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Influences of Temperament, Symbolic Gesture, and Caregiver Beliefs on Infant Emotional Expression

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Influences of Temperament, Symbolic Gesture, and Caregiver Beliefs on
Infant Emotional Expression.

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Human Environmental Sciences

by

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This thesis is approved for recommendation to the Graduate Council.

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Abstract

The purpose of the cross-sectional study was to analyze the relationships of infant temperament, communication through symbolic gesture, caregiver beliefs with emotional expression in infants. Participants were the parents and childcare teachers of sixteen infants and toddlers, between the ages of six and 25 months, currently enrolled at the University of Arkansas child development study center. The independent and combined influence of infant temperament, use of symbolic gestures, and the beliefs of parents and teachers were significantly related to infants' emotional expression in the study. Parent-reported scores of emotional expression competence were positively correlated to teacher-reported positive temperament levels ($r = .65$, $p = .01$) and parent-reported use of symbolic gesture ($r = .53$, $p = .05$). Parent-reported scores of emotional expression competence were negatively correlated to both parent-reported and teacher-reported negative temperament ($r = -.62$, $p = .01$). However, the use of symbolic gesture did not moderate the influence of negative temperament on emotional expression in parent-reported ($r = -.14$, $r = -.14$) or teacher-reported ($r = -.11$, $r = .22$). Awareness of baby sign language was significantly related to emotional expression for parents ($r = .55$, $p = .03$), but not for teachers ($r = .17$, $p = .54$).

Results revealed that emotional expression competence in infants was influenced by internal positive temperament and the external use of symbolic gesture as a communicative tool. Parent and teacher beliefs on caregiving and the development of infants and toddlers had a positive effect on positive emotional expression in infants.

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I could not have accomplished all of this without my family and friends, including my three “in-house editors”, who have been my constant cheerleaders. Once I made the unconventional decision to go back to school after a very long break, all jumped on board and sacrificed along with me. My son, in particular, allowed me to step out of my role of mother and become his classmate as we entered college together!

Dedication

In 1879, my great grandmother, Lenora Blakeley (Hudgins), graduated from the University of Arkansas. My grandmother, Helen Hudgins (Wiggans), and my mother, Ann Wiggans (Sugg) followed in her footsteps. One hundred years later, in 1979, I continued the tradition by being the first female 4th generation to graduate from the University of Arkansas. I dedicate this thesis to my legacies, especially my mother. My mother instilled in me the virtues of faith, generosity, honesty, respect, humility, dedication, perseverance, and most of all, unconditional love. She taught me to be a diligent homemaker and compassionate mother, but she also impressed upon me the importance of education. Thank you, Mama, for providing me with the nature and nurture that have made me into the person I am today and were the foundations for this thesis.

In memory of my daddy, Dr. John Gabriel Sugg 1922 – 2010.

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Introduction

Emotional competence is a complex developmental skill comprised of emotional expression, awareness, and regulation (Nelson, 2012). Emotionally competent children tend to feel capable, experience a general sense of balance in their emotions, and are better prepared to deal with conflicts constructively (Brackett, Crum, & Salovey, 2009; Denham, 2006). Emotional expression, a key feature of emotional competence, develops from birth through both internal and external factors. Although babies are born with the innate reactions derived from temperament, environmental conditions can influence children's emotional expression and, ultimately, emotional competence. Based on patterns of caregiving experienced over time, the study explored the relations among innate reactivity, as measured by temperament, and environmental influences, as measured by caregiver beliefs and interactions with infants. Symbolic gesture, as a communicative tool and its connection to infants' emotional expression, is the interactional modality of interest for the present study.

Background

Children are born with individuality and uniqueness through a blend of genetic characteristics and experiences at home, within their community, and in their culture (Wittmer & Petersen, 2014). Temperament of one's characteristics and socialization experience seem to be primary factors affecting one's mood. Temperament plays an important role, but emotional states and experiences from the social world greatly influence young children. This system of early emotional states and experiences is facilitated and interpreted by parents and teachers, which must become the context or structure for development of later states in children (Lewis & Michalson, 1983).

Competence in emotional expression refers to the ability to relate well and respond positively with others through interactions, relationships, and groups. It is the capacity to engage in mutually beneficial interactions that contribute to the emotional and physical good of all (Wittmer & Petersen, 2014). Children's competence in regulating their thoughts and emotions in order to get along well with others is observed through their behaviors or social skills (Marion, 2015). Emotional expression concepts are demonstrated by very young children through reactions to social situations, spontaneous or elicited, by acting out in their play (Ayoub & Fischer, 2006; Ayoub, Raya, & Russell, 2000; Dunn & Hughes, 2001). Competence in emotional expression can lead to healthy development of self-concept and positive relationships with others.

Even very young infants can express their emotions, and temperament plays a role. Infants and caregivers participate in an affective communication system by mutually regulating their interactions (Tronick, 1989). Individuals' affective, emotional, and motor responses in various situations are determined on a biological basis. These responses are factors in subsequent social interactions and functioning. Temperamental patterns of feelings and behaviors shape the outcomes of the ways children uniquely interpret their environmental experiences (Rothbart, 2012). Both biological factors and environmental influences affect individual differences in effortful control or self-regulation of emotions (Eisenberg, 2012).

Emotional expression is dependent on the ability to understand and communicate one's own feelings and moods, as well as the emotions of others. Communication is a vital connection that is essential to all human relationships. Children arrive into this world primed to communicate and have a desire to express their thoughts, feelings, needs, and wants. The onset of verbal language does not occur until infants are approximately 18 months old, but they have

other means by which they communicate while in the preverbal stages and beyond. Information relevant to their needs is conveyed through vocalizations, facial expressions, and motor behaviors.

Babies, from the first moment of life, are communicating with us using the language of emotional expression. They use their inborn abilities to engage with others through nonverbal communication. Prior to the onset of spoken language, preverbal children have the ability to communicate, to mentally represent concepts, and to symbolically represent referents in their absence (Acredolo & Goodwyn, 1985). Receptive and expressive domains of spoken development can be supplemented, clarified, and supported by the use of gesture as a language symbol in infancy (Capone & McGregor, 2004).

Caregivers are people who provide direct care, and give help and protection to someone. Infants' first relationships are generally with the biological or adoptive parents who are considered the primary caregivers. In addition to familial caregivers, many children have other influential, non-familial caregivers outside the home such as in childcare situations. Studies suggest that children's relationships with teachers as well as parents could be powerful predictors of later social development (Howes & Hamilton, 1992). Relationships with family members, teachers, other adults, and peers develop young children's capacities for satisfying interactions, peer play, prosocial behaviors, and negotiating conflicts (Wittmer, 2008). Positive attitudes and beliefs may increase caregivers' ability and willingness to provide external nurturance to benefit infants' emotional competencies.

Statement of the Problem

From the first day of their lives children have needs that must be met to sustain life. Parents and teachers can facilitate communication necessary to meet those needs by providing

positive environmental influences and recognizing infants' individual traits. Research of temperament suggests that children differ in their reactivity and self-regulation from an early age, and may follow different pathways to developmental outcomes. This emphasizes the importance of educating parents and childcare teachers that children's emotions and behaviors are not solely the result of social learning (Rothbart, 2012). Young children are highly dependent on external support and therefore are strongly influenced by their caregivers and their context (Sameroff & Edme, 1989). Positive outcomes for young children are more likely increased with high-quality relationships (Shonkoff, 2004). Parents and teachers can become frustrated and anxious when trying to meet those basic needs. Newborns do not yet have the mental and physical capacities to "use their words" to communicate their thoughts and feelings. Newborns do, however, have some capacity to discriminate visually and they possess certain physical reflexes (Bowlby, 1982).

Infants begin to use crying and other reflexive behaviors as an evolutionary function to alert caregivers of their needs. (Bowlby, 1973). There is evidence that even newborns with their very immature brains, limited cognitions, and weak bodies are motivated beyond instinctive behaviors to attract parental care for immediate biological needs (Trevvarthen & Aitken, 2001). Non-verbal cues can offer a channel of communication between infants and their parents and teachers. Ainsworth and Bowlby (1991) maintained that evolution has provided infants with signals and gestures that promote healthy development and caregivers should respond and follow those biologically wired cues.

Parents and teachers are limited in meeting preverbal infants' needs without the benefit of spoken language. Symbolic gesture is a communicative tool between infants and their caregivers which could help build solid foundations of mutual understanding, promote stronger

attachments, and alleviate negative emotions (Kopp, 1989). Using signs allows preverbal children to express and talk about their feeling and emotions. Additionally, signs are beneficial in the process of children learning to regulate their own behavior. Children who use signs can express their feelings and control their own behavior more successfully (Vallotton, 2008). There is evidence that the development of children's social skills is influenced by the use of symbol skills, both gestures and words. Symbol skills are mental tools that help children develop and build their understanding of the social world (Vallotton & Ayoub, 2010).

Symbolic gesture, as the interactional modality of the study, may be a connection of communication between preverbal infants and caregivers which could lead to positive emotional expression in infants. Exploring the relations among innate reactivity, as measured by temperament, and environmental influences, as measured by communication skills and by parent and teacher beliefs, may expose a connection between internal and external factors, and the development of emotional expression.

Purpose of the Study

The purpose of the cross-sectional study was to analyze the interrelationships among infant temperament, communication through symbolic gesture, and caregiver beliefs with emotional expression competence in infants. Participating parents assessed temperament, communication skills, and emotional expression competence of their children. The primary childcare teachers of those children completed the same assessments. Parents and teachers also completed surveys reflecting their beliefs on development and care of infants and toddlers.

The primary form of communication for very young babies is through their emotional expressions. The development is believed to stem from both innate reactions or temperament and what is learned through actual interactions with caregivers of a particular culture (Colonesi,

Zijlstra, van der Zande, & Bögels, 2012). Close relationships establish emotional security, sense of self, and understanding of the world in children. Parents who provide consistent nurturance help strengthen children's capacities to learn, develop, and are key to their development of emotional expression. Infant childcare teachers play a role by modeling positive relationships, facilitating exploration, meeting physical needs, and by providing comfort and support during stressful times (Raikes, 1996). Parents and teachers who make every effort to cultivate positive traits in children as early development of emotional expression can confer a variety of benefits (Calkins, 2012).

Discovering new, innovative ways to ease the daily routines of infants through developing communication tools could assist infants in emotional expression which could lead to emotional expression competence. These tools could potentially encourage closer attachment bonds with parents and teachers. The outcomes of incorporating the supplementary vehicle of symbolic gesture could facilitate preverbal infants to represent and communicate about their own emotions, as well as the emotions of others.

Gestural language refers to movements of the body that communicate meaning. Young children have a variety of innate communication skills to foster relationships prior to their ability to express in words their feelings, needs and desires. Systematic use of symbolic gesture initiates and maintains meaningful, emotion-related, explicit interactions with their caregivers (Vallotton, 2008). Developing proficient communication skills in infants and toddlers is an essential component to child development.

Current research finds that early interventions of providing infants and toddlers with symbolic tools can promote knowledge of emotional expression concepts and help engagement with parents and childcare teachers. Language-rich and gesture-rich environments may promote

both emotional expression and symbol skills (Vallotton & Ayoub, 2010). Experimental findings provide evidence that gestured input as an intervention enhances language development. It is hypothesized that gesture facilitates communication while language systems are still developing (Acredolo & Goodwyn, 1988).

A Baby Sign Language Pilot Study Survey (Bassett, 2015) conducted previously by the researcher indicated that parents and childcare teachers of infants and toddlers, and undergraduate child development students from the northwest Arkansas area had knowledge of and positive attitudes towards baby sign language. Symbolic gesture, when integrated into daily routines, could impact infants' abilities to communicate with the world around them in emotional expressive ways. In an attempt to bridge the communication gap between infants and their caregivers, the current study investigated the value of incorporating symbolic gesture in infants' daily routines. Infants' biological temperaments, communication skills, and the amount of exposure to symbolic gesture was measured to explore the impact on the level of infants' emotional expression.

