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A Path to Empathy: Child and Family Communication

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ABSTRACT

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This longitudinal study examined the association between communication in the family on the development of empathy in young children. Co-regulation and family expressiveness measured communication in parent-child dyads at age 12 months (N = 186), 24 months (N = 100), and 36 months (N=78). A follow-up was conducted at 60 months (N = 47) to measure empathy-related responding in children. Co-regulation styles change over time, generally increasing in the most engaged, two-way style of communication (symmetrical) and decreasing in one-sided and less engaged types. Greater family expressiveness predicted higher levels of empathy as observed in an empathy-eliciting experiment, but not as measured by mother interview, questionnaire, or child's response to facial expressions. In addition, empathy was not associated with the change in symmetrical co-regulation. The results of this study indicate that open, emotional family communication may be more important in the development of empathy than the style of dyadic communication.

Keywords: empathy, empathy-related responding, communication, co-regulation, family expressiveness, child, family, dyad, emotion socialization

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Introduction

The development of empathy is a crucial milestone for humans. Empathy motivates close personal bonds, which allows humans to engage in higher order functions such as collaboration, community, and compromise. Many people are troubled that a lack of empathy is prevalent in society and contributing to the pervasive violent crime in this country. Baron-Cohen (2011) described pathological disorders stemming from neglectful or abusive parents that result in "zero degrees of empathy" in the child. President Barack Obama has also voiced concern about an "empathy deficit" as a severe problem (Obama, 2006a). Obama, in his commencement speech to Xavier University graduates, discusses why empathy is important. He said, "When you choose to broaden your ambit of concern and empathize with the plight of others, whether they are close friends or distant strangers – it becomes harder not to act; harder not to help" (Obama, 2006b).

Lack of empathy is also a concern for those working with and studying mental health. In 2012, during a revision of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), the review team seriously considered omitting the diagnosis of narcissism—a personality disorder defined by excessive self-centeredness and lack of empathy (narcissism, n.d.). Allan Schore (2012)—a renowned psychiatrist and scientist—was disturbed by the prospect of this change, because for something to be classified as a disorder in the DSM, it needed to be abnormal. Therefore, to be considered for omission, narcissism must be all too common in our society. The DSM-5 eventually retained narcissism as a disorder (American Psychiatric Association, 2013).

Perhaps one of the most pressing questions of the 21st century is "How does empathy develop?" Throughout this paper, I will provide evidence that parents play a significant role in the emotional and prosocial development of the child. I propose that parents contribute to the development of empathy in their children by communicating in a way that is positive, open,

sensitive and emotionally supportive. More specifically, parents can foster a home environment that teaches about emotions and that is accepting of expression of emotions. In addition, beginning in infancy, parents and children can engage in positive, synchronous interpersonal exchanges.

This research examines the predictive nature of family emotional expressiveness in the home and observed co-regulation patterns of the parent-child dyad to predict the development of empathy in a five-year longitudinal study of 160 families. Empathetic responses and behaviors were assessed in five-year-olds using both observational and questionnaire techniques. These are indicators of the degree to which a child has developed empathy.

Empathy development must be a focal point in the search to curb violence and build a more society. There are certainly many ways in which empathy may be fostered. The types of parent-child interactions discussed in this paper may lay a foundation of emotional socialization that will pave a pathway to empathy.

Literature Review

Empathy is the multi-faceted process of being in-sync with another's emotion. Empathetic emotions may include "sympathy, compassion, softheartedness, tenderness, sorrow, sadness, upset, distress, concern, and grief" (Batson, 2011, p. 11). However, many of the emotions characterized as empathetic may not truly be empathy depending on the motivation behind the emotion. An 18-month-old child, for example, may feel *personally* distressed when another child is crying. A four-year-old child may also feel distressed when another child is crying, but instead of feeling *personal* distress like the younger child, the distress of the older child may be in sympathy with the crying child (Hoffman, 1987). In the latter case, the distress is empathetic, whereas in the earlier case the empathy may only be rudimentary—not fully-formed. Emotions are considered empathetic as long as they are based on sympathy and other-oriented.

The root of empathy is from the German *Einfühlung,* which means, "feeling into" (einfühlung, n.d.). Wispé (1987) reports that the term *Einfühlung* was first used by Robert Vischer in 1873 to describe an individual's experience with art, such as being "swept up" in a beautiful painting or musical aria. Lipps (1851-1914) is attributed to applying *Einfühlung* in the field of psychology to describe interpersonal relationships, and suggested that one can vicariously occupy another's body and share their experience. Scientific research has provided a sound biological basis for the understanding of empathy through explaining the underlying mechanisms involved–which is explained in more detail below. Lipps' theory about "feeling into" interpersonal relationships is still applicable, because it takes into account the value of human connection. This social and emotional approach will provide a foundation for understanding empathy in this research study.

Definition and Measurement Issues

There are many definitions for empathy, including knowing another's internal state, adopting another's posture (motor mimicry) or matching another's neural responses, coming to feel as the other feels, projecting oneself into another's situation, adopting an imagine-other perspective (or perspective taking), adopting an imagine-self perspective, and feeling vicarious personal distress (Batson, 2011). For the purpose of this paper, empathy is defined *as other-oriented emotional responses that stem from the perceived emotional state or need of others*—a definition that is congruent with the consensus of established researchers in the field (Batson, 2011; Eisenberg & Strayer, 1987; Hoffman, 1981).

The varying definitions of empathy has created problems when attempting to operationalize the construct of empathy. The underlying problem is that empathy is a process that occurs *internally* that scientists are attempting to measure *externally*. Therefore, a combination of creativity and practicality have produced a variety of ways to measure empathy-related responding. Zhou, Valiente, and Eisenberg (2003) list and describe four types of empathy measures; 1) self-report (picture stories, questionnaires, simulated experiments), 2) other-report (teacher or parent), 3) facial, gestural and vocal indices (in response to a simulated experiment), and 4) physiological (heart rate and skin conductance). None of these measures are fail-safe in their operationalization, measurement, and interpretation of empathy. Henceforth, it is difficult to compare research studies on a one-to-one basis. On the other hand, different measures may uncover different aspects of empathy-related responding, so having a variety of measures contributes to the whole picture. Zhou, Valiente, and Eisenberg recommend a multi-method approach in order to capitalize on measures' strengths while accounting for their weaknesses. The studies cited in this literature review used a variety of definitions and methods when

collecting and interpreting the data. Although they may have different working definition than employed in this paper, they add value in contributing to the overall picture of empathy development.

Developmental Context

By the end of the 20th century, research in the field of developmental psychology began to focus on whether or not infants and young children experience empathy. Hoffman (1981, 1982) was a prominent researcher in this arena and proposed that empathy develops throughout the lifespan. Infants show rudimentary forms of empathy called "emotional resonance" and emotion matching (Thompson, 1987). Newborns, for example, show emotional resonance when they cry in response to hearing other infants cry (Simner, 1971). This crying response in newborns was thought to be a result of the newborn feeling distressed. Follow up research has shown that newborns will not cry as much when hearing their own cry (pre-recorded) compared to hearing other babies cry—a form of emotional resonance (Dondi, Simion, Caltran, 1999).

In addition to emotional resonance, infants are also capable of emotion matching. Malatesta and Haviland (1982) found that an infant's positive expression during mother-infant face-to-face play increases as the mother matched and then accentuated the infant's positive emotional displays. If the mother were the only part of the dyad who was accentuating emotions, the amount of positive displays by the infant should remain the same. Surprisingly, the infant's positive arousal was, in turn, heightened in response to the mother. This type of emotional attunement, such as emotional resonance and emotion matching, may be considered a building block of later empathy.

Around 12 months, children develop a form of empathy called "egocentric empathy" (Hoffman, 2000). While the term may seem like an oxymoron, it aptly describes the self-focused

nature of emerging empathy in toddlers. Zahn-Waxler and colleagues have studied young children and recorded evidence of empathy-related prosocial responding emerging in the first year of life (Zahn-Waxler, Radke-Yarrow, & King, 1979; Roth-Hanania et al., 2011). In addition, Hamlin, Wynn, and Bloom (2007) showed that infants between six and ten months old may assess individuals based on how helpful they are to another and, consequently, prefer helpful over neutral or hindering individuals. This suggests that infants have a sense of social evaluation based on some form of empathy. Hoffman (1975) described one 10-month-old girl who, when she witnessed a friend fall down and cry, the girl stared, cried, sucked her thumb, and put her head on her mother's lap—behaviors she typically displays when hurt and seeking comfort. Children at this stage of development can orient toward others' emotions, although it is difficult for them to separate others' emotions from their own. Nonetheless, these emerging cognitive skills will transform their understanding of others as they continue to grow.

Hoffman (2000) describes the progression of cognitive leaps toward empathy that occur in the second and third years of a child's life. The first leap is the ability to make a distinction between oneself and another. Toddlers who recognized themselves in a mirror, a milestone indicating self *versus* other differentiation, were more likely to show altruistic helping behaviors to mothers and strangers in distress (Johnson, 1982; Zahn-Waxler, Schiro, Robinson, Emde, & Schmitz, 2001). The second leap is the ability to take another's perspective. This is another major developmental milestone that appears with cognitive maturation and typically occurs in the third year of life (Hoffman, 1975; 1981). With perspective taking comes the awareness of others' feelings, which is a major component of empathy. Concern for others increases through the third year of life toward both mother and stranger (Zahn-Waxler, Schiro, Robinson, Emde, & Schmitz, 2001). This trajectory toward greater and more advanced empathy continues into the

preschool years with older preschoolers showing more empathic prosocial responding to crying peers than younger preschoolers (Phinney, Feshbach, & Farver, 1986). Hoffman and others have shown how empathy begins in infancy and matures developmentally throughout childhood.

In addition to Hoffman, others have emphasized the importance of cognitive maturation, especially perspective taking, as the crux of empathy. Informed by Piaget's developmental theory, Thompson (1987) described the advancement of empathy as being contingent on the development of cognitive reasoning, such as "person permanence, the ability to differentiate psychological attributes of oneself and others, and rudimentary ability to assume the psychological role of another" (Thompson, 1987, p. 121). De Waal (2009) illustrated that empathy is multi-layered, like a Russian doll. The most primitive act of empathy is state-matching, which then moves to concern for others and finally perspective-taking. Batson (2011) similarly proposes a step process leading to empathic responses. He states, "First, one must recognize the other as an animate being who is not only qualitatively different from physical objects but also distinct from other animate beings, including oneself…Second, it is necessary to recognize that the other has values, goals, and feelings" (Batson, 2011, p. 37). Many experts agree that cognitive advancement is a crucial component of empathy development. As shown above, empathy is a maturational process that must be understood in a developmental context.

Emotion + cognition. Advanced empathy requires a cognitive process be attached to the emotion. Once emotions are aroused, one can become cognizant of another's state of mind and situation. The cognitive process involved in empathy allows one to understand how and why someone has different emotions and feelings. Through empathy, we can hypothetically "put ourselves in their shoes." Many scientists attribute the ability of humans to empathize with the advancement of cognitive skills combined with emotional arousal (e. g. Eisenberg & Strayer,

1987; Hoffman, 1981; Thompson, 1987). Interestingly, Darwin (1872) believed that morality, which is comprised of empathy among other things (e.g., prosocial behavior and following rules about social norms), evolved as a result of social instincts being merged with "intellectual powers." Furthermore, empathy requires "double-minded" attention, the ability to think about one's own mind while providing attention to someone else's (Baron-Cohen, 2011). Cognition, along with emotional maturity, is a necessary cog in the mechanism of empathy.

Neurophysiology. In addition to both the cognitive and emotional elements of empathy, research also demonstrates a physiological emotional arousal from witnessing another's emotion (Eisenberg, Fabes, & Spinrad, 2006). It is believed that the physiological component of empathetic arousal is initiated in the limbic system of the brain, which is, in part, the emotional center of the brain. MacLean (1913-2007) was the first to theorize that the limbic system, or the "visceral brain" as he called it, was one of the oldest parts of the brain and it evolved to manage senses and emotions (MacLean, 1949; Newman & Harris, 2009). MacLean and colleagues posited that the evolution of the limbic system spawned the formation of caring inter-personal relationships in mammals, particularly between mother and offspring (e.g. Murphy, MacLean, & Hamilton, 1981). MacLean further theorized that emotions underlie behavior. He stated that even though, "…our intellectual functions are carried on in the newest and most highly developed part of the brain, our affective behaviour [*sic*] continues to be dominated by a relatively crude and primitive [limbic] system This… provides a clue to understanding the difference between what we 'feel' and what we 'know'" (MacLean, 1949, p. 351). Therefore, empathetic propensities may have developed in the limbic system of the brain as a result of sociability, later combining with recently evolved areas of the brain, such as the prefrontal cortex, where higher order cognitive processes, such as reasoning and perspective taking, are believed to occur.

More recently, Decety and Howard have described a “bottom up” and “top down” neurology of empathy (Decety, 2010; Decety & Howard, 2014). The “bottom up” avenue is similar to what MacLean theorized, wherein pathways connecting the brainstem, superior colliculus, hypothalamus, pulvinar and amygdala are responsible for emotional resonance and affect sharing between individuals. These areas develop very early in fetal development are present in infancy and are part of the limbic and brain stem systems.

Part of the bottom-up processes of neural empathy has been attributed to the mirror neuron system (MNS) discovered by Rizzolatti and Craighero in the 1990’s (for a review see Rizzolatti & Craighero, 2004). Mirror neurons are not part of the limbic system, but are found primarily in the parietal cortex in both humans and primates, and account for imitative and matching behavior (Archaya & Shukla, 2012). The MNS has direct links to limbic and emotional areas, accounting for feelings of closeness or connection when we move together with others. This includes both motor actions as well as body and facial emotional expressive movements. Mirror neurons are activated by observing others’ actions, such as observing someone kicking a ball or tasting a lemon. These are the same neurons that would activate if the observer were the one executing that action. Essentially, the brain acts as though it is *performing* the behavior rather than just *witnessing* the behavior. Mirror neurons are present as early as eight months of age (Nystrom, Ljunghammar, Rosander, & von Hofsten, 2011) and it is posited that the MNS could be the neural apparatus which underlies emotion matching, affect sharing, and emotional resonance, although no studies have yet proven this theory (Hastings, Miller, Kahle, & Zahn-Waxler, 2014).

In addition to the “bottom up” neurological aspect of empathy, the “top down” process involves the medial prefrontal cortex and the ventromedial prefrontal cortex. This process

encapsulate the cognitive aspects of empathy, including perspective-taking. In short, both neurophysiological processes are important facets of the biological basis for empathy and research is still unfolding about how these neurological processes are involved.

