The Nature of Empathy

Shannon Spaulding, Rita Svetlova, and Hannah Read

Empathy is many things to many people. Depending on who you ask, it is feeling what another person feels, feeling bad for another person’s suffering, understanding what another person feels, imagining yourself in another person’s situation and figuring out what you would feel, or your brain activating as if you were experiencing the emotion another person is experiencing. These are just some of the various notions of empathy that are at play in philosophy, cognitive science, neuroscience, developmental psychology, and primatology. In this chapter, we will not stipulate a definition of empathy per se. Instead, we will review the development of empathy and purported mechanisms of empathy, which will allow us to tease apart various dimensions of empathy related concepts. Understanding the various dimensions of empathy provides context for some recent critiques of empathy as a moral compass and suggests several directions for future fruitful scientific and philosophical work on empathy.

# The Development of Empathy

The questions that motivate much of developmental research on empathy are: What cognitive, social, and motivational abilities does one need to have to be able to empathize with others? How – and in what sequence – do these abilities emerge in ontogeny? What drives individual differences in empathic responsiveness? Some important conceptual distinctions are drawn between automatic (involuntary, “contagious”) empathic reactions vs conscious, motivated reactions; between affective and cognitive aspects of empathy; and between self-oriented reactions (empathizer’s personal distress) and other-oriented reactions (concern for the other, or “sympathy”). An important variable contributing to these distinctions is the degree of overlap between the perceived internal state of the target of empathy and that of the empathizer. Recent advances in neuroscience have informed many of these questions.

## Emotional Contagion

A common theme in various conceptions of empathy is that empathizing involves feeling what another agent feels. The phenomenon of “affective sharing” (congruency of affect in the empathizer and the target) has been of interest to both neuroscientists and developmental psychologists as a possible starting point for empathic responding. Indeed, human infants seem to be biologically predisposed to share the affective states of others. From the moment they are born, newborns cry when they hear others’ distress signals (Sagi and Hoffman 1976, Decety and Meyer 2008, Hoffman 1984, Geangu et al. 2010, Hoffman 2001). Newborns’ contagious crying is the earliest developmental precursor of empathy.[[1]](#footnote-1)

A particularly interesting question for empathy researchers is whether such “emotional contagion” involves any, even if rudimentary, understanding that the source of distress lies within another person. Such understanding requires two things: distinguishing between self and other and recognizing that one is distressed *because* another is distressed. The general agreement in developmental literature is that even if infants in the first few months of life possess some sense of self, it does not imply any self-consciousness or self-awareness. Rather, it is an implicit sense of self as an agentive entity in the environment: the “ecological self” (Neisser 1991). Only later, over the course of the first and second years of life, the reciprocal social interactions with others provide the child with what Rochat (1995) calls a “social mirror”, laying the ground for objective self-awareness – understanding of the self not just as an agent, but as an object of others’ perception (Kagan et al. 1981, Moore et al. 2007).

How does objective self-awareness emerge and develop? Already in the first few months of life, human infants begin to engage in face-to-face “protoconversations” with caregivers that involve the mutual regulation of emotional engagement (Trevarthen 1979). Precursors of self- and other-understanding are thought to gradually develop in the course of these interactions, as the infant monitors the other’s behavior as well as the other’s reactions to his or her own behavior – a process that by the end of the first year gives rise to a new, “interpersonal self” (Moore et al. 2007, Neisser 1991). The tendency to match others’ affective states may be a part of this process, as matching the affect of a caregiver can elicit a shared affective experience that further fosters reciprocal interactions.

## Self versus Other

By the time of their first birthday, children acquire several new social-cognitive abilities that point to their nascent understanding of themselves and others as independent psychological agents: they are able to follow the attention of others by looking where others are looking (joint attention), use others’ reactions to novel objects to form their own attitudes toward these objects (social referencing), and attempt to imitate what others are doing with novel objects (imitative learning) (Carpenter et al. 1998). By the middle of the second year, a new kind of self-understanding becomes evident with the emergence of mirror self-recognition (Brooks-Gunn and Lewis 1984), explicit references to oneself by name, use of personal pronouns, and self-conscious emotions in response to the attention of others (Bullock and Lütkenhaus 1990, Kagan et al. 1981, Lewis and Ramsay 2004). These are all signs of objective self- and other-awareness – a phenomenon that, according to a number of scholars, is a fundamental prerequisite for the transition from automatic emotional reactivity to empathic responsiveness (Decety and Meyer 2008, Thompson, Barresi, and Moore 1997, Nichols, Svetlova, and Brownell 2009, Moore et al. 2007, Zahn-Waxler et al. 1992, Kagan et al. 1981).

Several experimental studies have examined associations between self-other awareness and empathy-related responding in young children. Most of them employ variations of the classic mirror self-recognition rouge task (Amsterdam 1972), as well as references to self, to index self-understanding. The outcome measures include empathic responses to an adult whose toy had broken (Bischof-Köhler 1991), whose toy had been taken (Johnson 1982), or who expressed pain upon hurting herself, as well as maternal reports of the child’s prosocial responsiveness (Zahn-Waxler et al. 1992). Significant relations were found between 18- and 24-month-olds’s mirror self-recognition and empathy toward distressed adults (Bischof-Köhler 1991, Johnson 1982). Nichols, Svetlova, and Brownell (2009) have additionally shown that 12- to 24-month-old toddlers with more advanced self- and other-awareness (controlling for age) were more empathically responsive to a distressed peer.

## Concern for Others

Empathy-related responding presents several challenges for someone who has just started to form a concept of self and others. To react with empathy, the child must know that another’s distress is unique to that person, even if the child herself is also distressed. The child must also know that the other person may need something different from what the child herself needs when she is upset. Ultimately, in order to act on the other’s distress helpfully, one must be able to inhibit one’s own distress and focus on the other. Developmentally, reactions of other-oriented concern (sometimes also called sympathy; Eisenberg (2000) emerge later than self-focused reactions of “contagious” personal distress.

Age-related developments revealed by studies of empathic and prosocial responsiveness in young children are quite consistent. In the study of the “development of concern for others,” Zahn-Waxler and colleagues (1992) found that rates of expressions of empathy and sympathy toward a distressed adult increased significantly between 13 and 24 months of age and that reactions of personal distress were gradually replaced by more constructive, action-oriented patterns. Comparing responses of 12-, 18-, and 24-month-olds to a distressed peer, Nichols, Svetlova, and Brownell (2015) found that 12-month-olds were neither interested nor concerned about the crying peer, 18- and 24-month-olds showed higher levels of social interest in the peer, and 24-month-olds showed greater empathy, sympathy and prosocial responsiveness toward the distressed peer than any of the younger ages. In a study of helping in one- and two-year-olds, Svetlova, Nichols, and Brownell (2010) found that whereas one-year-olds readily helped an adult in action-based situations which required inferring the adult experimenter’s goals, they had great difficulty knowing how to help when the situation involved the adult’s negative emotions. Two-year-olds were more responsive, and required less communicative cues from adults, in both action-based and emotion-based situations, suggesting that by that age children are able to read emotional cues of others and generate appropriate responses related to empathy and sympathy. Experiments by Denham (1986) and Vaish, Carpenter, and Tomasello (2009) explored affective perspective-taking abilities in toddlers, and found that by two years of age, toddlers begin to be able to make appropriate judgments about others’ emotional reactions even without explicit emotional cues.