Hypothesis I: Infant positive temperament, symbolic gesture use, and developmentally supportive caregiver beliefs will be independently and positively associated with emotional expression.

Hypothesis II: Infant negative temperament will be negatively associated with emotional expression.

Hypothesis III: Symbolic gesture use will moderate the relations of negative infant temperament on emotional expression.

Hypothesis IV: Parents and teachers who report more responsive beliefs on baby sign language will be associated with positive infant emotional expression.

Review of the Literature

Developmental science has evolved with alternating understandings of nature or nurture being the primary explanation for individual differences in life course paths. The environment to which babies are exposed plays a role in their emotional expression developmental outcomes. Interactions with adults in order to recognize, respond to, and self-regulate their internal states. To integrate personal change, context, regulation, and representational models, a unified theory of development has been proposed (Sameroff, 2010). There are two fundamental units: intrinsic properties of the individuals and extrinsic properties of experience. The unified theory of development could be viewed as a unity of opposites, a Yin and Yang, between one's cognitions and the world that is being perceived. Nature and nurture mutually constitute each other. Understanding both nature and nurture continues to push scientists concerned with continuities and differentiations within our biological and social experiences (Sameroff, 2010).

Emotional experiences tend to become feedback that reinforce themselves. Early experiences affect subsequent duration and frequency of other emotional states and experiences (Lewis & Michalson, 1983) which can lead to positive or negative emotional expression outcomes. Infants appear to impute unobservable desires or goals on a target object and use that to predict future behavior (Saxe, Carey, & Kanwisher, 2004). Biological and genetic characteristics of children, such as temperament, bring predisposition to the development of emotional expression. Psychological resources and behaviors of infants' caregivers are environmental influences that can contribute to the overall emotional competence of infants. Characteristics of children, their environment, and the dynamic interplay between the two are emphasized according to the transactional theory, as first proposed by Sameroff (1975).

The transactional model involves three parts that revolve over time. Infants' appearances or behaviors stimulate caregivers who attribute meaning to the observed actions. The caregivers then react and respond to the situation, possibly increasing knowledge and skills of the infants as well as their own. Mutual exchange of information is necessary for connections of communication between infants and caregivers. Continuous interactions of behaviors stimulating reactions and eliciting responses built over time increase knowledge and skill of both infants and caregivers as suggested in transactional theory (Sameroff, 1975).

As newborns quickly discover that they are not alone in this world, the need for attachment and communication begin to surface in order to satisfy their needs and wants. Vulnerable young children need a secure base from which to explore the world. According to attachment theory, developing a bonding relationship addresses basic feelings of trust, safety, and security (Bowlby, 1982). Research indicates that nurturing, stable, and consistent relationships in the early years are key to healthy growth, development, and learning. Responsive caregiving supports infants' development in their social environment (National Research Council and Institute of Medicine [NRCIM], 2000) which leads to healthy emotional expression development.

Emotional Expression

Expressing, experiencing, and perceiving emotions include the abilities to identify, communicate, and regulate one's own feelings, and to comprehend and empathize with emotions in others through relationships. Emotional expression is shaped through inborn biological maturation as well as influences and stimuli from the environment. Intrapersonal and interpersonal are both processes that lead to healthy emotional development (National Scientific Council on the Developing Child [NSCDC], 2004). Studies on infants' emotions are limited, but

there is a consensus that “feeling states”, internal and subjective perception, can be measured (Izard, 1977; Izard & Malatesta, 1978).

Emotional expression competence is how well a person copes with their own feelings and whether a person has empathy for and gets along well with others (Goleman, 2007). Facial expressions, combined with vocal and postural behaviors, can provide clues about preverbal infants’ motivations. Evidence shows that context-appropriate expressions of emotion such as interest, enjoyment, anger, pain, and disgust have been shown to signal behavioral dispositions in conjunction with these emotions (Sullivan & Lewis, 2003).

Three parts of emotion are necessary for emotional competence. From birth, infants have the ability to perceive or feel basic emotions of contentment and distress. In time, young children learn to read emotional cues in others through faces and body language. Feelings are communicated through emotional expression. Lastly, children learn to regulate their emotions by understanding and managing their moods and feelings (Marion, 2015). These competencies are grown and refined from birth due in part to the natural progression of development. Infants begin to alter unpleasant and distressful states with innate responses derived from the activation of their involuntary reflexes. They have internal mechanisms through temperament which activate emotions, and external factors that influence the regulation of those emotions (Kopp, 1989).

Perception of vocal and facial emotional expressions have been shown to emerge very soon after birth. In social interactions, communication signals are received through multimodal information conveyed by face and voice (Grossman, 2010). There is evidence that newborns express a preference for faces (Batki, Baron-Cohen, Wheelwright, Connellan, & Ahluwalia, 2000) and can orient direction of gaze toward a previously viewed face (Hood, Willen, & Driver, 1998). A study recognized that when mothers were positively vocalizing and using gestural

signals, newborns tended to look at their mothers and have facial expressions of joy. This demonstrated a well-organized infant affective system (Tronick, 1980).

As early as two to three months of age, infants recognize and respond meaningfully to emotional expressions of their caregivers (Cohn & Ellmore, 1988; Malatesta & Haviland, 1982). Newborns have synchrony with and show sensitivity to others' positive and negative emotional expressions (Field & Walden, 1982). Infants prior to five months old can reliably discriminate categories of expressions. This leads to the ability to seek out and use others' facial expressions to guide certain behaviors. By six months, infants can discriminate facial expressions and are using social referencing by their first birthday. Social referencing is having the ability to use parental emotional expressions to guide actions in unfamiliar situations. Beyond mirroring, infants use others' emotional expressions to guide them. Specific behaviors are related to specific expressions (Weinberg, 1989).

At seven months of age, infants are able to detect common emotion across modalities. Infants have a multiplicity of goals for engaging social and inanimate environments as well as internal goals. Information is processed about their current state in relation to their goals. They evaluate it and guide their actions toward accomplishment or redirection of the goal (Tronick, 1980). Reading emotional expressions has profound effects on what infants feel, think, and do. It is crucial for healthy development and optimal functioning throughout life (Grossman, 2010).

Babies' discover that their own thoughts and feelings can be known by others and that they can understand thoughts and feelings of others. Babies begin to interpret the meaning of events in their environment by using the facial expressions and emotional tone of others (Stern, 2000). Infants are highly attentive to social stimuli and begin to use social referencing to discriminate and categorize others' expressions and correctly connect them to environmental

events (Saxe, Carey, & Kanwisher, 2004). The emotional state of others is fundamental for infants to actively see affective information to supplement their own perception of an event. Children learn to “read” other children’s behavior. This remarkable ability to communicate nonverbally opens a door to our understanding children’s peer communication (Wittmer & Petersen, 2014). The ability to communicate through emotional expression is due partly to experience in social environments, but also from heredity through temperament.

Temperament

In order to reliably evaluate emotional expression, you must factor in temperament. Temperament is a set of unique, biological characteristics that influence how individuals react to the environment. Infants and toddlers bring different behavioral styles and different ways of expressing emotions when addressing an experience. Although adult behavior greatly effects young children, the unique attributes of temperament influence children’s abilities to express emotions and develop relationships. Traits include activity level, biological rhythms, approach/withdrawal, mood, intensity of reaction, sensitivity, adaptability, distractibility, and persistence (Wittmer & Petersen, 2014).

Three broad dimensions of temperament include Surgency – relating to positive emotionality and activity level; Effortful Control – relating to attentional, inhibitory, and activational control, and Negative Affectivity – relating to negative emotions. Children’s emotionality, activity, and attention refer to the individual differences in the constitutionality of temperament which is based on reactivity and self-regulation. It includes variability in positive and negative affect, as well as attentional reactivity and self-regulatory controls. Temperamental dispositions are reflected in orientations toward or away from objects, people, and events

(Rothbart, 2012). Positive and negative temperaments are not value statements, but reflections on the way children relate to the world.

Contemporary temperament research has documented four important findings. First, temperament is shaped by both genetic and environmental factors. It consists of individual differences in surgency or extraversion, effortful control, and negative affectivity. Second, children's experiences of the environment are influenced by temperament. Third, temperament, interacting with experiences, shapes crucial life outcomes. The fourth finding is that temperament shows stability, but can be shaped naturally through intervention (Shiner, 2012) and consistent positive and negative affectivity factors emerging in the infants (Bornstein, Putnick, Garstein, Hahn, Auestad, & O'Connor, 2015).

Part of the concept of temperament involves individual differences in emotional expressions. It reflects infants' biologically based biases toward experience and expression of emotions. Approaches to infant temperament studies yield evidence that emotions are expressed by the following: reactivity, the speed and intensity of activation of emotions; self-regulation, modifying the intensity and duration of emotions; and behavioral inhibition, withdrawal from novel situations (Cole, Martin, & Dennis, 2004). Biological characteristics of temperament contribute to the development of emotional expression and how infants react to their environmental influences. In order to accomplish ease of relationships, babies must have, at least in part, a "goodness of fit" with the adults who play the roles of primary caregivers. The "goodness of fit" theory suggests that different child-rearing strategies appear to work better when relating to children's various temperaments (Rothbart, 2012). Parents as well as non-familial caregivers who have similar temperamental traits and behaviors as their children tend to be better suited for each other (Wittmer, & Petersen, 2014).

Temperament and caregiving practices interact to predict children's developmental outcomes. Parental warmth and firm control are identified to be of particular importance. Temperament-related behaviors and parenting behaviors influence one another and are associated with emotional expression (Barber, Stolz, & Olsen, 2005). Outcomes of children's traits of temperament vary, but parents and childcare teachers may play an important role in moderating those outcomes depending on how well their caregiving styles adapt to children's temperament (Rothbart, 2012). Unique characteristics of temperament contribute to the nature and quality of children's peer relationships. Play behaviors with peers are influenced by the ability to focus attention, inhibit actions, and control intense emotions. Temperament describes children's tone of negative and positive emotions or moods and their interest and ability to communicate with others (Wittmer & Petersen, 2014).

Communication

Babies are born using the language of emotional communication. They use their inborn abilities to engage with others through nonverbal expressions. With mutually coordinated, bidirectional, and synchronous infant-adult interactions, affective communication is possible. Both infants and adults modify their expressions and behaviors in reciprocation of one another (Cohn & Tronick, 1987; Lester, Hoffman, & Brazelton, 1985). Infants begin to perceive and identify positive and negative affect and communicate moods and feelings. This exchange of emotional information is an important aspect of human interaction (Kahana-Kalman & Walker-Andrews, 2001). Self-directed behavior can communicate an infants' evaluation of their emotional state to parents and teachers. Caregivers may act on the communication to aid infants' accomplishment of goals through other-directed behavior. An affective communication system has a major influence on the accomplishment of infants' goals, the emotion experiences, and the

developmental outcomes (Tronick, 1989). Early communication with infants meets parent's ideologies from what they perceive are their infants' wants, thoughts, and needs (Doherty-Sneddon, 2008; Nelson, White, & Grewe, 2012).

Preverbal children can communicate with caregivers through the use of symbolic gesture. Gestures provide a means for interactions and may provide babies with the abilities to monitor and modify their own emotions and behaviors. With this ability to "talk", parents and teachers are better equipped to meet the needs of infants through comfort and reassurance (Vallotton, 2008), resulting in advancements in emotional expression and, ultimately, emotional competence. Parents of signing children report better social skills, fewer tantrums, and less frustration from their children. Parents who use signs with their children have less parent-related stress, have more affectionate interactions, and respond easier when their children are upset (Moore, Acredolo, & Goodwyn, 2001).

