

EXPLORING CONTEXTS THAT FACILITATE OPTIMAL  
INFANT AND TODDLER VERBAL AND  
NON-VERBAL COMMUNICATION

by

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A THESIS

Submitted in partial fulfillment of the requirements for the degree of  
Master of Science in the Department of Human Development  
and Family Studies in the Graduate School of  
The University of Alabama

TUSCALOOSA, ALABAMA

2015

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## ABSTRACT

Associations were examined between amount and type of communicative behavior and several contexts: child's age, communication partner (e.g., adult, peer), communication style (i.e., adult- or child-directed), and temperament. Researchers removed a common bias featured in much of the research on infant and toddler communication, the use of a mother or a classroom caregiver as the communication partner. To remove this bias, the children participated in four trials: one solo (alone) play for baseline information, one peer-play and two adult-child play interactions (one adult-directed and one child-directed).

Twenty two infants and toddlers from 6-to-26 months of age were videotaped and coded for nonverbal communication (e.g. showing, pointing, taking, and offering gestures) and verbal communication (e.g. vocalizations or non-word utterances and verbalizations or speaking words that were understood by the researchers), as well as affect (mood) during the four trials. A temperament scale was also completed by each child's teacher to examine the relationship between temperament and children's communicative behaviors. Researchers hypothesized: 1) Toddlers will verbally communicate (includes both vocalizations and verbalizations) more than infants; 2) All children will vocalize and verbalize more with adults than with peers; 3) The adult-directed trial will encourage higher amounts of communication from all children than the child-directed trial; and 4) Children with higher intensity, activity, approachability, positive mood and adaptability scores on the Carey Temperament Scale will vocalize and gesture more frequently in all trials.

Data analyses revealed that toddlers communicated more than infants the adult-directed trials yielded more communication than the solo and peer trials did, though the toddlers held the weight of the interactions when both groups were combined; the two adult trials were comparable, and not significantly different from each other. Temperament did not appear to affect young children's communication production, with the exception of a negative correlation between positive mood ratings and overall communication. Several other analyses examining correlations between other behaviors were also significant. In sum, contexts that facilitate optimal interactions differ for infants and toddlers. Adults should keep these results in mind when communicating with very young children, as there is more than one "optimal" context of communication for infants and toddlers.

## DEDICATION

This thesis is dedicated to my husband, who spent nearly as many hours keeping me mentally and emotionally stable as I spent conducting the study. I also dedicate this thesis to my mother, who always reminds me what defines my true worth, and my father who taught me to never back down from a challenge. Lastly, this thesis is dedicated to every Early Childhood Educator that I know, and all I have yet to meet, because we are worth more than they know.

## LIST OF ABBREVIATIONS AND SYMBOLS

$df$	Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data
$F$	Fisher's F ratio: A ration of two variances
$M$	Mean: the sum of a set of measurements divided by the number of measurements in the set
$n$	Number: Number in a trial or sample
$p$	Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value
$r$	Pearson product-moment correlation
$sd$	Standard Deviation: a quantity calculated to indicate the extent of deviation for a group as a whole
$t$	Computed value of t test
$<$	Less than
$>$	Greater than
$=$	Equal to

## ACKNOWLEDGMENTS

I am pleased to have this opportunity to thank the many colleagues, friends, and faculty members who have helped me with this research project. I am most indebted to Dr. Maria Hernandez-Reif for guiding me through this intense learning process and sharing her immense well of knowledge with me in so many ways. I would also like to thank my other committee members, Dr. Jason Scofield and Dr. Anthony Buhr, for their invaluable input, flexibility with my distance learning, and support of both the thesis and my academic progress. I would like to thank Sarah Kingsley, who dedicated so many hours of her precious time as my research assistant, and was willing to appear on camera and interact with the babies at all hours of the day. Your consistency with the children made all the difference in the data, and that is so appreciated. Thanks to Kelly Barton and Ashley Dobbins-Stewart for being a great UA support system and PDR lab mates. I thank all of the Human Development and Family Studies research assistants at The University of Alabama who gave time to help code and enter data. I am grateful to the University of Denver for employing me in an environment where I have been encouraged to use computer facilities needed to complete this project. I deeply appreciate my classroom co-teachers, Michelle Paulino, Jaeda Porter, Jessyca Pulido, Erika Ruiz, Rachel Schiff, Ruby Preece, and Maria Harper, who have been so understanding and sensitive in regard to the strain that I have been under for the last two years working full time and completing this study. This research would not have been possible without the support of my friends and my family who never stopped encouraging me to persist.

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## **Introduction and Literature Review**

### **Potential Benefits of Child Care on Communicative and Social Behavior**

Child care is becoming increasingly important in the lives of many families. According to the US Census Bureau, in 2011 24% of children age 0-4 years spent the most amount of time in a center-based arrangement (child care, nursery school, preschool, or Head Start). An additional 13% were primarily cared for by a non-relative in a home-based environment, such as a family child care provider (United States Census Bureau, 2011). Numerous studies have revealed that young children who attend high quality child care show increases in cognitive functioning, including language development (Etaugh, 1980; Field, Masi, Goldstein, Perry, & Parl, 1988; McCartney, 1984; NICHD Early Child Care Research Network, 2000; Swift, 1964; Sylva, Stein, Leach, Barnes, & Malmberg, 2011).

The National Institute of Child Health and Human Development (NICHD) Study of Early Child Care (2000), a prospective multisite study of over one thousand children, found that even after considering the effects of family characteristics, the quality of non-maternal child care was a significant predictor of children's cognitive and language development at ages 15, 24, and 36 months. In an English study that controlled for demographic variables and maternal caregiving, and involved 18-month-old children, more hours of group care were related to higher

cognitive scores, whereas more hours of individual care were related to lower orientation and engagement scores (Sylva et al., 2011). A study of 89 African American toddlers in child care centers with varying quality found that higher quality child care was related to higher measures of cognitive development (Bayley Scales of Infant Development), language development (Sequenced Inventory of Communication Development), and communication skills (Communication and Symbolic Behavior Scales) across time, even after adjusting for selected child and family characteristics (Burchinal, Roberts, Riggins, Zeisel, Neebe, & Bryant 2000). Field et al., (1988) found that children who had been in child care for nine or more months showed less onlooker and solitary play and more cooperative play and positive affect than children who had been in child care for less than nine months. The children who had spent over nine months in child care also spent more time interacting with their peers and had more frequent positive verbal interactions than their less-seasoned cohorts. Clarke-Stewart (1973) reported that mothers' responsiveness to their infants' social behavior was positively related to mental scores and measures of language and social competence. These findings can transfer to caregivers and high quality child care as well. Higher quality child care encourages higher language functioning.

