# Concern for Others in the First Year of Life: Theory, Evidence, and Avenues for Research

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ABSTRACT—***Concern for others has been thought to emerge in the 2nd year of life (Hoffman, 1975, 1984, 2000). Three related ideas underlying this view assume that younger infants cannot distinguish between self and other, cannot experience concern for others, and show self-distress because they misinterpret others' distress as their own. In this article, we review evidence contradicting these assumptions and propose an alternative view of early empathy development. Specifically, we argue that empathic concern does not depend on self-reflective abilities and exists during the 1st year of life, manifesting young infants' fundamental social nature. We also touch on avenues for research.***

KEYWORDS—*empathy; concern for others; infancy; early development*

The ability to feel concern and care for others is central to what makes us human. How early in development does it begin? For many years, empathy was viewed as a moral achievement attained during middle childhood; toddlers and young children were seen as perceptually and motivationally self-centered, and thus incapable of caring sentiments toward others (Zahn-Waxler, 1998; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). This view has been generally abandoned in recent decades, however, largely due to Hoffman's theory of empathy development and studies of young children (Zahn-Waxler, 1998). Hoffman viewed empathy as an innate capacity, with concern for others emerging during the second year of life (Hoffman, 1975, 1984, 2000). This change in perspective has been important but requires further development. In this article, we review evidence indicating that infants can show empathic concern for others earlier in life and propose an alternative view of the early development of empathy.

## THE NATURE OF CONCERN FOR OTHERS

Concern for others (also referred to as affective empathy, empathic concern, or sympathy) is an emotional response consisting of tender feelings on behalf of a distressed other. Concern is often accompanied by attempts to cognitively comprehend the other's state (i.e., cognitive empathy) and can motivate prosocial action to alleviate the other's distress. Our focus here is on the emotional core—the feeling of concern.

When individuals perceive another person's emotion, they often experience a similar emotion themselves (e.g., Decety & Meyer, 2008; Eisenberg, Fabes, & Spinrad, 2006). This ability, to feel what another is feeling—or *empathy*—is thought to result from overlap in brain circuits; exposure to another's emotion activates some of the same neural mechanisms involved when the self experiences that emotion (Decety & Meyer, 2008; Preston & de Waal, 2002; Singer, 2006). When empathy is evoked by another's distress, it can give rise to concern if the person remains focused on the other in distress and *feels for* the other. If the observer becomes overly aroused or distraught, the focus of concern can shift from the other to the self, resulting in self-distress (also known as personal distress or empathic distress; e.g., Eisenberg

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et al., 2006). The individual might also feel a mixture of empathic concern and self-distress, or alternate between the two.

## HOFFMAN'S THEORY OF EARLY EMPATHY DEVELOPMENT

Hoffman's (1975, 1984, 2000) stage theory, widely accepted in the field, posits that infants are born with the capacity for empathic distress but cannot experience empathic concern until the 2nd year of life (with individual differences assumed). Young infants are thought to lack awareness of the self as a separate physical entity from others and hence cannot distinguish between another person's distress and their own. This confusion of distress states leads the infant to respond with empathic distress that is self-focused (or undifferentiated, global) and to seek comfort for the self.

Some of Hoffman's theoretical assumptions have received substantial support. For example, empathic self-distress (or contagious crying) is present from the beginning of life in human infants. Newborns and infants respond to recorded cries of another infant with self-distress (e.g., crying), but are less distraught by other, equally loud sounds (e.g., Simner, 1971; see also Geangu, Benga, Stahl, & Striano, 2010). However, three other aspects of the theory remain unsubstantiated and merit scrutiny.

First, the assumption that young infants cannot distinguish between self and others is inconsistent with research on young infants' implicit ability to differentiate between self and others. Second, the suggestion that young infants are incapable of empathic concern is not based on empirical research; although studies of concern for another in distress during the 1st year of life are rare, existing evidence reveals a different picture. Third, the idea that self-distress occurs because infants confuse the other's distress as their own is problematic and neglects the role of emotion regulation.