Early childhood teachers are more responsive to meeting the needs of preverbal children using signs. They also report making better eye contact, being warm and affectionate, and talking to them more. Teachers feel they know the children better and pay closer attention. Preverbal children initiate conversations about their needs and feelings and can hold extended conversations with their caregivers as part of everyday routine interactions (Vallotton, 2008, 2009, 2011). Teachers who use both their mouths and hands as modes of communication help students learn and retain new information better. Symbolic gesture helps children understand and remember word concepts which, shortly after, leads to the actual spoken word (Vallotton, Decker, & Fusaro, 2010).

Symbolic Gesture

Manual communication has historically been viewed as a tool only for the deaf, not for the hearing population. Today, much research is being done on the impact symbolic gesture or baby sign language could have on normal hearing, preverbal infants. Symbolic gestures often represent unspoken content of thought when used along with speech (Goldin-Meadow, 2005; Acredolo & Goodwyn, 1985, 1988) and are part of the psychological tool set for emotional expression in both communication and representation. Gesture emerges and evolves naturally and predictably in the first year of life. It begins as intentional use of communication via deictic gestures. Soon after, representational gestures and symbolic play schemes emerge. Gesture continues to scaffold on more complex cognitive tasks such as language comprehension and clarity of children's own spoken messages (Capone & McGregor, 2004).

Studies have shown that typically-developing hearing children naturally use their hands to communicate before they can talk (Behne, Carpenter, & Tomasello, 2005; Acredolo & Goodwyn, 1988; Crais, Douglas & Campbell, 2004; Liszkowski, Carpenter, Henning, Striano, Tomasello, 2004; Liszkowski, Carpenter, Striano, & Tomasello, 2006). Pointing is one of the earliest intentional motor acts used as a primary means of communication in infancy (Vallotton & Ayoub, 2010). Children seeking confirmation or approval through pointing schemes and eye contact with adults are a precursor to signed and spoken naming (Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Folven & Bonvillian, 1991). Young infants begin to intentionally communicate by repeating or "showing off" behaviors that have previously gained adults' attention. This leads into the entry of deictic gestures by children using objects to gain adults' attention. These prelinguistic gestures include showing, giving, and pointing at predictable sequences around 10 months of age (Capone & McGregor, 2004; Bates, Camaioni, & Volterra, 1975; Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Folven & Bonvillian, 1991).

Children go through a progression of using signs for intentional communication. Using gestures and signs are part of a routine of learning the signs. Signs are used to spontaneously initiate communication or express a need and are used in response to others' words or signs (Acredolo & Goodwyn, 1985; Crais, Douglas, & Campbell, 2004; Vallotton, 2011). Pointing gestures, talkativeness, and vocabulary are indicators that words and gestures are tools for both communications in and representation of the emotional expression world of even very young children. These symbol skills, used as communicative tools, can increase engagement between children and their parents and teachers. The representational function of symbol skills as mental tools provides an understanding of emotional experiences and construct concepts of the social world. (Vallotton & Ayoub, 2010).

Infant signs work by making difficult concepts accessible to preverbal children. Children are capable of performing the signs because signs are easier to understand than words, and are more physical and concrete (Werner & Kaplan, 1963). Preverbal infants are capable of using systems of truly symbolic gestures representing referents and concepts in their absence. This set of abilities eventually develops from concrete to abstract (Werner & Kaplan, 1963; Acredolo & Goodwyn, 1988).

Baby sign language is defined as an augmentative communication approach that can be taught to normally developing hearing infants before they can talk. Claimed benefits include earlier communication; advanced speech, language, and literacy development; increased IQ and cognitive skills; reduced frustration and emotional outbursts; and strengthened and increased attachment bonds (Doherty-Sneddon, 2008; Nelson, 2012). A pre-test/post-test designed study suggested that baby sign training had a significant, positive impact on the overall development of children aged six months to two years and five months. Data showed a significant improvement

in communicative and social development as well as cognitive, adaptive behavior, and physical development (Mueller, Sepulveda, Rodriguez, 2014). Gesture input has been used in clinical practice to help children establish functional communication, enhance direction following, and facilitate word retrieval or development of an idea (German, 1992; Linder, 1993; Manolson, 1992).

Using baby signs promotes positive social interactions and relationships with parents and teachers. Signs can be used to help young children regulate their behavior and communicate their needs. This indicates that there is a strong possibility that using signs will promote emotional expression competence in preverbal children (Acredolo, & Goodwyn, 2000; Gongora & Farkas, 2009; Moore, Acredolo, & Goodwyn, 2001; Vallotton, 2008, 2011, 2012). The study examines what implications the external stimulus of symbolic gesture, as a communicative tool, has on emotional expression competencies.

Caregivers

The preceding four sections of the literature review on the constructs of emotional expression, temperament, communication, and symbolic gesture, involve the association with caregivers' practices and beliefs. Caregivers, both familial and non-familial, are charged with keeping children healthy and safe, to equip them with the skills and resources to succeed in life, and transmit basic cultural values to them. Parents and teachers can offer their children love, acceptance, appreciation, encouragement, and guidance (American Psychological Association [APA], 2016). Caregivers provide the most intimate context for the nurturing and protection of children as they develop their personalities and identities as they mature physically, cognitively, emotionally, and socially (Lerner & Castellino, 2000).

Relationships are a fundamental element in the human experience. Interacting with and relating socially to others are essential human skills that newborns develop rapidly from birth (Grossman, 2010). As part of early emotional expression with adults, infants and toddlers are capable of social interactions. Positive relationships can influence prosocial behavior and aid children in emotional expression competence (Wittmer & Petersen, 2014). Caregiving practices are strongly related to the attitudes, beliefs, traditions, and values of the caregiver which stem from culture, ethnicity, social, and economic contexts. Caregivers lay the groundwork for infants to explore and interact with their environments (Lerner & Castellino, 2000).

The concept of zone of proximal development allows caregivers to define children's immediate needs and shifting developmental status. Through this, caregivers can determine what children have already achieved developmentally, and what they will be able to achieve in the future (Vygotsky, 1978). Parents and teachers can provide assisted activities that are just one level above children's abilities in order to assist them through the zone of proximal development. This is referred to as scaffolding. As children demonstrate mastery of a task, support is decreased and children gain responsibility for their own growth (Olson & Platt, 2000).

Conscientious caregiving is associated with higher levels of emotional competence in children. Promoting supportive parent and teacher interactions with children is important to healthy development of emotional expression which leads to emotional competence (Eisenberg, Cumberland, & Spinrad, 1998). Infants' capacities are limited and not fully equipped to accomplish goals on their own. Part of the system depends on the capacities of caregivers to aid and supplement (Tronick, 1980). There is value in adult modeling to enhance children's learning. Ideas are built upon by listening to and talking to others more knowledgeable (Marion, 2015).

Newborns experience and express emotions, but they are developmentally too immature to associate the significance behind the emotions or have the abilities to regulate them. Consequently, there is a breakdown in communication between infants and their caregivers. Young children learn about social relationships through experiences with family members and teachers. Infants are highly dependent on external support and therefore are strongly influenced by their caregivers and their context (Sameroff & Edme, 1989). Emotional expression skills develop through the guidance and nonintrusive assistance from adults (Honig, 1994; Rubin, Burgess, & Hastings, 2002; Vygotsky, 1978) and depends greatly on responsive caregivers who mediate experiences (Morash & Bell, 2012).

Method

The focus of the study was to explore the relationships that biological factors, as measured by innate temperament, and environmental experiences, as measured by exposure to symbolic gesture and caregiver beliefs, may be associated with emotional expression. Data were collected through parent- and teacher-reported questionnaires on behalf of 16 infants and toddlers. Infant positive temperament, symbolic gesture use, and developmentally supportive caregiver beliefs were predicted to be independently and positively associated with emotional expression competence. Infant negative temperament was predicted to be negatively associated with emotional expression competence. Symbolic gesture use was predicted to moderate the relations of infant negative temperament with emotional expression competence. It was also predicted that parents and teachers who reported more responsive beliefs on baby sign language would be associated with positive emotional expression in infants.

Participants

The study sample consisted of the parents and teachers of 16 infants and toddlers currently enrolled at the Jean Tyson Child Development Study Center (JTCDS) at the University of Arkansas. The seven girls and nine boys ranged in age from six months to 25 months ($M = 15.94$, $SD = 6.54$). The ten mothers, five fathers, and one grandmother ranged in age from 30 to 58 years old ($M = 35.81$, $SD = 6.33$), two with undergraduate degrees and 14 with postgraduate degrees. The eight female childcare teachers ranged in age from 25 to 37 years ($M = 28.88$, $SD = 3.81$), seven with undergraduate degrees and one with a postgraduate degree.

Procedure

Parents. The parents of the 36 infants and toddlers enrolled at JTCDS were given IRB approved information packets containing an introduction letter and a consent form (see Figures 1, 2, and 3 for IRB approval letter, parent introduction letter, and parent consent form). Other materials included were three standardized assessment questionnaires, a survey on caregiver beliefs, and information on optional baby sign language training offered by the researcher. Parents representing 16 children agreed to participate and completed the three standardized assessment questionnaires on behalf of their children and the caregiver beliefs survey which were returned to the researcher upon completion.

Names and identifying information were collected in order to match teacher-reported data to parent-reported data for individual children. Once matching was complete, all identifying information was stripped from the records and each participant assigned a number. Signed consent forms were stored separately from raw data in a locked cabinet in a locked office. Names and identifying information were not included in the data file for analysis. All parents receiving information packets were invited to attend an optional baby sign language workshop regardless

of participation in the study. The researcher conducted two Baby Signs® Parent Workshops in which 12 parents attended. No data was collected in association with the workshops.

Teachers. All eight JTCDSC infant and toddler teachers were given IRB approved information packets containing an introduction letter and a consent form (see Figures 1, 4, and 5 for IRB approval letter, teacher introduction letter, and teacher consent form). Other materials included were three standardized questionnaires per participating children in their classrooms, a survey on caregiver beliefs, and information on optional baby sign language training. All eight teachers participated and completed the three standardized assessment questionnaires on behalf of the children in their care and the caregiver beliefs survey which were returned to the researcher upon completion.

Names and identifying information were collected in order to match teacher-reported data to parent-reported data for individual children. Once matching was complete, all identifying information was stripped from the records and each participant assigned a number. Signed consent forms were stored separately from raw data in a locked cabinet in a locked office. Names and identifying information were not included in the data file for analysis. All staff at JTCDSC were offered the opportunity to attend an optional baby sign language training regardless of participation in the study. The researcher conducted two Baby Signs® Early Childhood Education trainings. The 15 teachers who attended received three professional development hours with the Traveling Arkansas' Professional Pathways (TAPP) and the Center received Baby Signs® Center Certification. No data was collected in association with the trainings.

Measures

Participating parents completed three standardized questionnaires on assessment of their children: The Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan

& Carter, 2006) measuring emotional expression; Infant Behavior Questionnaire – Revised very short form (IBQ-Rvsf; Rothbart & Gartstein, 2000) measuring temperament; and the MacArthur-Bates Communicative Development Inventory: Words and Gestures (CDI-WG; Fenson, Marchman, Thal, Dale, Reznick, & Bates, 2007) measuring communication skills. Parents also completed a caregiver beliefs survey: Views on Development and Care of Infants and Toddlers (VDCIT; adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015).

Teachers of the 16 children completed the same three questionnaires as the parent on the corresponding children measuring emotional expression (BITSEA; Briggs-Gowan & Carter, 2006), temperament (IBQ-Rvsf; Rothbart & Gartstein, 2000), and communication skills (CDI-WG; Fenson, Marchman, Thal, Dale, Reznick, & Bates, 2007). Teachers also completed the VDCIT (adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015) reporting caregiver beliefs.