The Importance of Empathy

Empathy as an aspect of moral development. Widespread media attention on school shootings, intrapersonal violence, radical religious terrorism, and suicides of bullied teens support the notion that greater attention to moral development is needed. In 2013, there were 1.2 million violent crimes in the United States (U.S. Department of Justice-Federal Bureau of Investigation, 2014). Homicide rates in the United States are the highest of any other advanced, industrialized country in the world (CIVITAS, 2010). Shetgiri, Espelage, and Carroll (2015) report that the chance of a child being a victim of bullying averages from 1 in 5 to 1 in 3. While gun control legislation or stronger punitive punishments for offenders may be a "quick fix" for violence problems, according to Muscari, a researcher and professor of criminology, "The long-term antidote is empathy" (Jacobson, p. 20, 2015). Empathy is a critical aspect of personality and moral development (Strayer & Eisenberg, 1987; Hoffman, 2000) and the propagation of empathy may provide for a more peaceful and productive society.

Empathy decreases antisocial behaviors such as violence, aggression, bullying, and sexual predation, which instill fear and mistrust between members of a community High levels of empathy are related to lower levels of aggression, and as such, the presence of empathy may decrease anti-social behaviors (Batson, 1991; Feshbach, 1975; Lovett & Sheffield, 2007; Miller & Eisenberg, 1988; Zahn-Waxler et al., 1995). For example, particularly among boys, higher levels of empathy are associated with less bullying behavior (Gini, Albiero, Benelli, & Altoe, 2007; Stavrinides, Georgiou, & Theofanous, 2010). Similarly, an intervention program for sexual

predators that works to increase empathy for their victims has proven successful (Marshall, O'Sullivan, & Fernandez, 1996). These studies provide evidence that empathy is important in decreasing anti-social behaviors.

In addition to decreasing anti-social behaviors, another step toward moving communities toward peace and tolerance may be to increase prosocial behaviors. Empathy motivates prosocial behaviors—voluntary behaviors that are meant to benefit another individual—and increases social competence (Batson, 1991; Feshbach, 1975; Miller & Eisenberg, 1988). Empathetic emotions may predict an increase in prosocial behaviors, such as helping, comforting, and sharing, in children (Feshback, 1979, 1982; Iannotti, 1978; Staub, 1971). Specifically, empathy has been found to be related to prosocial behavior in a twin study that followed children from ages 14 to 36 months (Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008). Similarly, the presence of empathy in children aged five to 13 years is related to more prosocial behaviors (Roberts & Strayer, 1996). Moreover, children with high levels of empathy show more defense of bullying victims (Barchia and Bussey, 2011; Gini, Albiero, Benelli, & Altoe, 2007).

In addition to prosocial behaviors, social competence is another valuable side effect of empathy. “Social competence” is an umbrella term under which fit social skills, social communication, and interpersonal communication (Margaret Semrud-Clikeman, 2007). A positive association has been found between empathy and social competence with peers in preschool (Sallquist, Eisenberg, Spinrad, Eggum, & Garetner, 2009). Thus, fostering empathy early in human development could be an important tool for decreasing anti-social behaviors, like violence and bullying, while increasing prosociality.

Eisenberg and colleagues have noted that empathy does not *reliably* produce prosocial behaviors (Eisenberg, Spinrad, and Morris, 2014). In consequence, Batson (2011) proposes and

provides evidence for the empathy-altruism hypothesis, which is that empathy drives sympathy and altruism. Batson clarifies that altruism is not an act in and of itself, but it is a state of being in which one feels motivated to increase another's welfare. Care and concern, in turn, motivates individuals to remove or fill another's need. According to the empathy-altruism hypothesis, the morality of helping another operates solely for the other's welfare and not because there may be a positive byproduct for the self. Therefore, although empathy may not always directly produce prosocial behaviors, it can be an important catalyst for other moral emotions, such as altruism, which frequently yield moral actions.

Empathy benefits relationships. There are many professional and personal relationships that benefit from empathy. In fact, it may not be an exaggeration to say that *any* relationship would be enhanced with empathy. Recently, research in the medical field, for example, has emphasized empathy with patients as an important aspect of healing (Larson & Yao, 2005). Therapists are trained to respond empathetically to clients (Clark, 2010) and leaders that are empathetic are more influential (Kellett, Humphrey, & Sleeth, 2006). Romantic relationships in which partners exhibit empathy are more satisfying (Davis & Oathout, 1987). Parent-child, parent-teacher, and teacher-child relationships benefit from empathy and are especially powerful tools for modeling empathy to young children (Feshbach, 1987; Lightfoot, 2004; Yoon, 2002). Furthermore, empathy is also important beyond the human-human connection. Empathy for animals (McPhedran, 2007) and the environment (Berenguer, 2007) promote positive stewardship. Empathy is incredibly important as a facilitator of positive interpersonal relationships. The studies overviewed, though not nearly exhaustive, justify the need for fostering empathy. Empathy promotes moral behaviors and provides a moral foundation for a society whose members care for the needs of each other.

How Does Empathy Develop?

Given the importance of empathy in society, understanding its developmental origins may be crucial to solving or preventing bigger social problems. Empathy is the multi-faceted process of being in-sync with another's emotion. Empathy is multi-faceted because it involves many aspects of human development including neurology, emotionality, cognition, and sociology. This section will focus on the socialization of empathy through communication in the family environment.

Perhaps one of the more important cognitive processes involved in the development of empathy is the emergence of language. Language provides a medium for not only interpersonal exchanges, but is a primary mechanism for sharing and transmitting thoughts and interior feeling states with another.

Darwin alluded to altruistic behaviors as the defining characteristic that sets humans apart from other animals. Darwin described what he considered to be the unique human moral sense that leads "him[/her] without a moment's hesitation to risk his[/her] life for that of a fellow-creature… [or] to sacrifice in some great cause" (Darwin, 1872, p. 68) as the noblest of human attributes. Humans possess the ability to communicate their concern and feelings for other's emotions. Therefore, communication may be a defining factor in the development of empathy.

Family discourse – explicit. Intellectual abilities, such as language, are congruent with moral development and may be particularly important as a tool for developing empathy. Drawing upon Vygotsy's (1896-1934) theory of language development, Laible and Thompson (2000) proposed a theoretical basis for how language and morality are connected. They emphasize that the most influential tool for a child's development is language, and it is learned through a teacher-pupil setting (including the parent as teacher and child as pupil). As such, daily

conversations between parent and child are interwoven with social and moral messages. Even from a very young age phrases such as, “It hurts mommy when you hit” and “The barking dog scared you” teach a child how to treat others and feel connected to their emotions. In preschool-aged children, language from social interactions transforms into “egocentric speech”–self-talk that describes their own thoughts and actions (Vialle & Verenikina, 2000). These verbal cues have the propensity to become internalized into a child’s thoughts and feelings.

According to Vygotsky’s theory, internalization is the process when higher mental functions develop through interpersonal communication and cultural mediation. External speech becomes internal speech (Daniels, Cole, & Wertsch, 2007). Eventually children mediate and regulate their activity through their thoughts (i.e., inner speech) (Vialle & Verenikina, 2000). For example, preschoolers’ level of emotional understanding, including the ability to recognize emotions in others, has been linked with the number of conversations they have had with their mother about emotion (Dunn, Brown, & Beardsall, 1991; see also Brown & Dunn, 1996; Dunn, Bretherton, & Munn, 1987). In sum, one theory to explain the contribution of language to moral behavior is the developmental process of parent-child conversations turning into egocentric speech, then inner speech, and finally, becoming internalized in order to regulate the child’s moral beliefs and actions.

Parent-child conversations are an important factor in a child’s internalization of morals. Family discourse about emotions is a way in which parents explicitly teach about feelings, intentions, and consequences. In studies involving three-year-old children, those whose families regularly engaged in conversations about emotions were better able to explain feelings and actions of others from several months to years later (Dunn, Brown, Slomkowski, & et al., 1991; Dunn, Brown, & Beardsall, 1991). Similarly, mothers’ handling of verbal conflict with their 30-

month-old children–specifically how the mother justified, resolved, and mitigated conflict—predicted high levels of emotional understanding, social competence, and early conscious development in their children at age three (Laible & Thompson, 2002). In addition, emotion understanding of three-year-olds, likely a result of internalization of parent-child communication, contributes to positive peer relations and morality three years later in kindergarten (Dunn, 1995).

Indeed, mothers' navigation of verbal conflicts influences children's emotional understanding and social competence. Specifically relating to empathy development, Eisenberg (1992) found that parental "preaching"–explanations that draw attention to others' feelings and how a child's behavior affects others–enhances the child's perspective-taking and empathy. In addition, Karniol states, "It is parental language that sweeps children into linguistic perspective taking and parental socialization practices that provide children with the cognitive tools for bridging self-other preference gaps" (Karniol, 2010, p. 317). These studies show that family discourse is useful in helping children understand others' perspectives, emotions, and motives–an asset in moral internalization and the development of empathy.

Family discourse – implicit. Similar to Vygotsky's language-learning theory, Bandura (1971) proposed the Social Learning Theory: learning as a cognitive process in the context of social exchanges. One of Bandura's hallmark ideas is about modeling. Modeling is a powerful form of teaching. The old adage, "Do what I say, not what I do" speaks to the idea that actions are the prevailing method by which people learn behavior. Another adage, "Actions speak louder than words" refers to the commonly accepted idea that a person's example carries more influence than verbal instruction. As children interact with others, they learn moral lessons, such as how to manage their reactions in an appropriate manner (Karniol, 2010). Thompson, who has conducted much research about parent-child communication, states that one of the ways parents contribute

to moral development is “through the emotional valence of their communications to children” (Thompson, 2014, p. 83). When parents are open about expressing their own emotions and provide an emotionally safe space in the home for children to express their emotions also, it can facilitate the moral internalization process. In turn, children may feel more comfortable expressing their emotion without shame and be sympathetically responsive and empathetic to others.

As previously discussed, explicit familial conversations about emotion have a positive influence on how children learn to understand others. Another aspect of the family’s influence on emotion, based on Bandura’s Social Learning theory, is implicit. The emotional environment created by parents in the home can help children understand others’ emotions and increase empathy. Knafo et al. (2008) found that empathy and prosocial behavior is strongly associated with environmental effects, and much research by Knafo and others has been conducted to underscore the influence of the emotional environment on children’s development. Zahn-Waxler, Radke-Yarrow, & King (1977) found that mothers who are more positive in their emotional interactions with their infants, have toddlers that are more sympathetic in distress situations. Similarly, mother’s positive expressiveness mediates the relationship between parental warmth and children’s empathy in elementary-aged children (Zhou, Eisenberg, Losoya, Fabes, et al., 2002). The influence of emotional socialization is found in grade-school children as well. Eisenberg, Fabes, Schaller, Carlo, and Miller (1991) found that parents who have high levels of sympathy and provide an environment in the home that restricts behaviors that are emotionally harmful to others have grade-school children that are more sympathetic. Negative emotions in the home also have a strong influence. In the same study by Eisenberg, Fabes, Schaller, Carlo, and Miller (1991), mothers who were restrictive of all emotional displays (even if they were not

harmful to others) had children who had more physiological personal distress, but lower self-reported distress. Furthermore, negative submissive emotion (e.g., sadness) in the home is associated with girls' sympathy to a sympathy-inducing film (Eisenberg, et al., 1992). These studies highlight how important the family emotional environment is as a modeling tool for emotional expression and understanding in the development of children's sympathy and empathy.

One aspect of the emotional environment in the home is how families express and/or repress the expression of emotions. Researchers have identified links between positive family expressiveness and children's social competence. Boyum and Parke (1995) found that high positive family expressiveness coupled with high overall expressiveness is related to kindergarteners being favorably rated by their teachers in areas such as "liked by peers," "good at helping/sharing/taking turns" (prosocial), and "not verbally or physically aggressive." Further, family expressiveness is related to children's social competence in eight-year-olds (Baker, Fenning, & Crnic, 2010). Alternately, mothers' reports of negative family expressiveness (e.g., families discouraged expression of emotions) and higher levels of expressed anger are related to preschool children's mislabeling of angry feelings of a character (Garner, Jones, Miner, 1994). Moreover, in kindergarteners and third-graders, maternal reports of negative expressiveness in the home are negatively related to children's prosocial display rules, meaning the child is able to describe how a character in a story was concerned for another's feelings (Jones, Abbey, & Cumberland, 1998). Consequently, parents who deny children's expression of emotions, by dismissing, belittling, or punishing, sidestep the opportunity to connect with the child and educate them about emotions (Gottman, Katz, & Hooven, 1997). Hamilton (1973) explained that a child can be socialized to inhibit spontaneous emotional expressions. Family emotional expressiveness is clearly useful in understanding the emotion socialization of children in relation

to prosocial skills. What is not known is whether emotional expressiveness in the home beginning in infancy fosters empathy, which would likely produce the type of prosocial responding witnessed in older children that is recognized in previous research.

Family discourse – synchrony. As discussed, the socialization of empathy through communication in the family environment may contribute to the development of empathy in young children. Another avenue for empathy development may be through the interpersonal synchronous exchanges between parent and child. This pathway to empathy may be partly explained by human instinct. Remember that Lipps, who applied the term *Einfühlung* to psychology, theorized that empathy was instinctual (Wispé, 1987). Synchrony–reflexively feeling what someone else feels and responding to that feeling—is primitive and may be the social foundation of empathy (de Waal, 2009). Synchrony is embodied and reflexive without cognition. For example, synchrony is observed when a school of fish swims as one when evading a predator, or a flock of birds seamlessly changes direction mid-flight (de Waal, 2009). Humans also participate in synchrony as people chant in unison at a sporting event, sway at a concert, and even "catch" another's yawn. Synchrony "is the oldest form of adjustment to others. [It] builds upon the ability to map one's own body onto that of another, and make the other's movements one's own" (de Waal, 2009, p. 52). Primitive synchrony, as a reflex or instinct, may be the foundation of later empathy.

Synchrony in parental nurturing. Another theory about the evolution of empathy stems from synchrony in parental nurturing. To review, de Waal described synchrony as reflexively feeling with another and responding that feeling. An alternate definition for synchrony is also used in the field of child development. Feldman (2007a) defines synchrony as connectedness and social coordination between infant and caregiver. These two definitions although different,

both encompass the connectedness between two individuals. As such, parental synchrony may have been built upon primitive synchrony. Both uses of synchrony are included here as complimentary contributions to the discussion of empathy.

The foundation for empathy is possibly being laid very early in a child's life as the child experiences emotional interactions with his or her caregiver and is provided with support. Throughout infancy, expressions of emotion are signals to the caregiver (Bowlby, 1969). The caregiver must step in and provide an external source of regulation for the infant that the infant has not yet developed for themselves (Bowlby, 1953; Sander, 1975; Sroufe, 2000). "The infant and young child is a highly motivated and responsive social partner for whom emotions (of self and others) play a significant motivational and organizational role…" (Thompson, 1987, p. 122). Infants can recognize positive and negative emotional expressions from a very early age. Oster (1981) and, more recently with neuroimaging techniques, Vaillant-Molina, Bahrick and Flom (2013) have demonstrated that very young infants can recognize emotions in others. "Such temporally matched experiences sensitize infants to the regulatory function of early social encounters, afford infants the first practice in perspective taking and emotional sharing—the foundations of the moral orientation" (Feldman, 2007a, p. 583). Similarly, Plutchik (1987) stated, "Empathic sharing of emotions provides the fundamental basis for social bonding between parents and children" (p. 44). Infants play this part in their regulation, of signaling needs by expressing their emotional state, and caregivers must play the other, complimentary part, in order for the infant to be well regulated and form a moral foundation.