The first year of life is thus the time when humans begin to feel what others feels (emotional contagion); the second year is the period of great advances in self- other differentiation and the time when empathy develops and sympathy first emerges. However, the transition is far from being accomplished. In fact, as noted by Zahn-Waxler et al. (1992), “individuals clearly struggle between concern for the needs of self and the welfare of others throughout the life cycle” (p.133). The process of developing more mature forms of empathy-related responding goes in waves and circles; and even though we as adults will probably never return to the experience of neonatal contagious crying, we may continue to experience the rest of the range of empathy-related reactions, including emotional contagion and personal distress. However, our (adult) range of reactions is undoubtedly more diverse and flexible than that of a two-year-old. How does the development of empathy-related responding continue, and what shapes it, between early childhood and adulthood?

Current research shows that different components of empathy-related responding may follow distinct developmental pathways. Indeed, an agent’s ability to recognize and share a target’s affective experience may be present in its close-to-mature form starting very early in life when certain interpersonal and situational conditions are met. From the experimental evidence reviewed earlier, it appears that already by two years of age, as long as the child has enough information about the other person’s internal state (e.g., if the emotion of the other is clearly manifested by a facial expression and/or vocalization, and the type of emotion is familiar to the child), he or she is able to empathize.[[2]](#footnote-2)

## Theory of mind (mentalizing)

When the situation is more complex and the other’s state is less obvious or requires a modulated contextual appraisal, empathy requires “mentalizing”. Mentalizing, also known as theory of mind and mindreading, consists in attributing mental states to a target (Wimmer and Perner 1983, Premack and Woodruff 1978). What mentalizing contributes to empathy is the awareness that others' internal states may differ from our own (Frith and Frith 1999). There are two main theories on how mentalizing works: the Theory Theory and the Simulation Theory. We will describe the Theory Theory and the Simulation Theory below, but it is important to note that most theorists do not think there is only one way to mentalize. Theorizing and simulating are two legitimate ways to infer a target’s emotion (or mental state more generally). The question is under which conditions do we use each strategy.

One strategy for understanding a target’s mental states when they are not already obvious is to consider what one knows about folk psychology in general and this situation in particular and draw an inference about what the target’s mental states are and how he or she is likely to behave. This process of theorizing about others mental states may be conscious and explicit or non-conscious and tacit. “Theories” may include models, heuristics, and a body of assumptions. A general and modern way of characterizing the Theory Theory is in terms of an *information-rich* inference to the best explanation (Baker, Saxe, and Tenenbaum 2011, Carruthers 2006, Fodor 1983, Scholl and Leslie 1999, Wellman 2015).[[3]](#footnote-3)

An alternative way to figure out a target’s mental states is for one to imagine what one would think, feel, and do in the target’s situation, and attribute the result of the mental simulation to the target (Davies and Stone 1995b).[[4]](#footnote-4) Just like theorizing, mental simulation may be explicit and conscious or tacit and non-conscious. Whereas theorizing involves inferring others’ mental states on the basis of a rich body of information, simulation is meant to be an *information-poor* process. It does not require access to large bodies of information about folk psychology. Simulation simply requires an ability to mentally put oneself in a target’s position and figure out what one would feel, think, and do. One simply redeploys one’s own cognitive mechanisms for the purpose of understanding the other person’s perspective.

One important mark of sophisticated mentalizing ability is the capacity to understand that a target’s beliefs guide his or her actions even when those beliefs conflict with reality and/or with one’s own beliefs (Wellman, Cross, and Watson 2001). When children demonstrate this ability is a matter of intense debate (Apperly and Butterfill 2009, Carruthers 2016, Heyes 2014, Rakoczy 2012, Baillargeon, Scott, and He 2010). We can say with a fair degree of confidence that there are various transitions that occur over the first five years of life, and it appears to be challenging for children on the younger end of this range to reason about others’ complex mental states especially when the situational context is unclear and/or complicated.

One of the most significant transition occurs between three and four years old, and it is marked by the passing of what is known as the False Belief task. This task has been the most widely used test of children’s mentalizing ability (Wimmer and Perner 1983). In a classic version of the false-belief task (the change of location task), subjects watch Sally, a puppet, place a toy in a basket and leave the scene. Next, they watch Ann, another puppet, come in and move the toy to the cupboard and then leave the scene. Finally, they watch Sally return to the scene, and then they are asked a series of questions to ensure that they remember what happened and know where the toy actually is. The key question in this version of the task is “where will Sally look for her toy?” A child counts as passing this task if she (A) remembers the sequence of events, (B) tells the experimenter where the toy actually is, and (C) answers that Sally will look for the toy in the basket. Almost all children tested can do (A) and (B). The test condition is (C). In order to succeed on (C), children must separate what they know about the location of the toy from what Sally thinks about the location of the toy. They must understand that Sally thinks the toy is in one location (the basket), and will look for it there, but actually the toy is in a different location (the cupboard). Several versions of the False Belief task exist, and while the precise age of passing it varies between children and between task versions (Clements and Perner 1994, Wellman, Cross, and Watson 2001, Garnham and Ruffman 2001), children younger than three or four years typically fail, whereas older children typically pass.[[5]](#footnote-5)

If children before the age of three or four have a difficulty sorting out conflicting information about their own and another’s mental states, it ought to be challenging for them to deal with others’ emotional states if they are significantly different from the children’s own states and/or difficult to read from the situation. In fact, research shows that at the early school age, similarity between the perceiver and the victim of distress is still an important factor in empathy. For example, in a study in which 6- and 7-year-old boys and girls observed slide-sequence stories about boys and girls in different emotional states, they had a stronger vicarious emotional response to children of their own gender (Feshbach and Roe 1968). Mentalizing abilities continue to be a source of variability in empathic and prosocial responsiveness even in early adolescence. For instance, children who are better at reconciling conflicting emotional cues also exhibit more helping behaviors (Carlo et al. 1991). The transition between childhood and adolescence is also marked by an important development that is believed to be related to a combination of self-concept development, growth of perspective-taking abilities and moral reasoning: the ability to empathize with a generalized group of others (Fabes et al. 1999).

## Sympathy

Sympathy, feeling concern for a target, seems to develop later than empathy. Sympathy is another domain in which top-down processes, including mentalizing, perspective-taking, and emotion regulation, are implicated. Unlike empathy, sympathy requires the perceiver to evaluate the perceived affective state of the other and to form a motivational attitude toward it. It also involves effortful control – the ability to inhibit a predominant response, in this case the reaction of personal distress (Eisenberg and Eggum 2009, Rothbart 2007). While personal distress is one of the earliest reactions to others’ distress that children show, effortful control is a quite late-developing phenomenon. Neurologically, it relies on the prefrontal cortex – the latest-developing brain structure, whose myelination continues throughout adolescence and into early adulthood (Dahl 2004).

The ways in which mentalizing and emotion regulation abilities interact in predicting patterns in children’s empathy-related responding have been studied extensively by Eisenberg and colleagues (1991, 1994, 2006, 2011). One of their studies compared adults’ and 2nd- to 5th-graders’ empathic reactions to others’ distress, as well as their tendency to help the victims. The measures included self-reported reactions to a video of a woman and her two injured children who had been in a car accident, as well as the subjects’ facial expressions and heart rates recorded while they were watching the video. The subjects were then given the opportunity to offer help to the characters in the video. For both the self-reports and the physiological measures, the researchers looked separately at expressions of self-focused personal distress vs. sympathetic concern about the others. Consistent with Batson and colleagues’ (1983, 1987) earlier findings, in adults, self-reported sympathy and facial expressions of sympathy predicted helping. Children’s self-reports of personal distress and sympathy were not related to their prosocial behavior (possibly suggesting children’s immature abilities to self-reflect or to accurately report their experiences). However, physiological measures, in particular children’s facial display of personal distress, were negatively related to their helping behavior. Other developmental studies, using various measures of empathy-related responsiveness, have confirmed that children’s increased sympathy is positively correlated with other-oriented behavior. For a review, see Eisenberg (2000).