Data for the study were based on parent- and teacher-reported assessments on infants and toddlers in their care. To determine interrater reliability, all study measures were completed by both parents and teachers of the infants and toddlers. Cronbach's alpha was calculated for all assessments to measure reliability and internal consistency of the tools. Values of $p < .05^*$, $p < .01^{**}$, $p < .001^{***}$ were levels of significance.

Emotional expression. The dependent variable of the study was emotional expression. The BITSEA (Briggs-Gowan & Carter, 2006) was used as the instrument to collect the data to measure emotional expression. The BITSEA (Briggs-Gowan & Carter, 2006) is a nationally standardized, normative value-referenced, 42-item screen designed for parents and child care providers to identify social-emotional behavioral problems and competencies. The 31-item problem scale assesses social-emotional/behavioral problems such as aggression, defiance, over-activity, negative emotionality, anxiety, and withdrawal. The 11-item competence scale assesses

social-emotional abilities such as empathy, prosocial behaviors, and compliance. Higher total problem scores indicate higher level of behavioral and emotional problems equating negative emotional expression. Higher total competence scores indicate a higher level of competence or positive emotional expression.

According to Briggs-Gowan and Carter (2006), the BITSEA has excellent test-retest reliability ($r = 0.79-0.92$) and very good interrater reliability ($r = .55-.78$). It has adequate internal consistency (Cronbach's $\alpha = .79$ for the problem scale and $\alpha = .65$ for the competence scale) in a study identifying the BITSEA as an appropriate tool for screening infant's and toddler's early social-emotional behavioral problems and competency (Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2004). The BITSEA is designed for children ages 12-36 months, however, it has acceptable reliability and validity when used with children as young as six months (Lowell, Carter, Godoy, Paulicin, & Briggs-Gowan, 2011).

The BITSEA (Briggs-Gowan & Carter, 2006) consisted of separate forms for parents and childcare providers adjusting appropriate language. The competence scale and problem scale produced very good reliability and validity in the current study. Parent-reported competence scale had a Cronbach's alpha of .80 ($M = 14.92$, $SD = 4.19$) and .73 ($M = 13.08$, $SD = 3.55$) for the teacher-reported forms. The problem scale had a Cronbach's alpha of .86 ($M = 8.13$, $SD = 6.33$) for parent-reported and .67 ($M = 10.47$, $SD = 4.45$) for teacher-reported. Significance levels were very good for the competence scale with a correlating parent-reported and teacher-reported score ($r = .71$, $p = .00$). Parent-reported competence score was strongly negatively related to parent-reported problem score ($r = -.78$, $p = .00$) as well as to teacher-related problem score ($r = -.80$, $p = .00$).

Temperament. When studying emotional expression, infants' innate, unique characteristics must be taken into consideration. The instrument used to measure temperament in the study was the IBQ- Revised very short form (IBQ-Rvsf, Rothbart & Gartstein, 2000) which is a well-established caregiver-reported measure of temperament. The IBQ-Rvsf (Rothbart & Gartstein, 2000) consists of 37 items of three broad dimensions: Surgency – relating to positive emotionality and activity level; Negative Affect – relating to negative emotions; and Effortful Control – relating to attentional, inhibitory, and activational control. Internal consistency of the three broad factors was evaluated in a Gartstein & Rothbart (2003) infant temperament study. Cronbach's alpha for Surgency/Extraversion was .92, with estimates for the Negative Affectivity and Effortful Control/Regulation factors both equaling .91. Inter-rater agreement for the primary and secondary caregivers was also demonstrated with the three IBQ-Rvsf (Rothbart & Gartstein, 2000) broad factors: Surgency ($r = .49$), Negative Affect ($r = .70$), and Effortful Control ($r = .31$). Gartstein (2012) assess the levels of reliability and stability to those obtained by other more discrete scales of measuring temperament.

In the current study, the three subscales were scored independently for the IBQ-Rvsf (Rothbart & Gartstein, 2000). Surgency scale had a good parent-reported Cronbach's alpha of .75 ($M = 4.70$, $SD = 1.10$) and adequate for teacher-reported of .50 ($M = 1.83$, $SD = .59$). Effortful control scale had a Cronbach's alpha of .60 ($M = 4.42$, $SD = .80$) for parent-reported and .59 ($M = 3.88$, $SD = .80$) for teacher-reported. Both parent-reported ($r = .59$, $p = .02$) and teacher-reported ($r = .76$, $p = .00$) surgency and effortful control had significant relationship. Cronbach's alpha was very good at .69 ($M = 3.73$, $SD = 1.02$) for parent-reported negative affect and teacher-reported was .72 ($M = 3.73$, $SD = 1.02$). Parent-reported and teacher-reported negative affect scores were perfectly correlated ($r = 1.00$, $p = .00$).

Communication skills. Knowing what children can understand and can express through words or gestures aids in the measurement of communication skills. The MacArthur-Bates Communicative Development Inventory: Words and Gestures (CDI-WG, Fenson, Marchman, Thal, Dale, Reznick, & Bates, 2007) is a nationally recognized parent/teacher-report instrument used to assess the early language development of children 8 to 16 months old. Part I identifies items that the child understands (receptive language) out of a list of 28 phrases, and items that the child understands and produces the words (expressive language) from a 396-item vocabulary checklist. Part II focuses on the child's use of actions and gestures organized categorically into six sections of 63 items. A study on the variability in early communicative development (Fenson, Dale, Reznick, Bates, Thal, Pethick, & Stiles, 1994) reported high internal consistency in the two vocabulary scales yielding Cronbach's alpha values of .95 and .96 with comprehension scales .61, .65, .68, .64, and, .56 for the five subscales. Pearson correlations between test-retest assessment reported all at $p < .01$ reliability.

In the current study, Cronbach's alpha for total Part I Early Words and Part II Actions and Gestures on parent-reported forms was .30 and .46 for teacher-reported. Data was collected from subscales B. "phrases understood" out of 28, and D. "words produced" out of 363 in Part I. Subscale B. parent-reported scores had a mean of 15.31 (SD = 10.84) and teacher-reported a mean of 89.50 (SD = 126.27). In subscale D., parents reported a mean of 14.44 (SD = 9.91) and teachers a mean of 74.25 (SD = 115.87). Subscales A., B., C., D., and E. were summed for a score of total gestures out of 63 in Part II. Parents reported a mean of 31.25 (SD = 20.07) out of 59 "actions and gestures" and a mean of 24.94 (SD = 18.17) "actions and gestures" out of 62 for teacher-reported.

Beliefs of parents and teachers. Caregiving is based upon the schema of the caregivers. The Views on Development and Care of Infants and Toddlers (VDCIT, adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015) focused on the attitudes, beliefs, and behaviors of adult caregivers on infant and toddler development and care. The researcher formulated the 25-item survey by extracting questions from three previously used tools. There were 20 questions taken from three subscales of the Views on Infant/ Toddler Development and Care - Characterizing University Pedagogy for Infant/Toddler Development: Course Characteristics and Student Learning (CUPID; Vallotton, 2014): Knowledge of Infant Development (5), Early Childhood Practices (4), and Views on Development and Care (11). The remaining five questions were extracted from the Infant Toddler Early Experiences Project – JTCDS Teacher Survey (Henk, 2014), and a baby sign language knowledge and interest Pilot Study Survey (Bassett, 2015) utilized by the researcher in preparation for the current study.

The survey had five subscales of emotion, temperament, attachment, language, and baby sign language and each subscale was measured separately. The conceptually-based instrument had mixed reliability. Cronbach's alpha for the five subscales for parent-reported were: emotion .79 (M = 4.26, SD = .53); temperament -.18 (M = 3.63, SD = .31); attachment .85 (M = 4.24, SD = .63); language .25 (M = 4.06, SD = .44); and baby sign language -.41 (M = 4.06, SD = .54). Cronbach's alpha for the five subscales for teacher-reported were: emotion .52 (M = 4.15, SD = .37); temperament .51 (M = 3.82, SD = .37); attachment .87 (M = 3.96, SD=.64); language .70 (M = 4.31, SD = .33); and baby sign language .81 (M = 4.06, SD = .51).

The VDCIT (adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015) was compiled by the researcher and used for parent and teacher opinions only. As this was not a standardized

test as were the other four measures, reliability and stability were not established. It also lacked a substantial enough number of items to create internal reliability.

Optional baby sign language training. The researcher offered parent workshops and teacher trainings to all parents and teachers from the JTCDSC. Participation was completely optional, had no bearing on participation in the study, and no data was collected concerning the workshops and trainings for the study. The Baby Signs® Parent Workshop was a 90-minute session designed to introduce parents to the history and research behind the Baby Signs® movement. In addition, parents learned the benefits to families of incorporating baby signing into daily life and were provided with 16 introductory signs. The researcher, an Independent Certified Instructor trained in the Baby Signs® program, conducted the workshops which included parent manuals and instructional aids.

The Early Childhood Education training was administered to interested teachers and was three hours in duration. It was facilitated by the researcher using the Baby Signs® Center Certification Program. It is designed to equip child care centers with standardized training in incorporating signing into daily interactions between children and teachers.

Results

Analyses for this study proceeded in three stages. First, preliminary analysis examined correlations among demographic and study variables. Preliminary correlational analyses revealed strong intercorrelations among study variables and child age due to the maturation effect of developmental change. Language skills were heavily correlated with child age and emotional expression competence also weighed in substantially. Child age was thus used as a covariate for all further analyses of the study hypotheses.

For stage two of the study analyses, differences in parent and teacher-reported mean scores on all study measures were examined. Study hypotheses were examined using partial bivariate correlations with child age as the covariate. According to a child-controlled correlation, measurement of the variables of emotional expression, temperament, and communication skills showed some significant differences based on reporter (parent or teacher). Parents reported higher emotional competence scores and teachers reported higher emotional problem scores. Teachers reported lower scores of temperament surgency and effortful control, and higher levels of negative temperament as compared to the parents. Parents reported more communication skills in all three subscales than the teachers (see Tables 1 and 2 for a comparison of parent and teacher reported scores).

Table 1.

Assessments Descriptives

Construct (Assessment) <i>n</i> = 16	Parent-reported	Teacher-reported
	M (SD)	M (SD)
Emotional competence (BITSEA)	14.92 (4.19)	13.08 (3.55)
Emotional problem (BITSEA)	8.13 (6.33)	10.47 (4.45)
Temperament surgency (IBQ)	4.70 (1.10)	1.83 (.59)
Temperament effortful control (IBQ)	4.42 (.80)	3.88 (.80)
Temperament negative affect (IBQ)	3.73 (1.02)	3.73 (1.02)
Phrases understood out of 28 (CDI)	15.31 (10.84)	14.44 (9.91)
Words produced out of 396 (CDI)	89.50 (126.27)	74.25 (115.87)
Actions and gestures out of 63 (CDI)	31.25 (20.07)	24.94 (18.17)

Note. BITSEA = Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006); IBQ = Infant Behavior Questionnaire (Rothbart & Gartstein, 2000); CDI = Communicative Development Inventory (Fenson, Marchman, Thal, Dale, Reznick, & Bates, 2007).

Table 2.