Parental synchrony may have begun through the human obligation to provide sustenance for offspring and, especially in the case of helpless human newborns, safety and security. Females who responded quickly and sensitively to their offspring's needs would be expected to

out-reproduce those mothers who were distant. Mothers needed to be in tune with the emotions of their young and act instantaneously in order to prevent starvation and protect from predation. This constant attention to their young created relational bonds based on emotion (Bowlby, 1969; de Waal, 2009; Plutchik, 1987). Frodi et al. (1978) illuminated the close emotional and physiological tie that caregivers have with infants. In one experiment, parents were shown video of either a crying baby or a smiling baby. Afterward, parents rated their mood and their blood pressure and skin conductance were recorded to indicate arousal of the sympathetic nervous systems. Parents who viewed the crying baby had more negative mood, elevated blood pressure, and increased skin conductance—indicating a stress response from activation of the sympathetic nervous system. Conversely, parents who viewed the smiling baby were not negatively affected in any of the measures. This study demonstrates that a crying baby stimulates a stress response in the caregiver which would prompt the caregiver to meet the needs of the baby in order to end the crying. Termination of the crying would stimulate the caregiver's parasympathetic nervous system to activate—calming the stress response and returning their body to homeostasis. This innate synchrony between infants and caregivers may have developed over thousands of years in order to propagate and promote the species.

Interpersonal connectedness is an important part of compassion and empathy (Eisenberg, 2014 and Feldman, 2000). Mothers' sympathy, empathy, and responsiveness have been shown to predict equivalent feelings and behaviors in children (Davidov & Grusec, 2006; Eisenberg & Fabes, 1998; Moreno, Klute, & Robinson, 2008; Spinrad & Stifter, 2006; Trommsdorff, 1991; Zahn-Waxler, Radke-Yarrow, & King, 1979). Concerned attention in children -- another facet of empathy-related responding—is the result of maternal responsiveness (Spinrad & Stifter, 2006). Similarly, preschoolers with a history of effective dyadic regulation from infancy are markedly

empathic (Sroufe, 2000). In addition, a longitudinal relationship between maternal responsiveness and empathy is observed by Feldman (2007a, 2007b). Feldman found that synchrony with caregivers in infancy predicts empathy in adolescence. In addition, a *lack* of early dyadic regulation has been linked to later emotional and behavioral issues (See Sroufe, 2000 for a review). These emotional and behavioral issues can include anxiety disorders, aggression, conduct disturbances, depression, and pathology. Altogether, it is clear that maternal responsiveness promotes empathy-related responding in children and a lack thereof inhibits empathy development.

In conclusion, humans seem to have an innate ability to empathize with each other, similar to the innate abilities to learn how to walk or talk. As such, the development of empathy is a natural maturational process and is influenced by early caregiving relationships in which synchronous interactions nurture empathy (Kochanska, 2002). Therefore, early socialization plays a major part in how the ability to empathize is encouraged or muted. The next section will discuss a specific form of interpersonal synchrony called "co-regulation" and explore how co-regulation may play a role in the development of empathy in young children.

Synchrony in co-regulation. Earlier I argued that parents can build morality through language–by providing an emotionally expressive environment in the home. I propose another ingredient in cultivating fertile soil in which empathy can flourish; face-to-face, *synchronous* communication interactions between parent and child.

Fogel (1993) coined the term "co-regulation," which captures the role both the infant and caregiver play in the infant regulation and communication process. "Co-regulation is a social process by which individuals dynamically alter their actions with respect to the ongoing and anticipated actions of their partners" (Fogel, 2000, p. 34). Traditionally, mother-infant

interactions have been observed as a collection of separate behaviors between individuals (e.g., Isabella, 1993). Fogel (2000) reconceptualized mother-infant interactions within a more complex framework called the "relational communication system." The theory is that the social interaction is like a clock. It is impossible to tell the time by observing only one hand or one cog. All parts work together to provide a unique, observable system. Similarly, through co-regulation, mother and infant affect each other to form coordinated patterned structures "that have unique properties that transcend the individual components" (Fogel & Garvey, 2007).

In addition to Fogel, other researchers have identified similar patterns between parent and child. Plutchik (1987) considers the development of empathy a "process whereby emotionally significant experiences are shared by two or more individuals" (p. 44). Empathy may be induced by sending a signal to another. The "receiver of the…signal presumably experiences some of the same feelings as the sender and reacts behaviorally in a similar way" (Plutchik, 1987, p. 42). Some of these displays of signaling include displays between mother and child such as greeting displays or distress displays. These displays have the ability to induce similar feelings in both the sender and receiver. In addition, de Waal (2009) explains that humans bond through synchrony (dancing, strolling, singing along), because it fosters a social connection. The emotional response created through synchronous interactions may promote the development of empathy.

Based on his theory, Fogel (2000) developed the Relational Coding System (RCS) that identifies five observed co-regulated interaction states between mother and child. The RCS attempts to capture the degree of synchrony in the interaction. Symmetrical co-regulation, for example, is when the mother and infant are both invested in creating and maintaining the interaction. This is illustrated by a mother and child playing peek-a-boo–the child hides, the

mother seeks, the child anticipates being found, the mother finds, and they both giggle. It is also easy to observe the communicative synchrony that underlies this interaction.

The Relational Coding System has been used to describe the relationship between mother and child. Evans and Porter (2009) recently demonstrated that the RCS is predictive of attachment patterns in infants. Specifically, symmetrical co-regulation patterns at 6 months predicted secure attachment at 12 months. In addition, Hsu and Fogel (2001) noted that dynamic and developmental changes in the speech patterns of infants are related to co-regulation. Particularly, non-distressed infant vocalizations were positively related to symmetrical co-regulation and negatively related to unilateral—one individual is primarily promoting the interaction—co-regulation. Finally, Aureli and Presaghi (2010) modeled the trajectories of mother-infant co-regulation throughout the second year of life. Patterns which prevailed in the first year, such as unilateral co-regulation where the mother is the main instigator of the interaction, decreased rapidly in the second year and was replaced by symmetrical co-regulation where both child and parent are mutually engaged. These studies provide evidence that the patterns of interactions are influenced by and influence the dyadic relationship. Moreover, the dyadic relationship changes over the first two years of life and may change further as the child matures to a toddler and preschooler.

Synchrony between parent and child is theorized to be important in the development of empathy. However, co-regulated interactions, which can measure, to a certain extent, synchronization, have not been explored in relation to empathy development in children. Co-regulation may be an important part of understanding the origin of empathy, because it emphasizes the key ingredient in empathy–being in-sync with another.

Limitations in Empathy Research

There is a plethora of empirical research suggesting language and communication enhances sympathy, empathy, and prosocial behaviors. Much of this research examines explicit emotion teaching or modeling from parent to child. Less is known about the implicit emotional environment in the home, especially concerning children under the age of five. Moreover, there is no known research linking the emotional environment in the home with the development of empathy in the child.

For decades, researchers have been concerned about how the parent-child relationship provides positive outcomes for the child. Many foundational studies show a profound positive impact between sensitive caregiving and social and emotional competence in young children. Co-regulation is a less understood construct which may have important implications for fostering empathy in young children, because it plays into the more innate and rudimentary forms of empathy such as affect sharing and synchrony. No studies have attempted to understand the relationship between co-regulation and empathy. Furthermore, co-regulation has only marginally been studied in a longitudinal setting.

Summary

Empathy is a crucial aspect of human morality, because it fosters prosocial behaviors. Theories abound which suggest that empathy, at least rudimentary forms of empathy, exist innately in humans. Empirical research supports the idea that children are born with a tendency to connect to others in an emotional way. Emotional socialization by parents is important to build upon innate tendencies. Synchronous interactions between parent and child may enhance this innate ability. The ability to empathize becomes apparent once cognitive maturity allows intellectual appraisal of others, typically around preschool age. Language is a critical intellectual

skill through which children learn morality, including empathy and prosocial behaviors. Communication in the home, especially involving emotion and feelings of self and others may help children develop empathy. I hypothesize that parents contribute to the development of empathic traits in their children by parenting in a way that is positive, open, sensitive, and emotionally supportive.

This study is timely and will contribute to the research of empathy in childhood in two unique areas. Hypothesis one focuses on co-regulation changes over time. It is suspected that children's co-regulation will increasingly become better coordinated overtime leading to greater levels of symmetrical co-regulation. Relatedly, it is anticipated that the rate of change in symmetrical co-regulation across dyads will subsequently predict children's empathy. Specifically, those who increase in symmetrical co-regulation will show higher levels of empathy while those who do not, will show lower levels of empathy. The second hypothesis suggests that in addition to co-regulation, family expressiveness will also predict empathy-related responding in children at age five. Specifically, families who engage in greater levels of emotional expression will have children who demonstrated greater empathic responses, while lower emotional expressiveness will be linked to lower empathic responses.

Methodology

This section will describe the research methodology and procedures used for this study and consists of the following sections: design and purpose of the study, sampling and subjects, measures, and procedures.

Design and Purpose

The data for this study is part of a larger longitudinal dataset collected by colleagues from the Department of Psychology at the University of Utah from 2000-2005. The original intent of this study was to investigate how "creative interpersonal communication encourages the dynamic coupling of positive emotion and attention so that individuals can become more open to the opportunities that arise during developmental transitions and more ready to cope with the potential sources of disorganization" (Fogel & de Koeyer-Laros, p. 2, 2005). Originally, there were three planned waves of data collection: Wave One – 12-month-old children and mothers, Wave Two – 24-month-old children and mothers, and Wave Three – 36-month-old children and mothers. After Wave Three, additional funding was secured to fund Wave Four – 60-month-old children and mothers.

Sampling and Subjects

The sampling procedure involved recruiting from the Salt Lake County area by reviewing newspaper birth announcements, locating phone numbers in the phone book, contacting the mothers by phone and, if they agreed to participate, mailing participants a packet of questionnaires and a consent form. A follow-up phone call was made a week after initial contact wherein the research assistant offered assistance with questionnaires, answered questions, and scheduled a lab visit. This procedure was most effective with Anglo mothers. Latin families were more difficult to recruit because they tended to not publish birth announcement in the newspaper.

Techniques for recruiting Latin mothers included: distribution of flyers in community centers and supermarkets, advertisements placed in Hispanic newspapers, and finally, air time on a Hispanic radio station.

Infants included in the study were born healthy, full-term, and developing normally. In addition, infants were +/- one month from being 12 months of age at the first visit, 24 months at the second visit, 36 months at the third visit, and 60 months at the fourth visit. Mothers were at least 19 years or older and in a long-term relationship (not necessarily married) at first visit. Dyads were either of Anglo- or Latin-American background (origins in South-American and either first, second, or third generation). Fathers were not included in the study, because the researchers were interested in the infant's relationship with the primary caregiver—often the mother. Additionally, including fathers in the study would have been a significant additional cost of money and time. A total of 83 Anglo-American and 103 Latin American mother-infant dyads were recruited to participate at Wave 1 (See Table 1 for descriptive statistics).

Measures and Procedures

Demographics. Mothers were mailed demographic questionnaires at each time wave. Mothers were asked to fill out the questionnaires and return them to the lab. This study will use the gender and income data from Wave One.

Family emotional expressiveness. The Family Expressiveness Questionnaire (*FEQ*; Halberstadt, 1986) was used to assess the family's expression of emotions in order to understand the emotional socialization of the child. This questionnaire was given to the participants at Waves 3 and 4. The questionnaire had 40 items which cover a broad range of typical emotions in families (See Table 2 for items). Each item was rated by the mother on a 9-point scale ranging from 1 = *not at all frequently in my family* to 9 = *very frequently in my family*. Halberstadt,

Cassidy, Stifter, Parke and Fox (1995) report that two subscales of 20 items each grouped into 'positive' and 'negative' emotions show good factor loadings, though this study will not delineate between negative and positive expressiveness. Although the FEQ has not been used to understand the development of empathy in young children, it has been used to study social competence of preschoolers and grade school children (i.e., Baker, Fenning, & Crnic, 2010; Boyum & Parke, 1995).

Co-regulation. During all waves of data collection, co-regulation was captured using the The Revised Relational Coding System (*RRCS*; Fogel et. al, 2003). The purpose of the RRCS is to rate qualitative communication exchanges between two individuals. The unit of analysis is the dyad, rather than each of the two communication partners separately. The focus of observation is an action followed by an opportunity of the partner to participate. The unit may be brief or very long in duration. The RRCS contains five categories which describe different forms of co-regulation, from mutual participatory engagement to a complete lack of communication.

The RRCS was developed for use with all ages, but has most often been used with infant-mother dyads. The structure of the Revised Relational Coding System is divided into 5 categories which are described below.

Symmetrical co-regulation. Mutual and coordinated participation to create the interaction. Both partners are engaged in the interaction, which allows the interaction to develop in a co-creative process. They continuously change their reactions based on the information they receive from their partner. An infant participates in symmetrical co-regulation in the form of active or excited body movement, reaching, eye contact, or vocalizations.

Asymmetrical co-regulation. Mutual attention, but only one individual creates the interaction. One partner is bidding for, and innovating to gain, the other's attention. The other is

observing or attending to what the partner is doing, but he/she will not take an opportunity to innovate in return.

Unilateral co-regulation. One individual attempts to engage the other, who is not paying attention to the interaction. One partner is bidding for, and innovating to gain, the other's attention. The other is not attending to partner.

Disruptive co-regulation. One individual disrupts the activity of the other in order to gain interaction. The key to this code is the visible disruption wherein the partner abstains from adjusting for, or attempting to mend, the other's negative emotion.

Unengaged co-regulation. Neither are interacting with each other. There is no cooperation or interaction between partners despite the opportunity.

Mothers and children engaged in a "free play" episode during the lab visit which was videotaped. Mothers and children were situated in a small room with a few toys. Mothers were instructed, "Please play with these toys with your child in any way that is fun." The video recordings were analyzed by trained research assistants who scored co-regulation using the RRCS. Research assistants reached inter-rater reliability for each wave of data collection. They coded 15-25% of the sessions for reliability, which resulted in kappas ranging from .56-.74. See Table 3 for detailed inter-rater reliability information.

Empathy. Procedures were conducted to measure the degree to which a child exhibits empathy and empathy-related responding. Empathy was measured at age five, because at this age children are more likely to respond to abstract kinds of distress and more subtle emotional cues than their younger counterparts (Barnett, 1987). Based on Hoffman's theory of empathy development, the earliest age researchers can truly measure empathy is between 3 to 5 years. Although current research has attempted to show empathy at earlier ages (Davidov, 2015), it is

extremely difficult or impossible to accurately measure infants' and toddlers' emotional reactions as being purely other-oriented. The three procedures used to measure empathy-related responding included: Pain Simulation Procedure, Emotion Dolls and Empathy Home Interview. In addition, the My Child's Behavior questionnaire was used to capture more of the child's empathy-related responding.