Putting together all this data yields a specific developmental trajectory. Emotional contagion is present at birth. Personal distress is online very early in development, as well. The capacity to empathize with others when their emotions are simple and the context is straightforward develops sometime in the second year of life and continues to mature as children’s mentalizing abilities further develop. The capacity for sympathy is relatively late developing in comparison to the other empathy-related responses because sympathy involves effortful control, which continues to develop throughout childhood and adolescence.

# Mechanisms of Empathy

In philosophy and the cognitive sciences, much of the discussion of empathy concerns two subsystems of empathy: neural resonance or mentalizing. We shall explain each subsystem below, but is important to note at the outset that it is likely that both subsystems play a role in various empathic phenomena. Thus, the issue is how, not whether, neural resonance and mentalizing underlie empathy.

## Neural resonance

One mechanism of empathy is neural resonance, which is underwritten by so-called mirror neurons. Mirror neurons are neurons that activate when a subject acts, emotes, or experiences a certain sensation and also when a subject observes a target acting, emoting, or experiencing a certain sensation. For example, a host of neurons in the premotor cortex and posterior parietal cortex fires when I grasp an object, and this same host of neurons fires when I observe another person grasping an object (Rizzolatti and Craighero 2004). There are similar mirror neuron systems for experiencing and observing certain emotions. When I experience disgust and when I observe another person experiencing disgust the same collection of neurons in the insula fires (Calder et al. 2000, Wicker et al. 2003). Similar findings hold for the experience and observation of fear (Adolphs et al. 1994), anger (Lawrence et al. 2002), pain (Singer et al. 2004) and touch (Keysers and Perrett 2004). In each of these cases, groups of neurons are endogenously activated when the subject acts, emotes, or feels a certain way, and these same groups of neurons are exogenously activated (at an attenuated level) when the subject observes another acting, emoting, or feeling in those same ways.

Mirror neurons, which are present both in humans and other primates, are hypothesized to be an evolutionarily old mechanism underlying the tendency to automatically mimic and synchronize facial expressions, postures, and movements with those of others (Di Pellegrino et al. 1992, Rizzolatti and Craighero 2004, Gallese 2003). This ability has been linked to empathy in several areas of cognitive science. In social psychology, where this phenomenon is called “the Chameleon effect,” evidence suggests that the tendency to automatically imitate others’ bodily expressions is correlated with self-reported empathy (Chartrand and Bargh, 1999). In social-cognitive neuroscience, some argue that action mirror neuron system is connected to the emotion-related limbic system via the insula, an area involved in self-representation (Carr et al., 2003; Iacoboni, 2009). According to this account, the insula serves as a relay from action representation to emotional reaction, and “empathy may occur via a mechanism of action representation that shapes emotional contents” (Carr et al., p. 5497). In other words, the hypothesis is that we come to understand others’ feelings by first perceiving, processing, and mimicking their actions or appearances.

It is quite plausible that neural resonance is connected to various empathy-related concepts. Most clearly neural resonance seems to be a mechanism of emotional contagion, i.e., feeling an emotion as a result of perceiving another person feel that emotion. This may not be the only mechanism, of course. But, plausibly, it is one such mechanism.[[6]](#footnote-6) As a result of being a mechanism of emotional contagion, it is plausible that neural resonance plays a role in personal distress as described in the previous section. However, there are many routes to a subject feeling personally distressed by a target’s emotional experience. I may feel afraid for myself when I see an angry person, which would meet the definition of personal distress but clearly would not involve neural resonance in the relevant sense. Thus, there is only a tenuous connection between neural resonance and this empathy-related concept.

Neural resonance may also be connected to other empathic responses, e.g., recognizing that the target is having a certain affective experience and as a result having a congruent affective experience (when the recognition occurs via mental simulation this is sometimes called *affective empathy*, and when it occurs via theoretical inference it is sometimes called *cognitive empathy*), and recognizing that a target is having a certain affective experience and as a result feeling concern for the target (i.e., *sympathy*).

The connection between neural resonance and these empathic responses is not at all straightforward. Cognitive empathy, affective empathy, and sympathy involve more than just affective sharing. All three responses require recognizing that the target is have a certain emotion. The cognitive element of these empathic responses goes beyond mere affective sharing, and thus neural resonance clearly is not sufficient for these empathic responses (Debes 2010, Spaulding 2012, 2013, Debes 2017).

The issue of whether neural resonance is *necessary* for cognitive and affective empathy and sympathy is nuanced. On the one hand, there is strong evidence that subjects who have suffered damage to mirror neuron areas of the brain (amygdala, insula, ACC) have difficulty inferring others’ emotions as a result (Adolphs and Tranel 2003, Calder et al. 2000, Jackson, Meltzoff, and Decety 2005, Wicker et al. 2003). For example, subjects who suffer damage to the amygdala (purportedly part of the fear mirror neuron circuit) are deficient specifically in experiencing and attributing fear to others. In a *very* small study of two subjects with bilateral damage to the amygdala, researchers determined that both subjects are selectively impaired in their ability to experience fear and to recognize fear in isolated, static facial expressions. This double dissociation is *prima facie* evidence that neural resonance is somehow involved in some inferences about others’ emotions. On the other hand, these subjects were not impaired in their ability to recognize fear in richer visual stimuli that also contain non-facial expression cues, e.g., static or dynamic body postures (Atkinson, Heberlein, and Adolphs 2007, Adolphs et al. 2005). Subjects with damage to mirror neuron areas for fear retain the ability to attribute fear based on body language, semantic knowledge, and situations that typically evoke fear. Moreover, when one of the subjects was instructed to pay attention to the eye region of the target’s face, her deficit in recognizing facial expressions of fear was eliminated.[[7]](#footnote-7) This suggests that the cognitive deficits result from inputs to mirror neuron systems rather than problems with the mirror neuron systems Similar deficit patterns are found for the experience and recognition of disgust (Calder et al. 2000) and anger (Lawrence et al. 2002).

Putting all of this information together yields a complicated picture. Mirror neuron activation clearly is not causally sufficient for sympathy and cognitive and affective empathy, as we argued above. The evidence just canvassed suggests that mirror neuron activation may be necessary for certain narrowly constrained aspects of these empathic responding. In particular, mirror neuron activation may be necessary for reading others’ emotions from their static facial expressions. Static facial expressions are just one, not particularly naturalistic source of information about others’ emotions. In more ecologically typical environments, we use various sources of information about others’ emotions, and mirror neuron activation does not play such an important role in this richer context (Debes 2010, Spaulding 2012, 2013).[[8]](#footnote-8) Nevertheless, even if neural resonance is not a universal part of all routes to empathy, in virtue of the close connection between neural resonance and emotional contagion, it is seems to be a building block of some, possibly the most phylogenetically ancient routes. It is also believed to be a part of the early precursors of empathy in human ontogeny (Hoffman, 2000; (Decety and Svetlova 2012).

## Mentalizing

A second mechanism of empathy is mentalizing. In the developmental section, we discussed two varieties of mentalizing: theorizing and simulating. Theorizing, recall, consists in relying on a broad body of folk psychological information to draw an inference to the best explanation about a target’s mental states. Simulating, in contrast, involves mentally imagining oneself in a target’s situation and determining how one would think, feel, and act in that situation and then attributing that to the target.