## SELF–OTHER DIFFERENTIATION: IMPLICIT VERSUS EXPLICIT

To feel concern for another, one must be able to distinguish between self and other, recognizing that it is the other person, not the self, who is distressed. It has been assumed that self-other differentiation requires reflective, conceptual self-awareness, as typically revealed by mirror self-recognition tasks (e.g., Hoffman, 2000). A common task is the rouge test, in which a spot of color is placed unobtrusively on an infant's face and the infant is placed in front of a mirror; an infant who reaches to touch the mark after seeing it in the mirror is said to show self-recognition. Such tasks require relatively advanced cognitive abilities, which typically develop over the 2nd year (Butterworth, 1992).

Although explicit, reflective self-knowledge indexed by the rouge task appears to facilitate toddlers' prosocial behavior (Eisenberg et al., 2006; Zahn-Waxler et al., 1992), research examining concerned affect suggests that self-recognition is likely not a prerequisite for *feeling* concern. For example, in one study (Zahn-Waxler et al., 1992), across three time points, no significant correlations were found between self-recognition and empathic concern (and only one correlation approached significance). Moreover, self-recognition and empathic concern were unrelated in a Delhi sample, and only modestly related in a Berlin sample (Kärtner, Keller, & Chaudhary, 2010), suggesting culture-specific processes in how self-construal may relate to concern for others.

Instead of self-recognition, a simpler, implicit form of self-knowledge is likely sufficient for experiencing concern for others. The literature on self-concept refers to a basic, prereflective form of self-knowledge, present from the beginning of life (e.g., Butterworth, 1992; Gallagher & Meltzoff, 1996). This sense of self is based on the infant's subjective experience of his or her own sensory perception and self-generated actions. Thus, the infant can distinguish between self-generated movements and being moved by someone else, or between crying and hearing another's cry because these experiences *feel* different.

Empirical evidence for such early self–other differentiation includes the finding that newborns discriminate between their own (previously recorded) cries and those of another infant (Dondi, Simion, & Caltran, 1999); they respond with distress to another's crying but are relatively indifferent to their own. Thus, neonates' contagious crying cannot be explained by lack of differentiation between the distress of self and other (a point we will revisit). Moreover, neonates distinguish between the experience of touching their own faces versus having an experimenter do so, as reflected by the frequency of rooting responses (Rochat & Hespos, 1997); that is, they implicitly distinguish between a sensation caused by another and that generated by the self. Young infants distinguish between prerecorded video images and vocalizations depicting the self versus corresponding stimuli depicting a peer (Legerstee, Anderson, & Schaffer, 1998). Self–other discrimination might even exist before birth. In twin pairs examined in utero, movements directed toward the other twin showed a different pattern of motion than those directed toward the self (Castiello et al., 2010).

The ability to distinguish implicitly between self and others likely occurs because parts of the neural network *do not* overlap when processing similar experiences of self and others; some neural pathways are activated only (or faster) when the self is directly involved (Decety & Meyer, 2008; Singer, 2006). This form of implicit self–other differentiation should be sufficient to support concern for others in young infants by enabling them to recognize that the other person is hurting rather than the self.

## EVIDENCE OF CONCERN FOR OTHERS IN THE 1ST YEAR

Studies of empathy development typically began with infants in the 2nd year of life or onward; research on earlier concern for

others is rare. In one study, 6-month-olds were observed to see how they responded when a peer spontaneously cried and fussed (Hay, Nash, & Pederson, 1981). Self-distress responses were rare; instead, infants typically responded in an other-focused manner, with most directing attention to the crying peer and many orienting toward the other infant by leaning, gesturing, or touching. This suggests that other-oriented responses can be observed well before the second year of life, contrary to existing theory.

To examine Hoffman's hypothesized shift from empathic distress to empathic concern, another study examined how infants' responses to maternal and peer distress develop from 8 to 16 months (Roth-Hanania, Davidov, & Zahn-Waxler, 2011). Using assessment procedures and coding systems identical to prior work with toddlers and young children, the study found that concern for others emerged *prior* to the 2nd year of life. Moderate levels of affective empathy (indicated by facial expressions, vocalizations, and gestures reflecting concern) and cognitive empathy (attempts to explore and comprehend the others' distress) were already present at 8 and 10 months. While the cognitive component increased gradually across the transition to the 2nd year, the affective component (empathic concern) did not. This highlights the importance of distinguishing between subtypes of empathy early in development.