Pain simulation procedure. At Wave 4, an adaptation of Zahn-Waxler and colleagues (1992a, b) *Pain Simulation* procedure was instituted where the mother and a research assistant simulated pain (e.g., by getting her finger stuck in a clipboard) with the child present. This procedure was coded for a) *empathetic* responses (prosocial behaviors, such as helping or comforting; facial or vocal expressions of empathic concern; and hypothesis testing to understand the problem); b) *personal distress* (negative emotions evoked by other's distress); c) *inappropriate responses* or indifference (aggressive behaviors, positive affect, and unresponsive/indifferent). A rigorous process was implemented to achieve inter-rater reliability. After viewing video-taped sessions, a group of research assistants would meet together to discuss the coding scheme and compare practice coding. Differences in coding were resolved during these meetings. This process would replicate several times until all coders reached consensus. From this group, two coders were selected to code the Pain Simulation Procedure. They coded 15-20% of the sessions for reliability, until a kappa greater than .6 was achieved. Once inter-rater reliability was achieved one research assistant would continue to code the remaining sessions.

Emotion dolls. Additionally, at Wave 4, mother and child discussed a series of seven dolls with emotionally expressive faces (See Figure 1 for photographs). The lab created this procedure and coding system based on a review of empathy literature. The aim of this procedure was to measure children's empathy and prosocial responding. Mother and child were given the

set of dolls and asked to discuss each doll, one-by-one. The coding scale was adapted from a coding system by Robinson and Zahn-Waxler. Research assistants reached inter-rater reliability ($\varkappa$ = .62).

Empathy home interview. At Wave 4, a research assistant met with the mother in her home and audio-recorded an interview about the child. Similar to the Emotion Dolls protocol, the lab created this procedure and coding system based on a review of empathy literature. The purpose of this interview was to understand how the child reacts to emotional events. The interviews were coded for empathetic reactions when others express negative emotions. Research assistants reached inter-rater reliability (kappa = 1).

My child's behaviors. Prosocial behaviors are an important part of empathy-related responding. For this reason, prosocial behaviors were measured at Waves 4 using the My Child's Behaviors questionnaire adapted from The Preschool Behaviour Questionnaire (Tremblay, 1987). A prosocial scale from items extracted from the questionnaire have shown good reliability (Tremblay, 1992).

Analysis

This paper will test two hypotheses in order to understand the nature of co-regulation over time and how both co-regulation and family expressiveness contribute to the development of empathy-related responding. The longitudinal focus of these hypotheses was guided by Menard (2002). Hypothesis one is that there is intra-individual change in dyads' co-regulation from one period to another. There has been evidence to suggest that dyads change in co-regulation from age one to age two (Aureli & Presaghi, 2010). Based on that finding, I propose that dyads continue to change from age two through age three. Hypothesis Two is that the

change in co-regulation, in addition to family expressiveness, predicts a child's level of empathy at Wave 4. (See Table 4 for an overview of variables.)

Analyses were organized around the following steps: inspecting the central tendencies of the data, creating scale and latent variables, and results from testing the hypotheses.

Central Tendencies

First, I inspected the central tendencies of the data. Descriptive statistics are available in Table 1. Most notably, when plotting the means of the co-regulation data, I discovered that there is very limited data in asymmetrical, unilateral, disruptive and unengaged data by age three. The lack of data may limit the ability to estimate the trajectory of co-regulation change over time. In addition, I estimated correlations between all variables of interest (See Tables 5-10).

Scale and Latent Variables

Prosocial behavior items were taken from the My Child's Behaviors questionnaire. A factor analysis in IBM SPSS version 23 (IBM Corp, 2015) was used to determine if items loaded well together (See Table 11). The loadings were good for all except item 5 (reversed) "Doesn't share material used for a task in the classroom", item 42 "Volunteers to clear up a mess someone else has made", and item 46 "Volunteers to help clear up a mess someone else has made." A reliability analysis of the remaining items showed strong internal reliability to each other (α = .85). These items were summed together than divided by the total number of items (= 10) to create a prosocial scale variable. See Table 12 for a list of all items used in the scale.

The Family Expressiveness Questionnaire has 40 items with scores ranging from one to nine with nine being more expressiveness. These 40 items were summed together than divided by the total number of items (= 40) to create a mean expressiveness score.

A reliability analysis was conducted to determine if all four observed empathy variables (Pain Simulation Procedure, Home Interview, Prosociality, and Emotion Dolls Procedure) could be combined into a latent variable. The reliability analysis showed a weak relationship between all variables ($\alpha = .06$). Consequently, the decision was made to keep each empathy measure as a separate outcome variable.

Results

Hypothesis one. Hypothesis one tests if dyads change in co-regulation over time. I estimated latent growth curve models to understand the change in co-regulation over time. Growth curve models were run in Mplus 7 (Muthén & Muthén, 1998-2012) with Maximum Likelihood (MLR) estimations.

Model 1. A latent growth curve analysis was conducted on symmetrical co-regulation with the slope values set as linear (0, 1, and 2). The model did not fit the data well. Chi-square test of model fit (χ^2) (df = 1, N = 186) = 17.58, p = .00, Root Mean Square Error of Approximation (RMSEA) = .23, Tucker-Lewis Coefficient (TLI) = -2.73, and Comparative Fit Index (CFI) = .00. A plot revealed a non-linear trend in the data (See Figure 3). The growth curve analysis was conducted again with the slope values set as log linear (0, .69, and 1.11). A plot showed the log-linear model fit the data much better (See Figure 4). In addition, the model fit statistics for the log-linear growth curve model indicated a better or improvedfit to the data; χ^2 (df = 1, N = 186) = 2.90, p = .09, RMSEA = .10, TLI = .57, and CFI = .86. For the symmetrical co-regulation growth curve, the average in the sample at Wave One was 0.44 (p = .00) and the average change across time was .33 (p = .00), suggesting that at each wave of data collection, symmetrical co-regulation increased by .33. The random effects showed that there was not significant variance across the intercept (.01, p = .21) and slope (.00, p = .76), suggesting

that variability between dyads in their starting point at Wave One and their co-regulation change, did not vary significantly. The results from the symmetrical growth curve analysis support the hypothesis that symmetrical co-regulation changes over time.[1]

Hypothesis two. Hypothesis two tests if the change in co-regulation and family expressiveness predict empathy at age five. I estimated prediction models in which the growth parameters from the growth curves and family expressiveness questionnaire (FEQ) were explanatory variables and empathy was the outcome. In addition, the child's gender and family income were used as control variables. In this model, empathy was a measured by observation, mother interview, questionnaire data, and facial expression recognition as collected from the Pain Simulation Procedure, Empathy Home Interview, My Child's Behaviors Questionnaire, and Emotion Dolls Procedure respectively. To account for the small sample size, separate models were run for each empathy outcome variable—for a total of four SEMs.

I conducted the following Structural Equation Models (SEM) in Mplus 7 (Muthén & Muthén, 1998-2012) with Maximum Likelihood and (MLR) estimations.

Model 1a. The intercept and slope from symmetrical co-regulation in addition to FEQ, gender, and income were used to predict empathy as observed in the Pain Simulation (See Figure 5). The model fit statistics indicated appropriate fit to the data and were χ^2 (df = 11, N = 61) = 8.91, p = .71; RMSEA = 0; TLI = 1.28; CFI = 1. After accounting for the change in symmetrical co-regulation, gender and income, the level of family expressiveness was a significant predictor of empathy as coded from the Pain Simulation Procedure. FEQ was a significant predictor of empathy (β = .65, p = .00) suggesting that empathy increased .65 for each unit of FEQ when

[1] Growth curve models for asymmetrical, unilateral, disruptive, and unengaged co-regulation failed to estimate most likely due to attrition and lack of variance.

accounting for the change in symmetrical co-regulation, gender, and income. Neither the intercept (β = -.64, p = .33) nor slope (β = -.48, p = .53) of symmetrical co-regulation were significant predictors of empathy suggesting that neither the level of symmetrical co-regulation at Wave One nor the change in co-regulation predicts the levels of empathy at Wave Four. Gender (β = -.09, p = .51) and income (β = .24, p = .15) were also non-significant in the model. The R square was .60, suggesting that this model accounted for 60% of the variance in empathy from the Pain Simulation Procedure.

Model 1b. The intercept and slope from symmetrical co-regulation in addition to FEQ, gender, and income were used to predict empathy as recorded in the Home Interview. The model fit statistics for this SEM showed appropriate model fit (χ^2 (df = 11, N = 61) = 8.19, p = .70; RMSEA = 0; TLI = 1.57; CFI = 1). After accounting for the change in symmetrical co-regulation, family expressiveness, gender and income, there were no significant predictors of empathy as coded from the Home Interview. The R square was .46, suggesting that this model accounted for 46% of the variance in empathy from the Home Interview. Betas in Table 13 represent the regression weights in this model.

Model 1c. The intercept and slope from symmetrical co-regulation in addition to FEQ, gender, and income were used to predict empathy-related responding as recorded in the Prosociality Scale. The model fit statistics indicated a model fit that was slightly less than ideal (χ^2 (df = 11, N = 61) = 11.84, p = .38; RMSEA = .04; TLI = .91; CFI = .94). Because the goodness of fit statistics in structural equation modeling are based on the assumption that the sample size is large (N > 250), in a small sample size, the fit statistics may perform poorly. The "decision for accepting or rejecting a particular model may vary as a function of sample size, which is certainly not desirable" (Hu & Bentler, 1998, p. 429). Hu and Benler (1998) concluded

that "TLI… and CFI …fit indices are less sensitive to distribution and sample size" (p. 446) and "RMSEA tends to over reject substantially true-population models. Therefore a cautious interpretation of model acceptability based on [RMSEA] is recommended when sample size is small" (p. 447). In Model 1c, the RMSEA indicated a close approximate fit with the RMSEA ≤ .05 (Browne & Cudeck, 1993), whereas the chi-square (≥ .05), CFI (≥ .90), and TLI (> .90) indicated a reasonably good fit (Hu & Bentler, 1999). Therefore, I determined this model fit was appropriate for the data.

In this model, income was a significant predictor of prosociality (β = .38, p = .02) after accounting for FEQ, gender, and the change in symmetrical co-regulation. These results suggest that prosociality increased .38 for each unit increase in income. In other words, families with higher income had children with a higher degree empathy-related responding. FEQ, and gender were non-significant in the model. The R square was .68, suggesting that this model accounted for 68% of the variance in prosociality. Betas in Table 13 represent the regression weights in this model.

Model 1d. The intercept and slope from symmetrical co-regulation in addition to FEQ, gender, and income were used to predict empathy as observed in the Emotion Dolls Procedure. The model fit for this SEM indicated appropriate model fit (χ^2 (df = 11, N = 61) = 8.03, p = .71; RMSEA = 0; TLI = 1.43; CFI = 1). After accounting for the change in symmetrical co-regulation, family expressiveness, gender and income, there were no significant predictors of empathy as coded from the Home Interview. The R square was .76, suggesting that this model accounted for 76% of the variance in empathy from the Pain Simulation Procedure. Betas in Table 13 represent the regression weights in this model.

Discussion

The purpose of this study was to understand the nature of change in co-regulation and to examine the relationship between communication and empathy, within the contexts of the parent-child and family environment. This is one of the first studies to look specifically at measures of co-regulation and family expressiveness as predictors of empathy development in young children. The results of this study suggest that symmetrical co-regulation changes over time by increasing from age one to three. This study also suggests that emotional socialization in the home may be a stronger predictor of empathy development than co-regulation. The results of this study show that higher levels of family emotional expressiveness predicts higher levels of observed empathy to an empathy-eliciting experiment in children at age five. Unfortunately, part of the second hypothesis that change in co-regulation would predict empathy was not supported. In this section, I will expound upon these findings and attempt to explain the results.

Family Expressiveness

The hypothesis that family emotional expressiveness would predict empathy in young children was supported in this study. Eisenberg et al. (1996) describe empathy as an emotional response to another's emotion. Although empathy has cognitive components underlying it, it is largely a feeling, which bolsters the finding in this study that greater family emotional expressiveness is related to more empathy.

I chose to not delineate between positive and negative expressions in this study—to underscore the need for openness in emotional expression as an important aspect of empathy development. This position largely goes against the stance of previous research which reports that positive expressiveness rather than negative expressiveness promotes moral behaviors in children (Baker, Fenning, & Crnic, 2010; Zahn-Waxler, Radke-Yarrow, & King, 1977; Zhou,

Eisenberg, Losoya, Fabes, et al., 2002) and that negative expressiveness provides children with less social competence (Garner, Jones, Miner, 1994; Jones, Abbey, & Cumberland, 1998). However, a few studies reported that high *overall* expressiveness (Boyum & Parke, 1995) and some aspects of negative expressiveness (Eisenberg, et al., 1992) are related to children's social competence and sympathy. The current study adds to this latter research by focusing on all forms of emotional expressiveness.

Openness and acceptance may underlie why greater family expressiveness is associated with more empathy in children. Acceptance and open communication are core parts of Baumrind's hallmark authoritative parenting style. Authoritative parents engage in reciprocal communication where the child is encouraged to express their opinions and feelings and the parent shares their own as well (Baumrind, 1966). Authoritative parenting is associated with positive social and moral outcomes in children. Adolescents with authoritative parents scored higher on measures of social competence (Lamborn, Mounts, Steinberg, & Dornbusch, 2008). Similarly, Boyes and Allen (1993) found that authoritative parenting predicted more advanced moral reasoning in adolescents. Furthermore, Gottman (1997) counsels parents to let children express their emotions openly, though provide structure and feedback so children learn to appropriately express and regulate emotions. Though not directly associated with empathy, authoritative parenting encompasses open and respectful communication which positively affects children's social and moral development.

Open communication is also associated with the parent-child relationship and empathy. Etzion-Carasso and Oppenheim (2000) found that open communication was associated with secure attachment; whereas closed communication was associated with insecure/disorganized attachment. Attachment theory, developed by Ainsworth (1979), describes the quality of the

parent-child relationship and has been show to predict empathy (Kestenbaum, Farber, Sroufe, 1989). Plutchik (1987), describing empathy in the context of open communication, stated "empathy is a kind of induction process by which emotions, both positive and negative, are shared, and which increase the chances of similar behavior in the participants" (p. 43). Furthermore, in adolescents, open communication between mother and father predicted adolescent empathic concern and perspective taking (Heller, Robinson, Henry, & Plunkett, 2006). Considering previous research, this study furthers the understanding about how the family environment aids in the development of morality. Particularly, that greater family emotional expressiveness may provide an environment in which a child can see that family members' feelings are valued and there is a room to express emotions openly, which in turn may help the child empathize with others.