What are the neural underpinnings of theorizing and simulating? Of the brain regions shown to be involved in the evaluation of others’ emotions, the temporo-parietal junction (TPJ) is particularly important. In addition to being widely regarded as an important neural realizer of mentalizing (Samson et al. 2004, Saxe and Wexler 2005), the TPJ is commonly recruited in tasks involving self-other distinction. Specifically, it seems to play an important role in the distinction between self-produced actions and actions generated by others (Blakemore and Frith 2003). The TPJ is an association cortex with reciprocal connections to the PFC and the temporal lobes, which may contribute to its role in self-other differentiation. More importantly for the study of empathy-related responding, the right TPJ is specifically recruited when participants imagine how other people would feel in distressing situations, but not when they imagined the analogous situations for themselves (Jackson, Meltzoff, and Decety 2005, Lamm, Batson, and Decety 2007). These data suggest that the right TPJ is especially important for theorizing about others’ emotions and mental states more generally.

With respect to simulating, a meta-analytic study by Lee and Siegle (2009) examined common and distinct brain regions involved in explicit evaluation of one’s own and others’ emotions across 37 neuroimaging studies. The reviewed studies mainly asked participants to evaluate and report either the feelings of another person (based on vignettes or photographs), the participant’s own feelings, or both. The meta-analysis showed that in these paradigms, the insula and rostral ACC were specifically associated with evaluation of one’s own emotion, whereas the precuneus, superior temporal sulcus (STS) and the right TPJ were specifically associated with evaluation of others’ emotions. This confirms the idea that the right TPJ – along with the STS and precuneus – are neural mechanisms of theorizing. Brain regions that were involved in explicitly evaluating both one’s own and others’ emotions included the amygdala, lateral prefrontal cortex (lPFC), and dorso-medial prefrontal cortex (dmPFC). These data indicate that simulating others’ emotions is realized in a different network of brain regions than theorizing. In particular the dmPFC and lPFC are particularly important for simulating (though see De Brigard et al. (2015) for more fine-grained analysis of the brain regions involved in mentally simulating different sorts of targets).

## Which Kind of Empathy?

With the neural realizers of mentalizing and simulating others’ emotions on the table we can now examine how these mechanisms are related to the various empathy-related concepts described above. Consider cognitive and affective empathy and sympathy first. Both the Theory Theory and the Simulation Theory aim to explain how we understand what others’ emotions are, which is a necessary aspect of both sympathy, cognitive empathy, and affective empathy. For that reason, it seems that mentalizing (of either the theoretical or simulational sort) is necessary for empathy and sympathy. In particular, theorizing about a target’s emotional state is necessary for *cognitive empathy.* Clearly, however, theorizing about a target’s emotions is not sufficient for the affective sharing part of empathy. On the basis of what I know about you, your situation, and folk psychology in general, I may infer that you’re experiencing a certain emotion. But that does not entail that I will feel a congruent emotion in response. Similarly, just because I infer a target’s emotion in the way the Theory Theory posits does not entail that I will be sympathetic. An intelligent psychopath may be adept at inferring others’ emotions but feel no empathy or sympathy for others. Thus, the connection between the Theory Theory and sympathy and empathy is indirect. Theory theorists will need an additional element to explain why sometimes we feel congruent emotions and concern for a target and why sometimes we don’t.

In contrast, the Simulation Theory holds the way in which one infers what a target feels is by trying to feel what the target is feeling (at least in an attenuated way). Thus, the Simulation Theory offers a much more direct explanation of empathy, in particular *affective empathy*. Affective empathy is a direct outcome of mentally simulating a target’s emotions. We understand what a target feels and feel a congruent emotion ourselves because we have mentally simulated the target’s experience. As noted above, many theorists argue that we rely on both theorizing and simulating in understanding others’ mental states (Carruthers 1996, Goldman 2006, Spaulding 2012, Spaulding 2017, Nichols and Stich 2003). The Simulation Theory’s explanation of sympathy is a bit less obvious. The sympathetic response is not part of the mental simulation, so the simulation theorist would need to posit an additional, subsequent element to explain why it is that the subject feels a complementary emotion.

While the Theory Theory has no direct explanation of emotional contagion, proponents of the Simulation Theory have argued that neural resonance is a mechanism of low-level simulation. (See above.) If neural resonance is indeed a mechanism of simulational mentalizing,[[9]](#footnote-9) then the Simulation Theory has a clear explanation of emotional contagion. The explanation is similar to the explanation of affective empathy: we feel what a target feels because upon perceiving a target’s emotional expressions, our brain activates as if we were experiencing that emotion. The difference between the Simulation Theory’s story of affective empathy and emotional contagion is that only the former involves the subject recognizing that the target feels a certain emotion and feeling a congruent emotion *because* of this recognition.

Artificiality of empathy experiments (very simplified stimuli/tasks) and differences in tasks (passive viewing stimuli vs. active inference) have led to the impression that these subsystems are dissociable (Zaki 2014). While simplification of experiments is important, at least initially, to eliminate confounding factors in the research, now it is important to make stimuli in experiments more ecologically valid and to make sure experiments are comparing similar types of tasks. More recently, theorists have moved beyond questions of which subsystem is responsible for empathy – it is widely recognized that both subsystems contribute to empathy – to questions about when and how each neural mechanism activates empathy (Decety and Meyer 2008, Eisenberg and Eggum 2009, Decety 2010, Zaki and Ochsner 2012, Lombardo et al. 2010, Zaki et al. 2007).

# The Concept of Empathy

As we’ve seen, tracking the development of different dimensions of empathy and teasing apart the mechanisms that underlie each are useful to see how these aspects of empathy can occur together or separately and why empathy can therefore appear to take so many different forms. These different forms provide various ways to share the mental lives of others, but what makes them all empathy?

Debates about the concept of empathy are notoriously messy. On the one hand, some, including notable critics of empathy Paul Bloom (2017) and Jesse Prinz (2011a, 2011b) take empathy to involve feeling what one thinks another person is feeling. At the same time, others, such as Nel Noddings (2010) and Lawrence Blum (2011, 2018) take it to involve both shared feelings as well as motivation to respond appropriately to the target. Different still, some, such as Amy Coplan (2011), argue that empathy is primarily a matter of imagining what things must be like for another person in her situation, or “simulating” the target’s “situated psychological state,” as she puts it (40). Yet, debates about what empathy “really” is have proven intractable.

Far from attempting to settle or weigh in on such debates, we propose that empathy might be best understood as a complex, multidimensional response. In particular, empathy is comprised of affective, cognitive, and motivational dimensions (Read 2019).

Consider first empathy’s *affective dimension*. At its most basic, this simply involves feeling what another person feels, or sharing another person’s affective mental state (Slote 2007, Sreenivasan 2020). This very simple affect sharing can be mediated by varying degrees of awareness that one’s empathic feeling originated with the target. On the one hand, one might have very little or no such awareness—for instance, you are sad and I simply catch your sadness. This has also been called “emotional contagion” (Eisenberg and Eggum 2009) and, as discussed above, is something even infants appear to be capable of experiencing. On the other hand, more mature forms of affect sharing might involving feeling what another person feels *for her sake*, as (Maibom 2017) puts it. In fact, as mentioned above, some evidence suggests that the degree to which we have more or less other-oriented empathy is at least partly a function of the degree to which we have a clear sense of the differences between self and other (Nichols, Svetlova, and Brownell 2009), as well as the degree to which one’s empathy has some cognitive dimension (Maibom 2012).

