbox, necklace)
- Ritualized duplications (e.g., bye-bye, uh oh, night-night) code only 1 single word
- Two-part proper names (e.g., Big Bird, Mary Jane) code as 1 single word
- Single descriptive words/labels (e.g., block, red, blue, girl, etc.).
- Standard sign language, code as appropriate for single words
    - In group setting when child imitates teacher code as single word utterance

Single Words EXCLUDE:

- Vocalizations that serve as fillers, such as “mmm” or “huh”
- Sentences or phrases combining multiple understandable words
- Utterance in which no words are understood
- Nouns in other languages preceded by an article (e.g., la playa – this would be coded as a multi-word utterance).

Multiple Words: Includes utterances with 2 or more verbal words voiced by the child that are understood. The utterance may not be clearly articulated but must be intelligible to an unfamiliar adult other than caregiver. Coder should see at least 50% of the child’s face .

Do not segment “false starts” or stuttering into another coded utterance (code as one multi-word utterance). False starts are when a child starts to say something, but before finishing the sentence or thought, changes wording to another sentence. For example, “I think this is … this looks like a dog” would be coded as one multi-word utterance.

Multiple Words INCLUDE:

- Words that should fit together in a meaningful way that approximates a phrase or sentence (e.g., big truck)
- Does not need to be grammatically correct
- Does not need to have adult meeting (e.g., cow rides tractor).
- Standard sign language, code as appropriate for multiple word utterances
- Nouns preceded by an article (e.g., the dog).

Multiple words EXCLUDE:

- unless coder can state exactly what child says, code as vocalization
- If no words are understood, code as vocalization
- Utterance in which only 1 word is understood
- Utterance in which no words are understood