Co-Regulation

Another main hypothesis in this study was that co-regulation would be influential on empathy. As previously discussed, co-regulation taps into parent-child synchrony, maternal responsiveness and relationship patterns which have been shown to be predictive of empathy (Feldman, 2007a/b; Spinrad & Stifter, 2006;). Considering that co-regulation predicts attachment (Evans & Porter, 2009) and attachment predicts empathy (Kestenbaum, Farber, Sroufe, 1989), I posited that co-regulation would predict empathy. Despite this seemingly indirect connection, the hypothesis that co-regulation would predict empathy was not supported in these data. Two overarching reasons may explain this discrepancy—the nature of the data and the nature of the measure.

Nature of the data. There are four ways in which the data may have not been conducive to a robust relationship between co-regulation and empathy. First, the sample size was small.

Although there were 186 dyads available in the original growth curve model predicting change over time, there were only 61 dyads used in the final model which used that change to predict empathy. According to Marsden and Wright (2010), "small sample size will reduce statistical power and the probability of detecting an effect, especially when the effect size is small" (p. 203). Therefore, the attrition by wave four may have contributed to the findings that co-regulation does not predict empathy.

Second, the empathy experimental protocol could have been associated withempathic behaviors. In the Pain Simulation Procedure, children were coded for empathic responses toward a *stranger* who experienced pain. Van der Mark, van Ijzendoorn and Bakersmans-Kranenburg (2002) found that a weak association between attachment and empathy could be the result of a stranger as the victim in the pain simulation. Specifically, children tended to show less empathy toward a stranger than their mother. Fogel's (2001) Relational-Historical Approach to understanding development may help explain the discrepancy in children's empathic reactions toward mother versus stranger. Fogel states, "emotion is one way of discovering the meaning of a relationship for the self and, hence, the unique position of the self in the relationship" (p. 93). Fogel's approach embeds the child and his/her emotions into the history of the relationship. A child develops a relationship history with the mother, so measuring empathy (an emotional reaction) toward the mother may manifest very differently than toward a stranger with whom the child has no relationship history. Considering that the children were around five years old when this experiment was conducted, they may not have enough relational experience with strangers to exhibit measurable empathetic responses. Perhaps having the mother as the subject of the empathic responding would have led to more variability in levels of empathy. In consequence,

more variability in the empathy coding might have yielded a significant association with levels of co-regulation.

Third, social desirability to be a "good" mother could have affected the variability in co-regulation. The individuals in this study were filmed in a laboratory, not a natural setting. Therefore, during the co-regulation observations, there could have been an aspect of social desirability occurring—in that mothers may have acted in a way that would produce more engaged interactions. This would have resulted in more instances of symmetrical and asymmetrical co-regulation. Furthermore, the large majority of interactions in our sample are from these two co-regulation categories. Though the mothers were unaware of the co-regulation coding, the directive to "play" with their baby while people while being observed may have been enough to elicit an unnatural majority of symmetrical and asymmetrical instances. Perhaps observing mothers in a natural setting would have provided more variability in co-regulation observations resulting in clearer links to later child empathy.

Fourth, co-regulation was hypothesized as a change score predicting empathy. I was interested in the change in co-regulation as a predictor of empathy, so I modeled the analyses around that change. Co-regulation does change over time, as evidenced by the significant significant slope from the growth curve model, and the change shows that dyads are typically improving in their co-regulation style from one to three years. The dyads in this study moved toward more positive communication styles such as symmetrical and asymmetrical co-regulation and moved away from more negative styles such as disruptive and unengaged. This change decreases the amount of variance in the data. I used the change in co-regulation to predict empathy, but change might not be the best indicator of empathy development. Co-regulation may be more sensitive to the nuances in parent-child communication at younger ages.

Natures of the measures. The measures of co-regulation and Family Expressiveness Questionnaire may also explain the lack of a significant relationship between co-regulation and empathy. In the literature review, I argued that co-regulation and empathy both encompass forms of synchrony within human interactions. Perhaps the type of synchrony present in co-regulation is qualitatively different from the type of synchrony involved in empathy. The difference may be context versus content—context being that co-regulation captures the dynamic of the communication and content being that family expressiveness questionnaire captures the emotional nature of communication. Laible and Thompson's (2002) research about the impact of mother-child discourse on children's conscience development describes the importance of the emotional content of the communication. Laible and Thomson refer to other aspects of the parent-child communication in their study that were not significant and note, "not all elements of parent-child discourse are related to moral understanding" (p. 1437). In the same study, emotionally-saturated parent-child discourse was positively related to secure attachment (Laible & Thompson, 2000). In addition, attachment predicted empathy only when mediated with emotion regulation (Panfile & Laible, 2012). Co-regulation may provide the architecture for patterns of dyadic synchrony whereas empathy may require the emotional content found within those patterns of synchrony. Thus, co-regulation styles on their own may not be a good indicator of empathy, because the nature of the measure does not include an emotional component.

In conclusion, the emotional environment in the home may be a better predictor of empathy than co-regulation because it captures the emotional content of communication requisite for empathy development. In addition, co-regulation and family expressiveness are, for the most part, uncorrelated. This further suggests that they are measuring different types of communication in the home.

Other Empathy Outcomes

The last point of discussion concerns the findings that neither co-regulation nor family expressiveness were predictive of three outcomes including Home Interview, Emotion Dolls Procedure, and Prosociality. The Home Interview and the Emotion Dolls procedure were both created by Fogel's lab based on other empathy-eliciting procedures in the literature. The preliminary analysis concluded that these two measures do not fit well with the Pain Simulation Procedure, a reliable empathy-eliciting protocol. Therefore, these two new measures may not be robust methods of capturing empathy. In addition, Prosociality was included as a measure of empathy-related responding. Empathy can produce prosocial behaviors ((Batson, 1991; Feshbach, 1975; Miller & Eisenberg, 1988), so perhaps prosociality needed to be mediated by the empathy in order to better understand the relationship between family expressiveness and prosociality.

Limitations and Future Research

The initial growth curve model, to test the first hypothesis about change in co-regulation, included both Anglo and Latin dyads. Unfortunately, upon testing the second hypothesis, much of the Latin sample was dropped due to missing data in Wave 4. Wave 4 data was not fully collected—omitting much of the Latin-American population—because funding for the research project was expended. Consequently, generalizability from the second hypothesis concerning empathy outcomes may be limited to an Anglo-American, middle-class SES population.

While the major hypotheses were not supported by the results, a number of future possibilities extend from this investigation. First, a practical follow-up study would be to form hypotheses in a way that will allow inclusion of other co-regulation categories in the analyses. For example, asking if co-regulation at any individual time point is related to empathy outcomes. Additionally, it may be interesting to look at the patterns of co-regulation change from a

qualitative perspective. As has been discussed, most dyads improve in their co-regulation over time, but what about the dyads that do not improve? How do those dyads differ in relation to empathy or other outcomes such as attachment? Second, the Pain Simulation Procedure was coded for other behaviors besides a global empathy rating. These behaviors include aggression, ambivalence, self-focus, verbal sympathy, and so forth. It seems possible that family emotional expressiveness may be related to these additional behaviors beyond empathy. Third, it would be valuable to look at other variables in the larger data set that are related to emotion, considering that emotion was such an important factor in predicting empathy in this study. Possible hypotheses could ask how child temperament mediates the relationship between family expressiveness and empathy. More specifically, a highly reactive temperament could mediate, or account for the relationship between family expressiveness and empathy. Another possibility would be how attachment moderates a relationship between co-regulation and empathy. For example, secure attachment may strengthen the relationship between symmetrical co-regulation and empathy. There are many possibilities for further research that would dovetail logically with the current study.

Conclusion

The results of this study suggest that open emotional expressiveness in families may promote the development of empathy in young children. Furthermore, providing an environment where the range of family members' feelings are respected is an especially important finding from this study. Expressive openness may provide a foundation for children to express their own feelings while observing others' feelings in an emotionally safe environment. In turn, this foundation of emotional socialization may help children empathize with others. Other findings from this study suggest that the structure of dyadic communication, in the form of co-regulation,

is not related to empathy. Co-regulation may be unrelated because the emotional content of the interaction is not accounted for and emotion underlies empathy. This study builds upon previous research emphasizing that emotional socialization in the family is an important avenue for morality development in children. The implications of this research will guide future researchers as they develop new ways to understand the development of empathy and what role the family plays in that process. Furthermore, the practical implications of this research extend to parents of young children, parent educators, therapists, and to leaders in education, religion, and government who have an interest in promoting morality through the family. They can use the results of this research, in combination with previous research, to guide parenting behaviors and interventions for young children.

References

Ainsworth, M. S. (1979). Infant-mother attachment. *American Psychologist, 34*(10), 932-937.

American Psychiatric Association (2013). *Personality disorders.* Retrieved from http://www.dsm5.org/Documents/Personality%20Disorders%20Fact%20Sheet.pdf

Acharya, S., & Shukla, S. (2012). Mirror neurons: Enigma of the metaphysical modular brain. *Journal of Natural Science, Biology, and Medicine*, *3*(2), 118-124.

Aureli, T., & Presaghi, F. (2010), Developmental trajectories for mother–infant coregulation in the second year of life. *Infancy, 15*, 557–585.

Baker, J. K., Fenning, R. M., & Crnic, K. A. (2011). Emotion socialization by mothers and fathers: Coherence among behaviors and associations with parent attitudes and children's social competence. *Social Development, 20*(2), 412–430.

Baldwin, S. A., & Fellingham, G. W. (2013). Bayesian methods for the analysis of small sample multilevel data with a complex variance structure. *Psychological Methods*, *18*(2), 151-164.

Bandura, A. (1971). *Social learning theory*. New York City: General Learning Press.

Barchia, K., & Bussey, K. (2011). Predictors of student defenders of peer aggression victims: Empathy and social cognitive factors. *International Journal of Behavioral Development, 35*(4), 289-297.

Barnett, M. (1987). Empathy and related responses in children. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 146-162). Cambridge: Cambridge University Press.

Baron-Cohen, S. (2011). *Zero degrees of empathy: A new theory of human cruelty*. England: Penguin Books.

Batson, C. D. (2011). *Altruism in humans*. New York: Oxford University Press, Inc.

Baumrind, D. (1966). Effects of authoritative parental control on child behavior. *Child Development*, *37*(4), 887–907.

Berenguer, J. (2007). The effect of empathy in proenvironmental attitudes and behaviors. *Environment and Behavior, 39*(2), 269-283.

Bowlby, J. (1969). *Attachment and loss: Attachment* (Vol. 1). New York: Basic Books.

Bowlby, J. (1953). *Childcare and growth of love*. London, Baltimore: Penguin Books.

Boyes, M. C. & Allen, S.G. (1993). Styles of parent-child interaction and moral reasoning in adolescence. *Merrill-Palmer Quarterly, 39*, 551-570.

Boyum, L. A., & Parke, R. D. (1995). The role of family emotional expressiveness in the development of children's social competence. *Journal of Marriage and Family, 57*(3), 593-608.

Buck, R. W. (1975). Nonverbal communication of affect in children. *Journal of Personality and Social Psychology, 31*, 644-653.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In Bollen, K. A. & Long, J. S. (Eds.), *Testing structural equation models* (pp. 136–162). Beverly Hills, CA: Sage

Carlo, G., Hausmann, A., Christiansen, S., & Randall, B. A. (2003). Sociocognitive and behavioural correlates of a measure of prosocial tendencies for adolescents. *Journal of Early Adolescence, 23*, 107-134.

CIVITAS (2010). *Comparison of crime in OECD countries.* Retrieved from http://www.civitas.org.uk/crime/crime_stats_oecdjan2012.pdf

Clark, A. J. (2010). Empathy: An integral model in the counseling process. *Journal of Counseling & Development, 88*(3), 348–356.

Daniels, H., Cole, M., & Wertsch, J. V. (2007). *The Cambridge companion to Vygotsky*. Cambridge: Cambridge University Press.

Darwin, C. (1872). *The descent of man, and selection in relation to sex* (Vol. 1). Harvard University: D. Appleton.

Davidov, M. (2015, March). The early development of empathy for others in distress across the first year of life. In M. Davidov (Chair), *The development of social emotions in the early years*. Symposia conducted at the Society for Research in Child Development biennial meeting, Philadelphia, PA.

Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development, 77*(1), 44-58.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology, 10*, 85-104.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113-126.

David, M. H., & Oathout, H. A. (1987). Maintenance of satisfaction in romantic relationships: Empathy and relational competence. *Journal of Personality and Social Psychology*, *53*(2), 397-410.

De Waal, F. (2009). *The age of empathy*. New York: Harmony Books.

Decety, J. (2010). The neurodevelopment of empathy in humans. *Developmental Neuroscience*, *32*, 257-267.

Decety, J., & Howard, L. H. (2014). A neurodevelopmental perspective on morality. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 454-474). New York: Psychology Press.

Dondi, M., Simion, F., & Caltran, G. (1999). Can newborns discriminate between their own cry and the cry of another newborn infant? *Developmental Psychology, 35*(2), 418-426.

Dunn, J. (1995). Children as psychologists: The later correlates of individual difference in understanding of emotions and other minds. *Cognition and Emotion, 9*, 187-201.

Dunn, J., Brown, J., & Beardsall, L. (1991). Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology, 27*, 448-455.

Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual difference and their antecedents. *Child Development, 62*, 1352-1366.

Einfühlung (n.d.). *Oxford dictionaries*. Retrieved from http://www.oxforddictionaries.com/us/definition/american_english/Einfühlung

Eisenberg, N. (2007). Empathy-related responding and prosocial behavior. In G. Bock & J. Goode (Eds.), *Empathy and fairness* (pp. 71-80). Chichester, UK: John Wiley & Sons, Ltd.

Eisenberg, N. (1992). *The caring child.* Cambridge: Harvard University Press.

Eisenberg, N., Fabes, R. A., Carlo, G., Troyer, D., Speer, A. L., Karbon, M., & Switzer, G. (1992). The relations of maternal practices and characteristics to children's vicarious emotional responsiveness. *Child Development*, *63*(3), 583-602.

Eisenberg, N., Fabes, R. A., Murphy, B., Karbon, M., Smith, M., & Maszk, P. (1996). The relations of children's dispositional empathy-related responding to their emotionality, regulation, and social functioning. *Developmental Psychology, 32*, 195-209.

Eisenberg, N., Fabes, R. A., Schaller, M., Carlo, G., & Miller, P. A. (1991). The relations of parental characteristics and practices to children's vicarious emotional responding. *Child Development, 62*, 1393-1408.

Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2006). Prosocial behavior. In W. Damon & R. M. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Social, emotional, and personality development (Vol. 3,* 6th ed., pp. 646-718). New York: Wiley.

Eisenberg, N., Guthrie, I. K., Murphy, B. C., Shepard, S. A., Cumberland, A., & Carlo, G. (1999). Consistency and development of prosocial dispositions: A longitudinal study. *Child Development, 70*(6), 1360-1372.