The *cognitive dimension* of empathy involves understanding what another person is thinking and feeling and why—sometimes referred to as “mentalizing” (Zaki 2014), “theory of mind” (Leslie 1987), or even a kind of “cognitive empathy” in its own right (Spaulding 2017). This understanding can come in degrees. For instance, I might understand that you are scared with or without understanding what you are scared of. As discussed above, this cognitive dimension of empathy might be achieved by at least two different means or mechanisms. We can simulate the target’s mental state(s) ourselves (Simulation Theory) or infer the target’s mental state(s) based on observed behavior and our folk psychology theories of the relation between mental states and behavior (Theory Theory). These days it is most common to endorse a hybrid account according to which empathy’s cognitive dimensions is achieved by means of some combination of these different mechanisms (Decety 2010, Eisenberg and Eggum 2009, Zaki and Ochsner 2012).

Perspective taking, which involves simulation, is also often invoked as a key route to empathy’s cognitive dimension. This can be a matter of imagining either what it would be like to be in another person’s situation or what things must be like for another person in her situation—what Batson (2011) refers to as “imagine-self” versus “imagine-other” perspective taking. In both cases of perspective taking, one simulates or tries on the target’s mental state, imagining what it would one would think and feel in her situation (Coplan 2011, Goldman 2006, Gordon 1995). For instance, I might see someone rushing through the rain without an umbrella and imagine what it would be like for me, now on my morning commute, to be caught in the rain without an umbrella. Alternatively, I might imagine what things must be like for my friend who has recently had a new baby and is struggling to balance her new and existing responsibilities and relationships.

Finally, empathy might also have a *motivational dimension* by virtue of which the empathizer experiences some motivation to help or respond otherwise appropriately to the target. Blum (2011) characterizes this motivational dimension of empathy in terms of one having an “at least minimal *ceteris paribus* motivation” to respond appropriately to the target, while for Noddings (2010) it as a matter of “being moved” by the target’s situation—being moved, that is, to help the target achieve some goal or respond otherwise usefully and sensitively to her. And while empathy’s affective dimension might sometimes be motivating in its own right, it isn’t always. For example, I might be motivated to help someone as a result of sharing her fear, but doing so might also paralyze me. It is thus conceptually and empirically useful to distinguish the motivational and affective dimensions of empathy.

Empathy’s different dimensions, and the various forms that it can take depending on the nature and degree of prominence of these, might be distinguished from related concepts, including *empathic concern*, *sympathy*, and *personal distress*. While these related responses are commonly thought to involve some affectivity, it is typically not thought to be a shared affective experience, unlike empathy. For instance, on Batson’s (2011) account, “empathic concern” is a response to the target’s welfare. As such, the affective dimensions of empathic concern is conceptually tied to the target’s situation and may or may not correspond to the target’s own affective experience with respect to her situation. For example, (Hoffman 2001) describes a case of “empathic anger” felt for someone who has been attacked while the victim herself feels something different, such as fear, sadness, or disappointment. Something similar is often thought to be true of sympathy, the affective components of which are more commonly associated with a target’s welfare as opposed to her state of mind (Bloom 2017, Darwall 1998, Singer and Klimecki 2014, Slote 2010, Maibom 2009). Empathy might thus be distinguished from these neighboring concepts loosely in terms of *feeling with* another person as opposed to *feeling for* her.

These various conceptual distinctions notwithstanding, it is important to note that there is a great deal of debate about these different concepts and how they relate to one another. For example, Batson (2011) includes empathy under the broad heading of “empathic concern,” which includes sympathy. Similarly, for Blum, empathy and sympathy are species of the genus “fellow-feeling.” On the other hand, others argue for a much sharper distinction between these different responses (Slote 2010, Bloom 2017, Darwall 1998, Maibom 2009). Nonetheless we maintain that distinguishing between empathy and related responses as well as empathy’s different dimensions along the lines proposed here is crucial given the goal of studying the developmental and causal relations between them.

# Future Directions

We propose that fruitful future research might be conducted broadly along the following three lines.

## The Development of Empathy.

While a significant amount of research has addressed the development of empathy’s individual dimensions, as discussed above, relatively little attention has been paid to the way in which development of these different dimensions might mutually reinforce or promote one another along with the conditions under which this is so. For instance, to what extent, or under what conditions, does the development of the ability to match others’ affective states promote or contribute to the development of the ability to differentiate between self and other, and vice versa? Future research along these and related lines would greatly enhance existing developmental studies of empathy and its potential contribution to a number of prosocial tendencies and behaviors.

Additionally, research addressing the developmental relation between empathy’s different dimensions could contribute to vindicating empathy’s role in the moral life, contra claims by its most vocal critics (Bloom 2017, Prinz 2011a, b). According to these critics, affect matching forms of empathy with little or no cognitive dimension are subject to a number of limitations related to bias and motivation. These limitations render dubious any claims regarding their moral importance. Yet, if it turned out that even rudimentary affect matching promotes the development of empathy’s other dimensions as well as more sophisticated, multi-dimensional forms of empathy, then contra critics even simple affect matching may in fact occupy an important role in the moral life, particularly with respect to moral development.

## Empathy as a Motivated Response.

Empathy is, as Zaki (2018) notes, a “motivated response,” and as such can be developed and exercised across many different lines. Factors that seem to bear on our motivation to empathize in different contexts include our relationship with the target, including whether the target is an ingroup member, family member, friend, etc. (Cikara et al. 2014, Chiao and Mathur 2010); geographic proximity and similarity with the target (Hoffman 2001); the target’s perceived cuteness (Batson et al. 1995); as well as the perceived emotional, cognitive, and material cost of empathizing (Batson 2011). Some evidence also suggests that having and highlighting a goal for empathy, as well as the extent to which one’s group endorses norms regarding empathy for diverse others, promotes individual willingness and ability to empathize (Weisz and Zaki 2017). And a person’s beliefs about empathy’s malleability—or the extent to which it is possible to muster empathy even when one is not immediately inclined to empathize—seem to affect willingness and ability to empathize (Schumann, Zaki, and Dweck 2014). Further research might thus continue to examine these and other factors that bear on motivation to empathize.

Related research might also aim to determine the most promising means of intervening on motivation to empathize with the help of public institutions, such as schools. Creating structured opportunities for people to practice empathy and develop the relevant empathy-related abilities is likely crucial to ensuring that empathy is motivated in a host of challenging cases where we are prone to avoid it. For instance, cooperative learning models, such as the Jigsaw Classroom, have proven highly successful in promoting empathic abilities across various racial and socio-economic group divisions (Aronson 2002, Tropp and Saxena 2018). Future research might thus consider additional ways in which interventions aimed at promoting empathic abilities could be supported by, or implemented in, the context of various public institutions.

Empathy and Morality.

A third direction for future study regards the role of empathy in morality.This topic has received a great deal of attention in recent years from empathy’s proponents and critics alike. On the one hand, proponents of empathy argue that it plays a crucial role in moral judgment making (Slote 2007), moral motivation (Noddings 2010), moral development (Hoffman 2001), and even the promotion of close personal relationships (Betzler 2019). On the other hand, critics have pointed out empathy’s susceptibility to a number of morally troubling limitations. Most notably, it is often extended to racial (Gutsell and Inzlicht 2010, Xu et al. 2009), political (Zaki and Cikara 2015), or social (Cikara, Bruneau, and Saxe 2011) ingroup members at the expense of outgroup members, as well as those who are relatable to us and even geographically nearby—what Hoffman (2001) refers to as empathy’s “familiarity” and “here and now” biases (197).

Yet, across nearly all debates, the emphasis has been on the potential moral benefits of empathy for those in need, or those toward whom we are already in some close relationship—e.g. friendship, or romantic partnership. And while some, such as L.A. Paul (2017) have proposed that empathy might be extended to more diverse targets as a means to promote tolerance, how exactly this is so remains to be explained.