Moreover, prosocial behavior changed markedly over time: Acts of comforting and helping were rare during the 1st year, but increased substantially during the 2nd year of life. Prosocial behavior requires more sophisticated integration of affect, cognition, and action. Therefore, it too shows a different developmental trajectory. At the same time, connections between systems also exist: Affective and cognitive empathy observed in the 1st year systematically predicted subsequent levels of prosocial behavior during the 2nd year. Thus, a stable empathic disposition, already documented in the 2nd and 3rd years of life (Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008), appears to form even earlier. As occurred in the Hay et al. (1981) study, self-distress responses were rare. Thus, younger infants typically neither ignored the victim nor showed self-focused distress; instead, they attended to the other, often with sobered and concerned facial expressions and vocalizations (similar to how concern has been operationalized in toddlers and young children). Taken together, the best and most parsimonious interpretation is that as early as the 1st year, many infants show concern for the other.

This adds another dimension to knowledge about young infants' social proclivities. Infants are drawn to and engage in social interaction from birth (Trevarthen & Aitken, 2001) and, in fact, even before birth (Castiello et al., 2010). Typically developing infants show their unquestionable capacity and motivation to connect with and share emotions with others (e.g., Rochat, 2009; Trevarthen & Aitken, 2001). Research has emphasized early exchanges of positive emotions (joy, delight) between infants and caregivers. However, infants' fundamental motive for connectedness is also manifested by their involvement, interest, and concern when others are distressed. Concern for others is thus another expression of a basic motivation for sociality and affiliation. Consistent with this notion, sociable temperament has been linked to greater empathic concern in the first years of life (Light & Zahn-Waxler, 2011).

## REEXAMINING EMPATHIC DISTRESS

The process underlying young infants' empathic self-distress (or contagious crying) also merits reexamination (Dondi et al., 1999). Rather than stemming from confusion between the distress of others and that of the self, infants' self-distress (like that of children and adults) likely reflects difficulties regulating the emotional arousal induced by the other's distress. In general, an optimal level of arousal is crucial to empathic concern. The ability to regulate the arousal created by the other's distress is therefore important, with successful regulation supporting empathic concern and overarousal leading to self-focused distress (Decety & Meyer, 2008; Eisenberg et al., 2006). This process appears equally relevant to young infants. Moreover, because young infants have limited ability to self-regulate negative arousal, they may succeed only if the discomfort is relatively mild (e.g., when confronted with distress stimuli that are unambiguous yet not overwhelming).

Indeed, studies in which infants' empathic self-distress responses were prevalent (e.g., Geangu et al., 2010; Simner, 1971) used relatively prolonged and intense distress stimuli (4- to 6-min audio recording of a crying infant), which increase the likelihood of overarousal and dysregulation. In contrast, self-distress was scarce when milder and briefer distress stimuli were used (Hay et al., 1981; Roth-Hanania et al., 2011), enabling infants to more effectively regulate their arousal and remain other-focused. Even when infants show contagious crying, they usually do not show it right away (i.e., automatically). Infants typically begin to cry on average only after 1.5–3 min of exposure to the other's crying (Geangu et al., 2010; Simner, 1971), in other words, after they likely become overly stimulated and dysregulated. More direct evidence for the role of regulation can be found: Young infants' greater regulatory skills are associated with less self-distress in response to peer cries (Geangu, Benga, Stahl, & Striano, 2011). Moreover, greater self-regulatory abilities observed at 4.5 months predict less self-distress in response to a video of a distressed peer at 12 months (Ungerer et al., 1990). Thus, although young infants do experience empathic self-distress, it is not seen invariably and, as in children and adults, may depend on regulatory processes.

## AN ALTERNATIVE VIEW OF EMPATHY DEVELOPMENT

In our alternative perspective, infants' empathic responding repertoire during the 1st year of life is not limited to empathic self-distress; it also includes tender, empathic feelings for the other (affective concern) and attempts to comprehend the other's

distress (cognitive empathy). The specific response to another's distress depends at least in part on the ability to regulate the emotional arousal induced by the other's distress. Concern can be experienced even without fully understanding the other's predicament; simply comprehending that another person is upset or unwell is sufficient (Nichols, 2001); neurophysiological measures show that even young infants discern others' negative emotional states (Geangu, Hauf, Bhardwaj, & Bentz, 2011; Grossmann, Oberecker, Koch, & Friederici, 2010).