Eisenberg, N., Liew, J., & Pidada, S. (2001). The relations of parental emotional expressivity with the quality of Indonesian children's social functioning. *Emotion, 1*, 107-115.

Eisenberg, N., Spinrad, T. L., & Morris, A. (2014). Empathy related responding in children. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 184-207). New York: Psychology Press.

Eisenberg, N., & Strayer, J. (1987). *Empathy and its development*. Cambridge: Cambridge University Press.

Eisenberg, N., Wentzel, M., & Harris, J. D. (1998). The role of emotionality and regulation in empathy-related responding. *School Psychology Review, 27*, 506 – 521.

Etzion-Carasso, A., & Oppenheim, D. (2000). Open mother–pre-schooler communication: Relations with early secure attachment. *Attachment & Human Development*, *2*(3), 347-370.

Evans, C. A., & Porter, C. L. (2009). The emergence of mother-infant co-regulation during the first year: Links to infants' developmental status and attachment. *Infant Behavior and Development, 32*, 147-158.

Feldman, R. (2007a). Mother-infant synchrony and the development of moral orientation in childhood and adolescence: Direct and indirect mechanisms of developmental continuity. *The American Journal of Orthopsychiatry, 77*(4), 582-597.

Feldman, R. (2007b). Parent–infant synchrony and the construction of shared timing: Physiological precursors, developmental outcomes, and risk conditions. *Journal of Child Psychology and Psychiatry, 48*, 329–354.

Feshbach, N. D. (1987). Parental empathy and child adjustment/maladjustment. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 271-291). Cambridge: Cambridge University Press.

Feshbach, N. D. (1975). Empathy in children: Some theoretical and empirical considerations. *Counseling Psychologist 5*(2), 25-30.

Fogel, A. (1993). *Developing through relationships: Origins of communication, self, and culture.* Chicago, IL: University of Chicago Press.

Fogel, A. (2000). Beyond individuals: A relational-historical approach to theory and research on communication. In M.L. Genta (Ed.), *Il rapporto madre-bambino (The mother-child bond)* (pp. 1-55). Rome, IT: Carocci Editore.

Fogel, A. (2001). A relational perspective on the development of self and emotion. In H. A. Bosma & E. S. Kunnen (Eds.), *Identity and emotion: Development through self-organization* (pp. 93-114). New York: Cambridge University Press.

Fogel, A., & Branco, A. U. (1997). Meta-communication as a source of indeterminism in relationship development. In A. Fogel, M. Lyra, & J. Valsiner (Eds.), *Dynamics and indeterminism in developmental and social processes* (pp. 65–92). Mahwah, NJ: Erlbaum.

Fogel, A., & de Koeyer-Laros, I. (2005). *Protocol summary: Emotional development in early childhood* (Unpublished IRB application). University of Utah, Salt Lake City.

Fogel, A., de Koeyer, I, Secrist, C., Sipherd, A., Hafen, T., & Fricke, M. (2003). *The Revised Relational Coding System*. Unpublished manual. Salt Lake City: University of Utah, Department of Psychology.

Fogel, A., & Garvey, A. (2007). Alive communication. *Infant Behavior & Development*, *30*(2), 251-257.

Fong, T. C. T., & Ho, R. T. H. (2013). Factor analysis of the hospital depression and anxiety scale: A Bayesian structural equation modeling approach. *Quality of Life Research, 10*, 1-7.

Garner, P. W., & Jones, D. C. (1994). Social competence among low-income preschoolers: Emotion socialization practices and social cognitive correlates. *Child Development*, *65*(2), 622-637.

Gini, G., Albiero, P., Benelli, B., & Altoè, G. (2007). Does empathy predict adolescents' bullying and defending behavior? *Aggressive Behavior, 33*(5), 467–476.

Gottman, J. (1997). *Raising an emotionally intelligent child*. New York, NY: Simon and Schuster.

Gottman, J. M., Katz, L. F., & Hooven, C. (1997). *Meta-emotion: How families communicate emotionally*. Mahwah, NJ: Erlbaum.

Greener, S., & Crick, N. R. (1999). Children's normative beliefs about prosocial behavior: What does it mean to be nice? *Social Development, 8*, 349-363.

Halberstadt, A. G. (1986). Family socialization of emotional expression and nonverbal communication styles and skills. *Journal of Personality and Social Psychology, 51*(4), 827-836.

Hamilton, M. L. (1973). Imitative behavior and expressive ability in facial expression of emotion. *Developmental Psychology, 8*, 138.

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature, 450*, 557-559.

Hastings, P. D., Miller, J. G., Kahle, S., & Zahn-Waxler, C. (2014). The neurobiological bases of empathetic concern for others. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 411-434). New York: Psychology Press.

Heller, S. R., Robinson, L. C., Henry, C. S., and Plunkett, S. W. (2006). Gender differences in adolescent perceptions of parent-adolescent openness in communication and adolescent empathy. *Marriage & Family Review, 40*(4), 103-122.

Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and justice*. Cambridge: Cambridge University Press.

Hoffman, M. L. (1987). The contribution of empathy to justice and moral judgement. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 47-80). Cambridge: Cambridge University Press.

Hoffman, M. L. (1982). Development of prosocial motivation: Empathy and guilt. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 281-313). New York: Academic Press.

Hoffman, M. L. (1981). The development of empathy. In J. P. Rushton & R. M. Sorrentino (Eds.), *Altruism and helping behavior* (pp. 41-63). Hillsdale, NJ: Earlbaum.

Hoffman, M. L. (1975). Developmental synthesis of affect and cognition and its implication for altruistic motivation. *Developmental Psychology 11*(5), 607-622.

Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*(4), 424-453.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Hsu, H.C., & Fogel, A. (2001). Infant vocal development in a dynamic mother-infant communication system. *Infancy 2*(1), 87-109.

IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Isabella, R.A. (1993). Origins of attachment: Maternal interactive behavior across the first year. *Child Development, 64*, 605–621.

Jacobson, J. (2015). A cure for gun violence. *American Journal of Nursing, 115*(4), 19-20.

Johnson, D. B. (1982). Altruistic behavior and the development of self in infants. *Merrill-Palmer Quarterly, 28,* 379-388.

Jones, D. C., Abbey, B. B., & Cumberland, A. (1998). The development of display rule knowledge: Linkages with family expressiveness and social competence. *Child Development*, *69*(4), 1209-1222.

Karniol, R. (2010). *Social development as preference management: How infants, children, and parents get what they want from one another.* New York: Cambridge University Press.

Kellett, J. B., Humphrey, R. H., & Sleeth, R. G. (2006). Empathy and the emergence of task and relations leaders. *The Leadership Quarterly, 17*(2) 146-162.

Kestenbaum, R., Farber, E. A. & Sroufe, L. A. (1989), Individual differences in empathy among preschoolers: Relation to attachment history. *New Directions for Child and Adolescent Development, 44,* 51–64.

Knafo, A., Zahn-Waxler, C., Van Hulle, C., Robinson, J. L., & Rhee, S. H. (2008). The developmental origins of a disposition toward empathy: Genetic and environmental contributions. *Emotion*, *8*(6), 737-752.

Kochanska, G. (2002). Mutually responsive orientation between mothers and their young children: A context for the early development of conscience. *Current Directions in Psychological Science, 11*, 191-195.

Laible, D. J., & Thompson, R. A. (2000). Mother-child discourse, attachment security, shared positive affect, and early conscience development. *Child Development, 71*(5), 1424-1440.

Laible, D. J., & Thompson, R. A. (2002). Mother-child conflict in the toddler years: Lessons in emotion, morality, and relationships. *Child Development, 73*, 1187-1203.

Lamborn, S. D., Mounts, N. S., Steinberg, L. and Dornbusch, S. M. (1991), Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development, 62*(5), 1049–1065.

Land, K. C. & Zheng, H. (2010). Sample size, optimum allocation, and power analysis. In P. V. Marsden & J. D. Wright (Eds.), *Handbook of survey research* (7th ed., pp. 199-220). United Kingdom: Emerald Group Publishing Limited.

Larson E. B., & Yao X. (2005). Clinical empathy as emotional labor in the patient-physician relationship. *The Journal of the American Medical Association, 293*(9), 1100-1106.

Lightfoot, S. L. (2004*). The essential conversation: What parents and teachers can learn from each other.* New York: Random House Publishing Group.

Lovett, B. J., & Sheffield, R. A. (2007). Affective empathy deficits in aggressive children and adolescents: A critical review. *Clinical Psychology Review, 27*(1), 1–13.

MacLean, P.D. (1949). Psychosomatic disease and the visceral brain: Recent developments bearing on the Papez theory of emotion. *Psychosomatic Medicine, 11*(6), 338-353.

Malatesta, C. Z., & Haviland, J. M. (1982). Learning display rules: The socialization of emotional expression in infancy. *Child Development, 53*, 991-1003.

Marshall, W. L., O'Sullivan, C., & Fernandez, Y. M. (1996). The enhancement of victim empathy among incarcerated child molesters. *Legal and Criminological Psychology, 1*(1), 95–102.

McPhedran, S. (2009). A review of the evidence for associations between empathy, violence, and animal cruelty. *Aggression and Violent Behavior, 14*(1), 1-4.

Menard, S. (2002). *Longitudinal research* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Moreno, A. J., Klute, M. M., & Robinson, J. L. (2008). Relational and individual resources as predictors of empathy in early childhood. *Social Development, 17*(3), 613-637.

Murphy, M. R., MacLean, P. D., & Hamilton, S. C. (1981). Species-typical behavior of hamsters deprived from birth of the neocortex, *Science, 213*, 459-461.

Muthen, L. K., & Muthen, B. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles: Authors.

Narcissism. (n.d.) *American Heritage® Dictionary of the English Language, Fifth Edition*. (2011). Retrieved from http://www.thefreedictionary.com/narcissism

Narvaez, D. (2008a). Human flourishing and moral development: Cognitive science and neurobiological perspectives on virtue development. In L. Nucci & D. Narvaez (Eds.), *Handbook of moral character education* (pp. 310-327). Mahwah, NJ: Erlbaum.

Narvaez, D. (2008b). True ethics: The neurobiological roots of our multiple moralities. *New Ideas in Psychology, 26*, 95-119.

Newman, J. D., & Harris, J. C. (2009). The scientific contribution of Paul D. MacLean. *The Journal of Nervous and Mental Disease, 197*(1), 3-5.

Nystrom, P., Ljunghammar, T., Rosander, K., & von Hofsten, C. (2011). Using mu rhythm desynchronization to measure mirror neuron activity in infants. *Developmental Science*, *14*(2), 327-335.

Obama, B. H. (2006a, June). *Commencement Address*. Speech presented at the Northwestern University Commencement, Evanston, IL. Retrieved from http://www.northwestern.edu/newscenter/stories/2006/06/barack.html

Obama, B. H. (2006b, Aug). *Commencement Address.* Speech presented at the Xavier University Commencement, New Orleans, LA. Retrieved from http://obamaspeeches.com/087-Xavier-University-Commencement-Address-Obama-Speech.htm

Ontai, L. L., & Thompson, R. A. (2002). Patterns of attachment and maternal discourse effects on children's emotion understanding from 3- to 5-years of age. *Social Development, 11*, 433–450.

Oster, H. (1981). "Recognition" of emotional expression in infancy? In M. E. Lamb & L. R. Sherrod (Eds.), *Infant social cognition* (pp. 85-125). Hillsdale, NJ: Erlbaum.

Panfile, T. M. & Laible, D. J. (2012). Attachment security and child's empathy: The mediating role of emotion regulation. *Merrill-Palmer Quarterly, 58*(1), 1-21.

Phinney, J. S., Feshbach, N. D., & Farver, J. (1986). Preschool children's response to peer crying. *Early Childhood Research Quarterly, 1*(3), 207-219.

Plutchik, R. (1987). Evolutionary bases of empathy. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 38-46). Cambridge: Cambridge University Press.

Press, S. J. (2003). *Subjective and objective Bayesian statistics: Principles, models, and applications* (2nd ed.). New York, NY: Wiley.

Radke-Yarrow, M., & Zahn-Waxler, C. (1984). Roots, motives, and patterns in children's prosocial behavior. In E. Staub, D. Bar-Tal, J. Karylowski, & J. Reykowski (Eds.), *The development and maintenance of prosocial behavior* (pp. 81-115). New York: Plenum.

Ram, N., & Grimm, K. J. (2009). Growth mixture modeling: A method for identifying differences in longitudinal change among unobserved groups. *International Journal of Behavioral Development*, *33*(6), 565–576.

Rizzolatti, G., & Craighero, L. (2004). The mirror-neuron system. *Annual Review of Neuroscience, 27*, 169–192.

Roberts, W., & Strayer, J. (1996). Empathy, Emotional Expressiveness, and Prosocial Behavior. *Child Development, 67*, 449-470.

Roth-Hanania, R., Davidov, M., & Zahn-Waxler, C. (2011). Empathy development from 8 to 16 months: Early signs of concern for others. *Infant Behavior & Development, 34*, 447-458.

Sallquist, J., Eisenberg, N., Spinrad, T. L., Eggum, N. D., & Garetner, B. M. (2009). Assessment of preschoolers' positive empathy: Concurrent and longitudinal relations with positive emotion, social competence, and sympathy. *The Journal of Positive Psychology, 4*, 223-233.

Sander, L. (1975). Infant and caretaking environment. In E. J. Anthony (Ed.), *Explorations in child psychiatry* (pp. 129-165). New York: Plenum.

Schore, A. A. (June, 2012). *Modern attachment theory: The enduring impact of early right brain development on affect regulation.* Speech presented at the Annual Roots of Empathy Research Symposium, Toronto, Canada.

Semrud-Clikeman, M. (2007). *Social competence in children*. New York, New York: Springer Sciences & Business Media.

Shetgiri, R., Espelage, D. L., & Carroll, L. (2015). *Practical strategies for clinical management of bullying*. Switzerland: Springer International Publishing.

Simner, M. L. (1971). Newborn's responses to the cry of another infant. *Developmental Psychology, 5*, 136-150.

Spinrad, T. L., & Stifter, C. A. (2006). Toddlers' empathy-related responding to distress: Predictions from negative emotionality and maternal behavior in infancy. *Infancy, 10*(2), 97-121.

Sroufe, L. A. (2000). Early relationships and the development of children. *Infant Mental Health Journal, 21*(1–2), 67–74.

Sroufe, L. A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development, 7*(4), 349-367.

Stavrinides, P., Georgiou, S., & Theofanous, V. (2010). Bullying and empathy: A short-term longitudinal investigation. *Educational Psychology, 30*(7), 793-802.

Strayer, J., & Eisenberg, N. (1987). Empathy viewed in context. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 389-398). Cambridge: Cambridge University Press.

Thompson, R. (2014). Conscience development in early childhood. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 73-92). New York: Psychology Press.

Thompson, R. (1987). Empathy and emotional understanding: The early development of empathy. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 119-145). Cambridge: Cambridge University Press.