### **Infant and Toddler Communication in Child Care**

Few studies have examined how infants and toddlers interact while in child care. Perhaps this is because at this stage the social relationship is less reciprocal than at later stages. There are several attributes of communication that affect its outcome, and the literature is mixed. Like the current thesis, most of the research separates children into groups based on age. A study by Legendre and Munchenbach (2011) found that the immediate proximity to a caregiver can affect the amount of social interaction between young children (18 to 40 months of age) and their

peers. This study found that when children are not in the immediate proximity of a caregiver they spend more than twice as much time interacting with peers as when they are in the immediate proximity of a caregiver, regardless of age. In contrast, when children are in the immediate proximity of a caregiver, even though peers are also in close proximity, young children spend more than one quarter of their time oriented towards adults, either observing and paying attention to them, making social overtures to them, or actually interacting with them. On the other hand, the overall social orientation towards adults decreases substantially when children are farther than two meters away from caregivers (Legendre & Munchenbach 2011). These findings are significant because in studies where children are in free play and given the choice to interact with either peer or adult, bias can be introduced to the data due to proximity of the caregiver. This thesis will control for this bias.

In another study, conducted by Deynoot-Schaub and Riksen-Walraven, (2006) children were found to have significantly more interactions with caregivers than with peers, both at 15 months and at 23 months. The total number of interactions with caregivers was found to significantly decrease with age as the current literature suggests, but there was no increase in the total number of interactions with peers as they aged. A significant increase was only found for negative initiatives towards peers, which is not typically reported in the literature.

Studies have examined several different prompts for communication: talk, touch, and object related. One study found that children, regardless of age (within ages 7 to 31 months) were more likely to initiate an interaction if it involved the child giving, taking, or showing an object (Finkelstein, Dent, Gallacher, & Ramey, 1978). Talking or babbling was the second most successful behavior that prompted interactions. Touching, however, was drastically less effective when it came to initiating a social interaction. Children who are more comfortable

communicating verbally are more likely to be involved in numerous and high quality social behaviors. Based on these findings, the current study will use the encouragement of an object or activity to examine which social context leads to the most optimal communicative behaviors for each age including solo, peer, adult-directed, or child-directed play.

The findings from a study of infants aged 6-to-24 months found that infants were involved in social behaviors with either peers or teachers in 48% of the observations, and toddlers spent 39% of the time involved in social behaviors (Finkelstein, et al., 1978). Those percentages are somewhat higher than those reported for 3- and 4-year-old children in child care centers having teacher-child ratios equivalent to the center in the 1978 study, approximately 1:3. For example, O'Connor (1975) reported that children in child care were involved in social behavior approximately 30% of the time. Reuter and Yunik (1973) reported that social interactions among preschool age children occurred approximately 34% of the time in both a university laboratory school and a parent cooperative child care center. These findings detail how important general social communication is for children in child care.

In this thesis, communication is operationalized as nonverbal and verbal behaviors. *Nonverbal* behaviors include *showing* (e.g., the child holds an object up to a communication partner, but does not relinquish it), *pointing* (e.g., the child gestures to an object by pointing a finger), *nodding* (e.g., the child chooses to answer a yes or no question or otherwise respond to a communication partner by nodding or shaking the head to communicate a yes or no answer), *taking* (e.g., the child takes an object from a communication partner) and *giving* (e.g., the child offers an object and relinquishes it to a communication partner). *Verbal* behaviors include vocalizing and verbalizing. *Vocalizing* is indicated by vocal expressions that cannot be identified as words, including cooing, babbling, gibberish, vocal play in pitches and noises or imitation,

laughter, and whimpering. *Verbalizing* is indicated by vocal expressions that can be recognized as words, such as holophrase (a a single word expressing the ideas of a phrase or sentence), two-word utterances (e.g., my book), or simple sentences.

### **The Role of Temperament**

Temperament may play an important role in any study examining infant and toddler behavior and may reveal a deeper understanding of children's behavior beyond outward displays (Kagan, 1987). Studies have shown that temperament style assessed at age two is indicative of receptive and expressive language skills at age two as well as age three (Slomkowski, 1992). In a study of 3-year-olds prenatally exposed to methamphetamine, researchers found that externalizing, as well as internalizing, behaviors were lower in children with easy temperament, and higher in children with difficult temperament (Derauf et al. 2011). In a study conducted on 24-month old toddlers, researchers assessed their hypothesis that the shy/sociable temperament variable might be related to communication and vocabulary score. Researchers compared children in the top and bottom quartiles of a temperament Approach/Withdrawal scale. More sociable children (bottom quartile) scored significantly higher than shy children (top quartile) on their communication and vocabulary score measures (Prior et al., 2008). Additionally, children with easy temperaments, or who tend to be open to novelty, tend to be more social with their peers than children who are slower to warm up (Stocker & Dunn, 1990). This difference in outward showings of communication may relate to variations in social and vocal interchanges between the infants and toddlers in the current study.

Temperament can also affect behavioral traits such as attentional control and positive affect, which in turn encourage language acquisition. For example Dixon and Smith (2000)

found that high adaptability, soothability, as well as a happy mood were all positively associated with language development. However, when DeThorne and Deater-Deckard (2009) performed research focusing on three key aspects of child temperament--surgency, effortful control, and negative affect-- no significant interaction between these aspects and conversational language was found for 7-year-old children. This illustrates how malleable temperament may be during the very early formative years. In the current thesis, teachers completed the Carey Temperament Scale for each child in their care to examine the relationship of temperament to young children's communicative behaviors.

For the thesis, we were interested in *optimal* infant and toddler interactions (demonstrated by mood or affect) and their role in young children's communicative behaviors. A simple tally of total interactions could possibly introduce bias when regarding the most optimal interactions. If too many or a majority of the interactions were negative, this would indicate an unhealthy communicative exchange with the adult. Children learn and develop more successfully when they interact with comfort and respect. According to the National Association for the Education of Young Children's program standards for relationships, "Positive relationships are essential for the development of...constructive interactions with others... Warm, sensitive, and responsive interactions encourage [children] to respect and cooperate with others" (2008). Therefore, a positive mood or affect displayed by the children in the study was expected to relate to more optimal communication. Mood was assessed in two ways. Each 20-second frame of coded video was characterized as *positive, negative, or neutral* mood. These instances of mood were operationalized and compared across age group, trial, and temperament. Additionally, as teachers completed the Carey Temperament Scale, several of the questions were indicators of a generally more positive or negative overall mood behavior of each child.

## **Adult Communication Styles and Influences**

One of the hallmarks of high quality child care is the high amount of meaningful and developmentally appropriate adult-to-child communication. Teachers are encouraged to get down on the child's level, ask questions, and extend conversations with children. Teachers are also encouraged to speak to babies with the same frequency that they would speak to an older child. These practices all encourage the advancement of language and communicative development, starting at birth (NICHD Early Child Care Research Network, 2000). While in child care communication research there are varied styles of data collection, often there is little concern or attention to how adult style of communication affects children's communication. In the thesis, we control for adult style of communication.