Notably, the capacity for empathic concern does not depend on self-reflective abilities. Emergence of self-reflective skills does not create the motivation to care; rather, it affects *how* the individual can express and act upon feelings of concern (see also Hay, 2009). Greater mentalizing abilities and knowledge about the world provide the developing child with foresight and planning, and facilitate the use of (increasingly sophisticated) strategies for helping others in need; they also promote the ability to recognize and respond to the misfortune of others who are absent. But more cognitive abilities or top-down processing (Decety & Meyer, 2008) are unnecessary for the purely emotional experience of feeling for or caring about another (i.e., bottom-up processing). The latter, which constitutes the emotional core of concern for others, is evident in young infants and reflects their fundamental social nature. Moreover, this emotional capacity is not unique to humans and can be observed in other social animals (Ben-Ami Bartal, Decety, & Mason, 2011; de Waal, 2008).

Hoffman's theory focused on developmental stages and qualitative changes over time. Successive stages were based largely on changes in cognitive empathy and prosocial behaviors. It was assumed (but not demonstrated) that affective empathy was part of this pattern of change. However, emotions do not behave like cognitions and behaviors. They do not necessarily grow over time and it cannot be assumed that the affective core of empathy qualitatively changes with age. Consistently, longitudinal studies have found either no or a small increase in empathic concern with age (Knafo et al., 2008; Light et al., 2009; Roth-Hanania et al., 2011; Vaish, Carpenter, & Tomasello, 2009; Volbrecht, Lemery-Chalfant, Aksan, Zahn-Waxler, & Goldsmith, 2007; Zahn-Waxler et al., 1992); this is in contrast to the more substantial age increases found for cognitive empathy and prosocial behavior.

## LOOKING AHEAD

Infants' cognitive and social competencies have often been underestimated, as has empathic concern. The field needs a systematic investigation of concern during the 1st year of life, given how few studies exist. Such studies should examine typical development of aspects of concern for others during the 1st year and the social brain network that underlies them. Affective aspects of empathy are likely tied to limbic and paralimbic systems, which develop earlier in phylogeny and ontogeny, whereas cognitive aspects of empathy may rely on prefrontal and temporal cortices, which are slower to mature (Singer, 2006). New methods (e.g., Cheng, Lee, Chen, Wang, & Decety, 2012; Geangu et al., 2011; Grossmann et al., 2010) allow exploration of some of the neural, hormonal, and autonomic substrates of empathy in the 1st year of life (Light & Zahn-Waxler, 2011).

Importantly, researchers should use realistic assessment procedures, which enable disambiguation of affective and cognitive empathy. If distress stimuli are unclear or require advanced social knowledge to understand that another person is distressed, then lack of observed affective empathy may reflect a research design problem rather than a deficit in empathic concern. Distress stimuli also need to be suitable to young infants' emotion regulation capabilities (e.g., moderate in intensity).

Individual differences are another focus of interest. Some infants, by virtue of their constitution (e.g., temperament, genes), environments (e.g., parenting quality), or both, may be predisposed to experience greater (or lesser) concern for others. Investigating the mechanisms underlying early-appearing individual differences, as well as how they predict subsequent outcomes, is important. Also of interest are effects exerted by features of distress stimuli (e.g., intensity) and how they are moderated by child characteristics (e.g., regulatory strategies).

The contribution of early concern to other phenomena also merits study. By early in the 2nd year of life, infants behave altruistically by helping others without being asked, sometimes at a cost to themselves (Warneken & Tomasello, 2009). Early concern for others could motivate these subsequent altruistic acts, as well as other prosocial behaviors (e.g., sharing, comforting; Hay, 2009; Zahn-Waxler et al., 1992). Moreover, by 6 months of age, infants prefer prosocial characters (helpers) over antisocial ones (hinderers; Hamlin, Wynn, & Bloom, 2007). And older infants are sensitive to unequal allocation of resources, preferring a fair distribution over an unfair one (Geraci & Surian, 2011). Concern for others could underlie some of these early social and moral sensibilities.