Assessments Correlation

Measure	P-comp BITSEA	T-comp BITSEA	P-prob BITSEA	T-prob BITSEA	P-sur IBQ	T-sur IBQ	P-efl IBQ	T-efl IBQ	P-neg IBQ	T-neg IBQ	P-pu CDI	T-pu CDI	P-wp CDI	T-wp CDI	P-gest CDI	T-gest CDI
P-comp BITSEA	1															
T-comp BITSEA	.71**	1														
P-prob BITSEA	-.78***	-.80***	1													
T-prob BITSEA	-.17	-.10	.30	1												
P-sur IBQ	.45	.41	-.48	-.01	1											
T-sur IBQ	.31	.55*	.55*	-.03	.05	1										
P-efl IBQ	.46	.45	-.30	.45	.59*	.20	1									
T-efl IBQ	.65**	.79***	-.85***	.03	.30	.76***	.44	1								
P-neg IBQ	-.62*	-.26	.58*	.30	-.03	-.51	-.18	-.52*	1							
T-neg IBQ	-.62*	-.26	.58*	.30	-.03	-.51	-.18	-.52*	1.00***	1						
P-pu CDI	.50	.54*	-.38	-.05	.13	-.08	.15	.24	.07	.07	1					
T-pu CDI	.68**	.75***	.75***	.01	.32	.20	.39	.66**	-.26	-.26	.68**	1				
P-wp CDI	.37	.32	-.55*	.06	-.04	.39	.14	.61*	-.51	-.51	.09	.41	1			
T-wp CDI	.37	.46	-.65**	-.07	-.02	.57*	.10	.70**	-.56*	-.56*	.06	.43	.92***	1		
P-gest CDI	.53*	.18	-.38	-.38	.06	-.22	-.18	.11	.32	-.32	.58*	.47	.16	.14	1	
T-gest CDI	.41	.62*	-.72**	.00	.10	.76***	.17	.80*	-.53*	-.53*	.20	.51	.77***	.89***	.12	1

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; BITSEA = Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006); IBQ = Infant Behavior Questionnaire (Rothbart & Gartstein, 2000); CDI = Communicative Development Inventory (Fenson, Marchman, Thal, Dale, Reznick, & Bates, 2007). P-comp = Parent-reported emotional competence; T-comp = Teacher-reported emotional competence; P-prob = Parent-reported emotional problem; T-prob = Teacher-reported emotional problem; P-sur = Parent-reported temperament surgency; T-sur = Teacher-reported temperament surgency; P-efl = Parent-reported temperament effortful control; T-efl = Teacher-reported temperament effortful control; P-neg = Parent-reported negative temperament; T-neg = Teacher-reported negative temperament; P-pu = Parent-reported phrases understood; T-pu = Teacher-reported phrases understood; P-wp = Parent-reported words produced; T-wp = Teacher-reported words produced; P-gest = Parent-reported gestures; T-gest = Teacher-reported gestures.

Parents and teachers completed surveys on their beliefs on the development and care of infants in five categories of emotion, temperament, attachment, language, and baby sign language. Correlation of parent and teacher beliefs showed very little variance across all five subscales (see Tables 3 and 4 for a comparison of parent and teacher views).

Table 3.

Parent and Teacher Beliefs Descriptives

Construct (Assessment) <i>n</i> = 16	Parent beliefs	Teacher beliefs
	M (SD)	M (SD)
beliefs on infant emotion (VDCIT)	4.26 (.52)	4.13 (.33)
beliefs on infant temperament (VDCIT)	3.63 (.31)	3.81 (.38)
beliefs on infant attachment (VDCIT)	4.24 (.63)	3.90 (.62)
beliefs on infant language (VDCIT)	4.06 (.44)	4.30 (.28)
beliefs on baby sign language (VDCIT)	4.06 (.54)	4.19 (.53)

Note. VDCIT = Views on Development and Care of Infants and Toddlers (adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015).

Table 4.

Parent and Teacher Beliefs Correlation

Variable	P-emot VDCIT	T-emot VDCIT	P-temp VDCIT	T-temp VDCIT	P-att VDCIT	T-att VDCIT	P-lang VDCIT	T-lang VDCIT	P-bsl VDCIT	T-bsl VDCIT
P-emot VDCIT	1									
T-emot VDCIT	.53	1								
P-temp VDCIT	.59*	.52	1							
T-temp VDCIT	.30	.27	.48	1						
P-att VDCIT	.22	.60	.23	.54	1					
T-att VDCIT	.33	.80*	.37	.60	.71	1				
P-lang VDCIT	.41	-.29	.16	.18	-.07	.15	1			
T-lang VDCIT	.38	.82*	.74*	.64	.67	.83*	-.17	1		
P-bsl VDCIT	.07	.33	-.12	.12	.10	-.04	-.02	-.19	1	
T-bsl VDCIT	.81*	.34	.23	.20	.01	.21	.35	.33	.63	1

Note. * $p < .05$; VDCIT = Views on Development and Care of Infants and Toddlers (adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015); P-comp = Parent-reported emotional competence; T-comp = Teacher-reported emotional competence; P-bsl = Parent-reported baby sign language; T-bsl = Teacher-reported baby sign language.

For stage three of the study analyses, partial bivariate correlations (with child age as the covariate) were used to analyze the study's four hypotheses. Hypothesis one predicted that infant positive temperament, symbolic gesture use, and developmentally supportive caregiver beliefs would be independently and positively associated with emotional expression. Parent-reported emotional competence was significantly and positively related to teacher-reported temperament effortful control ($r = .65, p = .01$) and parent-reported symbolic gesture use ($r = .53, p = .05$). Teacher-reported emotional competence was significantly and positively related to teacher-reported positive temperament of surgency ($r = .55, p = .04$) and effortful control ($r = .79, p = .00$). Teacher-reported emotional competence was also significantly related to teacher symbolic gesture use ($r = .62, p = .01$) and parent beliefs ($r = .51, p = .05$) on attachment (see Table 5 for analyses testing study hypothesis one).

Table 5.

Hypothesis 1

Measure	P-comp BITSEA	T-comp BITSEA	P-sur IBQ	T-sur IBQ	P-eff IBQ	T-eff IBQ	P-gest CDI	T-gest CDI	P-emot VDCIT	T-emot VDCIT	P-temp VDCIT	T-temp VDCIT	P-att VDCIT	T-att VDCIT	P-lang VDCIT	T-lang VDCIT
P-comp BITSEA	1															
T-comp BITSEA	.71**	1														
P-sur IBQ	.50	.41	1													
T-sur IBQ	.31	.55*	.05	1												
P-eff IBQ	.46	.45	.59*	.20	1											
T-eff IBQ	.65**	.79***	.29	.76***	.44	1										
P-gest CDI	.53*	.18	.06	-.22	-.18	.11	1									
T-gest CDI	.42	.62*	.12	.76***	.17	.80***	.12	1								
P-emot VDCIT	-.28	-.06	-.40	-.14	-.26	-.20	.00	-.23	1							
T-emot VDCIT	-.16	-.08	-.43	.23	.08	.01	-.12	-.09	.02	1						
P-temp VDCIT	-.06	.05	-.18	.01	-.26	.02	.24	.20	.46	.00	1					
T-temp VDCIT	-.00	.18	-.61*	.47	-.32	.25	.09	.38	.53*	.41	.46	1				
P-att VDCIT	.45	.51*	.22	.29	.25	.59*	.07	.42	.25	-.39	.07	.02	1			
T-att VDCIT	-.18	-.11	-.69**	.11	-.24	-.11	.11	-.12	.33	.87***	.29	.67**	-.37	1		
P-lang VDCIT	.01	.13	-.11	-.07	.24	.10	-.01	-.05	.37	.08	.02	.29	-.08	.16	1	
T-lang VDCIT	-.15	.07	-.59*	.32	-.13	.06	-.03	.01	.28	.90***	.17	.66***	-.26	.94***	.06	1

Note: $p < .05$, ** $p < .01$, *** $p < .001$; BITSEA = Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006); IBQ = Infant Behavior Questionnaire (Rothbart & Gartstein, 2000); CDI = Communicative Development Inventory (Tenson, Marchman, Thal, Dale, Reznick, & Bates, 2007); VDCIT = Views on Development and Care of Infants and Toddlers (adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015); P-comp = Parent-reported emotional competence; T-comp = Teacher-reported emotional competence; P-sur = Parent-reported temperament surgery; T-sur = Teacher-reported temperament surgery; P-eff = Parent-reported temperament effortful control; T-eff = Teacher-reported temperament effortful control; P-gest = Parent-reported gestures; T-gest = Teacher-reported gestures; P-emot = Parent-reported beliefs on emotion; T-emot = Teacher-reported beliefs on emotion; P-temp = Parent-reported beliefs on temperament; T-temp = Teacher-reported beliefs on temperament; P-att = Parent-reported beliefs on attachment; T-att = Teacher-reported beliefs on attachment; P-lang = Parent-reported beliefs on language; T-lang = Teacher-reported beliefs on language.

Hypothesis two predicted that infant negative temperament would be negatively associated with emotional expression. Parent-reported emotional competence was significantly negatively related to parent-reported negative temperament ($r = -.62, p = .01$) and teacher-reported negative temperament ($r = -.62, p = .01$). Teacher-reported emotional competence was not significantly negatively related to parent-reported negative temperament ($r = -.26, p = .36$) or teacher-reported negative temperament ($r = -.26, p = .36$). Parent and teacher negative temperament scores were perfectly correlated. (see Table 6 for analyses testing study hypothesis two).

Table 6.

Hypothesis II

Measure	P-comp BITSEA	T-comp BITSEA	P-neg IBQ	T-neg IBQ
P-comp BITSEA	1			
T-comp BITSEA	.71**	1		
P-neg IBQ	-.62*	-.26	1	
T-neg IBQ	-.62*	-.26	1	1

Note. * $p < .05$, ** $p < .01$; BITSEA = Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006); IBQ = Infant Behavior Questionnaire (Rothbart & Gartstein, 2000); P-comp = Parent-reported emotional competence; T-comp = Teacher-reported emotional competence; P-neg = Parent-reported negative temperament; T-neg = Teacher-reported negative temperament.

Hypothesis three predicted that symbolic gesture use will moderate the relations of negative infant temperament on emotional expression. In order to analyze this hypothesis, the interaction terms for symbolic gesture and negative infant temperament were created. These computed interaction scores included: parent-reported symbolic gesture use * parent-reported infant negative temperament; parent-reported symbolic gesture use * teacher-reported negative infant temperament; teacher-reported symbolic gesture use * teacher-reported infant negative temperament; and teacher-reported symbolic gesture use * parent-reported negative infant temperament. The analysis testing the moderating effect of symbolic gesture use on the effect of negative infant temperament on emotional expression was not supported. While both symbolic gesture use and negative infant temperament were significantly related to emotional expression, the use of symbolic gesture did not moderate or change the influence of negative infant temperament on decreasing emotional expression (see Table 7 for analyses testing study hypothesis three).

Table 7.

Hypothesis III

Variable	P-comp BITSEA	T-comp BITSEA	P-neg IBQ	T-neg IBQ	P-gest CDI	T-gest CDI	P-gest P-temp	P-gest T-temp	T-gest T-temp	T-gest P-temp
P-comp BITSEA	1									
T-comp BITSEA	.71**	1								
P-neg IBQ	-.62*	-.26	1							
T-neg IBQ	-.62*	-.26	1.00***	1						
P-gest CDI	.53*	.18	-.32	-.32	1					
T-gest CDI	.42	-.63*	-.53*	-.53*	.66	1				
P-gest P- temp	-.14	.70	.70**	.70**	.42	-.51*	1			
P-gest T- temp	-.14	.70	.70**	.70**	.42	-.51*	1.00***	1		
T-gest T-temp	-.14	.22	.77***	.77***	-.02	-.08	.72**	.72**	1	
T-gest P- temp	-.14	.22	.77***	.77***	-.02	-.08	.72**	.72**	1.00***	1

Note. * $p < .05$, ** $p < .01$, *** $p < .001$; BITSEA = Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006); IBQ = Infant Behavior Questionnaire (Rothbart & Gartstein, 2000); CDI = Communicative Development Inventory (Fenson, Marchman, Thal, Dale, Reznick, & Bates, 2007); P-comp = Parent-reported emotional competence; T-comp = Teacher-reported emotional competence; P-neg = Parent-reported negative temperament; T-neg = Teacher-reported negative temperament; P-neg = Parent-reported gestures; T-neg = Teacher-reported gestures; P-gest P-temp = Parent-reported gesture x Parent-reported positive temperament; P-gest T-temp = Parent-reported gesture x Teacher-reported positive temperament; T-gest P-temp = Teacher-reported gesture x Parent-reported positive temperament; T-gest T-temp = Teacher-reported gesture x Teacher-reported positive temperament.