In one study of children under 27 months of age, researchers found that overall children directed their communication to adults. However, upon closer inspection, it was found that at the youngest age, 8 months, infants chose to communicate with their peers more than half of the time they were involved in interactions. Over time, up to the age of two years, these children steadily increased their communication with adults and decreased their communication with peers, until communication with adults comprised almost 80% of their interactions. Interestingly, in this study the children suddenly began addressing almost 50% percent of their interactions to peers at the age of 27 months (Mayer & Musatti, 1992).

Another study found that between the ages of one and two years the occurrence of children's interactions with adults decreased, and the occurrence of peer involvement increased, instead of over two years of age as in the previous study. Although peer involvement increased over the



span of the year, children were still engaged in social behaviors with teachers more than with peers (Finkelstein et al., 1978).

In yet another study, Test (1998) found that 16- to 28- month old children looked at teachers less than they did at peers or objects. However, vocalizing was most common with teachers, while moving toward and looking at behaviors were most common with peers. Much like Mayer and Musatti's 1992 study, Test (1998) found that interactions with peers increased at two years of age, while interactions with adults and with objects remained relatively constant.

"Motionese" is one way that an adult's communication style may influence an infant's or toddler's reciprocity and involvement. Motionese is similar to "motherese" or infant-directed speech, in that adults modify their object-related actions when interacting with infants. When compared to adult-directed action, infant-directed motionese occurs in closer proximity to the partner, involves higher interactiveness, more enthusiasm and more repetition, is simpler, and has increased amplitude of movement (Brand, Shallcross, Sabatos, & Massie, 2007). For example, when showing a new toy to a young child, an adult may repeat motions more often than they would with an adult, and with more enthusiasm. In a study examining motionese, researchers found that with more repetitive exposures to motionese, or intentional interaction with an object, 8-10 month old babies participated in more and longer bangs and shakes than infants with less repetition. The researchers believe that with more repetition, infants wanted to imitate the motion that the adult made (Koterba & Iverson, 2009). Although the current study will not code for motionese, the style will be utilized during the adult-directed interactions, as it is still an indicator of how adult-directed communication affects and encourages reciprocal communication in the very young child.

In the literature, the typical study design for research on social communication with infants and toddlers in child care is an open-ended, naturalistic setting, where children are coded while making choices between their peers and familiar adults in the classroom (Deynoot-Schaub & Riksen-Walraven, 2006; Finkelstein, Dent, Gallacher, & Ramey, 1978; Legendre and Munchenbach, 2011; Mayer & Musatti, 1992; O'Connor, 1975; Reuter & Yunik, 1973; Test, 1998). Studies on adult interactions with infants and toddlers are important as adults are the most frequent objects of communication in young children's environment. However, it can be easy to introduce bias when each teacher has a different communication dynamic and style with every individual child. Bias may be reduced by introducing a consistent adult who the children have been exposed to, instead of the teacher, to study infants' and toddlers' communication skills. In addition, studying different adult styles, such as child-directed versus adult-directed interactions, may reveal how adult styles affect how much, and in what nature, young children choose to communicate.

### **Current Study**

The current thesis examined how social context and child temperament affect infants' and toddlers' frequency of communication and mood reaction. Social context in this study was examined by studying infants and toddlers playing alone, versus when placed in close proximity to a peer, or an adult. The quality of child care is known to impact children's cognitive and language development (NICHD, 2000). Therefore, quality of care was controlled for in this study by choosing a model university program that met and exceeded the standards for accreditation by the National Association for the Education of Young Children. A temperament scale was included in the current study to examine if differences in children's communication styles relates to their temperament.

This study contributes to the existing body of literature by introducing an unbiased study design. Previous research has examined the context of infant and toddler communication with existing caregivers in naturalistic settings. The use of the previously unfamiliar adult in this study facilitated a more uniform reaction from the children. The aim of this research was to explore how the context of interaction (i.e. communication partner, age of child, and adult communication style) affects communicative behavior in infants and toddlers. Furthermore, this research examined the relationship between infants' and toddlers' temperament traits and communication.

Children participated in four different trials, designed to examine children's behaviors in different social contexts. A *solo* trial let children play alone, for baseline data; a *peer* trial provided an opportunity for each child to interact with another child from the classroom; an *adult-directed* trial featured a script carried out by the researcher who interacted with each child in a purposeful way reflected from best practices of communicating with young children; and a *child directed* trial allowed the child to control the pace of the interactions, as the researcher offered succinct and warm responses but minimal encouragement or extension of communication.

## **Hypotheses**

1. Toddlers (14-27 month olds) will show more verbal communication than infants (6 to 13 months).
2. All children will vocalize more with adults.
3. The adult-directed trial will encourage higher amounts of communication from all children than the child-directed trial.
4. Children with higher intensity, activity, approachability, positive mood and adaptability scores on the Carey Temperament Scale will vocalize and gesture more frequently in all trials.

## Methods

### Participants

All the parents with children over six months of age in two infant and two toddler classrooms at a university child care center were approached about this study. Twenty seven children were recruited for the study but only 22 participated in the study (five children presented with stranger anxiety and were terminated due to distress, fussiness and unwillingness to communicate). The 22 children who completed the study were classified into two groups: infants ( $n=8$ ; mean age =11 months;  $sd=2.24$  months) or toddlers ( $n=14$ ; mean age =20.79 months;  $sd=2.34$  months ). The infant group included 6 boys, and the toddler group included 5 boys. The children were from middle to upper middle income Socio Economic Status (SES) and were ethnically distributed as 96% Caucasian and 4% African American. Mothers averaged 34.4 years old ( $sd= 3.63$  years), and were distributed in education as: 8.7% with some college, 39.1% with a college degree, and 52.2% with a professional degree (See Table 1).

### Procedure

The parents and teachers were given measures to complete. Parents were given a short demographic information questionnaire inquiring about parent age, ethnicity, and education. The data for all children who completed the study are presented in Table 1.

The *Carey Temperament Scale* (2007) was completed for each child by the child's lead teacher using one of two questionnaires, depending on the child's age: the Revised Infant

Temperament Questionnaire (RITQ) for infants 4-11 months, and the Toddler Temperament Scale (TTS) for children 12-36 months. Each scale contains up to 100 items that are rated on a six-point scale. The rating system utilizes a range from “almost never” to “almost always.” The Carey Temperament Scale measures children in nine dimensions: activity levels, biological rhythmicity, approach/withdrawal to new people/events, adaptability or flexibility, intensity (the loudness / boisterousness levels used), mood (positive, negative or in-between), persistence or attention span, distractibility, and sensory threshold (sensitivity to sounds, lights, clothing, foods, etc.). The five dimensions that were expected to impact nonverbal and verbal communication were summarized into one temperament score for this study: Activity, Approachability, Intensity, Adaptability, and Mood. The Carey Temperament Scale separates children into three categories for each dimension, depending on how far the child deviates from the average. The scores on the dimensions are represented in terms of optimal communication behavior and include: high activity, high approachability, high intensity, high adaptability and high (positive) mood. Correlations examined the relations between temperament traits and communicative behaviors.