Finally, a comprehensive understanding of early concern for others can have valuable applied implications as well. Systematic knowledge regarding typical and nontypical responses to others' distress during the 1st year could shed light on developmental disorders and problems associated with deficiencies in empathy, and aid in their early detection (e.g., autism spectrum disorders, Decety & Meyer, 2008; callousness and antisocial behavior, Rhee et al., 2012). Moreover, knowledge of parameters that facilitate (and undermine) infants' development of concern could inform early intervention programs designed to help raise more compassionate and caring children and youths. Much may be gained, therefore, from a closer look at the early roots of concern for others.

## REFERENCES

Ben-Ami Bartal, I., Decety, J., & Mason, P. (2011). Empathy and prosocial behavior in rats. *Science*, *334*, 1427–1430. doi:10.1126/science.1210789

Butterworth, G. (1992). Origins of self-perception in infancy. *Psychological Inquiry*, *3*, 103–111. doi:10.1207/s15327965pli0302_1

Castiello, U., Becchio, C., Zoia, S., Nelini, C., Sartori, L., Blason, L., et al. (2010). Wired to be social: The ontogeny of human interaction. *PLoS ONE*, *5*(10), e13199. doi:10.1371/journal.pone.0013199

Cheng, Y., Lee, S. Y., Chen, H. Y., Wang, P. Y., & Decety, J. (2012). Voice and emotion processing in the human neonatal brain. *Journal of Cognitive Neuroscience*, *24*, 1411–1419.

Decety, J., & Meyer, M. (2008). From emotion resonance to empathic understanding: A social developmental neuroscience account. *Development and Psychopathology*, *20*, 1053–1080. doi:10.1017/S0954579408000503

de Waal, F. B. M. (2008). Putting the altruism back into altruism: The evolution of empathy. *Annual Review of Psychology*, *59*, 279–300. doi:10.1146/annurev.psych.59.103006.093625

Dondi, M., Simion, F., & Caltran, G. (1999). Can newborns discriminate between their own cry and the cry of another newborn infant? *Developmental Psychology*, *35*, 418–426. doi:10.1037/0012-1649.35.2.418

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

Gallagher, S., & Meltzoff, A. N. (1996). The earliest sense of self and others: Merleau-Ponty and recent developmental studies. *Philosophical Psychology*, *9*, 211–233. doi:10.1080/09515089608573181

Geangu, E., Benga, O., Stahl, D., & Striano, T. (2010). Contagious crying beyond the first days of life. *Infant Behavior & Development*, *33*, 279–288. doi:10.1016/j.infbeh.2010.03.004

Geangu, E., Benga, O., Stahl, D., & Striano, T. (2011). Individual differences in infants' emotional resonance to a peer in distress: Self–other awareness and emotion regulation. *Social Development*, *20*, 450–470. doi:10.1111/j.1467-9507.2010.00596.x

Geangu, E., Hauf, P., Bhardwaj, R., & Bentz, W. (2011). Infant pupil diameter changes in response to others' positive and negative emotions. *PLoS ONE*, *6*(11), e27132. doi:10.1371/journal.pone.0027132.

Geraci, A., & Surian, L. (2011). The developmental roots of fairness: Infants' reactions to equal and unequal distributions of resources. *Developmental Science*, *14*, 1012–1020. doi:10.1111/j.1467-7687.2011.01048.x

Grossmann, T., Oberecker, R., Koch, S. P., & Friederici, A. D. (2010). The developmental origins of voice processing in the human brain. *Neuron*, *65*, 852–858. doi:10.1016/j.neuron.2010.03.001

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature*, *450*, 557–560. doi:10.1038/nature06288

Hay, D. F. (2009). The roots and branches of human altruism. *British Journal of Psychology*, *100*, 473–479. doi:10.1348/000712609X442096

Hay, D. F., Nash, A., & Pederson, J. (1981). Responses of six-month-olds to the distress of their peers. *Child Development*, *52*, 1071–1075. doi:10.2307/1129114

Hoffman, M. L. (1975). Developmental synthesis of affect and cognition and its interplay for altruistic motivation. *Developmental Psychology*, *11*, 607–622. doi:10.1037/0012-1649.11.5.607

Hoffman, M. L. (1984). Interaction of affect and cognition in empathy. In C. Izard, J. Kagan, & R. B. Zajonc (Eds.), *Emotions, cognition and behavior* (pp. 103–131). Cambridge, UK: Cambridge University Press.