Future research in both neuroscience and philosophy might consider the feasibility and potential moral benefits of empathy for non-needy targets. Questions of potential interest include: is empathy a useful tool for promoting positive relationships between people who are opposed to one another for moral, political, or social reasons? How might empathy’s limitations due to bias and ingroup preferences be overcome in these cases such that it is usefully employed? Research addressing questions such as these would prove especially useful given recently high levels of so-called “affective polarization” (Iyengar and Westwood 2015) in much of the Western world, as well as other persistent, seemingly intractable domestic and international conflicts.

**References**

Adolphs, R., and D. Tranel. 2003. "Amygdala damage impairs emotion recognition from scenes only when they contain facial expressions." *Neuropsychologia* 41 (10):1281-1289.

Adolphs, R., D. Tranel, H. Damasio, and A. Damasio. 1994. "Impaired recognition of emotion in facial expressions following bilateral damage to the human amygdala." *Nature* 372 (6507):669-672.

Adolphs, Ralph, Frederic Gosselin, Tony W Buchanan, Daniel Tranel, Philippe Schyns, and Antonio R Damasio. 2005. "A mechanism for impaired fear recognition after amygdala damage." *Nature* 433 (7021):68.

Amsterdam, Beulah. 1972. "Mirror self‐image reactions before age two." *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology* 5 (4):297-305.

Apperly, I. A., and S. A. Butterfill. 2009. "Do humans have two systems to track beliefs and belief-like states." *Psychological Review* 116 (4):953.

Aronson, Elliot. 2002. "Building empathy, compassion, and achievement in the jigsaw classroom." In *Improving academic achievement*, 209-225. Elsevier.

Atkinson, A. P., A. S. Heberlein, and R. Adolphs. 2007. "Spared ability to recognise fear from static and moving whole-body cues following bilateral amygdala damage." *Neuropsychologia* 45 (12):2772-2782.

Baillargeon, R., R. Scott, and Z. He. 2010. "False-belief understanding in infants." *Trends in Cognitive Sciences* 14 (3):110-118.

Baillargeon, Renée, David Buttelmann, and Victoria Southgate. 2018. "Invited Commentary: Interpreting failed replications of early false-belief findings: Methodological and theoretical considerations." *Cognitive Development* 46:112-124.

Baker, Chris, Rebecca Saxe, and Joshua Tenenbaum. 2011. "Bayesian theory of mind: Modeling joint belief-desire attribution." Proceedings of the Annual Meeting of the Cognitive Science Society.

Batson, C Daniel, Jim Fultz, and Patricia A Schoenrade. 1987. "Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences." *Journal of personality* 55 (1):19-39.

Batson, C Daniel, Tricia R Klein, Lori Highberger, and Laura L Shaw. 1995. "Immorality from empathy-induced altruism: When compassion and justice conflict." *Journal of personality and social psychology* 68 (6):1042.

Batson, C Daniel, Karen O'Quin, Jim Fultz, Mary Vanderplas, and Alice M Isen. 1983. "Influence of self-reported distress and empathy on egoistic versus altruistic motivation to help." *Journal of personality and social psychology* 45 (3):706.

Batson, C. Daniel. 2011. *Altruism in humans*, *Altruism in humans.* New York, NY, US: Oxford University Press.

Betzler, Monika. 2019. "The Relational Value of Empathy." *International Journal of Philosophical Studies*:1-26.

Bischof-Köhler, Doris. 1991. "The development of empathy in infants."

Blakemore, Sarah-Jayne, and Chris Frith. 2003. "Self-awareness and action." *Current opinion in neurobiology* 13 (2):219-224.

Bloom, Paul. 2017. *Against empathy: The case for rational compassion*: Random House.

Blum, Lawrence. 2011. "Empathy and Empirical Psychology: A Critique of Shaun Nichols's Neo-Sentimentalism."

Blum, Lawrence. 2018. "A Moral Account of Empathy and Fellow Feeling." In *Forms of Fellow Feeling: Empathy, Sympathy, Concern and Moral Agency*, edited by N. Roughley and T. Schramme, 142. Cambridge: Cambridge University Press.

Brooks-Gunn, Jeanne, and Michael Lewis. 1984. "The development of early visual self-recognition." *Developmental Review* 4 (3):215-239.

Bullock, Merry, and Paul Lütkenhaus. 1990. "Who am I? Self-understanding in toddlers." *Merrill-Palmer Quarterly (1982-)*:217-238.

Calder, A. J., J. Keane, F. Manes, N. Antoun, and A. W. Young. 2000. "Impaired recognition and experience of disgust following brain injury." *Nature Neuroscience* 3 (11):1077-1078.

Carlo, Gustavo, George P Knight, Nancy Eisenberg, and Ken J Rotenberg. 1991. "Cognitive processes and prosocial behaviors among children: The role of affective attributions and reconciliations." *Developmental psychology* 27 (3):456.

Carpenter, Malinda, Katherine Nagell, Michael Tomasello, George Butterworth, and Chris Moore. 1998. "Social cognition, joint attention, and communicative competence from 9 to 15 months of age." *Monographs of the society for research in child development*:i-174.

Carruthers, P. 2006. *The Architecture of the Mind*: Oxford University Press.

Carruthers, P., and P. K. Smith. 1996. *Theories of Theories of Mind*. Cambridge: Cambridge University Press.

Carruthers, Peter. 1996. "Simulation and self-knowledge: a defence of theory-theory." *Theories of theories of mind*:22-38.

Carruthers, Peter. 2016. "Two systems for mindreading?" *Review of Philosophy and Psychology* 7 (1):141-162.

Chiao, Joan Y, and Vani A Mathur. 2010. "Intergroup empathy: how does race affect empathic neural responses?" *Current Biology* 20 (11):R478-R480.

Cikara, Mina, Emile G Bruneau, and Rebecca R Saxe. 2011. "Us and them: Intergroup failures of empathy." *Current Directions in Psychological Science* 20 (3):149-153.

Cikara, Mina, Emile Bruneau, Jay J Van Bavel, and Rebecca Saxe. 2014. "Their pain gives us pleasure: How intergroup dynamics shape empathic failures and counter-empathic responses." *Journal of experimental social psychology* 55:110-125.

Clements, Wendy A, and Josef Perner. 1994. "Implicit understanding of belief." *Cognitive development* 9 (4):377-395.

Coplan, Amy. 2011. "Will the real empathy please stand up? A case for a narrow conceptualization." *The Southern Journal of Philosophy* 49:40-65.

Dahl, Ronald E. 2004. "Adolescent brain development: a period of vulnerabilities and opportunities. Keynote address." *Annals of the New York Academy of Sciences* 1021 (1):1-22.

Darwall, Stephen. 1998. "Empathy, sympathy, care." *Philosophical Studies* 89 (2):261-282.

Davies, M., and T. Stone. 1995a. *Folk Psychology: The Theory of Mind Debate*. Oxford: Blackwell.

Davies, M., and T. Stone. 1995b. *Mental Simulation: Evaluations and Applications*. Oxford: Blackwell.

De Brigard, Felipe, R Nathan Spreng, Jason P Mitchell, and Daniel L Schacter. 2015. "Neural activity associated with self, other, and object-based counterfactual thinking." *Neuroimage* 109:12-26.

Debes, Remy. 2010. "Which empathy? Limitations in the mirrored “understanding” of emotion." *Synthese* 175 (2):219-239.

Debes, Remy. 2017. "Empathy and mirror neurons." *The Routledge Handbook to Philosophy of Empathy, New York: Routledge*:54-63.

Decety, Jean. 2010. "To what extent is the experience of empathy mediated by shared neural circuits?" *Emotion Review* 2 (3):204-207.