Table 1  
*Demographics*

Variables	<i>n</i> =	Mean	SD
<b>Children</b>			
<b>Infants</b>			
Age (mo)		11	2.2
Females	2		
Males	6		
<b>Toddlers</b>			
Age (mo)		21.7	4.3
Females	9		
Males	5		
<b>Parents</b>			
Mother Mean Age		34.4	3.63
<b>Race</b>			
Black	1		
White	21		
<b>Mother Education</b>			
>HS	0		
HS Grad	0		
1-3 years college	1		
College Graduate	9		
Professional (PhD, etc)	12		
<b>Father Education</b>			
>HS	1		
HS Grad	0		
1-3 years college	4		
College Graduate	8		
Professional (PhD, etc)	9		

## **Children**

The children participated in four trials: solo (alone), peer, adult-directed, and child-directed. The first trial was always the solo trial. The other three trials were counterbalanced across participants and consisted of two adult interaction trials and one peer interaction trial.

Each trial was videotaped and later coded. Each trial lasted five minutes and was conducted in the child's classroom. The adult in the trials was a female experimenter who, to reduce stranger anxiety, spent two hours in each classroom alongside the teacher the week before the experiment.

The experimenter was the same for all trials. All children participated in all four trials, with the exception of three children who completed three out of four trials. Each trial involved an activity, which was offered during a time that the class schedule called for the children to leave the room for outdoor play or play in another area of the school. This permitted for the study child to remain behind in the classroom to participate in the activity and reduced distraction from peers or from peers interfering in the activities. All trials were recorded by cameras placed inside the classroom and hidden behind a trifold board that was previously decorated by the children. Infants were seated in low chairs with attachable trays to allow them to manipulate the activity. Toddlers were seated at a child-sized table and chair in the classroom. Children were face-to-face during the peer trial. In the adult trials, the experimenter sat on the floor and at the child's level, to make sure that her face was even with the child's field of view. During preparation, if the child became distressed when the lead teacher left the classroom the teacher was called back to introduce the child to the activity, though she did not sit in close proximity to the child. For three children, the teacher needed to be very close to the child to facilitate participation in the activity. If the child became markedly distressed at any time, the experiment was ended for that day and attempted on another day. Children did not participate in filming on consecutive days.

## **Stimuli**

Stimuli and activities were designed to engage and involve the infants and toddlers, respectively. The infant group was presented with toy-like handheld stimuli, of similar size and



level of interest. Items were chosen so that they would be safe, interesting, open-ended and relatively unfamiliar to the infants. Each of the four trials had its own designated set of toys. Examples of these objects can be seen in Appendix A. The toddler group was presented with sensory table activities, of similar level of interest. Each trial featured a different sensory table. Sensory materials were chosen to be safe, engaging, and novel to the toddlers. These sensory materials are described in Appendix A.

### **Solo Play**

In the “solo” trial, the researcher presented the infant with two toys followed by an encouraging statement such as, “Sam, look at these new toys we have for you! Do you see them?” The researcher placed the toys on the child’s tray or table and ceased interacting with the child and stepped away. For toddlers, the experimenter led the child to a table and chair with a sensory table on it, with the sensory material inside. The researcher introduced the materials with an encouraging statement such as, “Look what’s in here, Claire! Look at all the pieces of fabric. Do you want to play with them?” The researcher would ensure that the toddler felt comfortable playing with the materials and would then step away and cease interactions.

### **Adult Play—Adult-Controlled**

The experimenter engaged the child in play with the toys or activity, saying something like, “Sam, look at these new toys we have for you! Can you show me what this one does?” The experimenter continued to encourage the child to interact and play with the toy. The routine was the same for toddlers, but involved the manipulation of sensory table materials. A script was designed for the experimenter, so that communication would be uniformly encouraged across all participants. The script included the following mandatory prompts: showing, offering or giving,

pointing, and taking, or asking to take. Vocal encouragement from the experimenter also encouraged expressive language and open communication. If a child was silent, the experimenter prompted the child with questions about the toy or material, or descriptions of the properties of the toy or material (i.e. “Look how bumpy this one is, do you feel it?” “Do you see what I can do with this one?” “Look, you found a long one!”). Every time the child initiated communication, the experimenter responded with an engaging reply.

### **Adult Play—Child-Controlled**

In this trial, the experimenter initially engaged the infant, saying something like, “Sam, look at these new toys you have,” or for a toddler, “Claire, check out all of these pasta noodles!” Thereafter, the experimenter refrained from initiating further interactions to provide the child with the opportunity to direct or lead the interactions. The experimenter succinctly and warmly responded each time to the child’s gestures and vocalizations. If the child remained silent during the trial, the experimenter briefly attempted to engage the child, but did not persist.

### **Peer Play**

Pairs of same-age children were randomly chosen for peer play with the toys and activities. The peers were always in the same classroom together and thus were familiar. Both children were coded for this interaction. When a child had to participate in the peer trial more than once due to an odd number in the classroom, that child’s second session was not coded. Infants were seated in low chairs with detachable tray tables, facing each other. Toddlers sat at a small play table with a sensory table on top of it. They faced each other, sitting in toddler-sized chairs, sharing the sensory table.

## Coding

Two independent research assistants were trained on the operational definitions of the dependent variables, which included 1) non-verbal communication (showing/pointing gestures, taking/offering gestures); 2) verbal communication (vocalizations like cooing, babbling, gibberish; one word utterances, or two or more word productions) and 3) affect (positive, neutral, and negative facial expressions and body language) (See Appendix B). The videotaped trials were coded in twenty second intervals, with the coder making tally marks to indicate all behaviors observed in each interval. One research assistant served as the primary observer, and her data were used to conduct the data analyses. The other research assistant coded 1/3 of the videos and served as the secondary observer for reliability purpose. The coding of the videotapes by the observers was analyzed by Pearson product-moment correlations for interobserver reliability using frequency of observed events as the dependent measures (see Table 2).

The two observers appeared to be highly reliable in coding vocalization (Range:  $r_s = .86 - .97$ ) and verbalization behaviors (Range:  $r_s = .85-.96$ ). For the non-verbal measures, the analysis revealed high reliability between the two observers (Range:  $r_s = .94 - 1.0$ ), with the exception of the adult-directed trials for showing ( $r_s = .23, p > .05$ ) and pointing ( $r_s = .29, p > .05$ ) (see Table 2).