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

Kärtner, J., Keller, H., & Chaudhary, N. (2010). Cognitive and social influences on early prosocial behavior in two sociocultural contexts. *Developmental Psychology*, *46*, 905–914. doi:10.1037/a0019718

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*, 737–752. doi:10.1037/a0014179

Legerstee, M., Anderson, D., & Schaffer, A. (1998). Five- and eight-months-old infants recognize their faces and voices as familiar and social stimuli. *Child Development*, *69*, 37–50. doi:10.2307/1132068

Light, S. N., Coan, J. A., Zahn-Waxler, C., Frye, C., Goldsmith, H. H., & Davidson, R. J. (2009). Empathy predicts dynamic change in prefrontal brain activity during positive emotion in children. *Child Development*, *80*, 1210–1231. doi:10.1111/j.1467-8624.2009.01326.x

Light, S., & Zahn-Waxler, C. (2011). The nature and forms of empathy in the first years of life. In J. Decety (Ed.), *Empathy: From bench to bedside* (pp. 109–130). Cambridge, MA: MIT Press.

Nichols, S. (2001). Mindreading and the cognitive architecture underlying altruistic motivation. *Mind & Language*, *16*, 425–455. doi:10.1111/1468-0017.00178

Preston, D., & de Waal, F. B. M. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, *25*, 1–20. doi:10.1017/S0140525X02000018

Rhee, S. H., Friedman, N. P., Boeldt, D. L., Corley, R. P., Hewitt, J. K., Knafo, A., et al. (2012). Early concern and disregard for others as predictors of antisocial behavior. *Journal of Child Psychology and Psychiatry*, *54*, 157–166. doi:10.1111/j.1469-7610.2012.02574.x

Rochat, P. (2009). Commentary: Mutual recognition as a foundation of sociality and social comfort. In T. Striano & V. Reid (Eds.), *Social cognition: Development, neuroscience and autism* (pp. 303–317). Oxford, UK: Blackwell.

Rochat, P., & Hespos, S. J. (1997). Differential rooting response by neonates: Evidence for an early sense of self. *Early Development and Parenting*, *6*, 105–112. doi:10.1002/(SICI)1099-0917(199709/12)6:3/4<105:AID-EDP150>3.0.CO;2-U

Roth-Hanania, R., Davidov, M., & Zahn-Waxler, C. (2011). Empathy development from 8 to 16 months: Early signs of concern for others. *Infant Behavior and Development*, *34*, 447–458. doi:10.1016/j.infbeh.2011.04.007

Simner, M. L. (1971). Newborn's response to the cry of another infant. *Developmental Psychology*, *5*, 136–150. doi:10.1037/h0031066

Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind reading: Review of literature and implications for future research. *Neuroscience & Biobehavioral Review*, *30*, 855–863. doi:10.1016/j.neubiorev.2006.06.011

Trevarthen, C., & Aitken, K. J. (2001). Infant intersubjectivity: Research, theory, and clinical applications. *Journal of Child Psychology and Psychiatry*, *42*, 3–48. doi:10.1111/1469-7610.00701

Ungerer, J. A., Dolby, R., Waters, B., Barnett, B., Kelk, N., & Lewin, V. (1990). The early development of empathy: Self-regulation and individual differences in the first year. *Motivation and Emotion*, *14*, 93–106. doi:10.1007/BF00991638

Vaish, A., Carpenter, M., & Tomasello, M. (2009). Sympathy through affective perspective-taking and its relation to prosocial behavior

in toddlers. *Developmental Psychology*, *45*, 534–543. doi:10.1037/a0014322

Volbrecht, M. M., Lemery-Chalfant, K., Aksan, N., Zahn-Waxler, C., & Goldsmith, H. H. (2007). Examining the familial link between positive affect and empathy development in the second year. *Journal of Genetic Psychology*, *168*, 105–129. doi:10.3200/GNTP.168.2.105-130

Warneken, F., & Tomasello, M. (2009). The roots of human altruism. *British Journal of Psychology*, *100*, 455–471. doi:10.1348/000712608X379061

Zahn-Waxler, C. (1998). From the enlightenment to the millennium: Changing conceptions of the moral sentiments. *Developmental Psychologist*, *7*, 1–7.

Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology*, *28*, 126–136. doi:10.1037/0012-1649.28.1.126