Decety, Jean, and Meghan Meyer. 2008. "From emotion resonance to empathic understanding: A social developmental neuroscience account." *Development and psychopathology* 20 (4):1053-1080.

Decety, Jean, and Margarita Svetlova. 2012. "Putting together phylogenetic and ontogenetic perspectives on empathy." *Developmental cognitive neuroscience* 2 (1):1-24.

Denham, Susanne A. 1986. "Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation." *Child development*:194-201.

Di Pellegrino, Giuseppe, Luciano Fadiga, Leonardo Fogassi, Vittorio Gallese, and Giacomo Rizzolatti. 1992. "Understanding motor events: a neurophysiological study." *Experimental brain research* 91 (1):176-180.

Eisenberg, Nancy. 2000. "Emotion, regulation, and moral development." *Annual review of psychology* 51 (1):665-697.

Eisenberg, Nancy, and Natalie D Eggum. 2009. "Empathic responding: Sympathy and personal distress." *The social neuroscience of empathy* 6:71-83.

Eisenberg, Nancy, and Richard A Fabes. 1991. "Prosocial behavior and empathy: A multimethod developmental perspective."

Eisenberg, Nancy, Richard A Fabes, Bridget Murphy, Mariss Karbon, Pat Maszk, Melanie Smith, Cherie O'Boyle, and Karen Suh. 1994. "The relations of emotionality and regulation to dispositional and situational empathy-related responding." *Journal of personality and social psychology* 66 (4):776.

Eisenberg, Nancy, Tracy L Spinrad, and Adrienne Sadovsky. 2006. "Empathy-related responding in children." *Handbook of moral development* 517:549.

Engelbert, Mark, and P. Carruthers. 2011. "Descriptive Experience Sampling: What is it good for?" *Journal of Consciousness Studies* 18 (1):130-149.

Fabes, Richard A, Nancy Eisenberg, Sarah Jones, Melanie Smith, Ivanna Guthrie, Rick Poulin, Stephanie Shepard, and Jo Friedman. 1999. "Regulation, emotionality, and preschoolers' socially competent peer interactions." *Child development* 70 (2):432-442.

Feshbach, Norma D, and Kiki Roe. 1968. "Empathy in six-and seven-year-olds." *Child development*.

Fodor, J. A. 1983. *The Modularity of Mind*. Cambridge, MA: MIT Press.

Frith, Chris D, and Uta Frith. 1999. "Interacting minds--a biological basis." *Science* 286 (5445):1692-1695.

Gallese, Vittorio. 2003. "The roots of empathy: the shared manifold hypothesis and the neural basis of intersubjectivity." *Psychopathology* 36 (4):171-180.

Garnham, Wendy A, and Ted Ruffman. 2001. "Doesn’t see, doesn’t know: is anticipatory looking really related to understanding or belief?" *Developmental Science* 4 (1):94-100.

Geangu, Elena, Oana Benga, Daniel Stahl, and Tricia Striano. 2010. "Contagious crying beyond the first days of life." *Infant Behavior and Development* 33 (3):279-288.

Goldman, A. I. 2006. *Simulating Minds: The Philosophy, Psychology, and Neuroscience of Mindreading*: Oxford University Press, USA.

Gordon, Robert M. 1995. "Sympathy, simulation, and the impartial spectator." *Ethics* 105 (4):727-742.

Gutsell, Jennifer N, and Michael Inzlicht. 2010. "Empathy constrained: Prejudice predicts reduced mental simulation of actions during observation of outgroups." *Journal of experimental social psychology* 46 (5):841-845.

Heyes, C. 2014. "False belief in infancy: a fresh look." *Developmental Science* 17 (5):647-659. doi: 10.1111/desc.12148.

Hoffman, Martin L. 1984. "Interaction of affect and cognition in empathy." *Emotions, cognition, and behavior*:103-131.

Hoffman, Martin L. 2001. *Empathy and moral development: Implications for caring and justice*: Cambridge University Press.

Iyengar, Shanto, and Sean J. Westwood. 2015. "Fear and Loathing across Party Lines: New Evidence on Group Polarization." *American Journal of Political Science* 59 (3):690-707.

Jackson, PL, AN Meltzoff, and J Decety. 2005. "How do we perceive the pain of others? A window into the neural processes involved in empathy." *NeuroImage* 24 (3):771-779.

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

Kagan, Jerome, Robin Mount, Susan Hiatt, Susan Linn, J Steven Reznick, Mary Katz, and Maxwell. 1981. *The second year: The emergence of self-awareness*: Harvard University Press Cambridge, MA.

Keysers, C., and D. I. Perrett. 2004. "Demystifying social cognition: A Hebbian perspective." *Trends in Cognitive Sciences* 8 (11):501-507.

Lamm, C., C. D. Batson, and J. Decety. 2007. "The neural substrate of human empathy: Effects of perspective-taking and cognitive Appraisal." *Journal of Cognitive Neuroscience* 19 (1):42-58.

Lawrence, A. D., A. J. Calder, S. W. McGowan, and P. M. Grasby. 2002. "Selective disruption of the recognition of facial expressions of anger." *Neuroreport* 13 (6):881-884.

Lee, Kyung Hwa, and Greg J Siegle. 2009. "Common and distinct brain networks underlying explicit emotional evaluation: a meta-analytic study." *Social Cognitive and Affective Neuroscience* 7 (5):521-534.

Leslie, Alan M. 1987. "Pretense and representation: The origins of" theory of mind."." *Psychological review* 94 (4):412.

Lewis, Michael, and Douglas Ramsay. 2004. "Development of self‐recognition, personal pronoun use, and pretend play during the 2nd year." *Child development* 75 (6):1821-1831.

Lombardo, Michael V, Bhismadev Chakrabarti, Edward T Bullmore, Sally J Wheelwright, Susan A Sadek, John Suckling, MRC Aims Consortium, and Simon Baron-Cohen. 2010. "Shared neural circuits for mentalizing about the self and others." *Journal of cognitive neuroscience* 22 (7):1623-1635.

Maibom, Heidi L. 2012. "The many faces of empathy and their relation to prosocial action and aggression inhibition." *Wiley Interdisciplinary Reviews: Cognitive Science* 3 (2):253-263.

Maibom, Heidi L. 2009. "Feeling for Others: Empathy, Sympathy, and Morality." *Inquiry* 52 (5):483-499. doi: 10.1080/00201740903302626.

Maibom, HL. 2017. "Affective empathy." *The Routledge handbook of philosophy of empathy*:22-32.

Moore, Chris, Jennifer Mealiea, Nancy Garon, and Daniel J Povinelli. 2007. "The development of body self‐awareness." *Infancy* 11 (2):157-174.

Neisser, Ulric. 1991. "Two perceptually given aspects of the self and their development." *Developmental Review* 11 (3):197-209.

Nichols, S., and S. Stich. 2003. *Mindreading: An Integrated Account of Pretence, Self-Awareness, and Understanding Other Minds*, *Oxford cognitive science series*. Oxford: Oxford University Press.

Nichols, Sara R, Margarita Svetlova, and Celia A Brownell. 2009. "The role of social understanding and empathic disposition in young children’s responsiveness to distress in parents and peers." *Cognition, brain, behavior: an interdisciplinary journal* 13 (4):449.

Nichols, Sara R, Margarita Svetlova, and Celia A Brownell. 2015. "Toddlers’ responses to infants’ negative emotions." *Infancy* 20 (1):70-97.

Noddings, Nel. 2010. "Complexity in caring and empathy." *Abstracta* 6 (2):6-12.

Paul, Laurie A. 2017. "First personal modes of presentation and the structure of empathy." *Inquiry* 60 (3):189-207.