Table 2

*Reliability check: Pearson product moment correlations (and p values in parentheses) between Primary and Secondary Observers across the different trials and measures.*

Measures	Trials			
	Solo	Peer	Adult-directed	Child-directed
<i>Verbal</i>				
Vocalizing	.97 (<.001)	.86 (.014)	.91 (.004)	.97 (<.001)
Verbalizing	.85 (.016)		.96 (.001)	.89 (.007)
<i>Non-verbal</i>				
Showing	.94 (.001)	.98 (<.001)	.23 (>.05)	.97 (<.001)
Pointing			.29 (>.05)	.04 (>.05)
Taking		.999 (<.001)	.995 (<.001)	.94 (.002)
Offering/giving			.97 (<.001)	1.00
Nodding			.94 (.002)	1.00

## Results

### **Hypothesis 1: Toddlers will verbally communicate (includes both vocalizations and verbalizations) more than infants.**

An independent sample t-test was conducted and revealed that as hypothesized, toddlers communicated more ( $M = 82.8$ ,  $SD = 45.14$ ) than infants ( $M = 32.5$ ;  $SD=24.8$ )  $t(18) = 2.86$ ,  $p = .01$ ).

### **Hypothesis 2: Verbalization and vocalization will be greater for adult trials.**

Paired sample t-tests were run to examine if children, irrespective of age group, verbally communicated more in the adult trials than in the other trials. The analysis revealed verbal communication was greater for the adult-directed trials ( $M=20.8$ ;  $SD = 18.7$ ) than for the solo trials ( $M = 6.5$ ,  $SD = 6.6$ ),  $t(21) = 3.29$ ,  $p = .003$  and marginally greater than for the peer trials ( $M = 15.75$ ,  $SD= 11.7$ )  $t(19) = 1.78$ ,  $p = .095$ . Children's communication with the adult during the child-directed trials ( $M = 18.9$ ,  $SD = 18.1$ ) was also greater than during the solo trial ( $M = 6.5$ ,  $SD = 6.6$ ),  $t(20) 3.33$ ,  $p < .01$ .

### **Hypothesis 3: The adult-directed trial will encourage higher amounts of communication from all children than the child-directed trial.**

This hypothesis was not supported. As can be seen in Table 3, when ages were not accounted for, the adult-directed trial was comparable to the child-directed trial,  $t(20) = .43$ ,  $p > .05$ .

Table 3

*Communicative behaviors (verbal and non-verbal) by trial across all children*

Variables	Solo	Peer	Adult-directed	Child-directed
# of Behaviors	12.63 (1.63)	17.71 (3.31)	30.83 (4.1)	27.21 (4.42)

**Hypothesis 4: Children with higher intensity, activity, approachability, positive mood and adaptability scores on the Carey Temperament Scale will vocalize and gesture more frequently in all trials.**

### **Temperament**

Temperament and affect/mood scores on total communication were analyzed with a Pearson correlation. These analyses revealed a marginally significant negative relationship between a positive mood score (children who were rated as having more positive mood by their teacher) and total communicative behaviors,  $r = -.33$ ,  $p = .08$ . This finding was unexpected and deserves a second look in future replications of this topic. All other scores that were analyzed (i.e. Activity score, Approachability score, Intensity score, and Adaptability score) were not significantly correlated with total amounts of communicative behaviors.

### **Comparing Children's Total Communicative Behaviors (verbal and non-verbal) across Social Contexts**

Collapsed across infants and toddlers, children's communicative behaviors (verbal and nonverbal) were analyzed with paired sample  $t$ -tests to examine differences in responding across the social contexts (i.e. solo, peer, adult-directed, child-directed). These analyses revealed the following: (1) Fewer communicative behaviors were displayed in the solo trial compared to the peer trial,  $t(19) = 3.56$ ,  $p = 0.002$ , the adult-directed-trial  $t(21) = 4.66$ ,  $p < .01$ , and the child-directed trial  $t(20) = 4.54$ ,  $p < 0.01$ , suggesting that infants and toddlers use verbal and

nonverbal communication least frequently while playing alone; (2) Fewer communicative behaviors were displayed in the peer trial compared to the adult-directed trial,  $t(19) = 3.41, p = 0.003$ , suggesting that infants and toddlers use verbal and nonverbal communication less frequently while playing with another child than while playing with an adult who is guiding and encouraging the context of the interaction; and, (3) Fewer communicative behaviors were also displayed in the peer trial compared to the child-directed trial  $t(19) = 2.12, p = 0.047$ , suggesting that infants and toddlers use verbal and nonverbal communication less frequently while playing with another child than while playing with an adult who is not guiding and encouraging the context of the interaction.

### **Comparing verbal and nonverbal behaviors within age group (infants, toddlers) for the different trials**

Inspection of the children's behaviors by age group revealed no significant differences among trials for infants (all  $ps > .05$ ). In contrast, toddlers revealed the following:

(1) fewer communicative behaviors were displayed in the solo trial than in the peer trial,  $t(11) = 4.08, p = 0.002$ , adult-directed-trial  $t(13) = 5.8, p < .01$ , and child-directed trial  $t(12) = 5.62, p < 0.01$  suggesting that toddlers use verbal and nonverbal communication less frequently while playing alone which is not surprising;

(2) fewer communicative behaviors were coded in the peer trial than in the adult-directed trial,  $t(11) = 4.21, p = 0.001$ , suggesting that toddlers use fewer verbal and nonverbal communicative behaviors less frequently when playing with another child than when playing with an adult who is guiding and encouraging the context of the interaction.

(3) marginally fewer communicative behaviors were evident in the peer trial than in the child-directed trial  $t(11) = 2.08, p = 0.061$ , suggesting that toddlers use verbal and nonverbal communication less frequently when playing with another child than when playing with an adult who is not guiding and encouraging the context of the interaction.

**Comparing Communication Style (verbal, non-verbal) by Age Group (infants, toddlers) and across Social Contexts (solo, peer, adult-directed, child-directed)**

ANOVAs to examine specific non-verbal behaviors by age group (infants, toddlers) and trials (solo, peer, adult-directed, child-directed) revealed:

**For peer interactions:**

(1) more frequent taking behaviors by infants than toddlers,  $F(1, 17) = 12.25, p = 0.003$ , suggesting that when playing face-to-face with a peer, infants engage more frequently in the action of taking toys away from other children than toddlers do.

(2) more verbal behaviors by toddlers than by infants,  $F(1, 17) = 15.91, p = 0.001$ , suggesting that toddlers vocalize more than infants in the presence of their peers.

**For adult-directed interactions:**

(1) greater nodding behaviors by toddlers than by infants  $F(1, 20) = 5.72, p = 0.027$ , suggesting that infants are less likely to have developed the skill of nodding or that they choose to use it less frequently than toddlers choose to use it when interacting with adults who are controlling the interaction.

(2) more giving behaviors by infants than by toddlers  $F(1, 20) = 5.68, p = 0.027$ , suggesting that infants offer more toys to the adults than toddlers when communicating with an adult who is controlling the interaction.



(3) more verbalizing behaviors by toddlers than infants  $F(1, 20) = 5.47, p = 0.03$ , suggesting that infants use words less than toddlers to communicate with an adult who is controlling the interaction.