Tremblay, R. E., Desmarais-Gervais, L., Gagnon, C., & Charlebois, P. (1987). The Preschool Behaviour Questionnaire: Stability of its factor structure between cultures, sexes, ages and socioeconomic classes. *International Journal of Behavioral Development, 10*(4), 467-484.

Tremblay, R. E., Vitaro, F., Gagnon, C., Piche, C., & Royer, N. (1992). A prosocial scale for the Preschool Behavior Questionnaire: Concurrent and predictive correlates. *International Journal of Behavioral Development, 15*(2), 227-245.

Trommsdorff, G. (1991). Child-rearing and children's empathy. *Perceptual and Motor Skills, 72*, 387-390.

U.S. Department of Justice – Federal Bureau of Investigation (2014). *Uniform Crime Report: Crime in the United States, 2013*. Retrieved from http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2013/crime-in-the-u.s.-2013/violent-crime/violent-crime-topic-page/violentcrimemain_final.pdf

Vaillant-Molina, M., Bahrick, L. E., & Flom, R. (2013). Young infants match facial and vocal emotional expressions of other infants. *Infancy*, *18(SI),* E97-E111.

Valiente, C., Eisenberg, N., Fabes, R. A., Shepard, S. A., Cumberland, A., & Losoya, S. H. (2004). Prediction of children's empathy-related responding from their effortful control and parents' expressivity. *Developmental Psychology, 40*, 911-926.

Van der Mark, I. L., van Ijzendoorn, M. H. & Bakemans-Kranenburg, M. J. (2002). Development of empathy in girls during the second year of life: Associations with parenting, attachment, and temperament. *Social Development, 11*(4), 451-468.

Vialle, W., & Verenikina, I. (2000). *Handbook on child development*. Australia: Cengage Learning.

Wispé, L. (1987). History of the concept of empathy. In N. Eisenberg and J. Strayer (Eds.), *Empathy and its development* (pp. 17-37). Cambridge University Press: Cambridge

Yoon, J. S. (2002). Teacher characteristics as predictors of teacher-student relationships: Stress, negative affect, and self-efficacy. *Social Behavior and Personality, 30*(5), 485-493.

Young, S. K., Fox, N. A., & Zahn-Waxler, C. (1999). The relations between temperament and empathy in 2-year-olds. *Developmental Psychology, 35*, 1189-1197.

Zahn-Waxler, C., Cole, P. M., Welsh, J. D., & Fox, N. A. (1995). Psychophysiological correlates of empathy and prosocial behaviors in preschool children with problem behaviors. *Development and Psychopathology, 7*, 27-48.

Zahn-Waxler, C., Radke-Yarrow, M. (1982). The development of altruism: Alternative research strategies. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 109-137). New York: Academic.

Zahn-Waxler, C., Radke-Yarrow, M., & King, R. A. (1977, March). *The impact of the affective environment on young children*. Paper presented at the meeting of the Society for Research in Child Development, New Orleans, Louisiana.

Zahn-Waxler, C., & Radke-Yarrow, M., & King, R. A. (1979). Child rearing and children's prosocial initiations toward victims of distress. *Child Development, 50*, 319-330.

Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). The development of empathy in twins. *Developmental Psychology, 28(6),* 1038-1047.

Zahn-Waxler, C., Robinson, J.L., & Emde, R.N. (1992). Development of concern for others. *Developmental Psychology, 28(1),* 126-136.

Zahn-Waxler, C., Schiro, K., Robinson, J. L., Emde, R. N., & Schmitz, S. (2001). Empathy and prosocial patterns in young MZ and DZ twins: Development and genetic and environmental influences. In R. N. Emde & J. K. Hewitt (Eds.), *Infancy to early childhood: Genetic and environmental influences on developmental change* (pp. 141-162). Oxford, UK: Oxford University Press.

Zhou, Q., Eisenberg, N., Losoya, S. H., Fabes, R., A., Reiser, M., Guthrie, I. K., … Shepard, S. A. (2002). The relations of parental warmth and positive expressiveness to children's empathy-related responding and social functioning: A longitudinal study. *Child Development, 73*(3), 893-915.

Zhou, Q., Valiente, C., & Eisenberg, N. (2003). Empathy and its measurement. In S. Lopez & C. R. Snyder (Eds.), *Positive psychological assessment: A handbook of models and measures*. (pp. 269-284). Washington, D.C: American Psychological Association

Table 1

Descriptive Statistics

	N	Min	Max	Mean	Std Dev
Annual Income	141	$2,000	$180000	$39,859.91	$28,552.15
Income/1000	141	$2	$180	$39.86	$28.55
FEQ	72	3.13	12.55	5.84	1.45
Symmetrical					
Wave 1	186	.08	.94	.44	.18
Wave 2	100	.16	1	.70	.17
Wave 3	78	.46	1	.81	.11
Asymmetrical					
Wave 1	186	0	.47	.11	.08
Wave 2	100	0	.35	.07	.07
Wave 3	78	0	.21	.04	.04
Unilateral					
Wave 1	186	.01	.92	.39	.16
Wave 2	100	0	.57	.19	.12
Wave 3	78	0	.5	.12	.10
Disruptive					
Wave 1	186	0	.17	.01	.02
Wave 2	100	0	.03	.00	.00
Wave 3	78	0	.01	.00	.00
Unengaged					
Wave 1	186	0	.26	.03	.04
Wave 2	100	0	.12	.02	.00
Wave 3	78	0	.01	.00	.00
Pain Simulation	46	2	7	4.02	1.27
Home Interview	44	2.33	5	3.88	.49
Prosociality	47	1.2	2.8	2.10	.39
Emotion Dolls	46	2	7	3.74	1.06

Wave	N	Males	Anglo	Disruptive	Unengaged
1	186	100	82	54	110
2	100	47	52	10	61
3	78	39	44	1	43
4	47	22	40	n/a	n/a

Table 2

Family Expressiveness Questionnaire

Item #	Question	Item #	Question
1	Showing forgiveness	21	Complimenting someone
2	Thanking family members	22	Expressing sympathy
3	Exclaiming over a beautiful day	23	Expressing deep affection
4	Showing contempt	24	Quarreling
5	Expressing dissatisfaction	25	Crying when someone leaves
6	Praising someone	26	Spontaneously hugging
7	Expressing anger	27	Expressing momentary anger
8	Sulking over unfair treatment	28	Expressing concern
9	Blaming one another	29	Apologizing
10	Crying after a disagreement	30	Offering to help
11	Putting down others' interests	31	Snuggling
12	Showing dislike	32	Crying for being punished
13	Seeking approval	33	Trying to cheer up someone
14	Expressing embarrassment	34	Expressing hurt
15	Falling apart during tense situations	35	Expressing happiness
16	Expressing exhilaration	36	Threatening
17	Expressing excitement	37	Criticizing
18	Demonstrating admiration	38	Expressing gratitude
19	Expressing sorrow	39	Surprising someone with a gift
20	Expressing disappointment	40	Saying "I'm sorry"

Table 3

Overview of Reliability: Co-Regulation

	Tapes coded/Total tapes (%)	Kappa
Anglo		
Wave One	14/82 (17%)	.63 (.34 -.93)
Wave Two	17/62 (27%)	.59 (.36 -.78)
Wave Three	11/44 (25%)	.70 (.44 -.88)
Latin		
Wave One	14/82 (17%)	.60 (.28-.83)
Wave Two	18/48 (17%)	.56 (.21-.83)
Wave Three	7/34 (21%)	.65 (.29-.90)

Table 4

Overview of Variables

Name	Description	Independent/ Dependent	Type	Collected
Co-regulation	Quality of dyadic communication	Independent	Continuous - 5 categories coded as a proportion/percentage of the entire episode	Waves 1, 2 , 3
Family Expressiveness Questionnaire [FEQ]	The amount of positive and negative expressions of emotions in the home	Independent	Continuous - 40 items, Positive and Negative scales	Wave 3
Pain Simulation Procedure	Empathy-related responding for victim of pain	Dependent	Continuous - Code for "overall" empathy during session, codes for each aspect of empathy-related responding	Wave 4
Emotion Dolls	Empathy-related responding as children describe emotional expressions of dolls	Dependent	Continuous - 7 dolls coded for a variety of reactions. "Overall" empathy code	Wave 4
Home Interview	Mother was interviewed about events in the child's life and the child's empathy-related reactions	Dependent	Continuous- Coded for positive and negative empathic reactions.	Wave 4
My Child's Behaviors (MCB; Prosociality)	Behavior questionnaire with 13 prosocial items to capture empathy-related responding	Dependent	Continuous – Prosocial scale	Wave 4

Table 5

Correlations of Demographics, Family Expressiveness Questionnaire and Empathy Variables

	Income	Gender	FEQ	Pain Sim.	Emotion Dolls	Home Int. Negative	MCB Prosocial
Income	1						
Gender	.09	1					
FEQ	-.06	-.01	1				
Pain Simulation	.05	-.12	.35	1			
Emotion Dolls	.02	-.07	.03	-.09	1		
Home Int. Neg.	-.20	-.17	.16	.21	.03	1	
MCB Prosocial	.34*	-.41**	.10	.16	.05	.12	1

*. Correlation is significant at the .05 level (two-tailed). **. Correlation is significant at the .01 level (two-tailed).

Table 6

Correlations of Demographics and Wave 1 and 2 Co-regulation

	Income	Gender	Sym Wave 1	Asym Wave 1	Uni Wave 1	Disrup Wave 1	Unen Wave 1	Sym Wave 2	Asym Wave 2	Uni Wave 2	Disrup Wave 2	Unen Wave 2
Income	1											
Gender	.09	1										
Sym Wave 1	.05	-.16*	1									
Asym Wave 1	-.27**	-.02	-.32**	1								
Uni Wave 1	.20*	.13	-.77**	-.24**	1							
Disrup Wave 1	-.28**	.19**	-.11	.14	-.12	1						
Unen Wave 1	-.13	.02	-.34**	.20**	-.01	.05	1					
Sym Wave 2	.24*	.03	.25*	-.32**	-.04	-.22*	-.16	1				
Asym Wave 2	-.27*	.02	-.19	.48**	-.11	.32**	.09	-.60**	1			
Uni Wave 2	-.16	-.04	-.21*	.11	.14	.09	.14	-.84**	.12	1		
Disrup Wave 2	-.04	.002	-.05	.26**	-.16	.35**	.08	-.15	.23*	.02	1	
Unen Wave 2	-.11	-.08	.01	.18	-.18	.10	.15	-.50**	.42**	.18	-.02	1

*. Correlation is significant at the .05 level (two-tailed). **. Correlation is significant at the .01 level (two-tailed).

Table 7

Correlations of Demographics and Wave 3 and 4 Co-regulation

	Income	Gender	Sym Wave 3	Asym Wave 3	Uni Wave 3	Disrup Wave 3	Unen Wave 3	Sym Wave 4	Asym Wave 4	Uni Wave 4	Disrup Wave 4	Unen Wave 4
Income	1											
Gender	.09	1										
Sym Wave 3	-.08	-.04	1									
Asym Wave 3	-.24	-.02	-.37**	1								
Uni Wave 3	.28*	.09	-.84**	-.11	1							
Disrup Wave 3	.53**	.11	-.20	-.03	.25*	1						
Unen Wave 3	-.12	-.19	-.27*	.13	.03	-.01	1					
Sym Wave 4	-.04	.11	.50**	-.18	-.45**	.[a]	.05	1				
Asym Wave 4	.10	-.13	-.12	.13	.03	.[a]	.08	-.52**	1			
Uni Wave 4	.04	-.08	-.43*	.13	.41*	.[a]	-.07	-.96**	.33*	1		
Disrup Wave 4	-.06	.14	-.28	.08	.22	.[a]	-.10	-.06	.03	-.07	1	
Unen Wave 4	-.17	-.11	-.39*	.27	.28	.[a]	.09	-.21	.02	.12	.05	1

*. Correlation is significant at the .05 level (two-tailed). **. Correlation is significant at the .01 level (two-tailed). a. Cannot be computed .

Table 8

Correlations of Family Expressiveness Questionnaire, Empathy and Co-regulation—Wave 1

	FEQ	Pain Sim.	Emotion Dolls	Home Int.	MCB Prosocial	Sym Wave 1	Asym Wave 1	Uni Wave 1	Disrup Wave 1	Unen Wave 1
FEQ	1									
Pain Sim.	.35	1								
Emotion Dolls	.03	-.09	1							
Home Int. Neg.	.16	.21	.03	1						
MCB Prosocial	.10	.16	.05	.12	1					
Sym Wave 1	.12	.10	.24	.02	.13	1				
Asym Wave 1	.08	.03	-.38**	.14	-.20	-.32**	1			
Uni Wave 1	-.15	-.11	-.16	-.06	-.10	-.77**	-.24**	1		
Disrup Wave 1	.08	.12	-.24	.04	.03	-.11	.14	-.12	1	
Unen Wave 1	-.08	-.18	-.002	.02	.10	-.34**	.20**	-.01	.05	1

*. Correlation is significant at the .05 level (two-tailed). **. Correlation is significant at the .01 level (two-tailed).

Table 9

Correlations of Family Expressiveness Questionnaire, Empathy and Co-regulation—Wave 2

	FEQ	Pain Sim.	Emotion Dolls	Home Int.	MCB Prosocial	Sym Wave 2	Asym Wave 2	Uni Wave 2	Disrup Wave 2	Unen Wave 2
FEQ	1									
Pain Sim.	.35	1								
Emotion Dolls	.03	-.09	1							
Home Int. Neg.	.16	.21	.03	1						
MCB Prosocial	.10	.16	.05	.12	1					
Sym Wave 2	.05	-.15	.01	-.01	.04	1				
Asym Wave 2	.02	-.18	-.20	.05	-.07	-.60**	1			
Uni Wave 2	-.09	.17	.13	-.09	-.12	-.84**	.12	1		
Disrup Wave 2	.24	.10	-.24	.08	-.01	-.15	.23*	.02	1	
Unen Wave 2	-.07	.08	-.04	.01	.51**	-.50**	.42**	.18	-.02	1

*. Correlation is significant at the .05 level (two-tailed). **. Correlation is significant at the .01 level (two-tailed).

Table 10

Correlations of Family Expressiveness Questionnaire, Empathy and Co-regulation—Wave 3

	FEQ	Pain Sim.	Emotion Dolls	Home Int.	MCB Prosocial	Sym Wave 3	Asym Wave 3	Uni Wave 3	Disrup Wave 3	Unen Wave 3
FEQ	1									
Pain Sim.	.35	1								
Emotion Dolls	.03	-.09	1							
Home Int. Neg.	.16	.21	.03	1						
MCB Prosocial	.10	.16	.05	.12	1					
Sym Wave 3	.08	.08	.05	-.22	-.03	1				
Asym Wave 3	.09	-.01	-.12	.06	.04	-.37**	1			
Uni Wave 3	-.10	-.02	-.01	.19	.04	-.84**	-.11	1		
Disrup Wave 3	-.00	.[a]	.[a]	.[a]	.[a]	-.20	-.03	.25*	1	
Unen Wave 3	.16	-.05	.13	-.01	.02	-.27*	.13	.03	-.01	1

*. Correlation is significant at the .05 level (two-tailed). **. Correlation is significant at the .01 level (two-tailed). a. Cannot be computed.