Hypothesis four predicted that parents' and teachers' reports of more responsive beliefs and attitudes on baby sign language would be associated with positive infant emotional expression. Analyses indicated that parent-reported levels of emotional expression were related to their more positive beliefs on the use of baby sign language ($r = .55, p = .05$). Even though teachers reported more positive overall beliefs of the use of baby sign language, there was no significant relation with reports of emotional expression (see Table 8 for analyses testing study hypothesis four).

Table 8.

Hypothesis IV

Measure	P-comp BITSEA	T-comp BITSEA	P-bsl VDCIT	T-bsl VDCIT
P-comp BITSEA	1			
T-comp BITSEA	.71**	1		
P-bsl VDCIT	.55*	.51	1	
P-bsl VDCIT	.17	.02	-.06	1

Note. * $p < .05$, ** $p < .01$; BITSEA = Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006); VDCIT = Views on Development and Care of Infants and Toddlers (adapted from Vallotton, 2012; Henk, 2014; & Bassett, 2015); P-comp = Parent-reported emotional competence; T-comp = Teacher-reported emotional competence; P-bsl = Parent-reported baby sign language; T-bsl = Teacher-reported baby sign language.

Discussion

Infants have a desire and need to communicate prior to the onset of spoken words. Emotional expression is a vessel in which preverbal infants can convey feelings, thoughts, wants, and needs so caregivers can recognize and meet those feelings, thoughts, wants, and needs. Although infants are born with biological dispositions and innate reactions, caregivers can foster emotional expression competency through communicative interactions and experiences. Children's experiences in given situations and child-rearing practices play a part in whether specific traits lead to positive or negative emotional expression outcomes (Rothbart, 2012). The nature of biological reactivity and the nurture of caregivers mutually constitute each other (Sameroff, 2010). There is a circular dynamic interplay between caregivers and infants (Sameroff, 1975) with whom a bond of attachment has been established (Bowlby, 1982).

Data collection from the study were dependent on parents and teachers reporting on children's characteristics, development, and behaviors. A correlation of all parent-reported and teacher-reported study measures was analyzed. There was a skewness in the observations and evaluations between parents and teachers reporting on the same child. On average, parents reported higher levels of emotional competence, positive temperament, and communication skills. Teachers reported higher levels of emotional problems and lower levels of communication skills. Parents and teachers had perfect correlation in regard to negative temperament.

The consensus was that parents reported higher and more positive levels of competence on their own children than the teachers of those same children. This phenomenon may have occurred because parents have stronger attachments with their children and may be more in tune with their feelings, thoughts, wants, and needs. Parent reports may have been biased due to the desire of the respondents to portray their own children in a desirable way. Teachers may be more

objective in assessing children as they do not have same relationship as children do with their parents. Children may elicit different responses and behaviors at home with familial caregivers than they do in an environment outside the home. In a childcare situation, children are exposed to non-familial caregivers and are in the presence of peers. Teachers have multiple children in their care and have less time to devote to individual children than parents would at home. Even though children may spend more waking hours with teachers, the study suggests that parents may have more insight into their children's characteristics, behaviors, and development, and there may be some parent bias. Teachers may be more objective towards children's characteristics, behaviors, and development, but the dynamics of caring for multiple children may influence their ability to devote focus on each individual child.

In contrast to the outcomes of the parent-reported and teacher-reported assessment correlation, the views on development and care of infants and toddlers were closely associated for parents and teachers. There was very little variance in the parents' and teachers' beliefs on emotion, temperament, attachment, language, and baby sign language. The education levels of both parents and teachers may have influenced the higher score levels in knowledge of child development and child-rearing practices. All of the teachers were childcare professionals holding at least a bachelor's degree which would be expected of a high quality childcare facility. However, the majority of the parents had achieved doctorate degrees which is highly unlikely in an average study sample. This skewness may be due to researcher's use of a convenience sample and because the Child Development Study Center is affiliated with a university and associated with child development lab students.

Emotional expression. The study explored relations to emotional expression competence with respect to internal influences, as measured by temperament, and external influences, as

measured by caregiver beliefs and interactions with infants through the use of symbolic gesture. Data were consistent with hypothesis one that temperament, communication through use of symbolic gesture, and caregiver beliefs were independently and positively associated with emotional expression. High levels of emotional expression competence were reported by both parents and teachers in association with positive temperament and symbolic gesture. Teachers reported high emotional expression scores in correlation to parents' reports on attachment.

These findings suggested that internal and external influences independently and collectively may affect the emotional expression competence in children. Acknowledgement by caregivers that inborn characteristics may affect the way children react to their environments, caregiving interactions through symbolic gesture, and positive caregiver beliefs may lead to healthy and competent infant emotional expression.

Temperament. The study investigated the association of negative temperament and emotional expression competence in order to reliably detect any moderating effect of symbolic gesture use in relation to the variables. Parents reported that children with higher scores of negative innate reactivity were not in relation to positive emotional expression scores. In other words, the variables of negative temperament and positive emotional expression were negatively associated as was predicted in hypothesis two. Teachers, however, did not associate high emotional competence with negative temperament. This discrepancy may indicate that parents had a more accurate account of their children's internal thermometers and external emotional consistencies. Results conclude that internal negative affect may interact in the prediction of children's developmental outcomes.

Communication. Even though negative temperament was negatively associated with emotional expression competence, computed interaction scores of negative temperament and

symbolic gesture use did not support hypothesis three that there was any moderating effect on emotional expression competence. Negative temperament did not change and was not moderated by gesture use. Both variables of symbolic gesture use and negative infant temperament were significantly related to emotional expression outcomes, but independent of each other. Internal and external influences were both independently important. There were limitations to the cross-sectional study design of existing circumstances. The amount of time to conduct the study was limited and a convenient sample was necessary. A larger, more diverse study sample and a longitudinal or pre-test post-test study of symbolic gesture use over time may have produced different outcomes to the hypothesis. Previous research has suggested that symbolic gesture use with preverbal children stimulates communication with caregivers and promotes positive emotional expression development (Acredolo, & Goodwyn, 2000; Gongora & Farkas, 2009; Moore, Acredolo, & Goodwyn, 2001; Vallotton, 2008, 2011, 2012).

Symbolic gesture. Data from the current study suggested parents have positive responsiveness to beliefs on baby sign language use in its association with infant emotional expression competence. Teachers reported high beliefs in baby sign language, but there was no correlation with gesture use affecting competence in emotional expression. Results indicate parents may be more attuned to the use of gestures as a means of communication for emotional responses. Benefits of the intentional use of symbolic gesture used as a vessel of communication between preverbal children and their caregivers has been supported by previous studies. Early gesture use predicted later development of emotional expression concepts (Vallotton & Ayoub, 2010). Perhaps baby sign language usage should have a greater presence in childcare. Using sign language in the classroom could also be used as a tool for professional development with teachers (Vallotton, 2011).

Caregivers. Developmental emotional expression outcomes of infants are dependent, in part, on caregiving practices. Caregiving practices are dependent, in part, on the caregivers' beliefs, attitudes, and behaviors. Early emotional states and experiences of infants are greatly influenced by the interpretation and facilitation of parents and teachers. The present study could lead caregivers to better understand the importance of the development of emotional expression in infants and ways to accomplish the fostering. It suggested that parental and non-parental caregivers may interpret infants cues differently, but there is a need to work collectively. Both parents and teachers benefit from forming attachment bonds with infants in order to communicate effectively. The study reflects that caregiver beliefs are contingent to caregiving practices and infant emotional expression. Additionally, incorporating symbolic gesture in daily routines appeared to promote positive communication skills, attachment bonds, and emotional expression.

Conclusion

Results revealed that emotional expression competence in infants is influenced by internal positive temperament and the external use of symbolic gesture as a communicative tool. Parent and teacher beliefs on caregiving and the development of infants and toddlers had a positive effect on positive emotional expression in infants. Parents and teachers can stimulate emotional expression in children by acknowledging individual biological differences, providing positive environmental experiences, and building reciprocal communication skills. The study shows that internal characteristics and behaviors of infants, external interactions with infants, and positive caregiver beliefs may lead to healthy and competent infant emotional expression.

Possible benefits of the study included: expanding the knowledge of relations among infant temperament, symbolic gesture use, and emotional expression in the field of child

development; educating parents of the importance of attachment, communication, and positive caregiving beliefs; and training childcare teachers to incorporate baby sign language as part of the curriculum.

Further research would benefit from larger sample sizes and longitudinal study in the areas of emotional expression and symbolic gesture use of infants. There has been a lack of empirical research on baby sign language. There is a need for more testing of signing children compared to those of their non-signing peers in regards to emotional expression skills. More studies may provide positive data supporting its use to enhance emotional expression, communication skills, tantrum reduction, use in child care facilities, or in clinical use. As baby signing continues to grow in popularity for infants with normal hearing, more research is necessary.

References

- Acredolo, L., & Goodwyn, S. (1985). Symbolic gesturing in language development: A case study. *Human Development, 28*, 40-49.
- Acredolo, L., & Goodwyn, S. (1988). Symbolic gesturing in normal infants. *Child Development, 59*, 450-466. doi:10.2037/1130324
- Acredolo, L., & Goodwyn, S. (2000). The long-term impact of symbolic gesturing during infancy on IQ at age 8. *International Society for Infant Studies*. Brighton, U.K.
- Ainsworth, M.S., & Bowlby, J. (1991). An ethological approach to personality development. *American Psychologist, 46*(4), 333-341.
- American Psychological Association (2016). *Parents and caregivers are essential to children's healthy development*. <http://www.apa.org/pi/families/resources/parents-caregivers.aspx>
- Ayoub, C., & Fischer, K. W. (2006). Developmental pathways and intersections among domains of development. In: McCartney, K., Phillips, D., editors. *Blackwell handbook on early childhood development*, 62-82. Oxford, UK.
- Ayoub, C., Raya, P., & Russell, C. (2000). Emotions in pretense scheme coding manual. *Human development and psychology, laboratory manual*. Cambridge, MA: Harvard University.
- Barber, B. K., Stolz, H. E., & Olsen, J. A. (2005). Parental support, psychological control, and behavioral control: Assessing relevance across time, culture, and method. *Monographs of the Society for Research in Child Development, 70*, 1-147.
- Bassett, M. (2015). Study - Baby sign language pilot survey.
- Bates, E., Benigni, L., Bretherton, I., Camaioni, L., & Volterra, V. (1979). Cognition and communication from nine to thirteen months: Correlational findings. In E. Bates (Ed.), *The emergence of symbols: Cognition and communication in infancy*, 69-140. New York, NY: Academic Press.
- Bates, E., Camaioni, L., & Volterra, V. (1975). The acquisition of performatives prior to speech. *Merrill-Palmer Quarterly, 21*, 205-226.
- Batki, A., Baron-Cohen, S., Wheelwright, A., Connellan, J., & Ahluwalia, J. (2000). Is there an innate gaze module? Evidence from human neonates. *Infant Behavior and Development, 23*(2), 223-229.
- Behne, T., Carpenter, M., & Tomasello, M. (2005). One-year-olds comprehend the communicative intentions behind gestures in a hiding game. *Developmental Science, 8*(6), 492-499.