**For child-directed interactions:**

(1) less frequent verbalizing behaviors by infants than by toddlers  $F(1, 18) = 8.24, p = 0.01$ , suggesting that infants use fewer words than toddlers in their communication with an adult.

(2) more taking behaviors by infants than by toddlers  $F(1, 18) = 4.19, p = 0.056$ , suggesting that infants engage in the activity of taking toys or objects from an adult more frequently than toddlers do.

**Affect or "Mood" Differences for Infants vs. Toddlers by Trial**

Infants' versus toddlers' mood were compared for each social context (i.e. solo, peer, adult-directed, child-directed) with independent sample *t*-tests. These analyses revealed the following (see Table 3):

**For the solo trial:**

1) the infant group displayed more negative mood than the toddler group  $t(21) = 2.74, p = 0.01$ , suggesting that infants experience more stress while playing alone than toddlers do.

2) the toddler group displayed more neutral mood than the infant group  $t(21) = 2.89, p = 0.01$ , suggesting that infants display a wider range of emotion during solo play than toddlers do.

**For peer interactions:**

1) the toddler group showed more positive mood than the infant group  $t(18) = 2.28, p = 0.035$ , suggesting that when playing with another child, toddlers were more likely to be happy or excited than infants.

2) The infant group showed more neutral mood than the toddler group  $t(18) = 2.28, p = 0.035$ , suggesting that during play with a peer, infants were more likely to display less range of emotion than toddlers.

**For child-directed interactions:**

1) the toddler group showed marginally more positive mood than the infant group  $t(19) = 1.79, p = 0.09$ , suggesting that when an adult is not encouraging or directing the communication, toddlers are more likely to be happy or excited than infants.

2) the infant group displayed marginally more frequent neutral mood than the toddler group  $t(19) = 1.82, p = 0.09$ , suggesting that toddlers display a wider range of emotion during an interaction not guided by an adult, than infants do.

No significant differences in mood between infants and toddlers were found during the adult-directed interaction. This suggests that regardless of age, the children reacted with the same mood to an adult who was guiding and facilitating the interactions. It should be noted that there were no instances of negative mood at all in the peer trials, regardless of the age of the child. This may show that playing one-on-one with a peer was least likely to produce negative reactions.

## Mood or Affect Differences

Table 4  
*Infant and toddler mood states across trials (percentages)*

Variables	Solo	Peer	Adult-Directed	Child-Directed
<b>Infants</b>				
Positive	14	6.7	29.6	31.7
Neutral	78.5	93.3	70.4	67.5
Negative	7.5	0	0	0.8
<b>Toddlers</b>				
Positive	3.8	25	43.7	60
Neutral	96.2	75	52.9	39
Negative	0	0	3.4	1

## Discussion

Greater numbers of children are attending child care in the United States (United States Census Bureau, 2011). While quality childcare has been associated with more optimal cognitive and language development in young children (Etaugh, 1980; Field, Masi, Goldstein, Perry, & Parl, 1988; McCartney, 1984; NICHD Early Child Care Research Network, 2000; Swift, 1964; Sylva, Stein, Leach, Barnes, & Malmberg, 2011), little is known about what aspects of quality child care facilitate children's communicative skills. For example, while in child care, the literature is mixed in terms of whether young children prefer to interact with peers or adults (Deynoot-Schaub & Riksen-Walraven, 2006; Finkelstein, Dent, Gallacher, & Ramey, 1978; Legendre and Munchenbach, 2011; Mayer & Musatti, 1992; O'Connor, 1975; Reuter & Yunik, 1973; Test, 1998). Moreover, little is known about the quality of exchanges that occur during adult versus peer interactions. Also, inconsistent structure across communication studies with infants and toddlers make it difficult to make general statements about children's communicative skills particularly because most studies favor a naturalistic as opposed to an experimental design when studying young children's interaction behaviors. The current thesis aimed to better understand factors that impact infant and toddler communication, as well as to examine if temperament plays a role in young children's communication style in a child care environment. Improvement in the research design included using an experimental within-subjects method as opposed to a naturalistic design and keeping the quality of the child care consistent. In the thesis, several factors were explored, and controlled, to identify optimal conditions impacting very young children's communicative behavior. The unique study design included 1) examining

young children's communication with a consistent, non-caregiver adult, to control for caregiver bias, 2) controlling the distance or proximity of the interaction partner, given that this has been associated with interaction frequency in the literature (Legendre & Munchenbach, 2011), 3) varying the adult's interaction style with the child to examine whether adult-directed interaction facilitates greater child communication behaviors than child-directed interaction, and 4) using unique stimuli that in the adult interaction trials were moved in uniform ways that elicited children's attention. Infants' and toddlers' communication styles were assessed across four different trials that included playing 1) alone, 2) with a peer, 3) with an adult who directed the interaction (i.e., adult-directed), and 4) with an adult who mindfully permitted the child to lead the interaction (i.e., child-directed). In addition, infant and toddler behaviors were compared to examine age as an additional factor.

As hypothesized, toddlers communicated more across all social settings than infants (Hypothesis 1). However, across both age groups, infants and toddlers communicated more in the presence of an adult than when with a peer or when playing alone (Hypothesis 2). This is consistent with studies that identify the adult as the favored communication partner for young children when the adult is in close proximity (Deynoot-Schaub & Riksen-Walraven, 2006; Finkelstein et al., 1978; Legendre and Munchenbach, 2011; Mayer & Musatti, 1992; Test 1998). This finding is important because it clarifies that young children are more communicative with adults, even when the adult is significantly less familiar than peers, or only somewhat familiar, and had been in their presence for only two hours prior to the interaction sessions. Interestingly, in the current study, young children communicated as frequently when the adult lead the interaction as when the adult permitted the child to lead the interaction, which was an unexpected

finding (Hypothesis 3). Also surprising was that children's temperament did not appear to influence their communication frequency (Hypothesis 4).

A closer look revealed that toddlers showed the greatest frequency of communicative behaviors when the adult guided the interaction as opposed to when the child guided the interaction. Future research might examine developmentally appropriate ways in which adults can stimulate communicative behaviors in young children given that young children are compelled to interact and communicate more with adults.

While peer interactions elicited fewer communicative behaviors than adult interactions, nonetheless, young children displayed close to 20 interactive behaviors with peers in the span of 5 minutes. Moreover, young children engaged in twice as many communicative behaviors in the presence of a peer compared to when playing alone with an adult in the room. This supports that the presence of a peer prompts young children to engage in communicative interactions.

As expected, and not surprising, across all trials toddlers verbalized and vocalized more than infants. Toddlers also nodded more than infants in the adult-directed trial. Overall, these findings suggest that toddlers are more apt than infants at communicating with their peers and adults.