Table 11
Exploratory Factor Analysis My Child's Behaviors – Prosociality

	1	2	3
Tries to stop quarrels	.632	.093	-.273
Doesn't share (reversed)	.160	.139	.759
Invites others to join in	.726	-.401	-.041
Helps someone hurt	.744	-.277	.038
Helps others pick up	.412	.651	-.072
Praises others work	.760	-.006	.079
Sympathy: mistakes others	.670	-.311	.004
Offer help to other kids	.716	-.241	-.401
Helps sick kids	.731	.018	.092
Comforts upset kids	.681	-.289	.291
Doesn't share (reversed)	.311	.395	.590
Clean up others mess	.357	.781	-.306
Clean up others mess	.483	.653	-.070

Extraction Method: Principal Component Analysis. a. 3 components extracted.

Table 12
My Child's Behaviors—Prosociality Scale

Item #	Question
2	If there is a quarrel or dispute will try to stop it.
7	Will invite bystanders to join in a game.
9	Will try to help someone who has been hurt.
19	Spontaneously helps to pick up objects that another child has dropped (eg. Pencils, books, etc)
22	Takes the opportunity to praise the work of less able children.
24	Shows sympathy to someone who has made a mistake.
27	Offers to help other children who are having difficulty with a task in the classroom.
31	Helps other children who are feeling sick.
36	Comforts a child who is crying or upset.
38 (reversed)	Doesn't share toys.

Table 13

Models 1a-1d Structural Equation Models Estimates

	Pain (a)	Home Interview (b)	Prosociality (c)	Emotion Dolls (d)
Intercept	β = -.64 , *p* =.33	β = -.50, *p* = .63	β = -1.05, *p* = .61	β = -.17, *p* = .85
Slope	β = -.48, *p* =.52	β = -.88, *p* = .43	β = -1.27, *p* = .55	β = -.93, *p* = .38
FEQ	β = .65, *p* = .00*	β = .27, *p* = .34	β = .33, *p* = .17	β = -.05, *p* = .87
Gender	β = -.09, *p* = .51	β = -.16, *p* = .39	β = -.26, *p* = .10	β = -.30, *p* = .06
Income	β = .24, *p* = .15	β = -.22, *p* = .28	β = .38, *p* = .02*	β = .03, *p* = .88

*Correlation is significant at the .05 level (two-tailed).

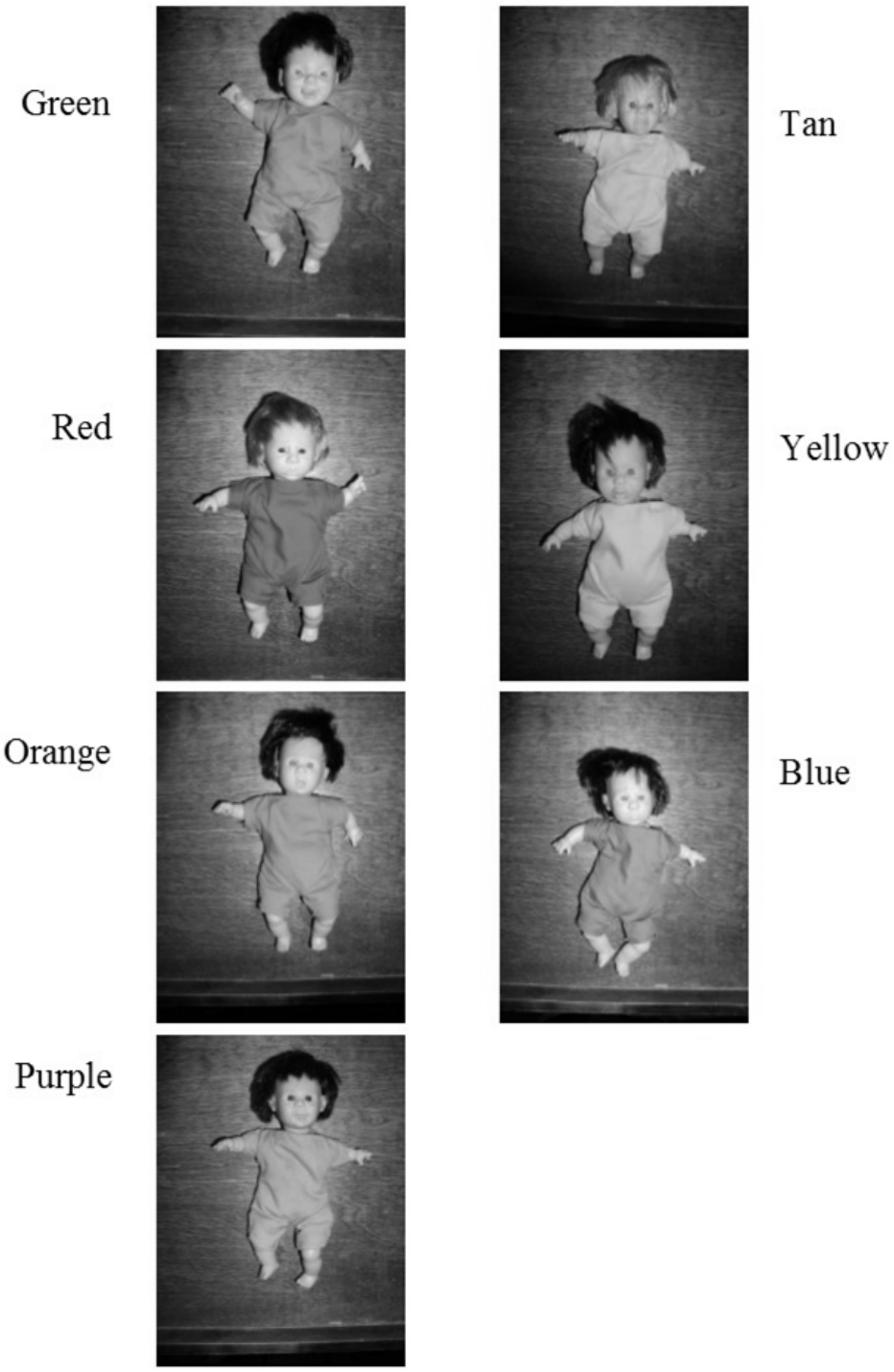

Figure 1. Photographs of emotion dolls

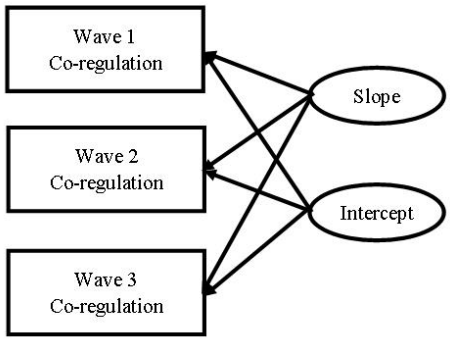

Figure 2. Model 1 – Latent Growth Curve Analysis

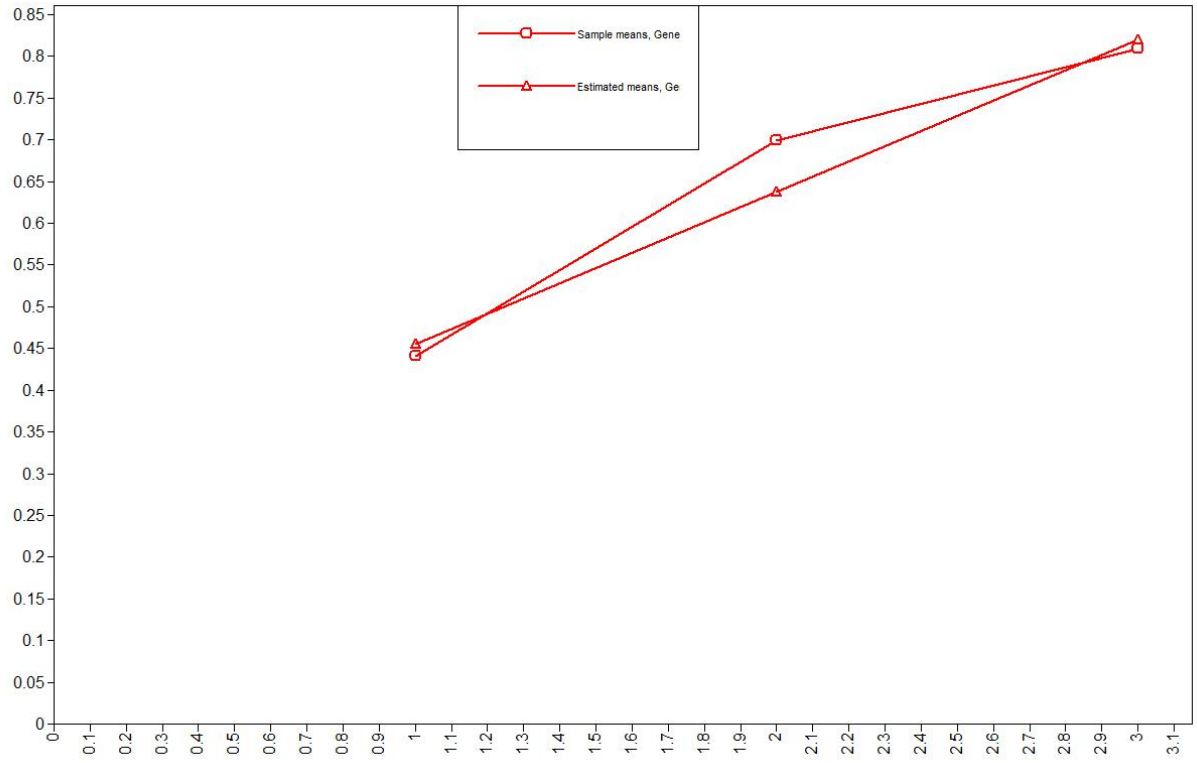

Figure 3. Symmetrical Growth Curve - Linear

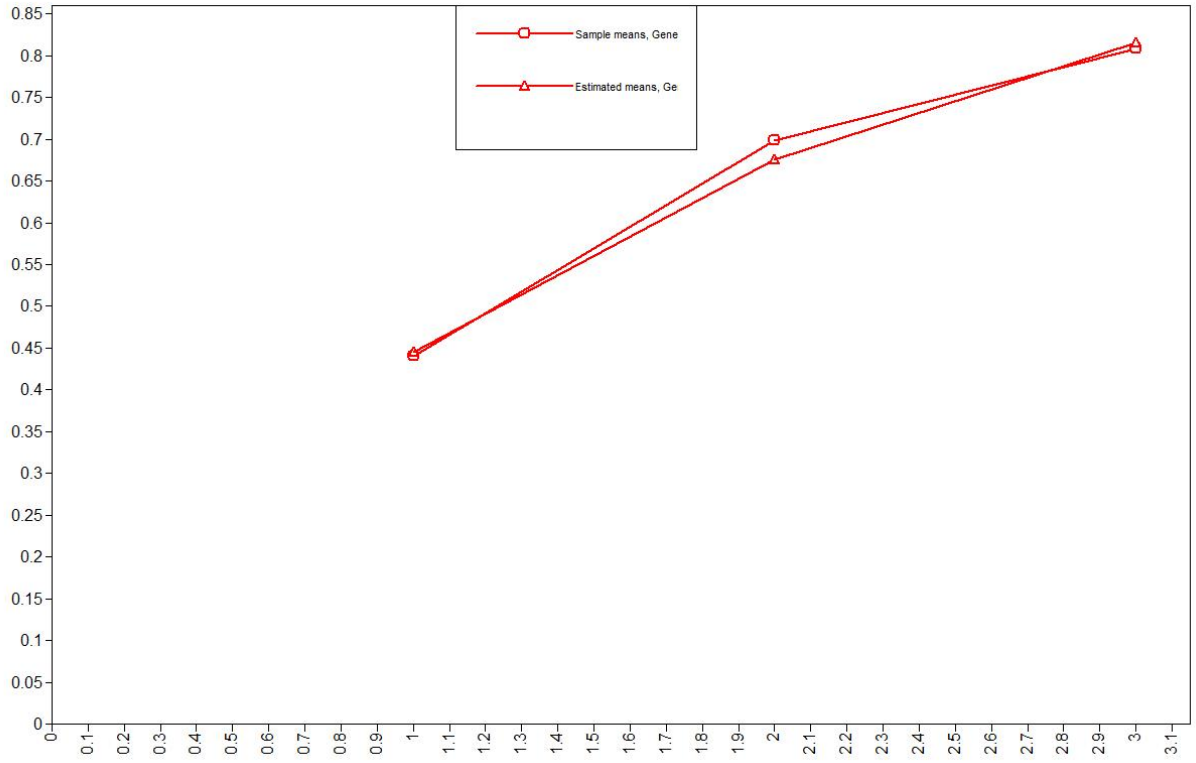

Figure 4. Symmetrical Growth Curve – Log-Linear

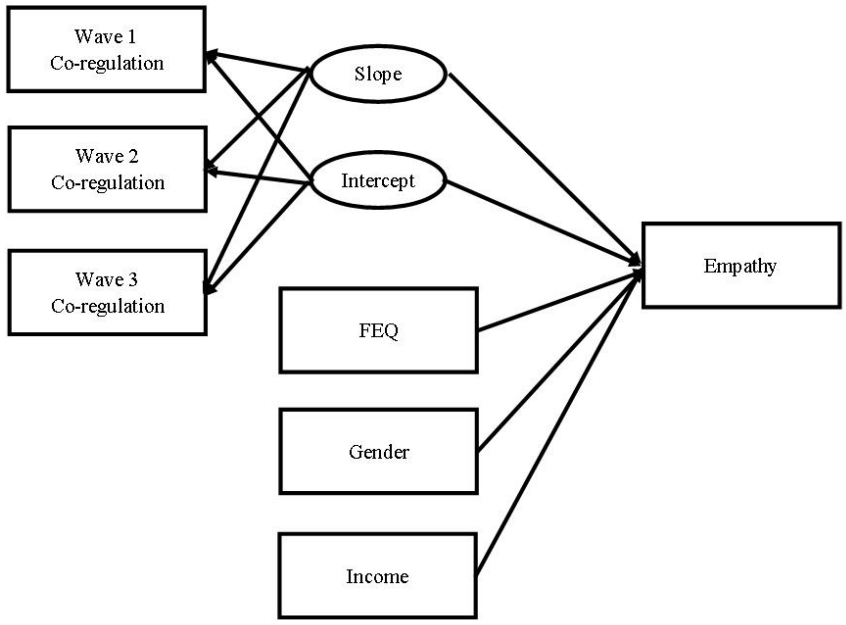

Figure 5. Model 1a – Empathy predicted by Family Expressiveness Questionnaire and the change in co-regulation