- Bornstein, M. H. & Putnick, D. L., Garstein, M. A., Hahn, C., Auestad, N., & O'Connor, D. L. (2015). Infant temperament: Stability by age, gender, birth order, term status, and socioeconomic status. *Child Development, 86*(3), 844-863.
- Bowlby, J. (1973). *Attachment and loss, Vol.2: Separation*. New York, NY: Basic Books.
- Bowlby, J. (1982). Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry, 52*(4), 664-678. doi:10.1111/j.1939-0025.1982.tb01456.x
- Brackett, M. A., Crum, A., & Salovey, P. (2009). Emotional intelligence. In S. J. Lopez (Ed.), *Encyclopedia of positive psychology*, 310-315. New York, NY: Blackwell.
- Briggs-Gowan, M. J., & Carter, A. S. (2006). The brief infant-toddler social & emotional assessment (BITSEA). San Antonio, TX: Psychological Corporation.
- Briggs-Gowan, M. J., Carter, A. S., Irwin, J. R., Wachtel, K., & Cicchetti, D. V. (2004). The Brief Infant-Toddler Social and Emotional Assessment: screening for social-emotional problems and delays in competence. *Journal of Pediatric Psychology, 29*(2), 143-155.
- Calkins, S. (2012). Temperament and its impact on child development: Comments on Rothbart, Kagan, Eisenberg, and Schermerhorn and Bates. *Temperament*.
- Capone, N. C., & McGregor, K. K. (2004). Gesture development: A review for clinical and research practices. *Journal of Speech, Language, and Hearing Research, 47*, 173-186.
- Cohn, J. F., & Ellmore, M. (1988). Effect of contingent changes in mothers' affective expression on the organization of behavior in 3-month-old infants. *Infant Behavior and Development, 11*, 493-505.
- Cohn, J. F., & Tronick, E. Z. (1987). Mother-infant face-to-face interaction: The sequence of dyadic states at 3, 6, and 9 months. *Developmental Psychology, 23*, 68-77.
- Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodology challenges and directions for child development research. *Child Development, 75*(2), 317-333.
- Colonnese, C., Zijlstra, B. J. H., van der Zande, A., & Bögels, S. M. (2012). Coordination of gaze, facial expressions and vocalization of early infant communication with mother and father. *Infant Behavior and Development, 35*(3), 523-532.
- Crais, E., Douglas, D.D., & Campbell, C.C. (2004). The intersection of the development of gestures and intentionality. *Journal of Speech, Language, and Hearing Research, 47*, 678-694.
- Doherty-Sneddon, G. (2008). The great baby signing debate. *The Psychologist, 21*(4), 300-303.

- Dunn, J., & Hughes C. (2001). 'I got some swords and you're dead!': Violent fantasy, antisocial behavior, friendship, and moral sensibility in young children. *Child Development, 72*, 491-505. [PubMed: 11333080]
- Eisenberg, N. (2012). Temperamental effortful control (self-regulation). *Encyclopedia of Early Childhood Development*.
- Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry, (4)*, 241-273.
- Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. J., Pethick, S. J., & Stiles, J. (1994). variability in early communicative development. *Monographs of the Society for Research in Child Development, 59(5)*. i-185. <http://doi.org/10.2307/1166093>
- Fenson, L., Marchman, V., Thal, D.J., Dale, P.S., Reznick, J.S., Bates, E. (2007). MacArthur-Bates Communicative Development Inventories: Words and Gestures. Baltimore, MD: Brookes. ISBN: 978-1-55766-888-2
- Field, T. M., & Walden, T. A. (1982). Production and perception of facial expressions in infancy and early childhood. *Advances in Child Development and Behavior, 16*, 169-211.
- Folven, R., & Bonvillian, J. D. (1991). The transition from non-referential to referential language in children acquiring American Sign Language. *Developmental Psychology, 27*, 806-816.
- Gartstein, M.A. (2012). Asking questions about temperament: self- and other-report measures across the lifespan. In M. Zentner & R. Shiner (Eds.), *Handbook of temperament*, 183-208. New York, NY: Guilford.
- Gartstein, M.A., & Rothbart, M.K. (2003). Studying infant temperament via the revised infant behavior questionnaire. *Infant Behavior and Development, 26*, 64-86.
- German, D. (1992). Word-finding intervention for children and adolescents. *Topics in Language Disorders, 13(1)*, 33-50.
- Goldin-Meadow S. (2005). The two faces of gesture: Language and thought. *Gesture, 5*, 241-257. Special issue: Gestural communication in nonhuman and human primates.
- Goleman, D. (2007). *Selling SEL: An interview with Daniel Goleman*. CASEL Forum, New York, NY. Retrieved on March 18, 2009, from <http://www.edutopia.org/daniel-goleman-sel-video>.
- Gongora, X. & Farkas, C. (2009). Infant sign language program effects on synchronic mother-infant interactions. *Infant Behavior & Development, 32*, 216-225.
- Grossman, T. (2010). The development of emotion perception in face and voice during infancy. *Restorative Neurology and Neuroscience, 28(2)*, 219-236.

- Henk, J. (2014). Study - Infant toddler early experiences project: JTCDSC teacher survey
- Honig, A. (1994). Helping toddlers with group entry skills. *Zero to Three, 14*(5), 15-19.
- Hood, B. M., Willen, J. D., & Driver, J. (1998). Adult's eyes trigger shifts of visual attention in human infants. *Psychology Science, 9*, 131-34.
- Howes, C., & Hamilton, C. E. (1992). Children's relationships with caregivers: Mothers and child care teachers. *Child development, 63*(4), 859-866.
- Izard, C.E. (1977). *Human emotions*. New York, NY: Plenum.
- Izard, C.E., & Malatesta, C.Z. (1978). Perspectives on emotional development: 1. Differential emotions theory of early emotional development. *Handbook of infant development* (2nd ed.), 494-554. New York, NY: Wiley.
- Kahana-Kalman, R., & Walker-Andrews, A.S. (2001). The role of person familiarity in young infants' perception of emotional expressions. *Child Development, 72*(2), 352-369.
- Kopp, C. (1989). Regulation of distress and negative emotions: A developmental view. *Developmental Psychology, 25*, 343-354.
- Lerner, J. V., & Castellino, D. R. (2000). Parent-child relationship in childhood. Parent Management Training. *Encyclopedia of psychology, 6*, 46-50.
- Lester, B., Hoffman, J., & Brazelton, T. B. (1985). The structure of mother-infant interaction in term and preterm infants. *Child Development, 56*, 15-27.
- Lewis, M., & Michalson, L. (1983). *Children's emotions and moods: Developmental theory and measurement*. New York, NY: Plenum.
- Linder, T. W. (1993). *Transdisciplinary play-based intervention: Guidelines for developing meaningful curriculum for young children*. Baltimore, MD: Paul H. Brooke.
- Liszkowski, U., Carpenter, M., Henning, A., Striano, T., & Tomasello, M. (2004). Twelve-month-olds point to share attention and interest. *Developmental Science, 7*, 297-307.
- Liszkowski, U., Carpenter, M., Striano, T., & Tomasello, M. (2006). 12- and 18-month-olds point to provide information for others. *Journal of Cognition and Development, 7*, 173-187.
- Lowell, D. I., Carter, A. S., Godoy, L., Paulicin, B., & Briggs-Gowan, M. J. (2011). A randomized controlled trial of Child FIRST: A comprehensive home-based intervention translating research into early childhood practice. *Child Development, 82*(1), 193-208.
- Malatesta, C. Z. & Haviland, J. M. (1982). Learning display rules: The socialization of emotion

- expression in infancy. *Child Development*, 53, 991-1003.
- Marion, M. (2015). *Guidance of young children*. (9th ed.). NJ: Pearson. ISBN 10: 0-13-342722-6, ISBN 13: 978-0-13-342722-6
- Manolson, A. (1992). *It takes two to talk: A parent's guide to helping children communicate*. Toronto, Ontario, Canada: The Hanen Centre.
- Moore, B., Acredolo, L., & Goodwyn, S. (2001). *Symbolic gesturing and joint attention: Partners in facilitating verbal development*. In Biennial Meeting of the Society for Research in Child Development. Minneapolis, MN.
- Morash, K.C., & Bell, M.A. (2012). Self-regulation of negative affect at 5 and 10 months. *Developmental psychobiology*, 52(2), 215-221. doi:10.1002/dev.20584
- Mueller, V., Sepulveda, A., Rodriguez, S. (2014). The effects of baby sign training on child development. *Early Child Development and Care*, 184(8), 1178-1191. doi:10.1080/03004430.2013.854780
- National Research Council and Institute of Medicine (2000). *From neurons to neighborhoods: The science of early childhood development*. Committee on Integrating the Science of Early Childhood Development. Edited by J. P. Shonkoff and D. A. Phillips. Board on Children, Youth and Families, Commission on Behavioral and Social Sciences and Education. Washington, DC: National Academies Press.
- National Scientific Council on the Developing Child (2004). *Children's emotional development is built into the architecture of their brains*. Working Paper No. 2.
- Nelson, J. (2012). *Why feelings matter: The importance of emotional competence in early childhood* (Lecture). Dallas, TX: University of Texas-Dallas, Center for Children and Families, February 24. Retrieved June 10, 2013, from <http://ccf.utdallas.edu/programs-resources/spring-lecture-series/2012-lectures>
- Nelson, L. H., White, K. R., & Grewe, J. (2012). Evidence for website claims about the benefits of teaching sign language to infants and toddlers with normal hearing. *Infant and Child Development*, 21(5), 474-502.
- Olson, J., & Platt, J. (2000). *The instructional cycle. Teaching children and adolescents with special needs*, 170-197. Upper River Saddle, NJ: Prentice-Hall, Inc.
- Raikes, H. (1996). A secure base for babies: Applying attachment concepts to the infant care setting. *Young Children*, 51(5), 59-67.
- Rothbart, M. K. (2012). Early temperament and psychosocial development. *Encyclopedia on early childhood development*.
- Rothbart, M. K., & Gartstein, M.A. (2000). Infant behavior questionnaire – Revised very short

Form (IBQ – Rvsf).

- Rubin, K. H., Burgess, K., & Hastings, P. (2002). Stability and social-behavioral consequences of toddlers' inhibited temperament and parenting behaviors. *Child Development, 73*(2), 483-496.
- Sameroff, A. J. (1975). Early influences on development: Fact or fancy? *Merrill-palmer Quarterly of Behavior and Development, 21*(4), 267-294.
- Sameroff, A. J. (2010). A unified theory of development: A dialectic integration of nature and nurture. *Child Development, 6*-22.
- Sameroff, A. J., & Emde, R. N. (1989). *Relationship disturbances in early childhood: A developmental approach*. New York, NY: Basic Books.
- Saxe, R., Carey, S., & Kanwisher, N. (2004). Understanding other minds: Linking developmental psychology and functional neuroimaging. *Annual Review of Psychology, 55*, 87-124. doi:10.1146
- Shiner, R. L. (2012). The impact of temperament on child development: Comments on Rothbart, Eisenberg, Kagan, and Schermerhorn & Bates. *Encyclopedia on early childhood development*.
- Shonkoff, J. P. (2004). *Science, policy and the developing child: Closing the gap between what we know and what we do*. Washington, DC: Ounce of Prevention Fund. <http://www.ounceofprevention.org/downloads/publications/shonkoffweb.pdf> (accessed on December 7, 2006) Note, the preceding Web address is no longer valid.
- Stern, D. (2000). *The interpersonal world of the infant*. New York, NY: Basic Books.
- Sullivan, M.W., & Lewis, M. (2003). Emotional expressions of young infants and children. *Infants and young children, 16*(2), 120-142.
- Trevarthen, C., & Aitken, K. J. (2001). Infant intersubjectivity: Research, theory, and clinical applications. *Journal of Child Psychology and Psychiatry, 42*, 3-48.
- Tronick, E. (1980). Infant-mother face-to-face interaction: Age and gender differences in coordination and the occurrence of miscoordination. *Child Development, 60*, 85-92.
- Tronick, E. Z. (1989). Emotions and emotional communication in infants. *American Psychologist, 44*(2), 112-19.
- Vallotton, C. (2008). Infants take self-regulation into their own hands. *Zero to Three, 29*, 29-34.
- Vallotton, C. (2008). Signs of emotion: What can preverbal children “say” about internal states? *Infant Mental Health Journal, 29*, 234-258.