The findings also revealed some interesting infant social behaviors that have not been previously documented. For example, infants took more toys from their peers than toddlers. Perhaps, this is a sign that closer to two years of age toddlers start to understand the concept of sharing, and are less likely to take objects from their like-aged communication partner. Also interesting were the findings that infants offered more toys to adults when the adult directed the interaction, but took more toys from the adult when the adult allowed the infant to direct the

interaction. Perhaps the infant sees the child-directed interaction by the adult as more comparable to a peer interaction. These interesting nonverbal displays might be evidence of prosocial behaviors in infancy, such as starting to share, especially when the communicative partner is more engaged in the interaction.

The infants' and toddlers' mood appeared to be affected by the social context. Infants reacted more negatively to playing alone than toddlers, while toddlers showed more neutral mood, suggesting that playing alone is more stressful to infants than toddlers. It also appeared that toddlers enjoy peer play more than infants, as they were more positive in mood. When the children were expected to initiate communication with the adult, toddlers were more positive in mood than infants. Infants were more neutral in mood, suggesting that infants find it less enjoyable to be involved in one-sided communication or interactions.

Interestingly, when adults were in charge of controlling the interaction, infants and toddlers acted the same. It should also be noted that there were no instances of negative mood at all in the peer trials, regardless of the age of the child. This may show that playing one-on-one with a peer for short periods may help young children learn to socialize.

While coding for mood was informative in terms of revealing that young children are in a better mood when interacting with adults and at least not negative when interacting briefly with a peer, the temperament measure was less revealing. The Carey Temperament scores revealed only one marginal finding that suggested that greater communicative behaviors were related to less positive mood. This perplexing finding is difficult to interpret. Perhaps the correlation was indicative of a trend towards more neutral mood with greater communicative behaviors. Future research with a larger sample size and more diversity in temperament style is required to gain

insight into the role, if any, that temperament may play in young children's communicative behaviors.

### **Limitations**

Limitations of the study included a small sample size and the use of only one child care center. The study needs to be replicated and perhaps include numerous peer and adult interactions per participant to test the robustness of the findings. Another limitation was that while overall interobserver reliability was in the acceptable range, for a couple of non-verbal measures, the reliability between the two observers was very low. This might relate to a lack of operational definition regarding adults' showing and pointing at objects for children and will require additional research. Despite these limitations, the findings from this thesis contribute to the literature on infant and toddler communication with a new paradigm, as well as a possible clarification that young children indeed prefer to interact with adults over peers. Future research should better explore gesturing and other forms of non-verbal and verbal communications in young children in relation to cognitive as well as emotional and social development.

Recent infant and toddler communication literature can also offer additional perspective and insight to the findings reviewed in this thesis. One interesting school of thought introduces the concept of a developmental shift between crawling and walking, and the effect this shift has on communication. For example, one such researcher has suggested the influence of a developmental progression that links social and exploratory behaviors with the transition to independent walking (Clearwood, 2011). Independently walking infants (as compared to non-walking infants who were in a walker) spent significantly more time interacting with toys as well as with their mothers. Walking infants, or toddlers, also made more vocalizations and more directed gestures compared to infants in the walker. Even when controlled for age, the transition



to independent walking marked increased interaction time with mothers, as well as more sophisticated interactions, including directing mothers' attention to particular objects. The results suggest a developmental progression linking social interactions with milestones in locomotor development. This finding could help account for the developmental and communicative shift seen in most infant and toddler communicative research.

A similar study corroborated that crawlers and walkers interact with objects and their mothers differently (Karasik, Tamis-LeMonda, & Adolph, 2014). Over age, infants increased their total time with objects and frequency of sharing objects with mothers. Walking was associated with new forms of object behaviors: Walkers accessed distant objects, carried objects, and approached mothers to share objects, while crawlers preferred to play with objects close at hand and shared objects while remaining stationary. Interestingly, earlier object activities predicted walking status: Crawlers who accessed distant objects, carried objects, and shared objects over distances at 11 months were more likely to walk by 13 months. This is an interesting illustration of a possible contributing factor to the findings in this thesis, and would explain the gap seen between the infant and toddler groups, and the infant group's lack of susceptibility to the different communication partners, as well as the toddler group's significant differences between the 4 trials.

A study of 492 Italian infants (8 to 18 months) investigated a developmental pattern between actions and gestures, and their relation with spoken vocabulary in both comprehension and production (Caselli, Rinaldi, Stefanini & Volterra, 2012). Actions and gestures were more strongly correlated with word comprehension than word production. Interestingly, the researchers found in their literature review that these findings are similar to those of different Western languages, indicating a common biological and cultural basis in infant communication.

A related study found that early gestures *selectively* predict later language learning (Rowe & Goldin-Meadow, 2009). The findings from this study suggest that gesture predictions are very finely-tuned. Children's gesture vocabulary (the number of different meanings expressed via gesture) at 18 months is a strong predictor of verbal vocabulary size at 42 months, but their gesture+speech 'sentences' (combinations in which gesture conveys one idea and speech another) are not. In contrast, the gesture+speech sentences children produce at 18 months are a strong predictor of verbal sentence complexity at 42 months, but their gesture vocabulary is not. The two skills are not identical. Skills such as these differ widely during the preschool years, and these differences can be seen many months earlier, in children's early use of gestures.

A longitudinal study examined the role that gestures and words play in the development of engagement skills and social-emotional concepts during toddlerhood (Vallotton & Ayoub 2010). Children's gestures and words during mother-child interactions were used as symbol skill indicators to predict children's abilities to engage others and the number of social-emotional concepts children portray during play. After examining longitudinal data from 108 children and mothers collected when children were 14, 24, and 36 months old, researchers found that early words had a stronger effect on engagement skills while early gesture use predicted later development of social-emotional concepts. Therefore, even in early development, words and gestures can be indicative of future communicative abilities and concepts.

Furthermore, research in this area can be very instrumental in predicting future language success and should be utilized as such. One such study conducted by Kuhn, Willoughby, Wilbourn, Vernon-Feagans, and Blair (2014) examined the direct and indirect effects of preverbal and verbal communications in toddlers (15 months to 3 years) on executive function (referring to cognitive abilities involved in the control and coordination of information in the

service of goal-directed actions). Most relevantly, although communicative gestures were not directly related to executive functioning, they were directly related to language at 2 and 3 years, which was directly related to executive functioning. Thus, a positive association between gestures at 15 months and executive functioning at 4 years can be assumed.

Taken together these findings suggest that infants and toddlers do communicate differently based on who they are communicating with, and at different ages. All children preferred to interact with adults. Future research should take note of the study design featuring the previously unfamiliar adult to avoid bias. As shown in the results of this study, findings were consistent with previous research, but were also able to tease out more detail about young children's interactions, such as that adult-directed interactions appear to be better for facilitating communication in young children.



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## Appendix A

### Stimuli

INFANTS: Small handheld manipulatives: multiple different textures, shapes. Similar size.

Small enough to handle but not so small that it can fit inside the mouth. Examples below. Give two at a time.