- Vallotton, C. (2009). Do infants influence their quality of care? Infants' communicative gestures predict caregivers' responsiveness. *Infant Behavior and Development*, 32, 351-365.
- Vallotton, C. (2011). Babies open our minds to their minds: How "listening" to infant signs complements and extends our knowledge of infants and their development. *Infant Mental Health Journal*, 32(1), 115-133.
- Vallotton, C. (2011). *Sentences and conversations before speech? Gestures of preverbal children reveal cognitive and social skills that do not wait for words*. In Integrating gesture: The interdisciplinary nature of gesture, 105-120. John Benjamins: Amsterdam, The Netherlands.
- Vallotton, C. (2012). Infant signs as intervention? Promoting symbolic gestures for preverbal children in low-income families supports responsive parent-child relationships. *Early Childhood Research Quarterly*, 27(3), 401-415.
- Vallotton, C. (2014). Study - CUPID: Characterizing University Pedagogy for Infant/Toddler Development: Student and Course Characteristics.
- Vallotton, C. & Ayoub, C. (2010). Symbols build communication and thought: The role of gestures and words in the development of engagement skills and social-emotional concepts during toddlerhood. *Social Development*, 19(3), 601-626.
doi:10.1111/j.14679507.2009.00549.x
- Vallotton, C.D., Decker, K.B., & Fusaro, M. (2010). *A bridge to somewhere: Symbolic gestures as concrete representations that build towards abstract ones*. XVIIth Biennial International Conference on Infant Studies. Baltimore, MD.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Weinberg, K. (1989). *The relation between facial expressions of emotion and behavior in 6 month old infants*. Unpublished master's thesis, University of Massachusetts: Amherst.
- Werner, H. & Kaplan, B. (1963). *Symbol formation*. Oxford, England: Wiley.
- Wittmer, D. S. (2008). A focus on peers in the early years: The importance of relationships. *Zero to three*. Washington, DC.
- Wittmer, D., & Petersen, S. (2014). *Infant and toddler development and responsive program planning: A relationship-based approach*. (3rd ed.) NJ: Pearson.
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Appendix

Figure 1. IRB Approval Letter



January 20, 2016

MEMORANDUM

TO: Mary Bassett
Jennifer Henk

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 15-12-418

Protocol Title: *Influences of Temperament, Symbolic Gesture, and Caregiver Beliefs on Infant Emotional Expression*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 1/20/2016 Expiration Date: 1/08/2017

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 60 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Figure 2. Parent Introduction Letter

Parents,

I am in the second year of the Master's program in Human Development and Family Sciences with an emphasis in Child Development at the University of Arkansas. I am currently acting as lab assistant for the U of A undergraduate students who use the Jean Tyson Child Development Study Center. Prior to returning to school, I substitute taught at the Center for a year.

I would like to invite you to participate on behalf of your infant or toddler in the research project I am pursuing for my thesis involving the influences of symbolic gesture, innate temperament, and caregiver beliefs on emotional expression. Your obligations would include signing a consent form to participate, completing a Communicative Development Inventory (CDI - Fenson, 2007) on early language development, an Infant Behavior Questionnaire (IBQ - Gartstein & Rothbart, 2003) on infant temperament, a Brief Infant Toddler Social-Emotional Assessment (BITSEA - Briggs-Gowan & Carter, 2006) on emotional expression competency, and a Views on Development and Care of Infants and Toddlers Questionnaire (adapted from Vallotton, 2014).

All questionnaires and assessments will individually take no more than twenty minutes to complete. In addition, you will have the option to participate in a FREE 90-minute Baby Signs® Parent Workshop (Acredolo & Goodwyn, 2003) which includes baby sign language training and education on the benefits of the use of symbolic gesture on child development.

Data and results from the research project will be available to you upon request at the conclusion of the study as well as your child's individual assessments. Child development specialists and speech-language pathologists will have the opportunity to review the study for potential contributions to the fields.

The benefits to you will be gaining insight into your child's early language development, temperament, emotional expression competency, and the opportunity to participate in the FREE Baby Signs® Parent Workshop which normally carries a \$60 fee. The workshop is optional and not required to participate in the study. You also have the option to attend the workshop regardless of participation in the study.

If you choose to participate in the research project, sign the consent form and complete the CDI (Fenson, 2007), IBQ (Gartstein & Rothbart, 2003), and Views Questionnaire (adapted from Vallotton, 2014). The BITSEA (Briggs-Gowan & Carter, 2006) will be completed at the conclusion of the study. If you are interested in participating in the Baby Signs® Parent Workshop (information included in packet), you may return the questionnaires at that time. Otherwise, please return the completed materials to your child's teacher in the enclosed envelope by January 11, 2016.

Jean Tyson Child Development Study Center is committed to the care and safety of your child as well as to continued research in the field of child development. It provides an incredible outlet to further the education of students in child development and other related areas. Thank you for allowing your child to be a part of this important process. In conclusion, I would like to encourage you to be a part of this research project as it should be beneficial for all.

Figure 3. Parent Consent Form

CONSENT FORM

Parent

IRB #15-12-418 Start Date: 12/1/2015 Expiration Date: 12/1/2016

RESEARCH PROJECT

The influences of symbolic gesture, infant temperament, and caregiver beliefs on infant emotional expression.

The MacArthur-Bates Communicative Development Inventories: Words and Gestures (Fenson, 2007) is designed to capture information about early language development.

The Infant Behavior Questionnaire – Revised vsf (Gartstein & Rothbart, 2003) is designed to evaluate temperament in infants and toddlers.

The Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006) is designed to evaluate social-emotional development in infants and toddlers.

The Views on Development and Care of Infants and Toddlers (adapted from Vallotton, 2014) is designed to acquire caregivers' views on the development and care of infants and toddlers.

If you agree to participate, you will be given the questionnaires to fill out which should take less than twenty minutes each to complete.

You may skip any questions that make you feel uncomfortable. The researcher is not interested in individual responses, only the average responses. Names and identifying information will be collected in order to match teacher reported data to parent reported data for individual children. Once matching is complete, all identifying information will be stripped from the records and each participant assigned a number. Names and identifying information will not be included in the data file for analysis.

Participation in this study does not guarantee any benefits to you. However, possible benefits include the potential to gain knowledge about the early language development, temperament and emotional expression competency of your child. You may also opt to receive free baby sign instruction and learn the benefits of its use in daily routines.

If you have any questions about your rights as a research participant, you may contact the University of Arkansas Compliance Coordinator, Institutional Review Board

By signing below, you attest that you are 18 years old. By signing below, you are indicating that you freely consent to participate in this research study.

PARTICIPANT'S SIGNATURE: _____ DATE: _____

IRB #15-12-418
Approved: 01/20/2016
Expires: 01/08/2017

Figure 4. Teacher Introduction Letter

Teachers,

I am in the second year of the Master's program in Human Development and Family Sciences with an emphasis in Child Development at the University of Arkansas. I am currently acting as lab assistant for the U of A undergraduate students who use the Jean Tyson Child Development Study Center. Prior to returning to school, I substitute taught at the Center for a year.

I would like to invite you to participate on behalf of the infants and toddlers in your class in the research project I am pursuing for my thesis involving the influences of symbolic gesture, innate temperament, and caregiver beliefs on emotional expression. Your obligations would include signing a consent form to participate, completing Communicative Development Inventories (CDI - Fenson, 2007) on early language development, Infant Behavior Questionnaires (IBQ - Gartstein & Rothbart, 2003) on infant temperament, Brief Infant Toddler Social-Emotional Assessments (BITSEA - Briggs-Gowan & Carter, 2006) on emotional expression competency, and Views on Development and Care of Infants and Toddlers Questionnaires (adapted from Vallotton, 2014) on children in your class whose parents have consented to participate in the study.

All questionnaires and assessments will individually take no more than twenty minutes to complete. In addition, you will have the option to receive professional development hours for participating in a Baby Signs® Early Childhood Education training (Acredolo & Goodwyn, 2003) which includes baby sign language training and education on the benefits of the use of symbolic gesture on child development.

Data and results from the research project will be available to you upon request at the conclusion of the study as well as the individual assessments of the children in your class. Child development specialists and speech-language pathologists will have the opportunity to review the study for potential contributions to the fields.

The benefits to you will be gaining insight into early language development, temperament, and emotional expression competency of the children in your class. You will have the opportunity to receive three TAPP hours for participating in a Baby Signs® Early Childhood Education training (Acredolo & Goodwyn, 2003) at no cost to you. Additionally, the training will classify the Center as a Certified Baby Signs® Center. The training is optional and not required to participate in the study. You also have the option to attend the training regardless of participation in the study.

If you choose to participate in the research project, sign the consent form and complete the CDI (Fenson, 2007), IBQ (Gartstein & Rothbart, 2003), and Views Questionnaire (adapted from Vallotton, 2014) on each child whose parents have consented to participate in the study. The BITSEA (Briggs-Gowan & Carter, 2006) will be completed at the conclusion of the study. If you are interested in participating in the Baby Signs® Early Childhood Education training (information included in packet), you may return the questionnaires at that time. Otherwise, please return the completed materials to the researcher in the enclosed envelope by January 11, 2016. Jean Tyson Child Development Study Center is committed to the care and safety of children as well as to continued research in the field of child development. It provides an incredible outlet to further the education of students in child development and other related areas. Thank you for being a part of this important process. In conclusion, I would like to encourage you to be a part of this research project as it should be beneficial for all.

Figure 5. Teacher Consent Form

CONSENT FORM

Teacher

IRB #15-12-418 Start Date: 12/1/2015 Expiration Date: 12/1/2016
RESEARCH PROJECT

The influences of symbolic gesture, infant temperament, and caregiver beliefs on infant emotional expression.

The MacArthur-Bates Communicative Development Inventories: Words and Gestures (Fenson, 2007) is designed to capture information about early language development.

The Infant Behavior Questionnaire – Revised vsf (Gartstein & Rothbart, 2003) is designed to evaluate temperament in infants and toddlers.

The Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006) is designed to evaluate social-emotional development in infants and toddlers.

The Views on Development and Care of Infants and Toddlers (adapted from Vallotton, 2014) is designed to acquire caregivers' views on the development and care of infants and toddlers.

If you agree to participate, you will be given the questionnaires to fill out which should take less than twenty minutes each to complete.

You may skip any questions that make you feel uncomfortable. The researcher is not interested in individual responses, only the average responses. Names and identifying information will be collected in order to match teacher reported data to parent reported data for individual children. Once matching is complete, all identifying information will be stripped from the records and each participant assigned a number. Names and identifying information will not be included in the data file for analysis.

Participation in this study does not guarantee any benefits to you. However, possible benefits include the potential to gain knowledge about the early language development, temperament and emotional expression competency of your child. You may also opt to receive free baby sign instruction and learn the benefits of its use in daily routines.

If you have any questions about your rights as a research participant, you may contact the University of Arkansas Compliance Coordinator, Institutional Review Board.

By signing below, you attest that you are 18 years old. By signing below, you are indicating that you freely consent to participate in this research study.

PARTICIPANT'S SIGNATURE: _____ DATE: _____

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