TODDLERS: Activities were designed so that they 1) are similar enough to children's daily activities to not be so novel that they stop communicating because of concentration, 2) are new and interesting enough to hold the kids' attention for *at least* 5 minutes, and 3) allow for two children to play at once during the peer play, sharing the same space and using the same materials. With these types of activities, there can be a different activity for each of the four trials.

### Sensory Tubs

Solo: Different textures of fabric

Adult-Directed: Ribbons

Child-Directed: Multiple kinds of pasta

Peer: PomPom and Styrofoam balls





## Appendix B

### Coding Scheme

#### A. Show

Child refers to an object, by *holding* it up to show the peer or adult.

If the child holds the object up to show it, and it is relinquished to the peer or adult, that will be coded as *offering* instead.

#### B. Point

Child refers to something, by *pointing* at it. Can be far away, across the room. Or up close, like the toy in their hand.

#### C. Vocalization

An utterance that the coder does not recognize as a word.

One tally mark will indicate a phrase-like utterance (i.e. if the child pauses their vocalization or takes a breath, it merits only one tally mark on the coding sheet under *vocalization*).

1. Cooing (i.e. “ooh”, “ahh”)
2. Babbling (i.e. “bababa”, “dadada”)
3. Gibberish (i.e. “mamababadeebah”)
4. Vocal play/range of pitches and noises/imitations (i.e. squeals, rhythmic utterances from infants and imitation noises “rawr” from toddlers)
5. Laughing
6. Whimpering

#### D. Verbalization

An utterance that the coder recognizes as a word.

One tally mark will indicate a phrase-like utterance (i.e. if the child pauses their verbalization or takes a breath, it merits only one tally mark on the coding sheet under *verbalization*).

1. One syllable words and holophrasis (i.e. “no,” and “mine”)
2. Short sentences (i.e. “That’s pretty.”)
3. Long sentences or phrases (i.e. “I like the purple one”)
4. Questions (i.e. “Can I have that?”)

E. Nodding head “yes” or shaking head “no”

Child will respond to communication partner by head movement either with or without verbal communication as well.

F. Take

An object is *asked for or reached for and received* from the adult or peer. Coder will look for reaching and grabbing followed by receiving.

G. Offer/Give

An object is *offered and relinquished* to the adult or peer. Coder will look for holding out and giving the object to the peer or adult. Throwing the toy for the adult to get is *not* considered giving.

If the child appears to offer but does not relinquish the object, it will be coded as *showing* instead.

H. SOLO trial only –*Attempts to leave activity* to go play with researchers

Child walks out of the view of the camera to engage the researcher and is then redirected back to the activity by the researcher. Communication in response to this redirection was not coded.

I. Affect

Coder will mark one of the three choices for affect for each 20 second pass of the video. Coder will indicate the *overall affect* for that 20 second portion.

Positive affect indicators

1. Smiling expression
2. Posture facing the activity for the full
3. Social and gentle vocal expressions
4. Frequent showing, pointing, and offering gestures
5. Quick and eager responses to adult or peer interactions.
6. High interest and involvement in the activity
7. Laughing

#### Negative affect indicators

1. Frowning
2. Turning away
3. Hostile and unhappy vocal expressions
4. Frequent forcible taking, trouble sharing
5. Responds unhappily to adult or peer interactions
6. Displeasure at involvement in the activity
7. Crying/whimpering/complaining

#### Neutral affect indicators

1. Neither positive nor negative facial expression
2. Both facing and turning postures
3. Low number or low intensity of vocalizations, or otherwise hard to classify.
4. Ignores prompts from adults or peers
5. Inconsistent at responding to interactions from adult or peer
6. Neither pleasure nor displeasure in the activity, low interest
7. Neither laughs nor cries observed.

## Appendix C

### IRB Approval/Renewal Paperwork

Office for Research  
Institutional Review Board for the  
Protection of Human Subjects

THE UNIVERSITY OF  
**ALABAMA**  
R E S E A R C H

May 22, 2014

Lindy Carper  
Human Development & Family Studies  
College of Human Environmental Science  
The University of Alabama

Re: IRB # 13-OR-014-R1 (Data Analysis Only) "Exploring Contexts that Facilitate Optimal Infant and Toddler Interactions"

Dear Ms. Carper:

The University of Alabama Institutional Review Board has granted approval for your renewal application.

Your renewal application has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

*(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.*

Your application will expire on May 21, 2015. If your research will continue beyond this date, complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, complete the appropriate portions of the IRB Study Closure Form.


Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,



358 Rose Administration Building  
Box 870127  
Tuscaloosa, Alabama 35487-0127  
(205) 348-8461  
FAX (205) 348-7189  
TOLL FREE (877) 820-3066

  
Carpanlato T. Myles, MSM, CIM, CIP  
Director & Research Compliance Officer  
Office for Research Compliance  
The University of Alabama

IRB Project #: 13-OR-014-R1

UNIVERSITY OF ALABAMA  
INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS  
REQUEST FOR APPROVAL OF RESEARCH INVOLVING HUMAN SUBJECTS

I. Identifying information

	Principal Investigator	Second Investigator	Third Investigator
Names:	Lindy Carper	Anthony Buhr	
Department:	HDFS	Communicative Disorders	
College:	CHES	A&S	
University:	UA	UA	
Address:	Child Development Research Center	Speech and Hearing Clinic	
Telephone:	251-689-4962	205-348-1413	
FAX:			
E-mail:	lmcarter@crimson.ua.edu	abuhr@as.ua.edu	

Title of Research Project: Exploring Contexts that Facilitate Optimal Infant and Toddler Interactions

Date Submitted:  
Funding Source: None

Type of Proposal	<input type="checkbox"/> New	<input type="checkbox"/> Revision	<input checked="" type="checkbox"/> Renewal Please attach a renewal application	<input type="checkbox"/> Completed	<input type="checkbox"/> Exempt
Please attach a continuing review of studies form					
Please enter the original IRB # at the top of the page					

UA faculty or staff member signature: \_\_\_\_\_

II. NOTIFICATION OF IRB ACTION (to be completed by IRB):

Type of Review: \_\_\_\_\_ Full board  Expedited

IRB Action:

\_\_\_\_ Rejected Date: \_\_\_\_\_  
\_\_\_\_ Tabled Pending Revisions Date: \_\_\_\_\_  
\_\_\_\_ Approved Pending Revisions Date: \_\_\_\_\_

Approved-this proposal complies with University and federal regulations for the protection of human subjects.

Approval is effective until the following date: 5-21-15

Items approved: \_\_\_\_\_ Research protocol (dated \_\_\_\_\_)  
\_\_\_\_\_ Informed consent (dated \_\_\_\_\_)  
\_\_\_\_\_ Recruitment materials (dated \_\_\_\_\_)  
\_\_\_\_\_ Other (dated \_\_\_\_\_)

Approval signature: \_\_\_\_\_ Date: 5/22/2014