Premack, David, and Guy Woodruff. 1978. "Does the chimpanzee have a theory of mind?" *Behavioral and Brain Sciences* 1 (04):515-526.

Preston, Stephanie D, and Frans BM De Waal. 2002. "Empathy: Its ultimate and proximate bases." *Behavioral and brain sciences* 25 (1):1-20.

Prinz, Jesse. 2011a. "Against empathy." *The Southern Journal of Philosophy* 49:214-233.

Prinz, Jesse. 2011b. "Is empathy necessary for morality." *Empathy: Philosophical and psychological perspectives* 1:211-229.

Rakoczy, Hannes. 2012. "Do infants have a theory of mind?" *British Journal of Developmental Psychology* 30 (1):59-74. doi: 10.1111/j.2044-835X.2011.02061.x.

Read, Hannah. 2019. "A typology of empathy and its many moral forms." *Philosophy Compass*:e12623.

Rizzolatti, G., and L. Craighero. 2004. "The mirror-neuron system." *Annual Review of Neuroscience* 27 (1):169-192.

Rochat, Philippe. 1995. "Early objectification of the self." *ADVANCES IN PSYCHOLOGY-AMSTERDAM-* 112:53-72.

Rothbart, Mary K. 2007. "Temperament, development, and personality." *Current directions in psychological science* 16 (4):207-212.

Ruffman, Ted, Benjamin Lorimer, and Damian Scarf. 2017. "Do infants really experience emotional contagion?" *Child Development Perspectives* 11 (4):270-274.

Sagi, Abraham, and Martin L Hoffman. 1976. "Empathic distress in the newborn." *Developmental Psychology* 12 (2):175.

Samson, Dana, Ian A Apperly, Claudia Chiavarino, and Glyn W Humphreys. 2004. "Left temporoparietal junction is necessary for representing someone else's belief." *Nature neuroscience* 7 (5):499.

Saxe, Rebecca, and Anna Wexler. 2005. "Making sense of another mind: the role of the right temporo-parietal junction." *Neuropsychologia* 43 (10):1391-1399.

Scholl, Brian J, and Alan M Leslie. 1999. "Modularity, development and ‘theory of mind’." *Mind & Language* 14 (1):131-153.

Schumann, Karina, Jamil Zaki, and Carol S Dweck. 2014. "Addressing the empathy deficit: Beliefs about the malleability of empathy predict effortful responses when empathy is challenging." *Journal of Personality and Social Psychology* 107 (3):475.

Scott, Rose M, and Renée Baillargeon. 2017. "Early false-belief understanding." *Trends in Cognitive Sciences* 21 (4):237-249.

Singer, T., B. Seymour, J. O'Doherty, H. Kaube, R. J. Dolan, and C. D. Frith. 2004. "Empathy for pain involves the affective but not sensory components of pain." *Science* 303 (5661):1157-1162.

Singer, Tania, and Olga M Klimecki. 2014. "Empathy and compassion." *Current Biology* 24 (18):R875-R878.

Singer, Tania, and Claus Lamm. 2009. "The social neuroscience of empathy." *Annals of the New York Academy of Sciences* 1156 (1):81-96.

Slote, Michael. 2007. *The ethics of care and empathy*: Routledge.

Slote, Michael. 2010. *Moral sentimentalism*: Oxford University Press.

Spaulding, S. 2012. "Mirror neurons are not evidence for the Simulation Theory." *Synthese* 189 (3):515-534.

Spaulding, S. 2013. "Mirror neurons and social cognition." *Mind & Language* 28 (2).

Spaulding, S. 2015. "Simulation Theory." In *Handbook of Imagination*, edited by A. Kind. Oxford: Routledge Press.

Spaulding, Shannon. 2017. "Cognitive empathy." *The Routledge handbook of philosophy of empathy*:13-21.

Sreenivasan, G. 2020. *Emotion and Virtue*. Oxford: Oxford University Press.

Svetlova, Margarita, Sara R Nichols, and Celia A Brownell. 2010. "Toddlers’ prosocial behavior: From instrumental to empathic to altruistic helping." *Child development* 81 (6):1814-1827.

Thompson, Carol, John Barresi, and Chris Moore. 1997. "The development of future-oriented prudence and altruism in preschoolers." *Cognitive Development* 12 (2):199-212.

Trevarthen, Colwyn. 1979. "Communication and cooperation in early infancy: A description of primary intersubjectivity." *Before speech: The beginning of interpersonal communication* 1:530-571.

Tropp, Linda R, and Suchi Saxena. 2018. "Re-weaving the social fabric through integrated schools: How intergroup contact prepares youth to thrive in a multicultural society." Brief No. 13.

Vaish, Amrisha, Malinda Carpenter, and Michael Tomasello. 2009. "Sympathy through affective perspective taking and its relation to prosocial behavior in toddlers." *Developmental psychology* 45 (2):534.

Weisz, Erika, and Jamil Zaki. 2017. "Empathy building interventions: A review of existing work and suggestions for future directions." *The oxford handbook of compassion science*:205-217.

Wellman, H.M., D. Cross, and J. Watson. 2001. "Meta analysis of theory of mind development: the truth about false belief." *Child Development* 72 (3):655-684.

Wellman, Henry M. 2015. *Making Minds: How Theory of Mind Develops*: Oxford University Press.

Wicker, B., C. Keysers, J. Plailly, J. P. Royet, V. Gallese, and G. Rizzolatti. 2003. "Both of us disgusted in my insula: The common neural basis of seeing and feeling disgust." *Neuron* 40 (3):655-664.

Wimmer, Heinz, and Josef Perner. 1983. "Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception." *Cognition* 13 (1):103-128.

Xu, Xiaojing, Xiangyu Zuo, Xiaoying Wang, and Shihui Han. 2009. "Do you feel my pain? Racial group membership modulates empathic neural responses." *Journal of Neuroscience* 29 (26):8525-8529.

Zahn-Waxler, Carolyn, Marian Radke-Yarrow, Elizabeth Wagner, and Michael Chapman. 1992. "Development of concern for others." *Developmental psychology* 28 (1):126.

Zaki, Jamil. 2014. "Empathy: a motivated account." *Psychological bulletin* 140 (6):1608.

Zaki, Jamil. 2018. "Empathy is a moral force." *Atlas of moral psychology*:49-58.

Zaki, Jamil, and Mina Cikara. 2015. "Addressing empathic failures." *Current Directions in Psychological Science* 24 (6):471-476.

Zaki, Jamil, and Kevin N Ochsner. 2012. "The neuroscience of empathy: progress, pitfalls and promise." *Nature neuroscience* 15 (5):675.

Zaki, Jamil, Kevin N Ochsner, Josh Hanelin, Tor D Wager, and Sean C Mackey. 2007. "Different circuits for different pain: patterns of functional connectivity reveal distinct networks for processing pain in self and others." *Social neuroscience* 2 (3-4):276-291.

1. Though the idea that newborns experience emotional contagion is widely shared in developmental psychology, not everyone agrees. See Ruffman, Lorimer, and Scarf (2017) for a critical analysis of studies purporting to demonstrate emotional contagion. Ruffman and colleagues offer a deflationary account of newborns crying in response to other newborns crying in terms of the aversive acoustic properties of neonate crying. [↑](#footnote-ref-1)
2. In neuroscientific literature, this route to empathy is called *bottom-up processing* (Decety and Meyer 2008, Singer and Lamm 2009), although some also use this term to refers to a lower-level perceptual mechanism, e.g., Preston and De Waal (2002). [↑](#footnote-ref-2)
3. For a historical overview of the Theory Theory, see the following collected volumes: Davies and Stone (1995a), Carruthers and Smith (1996). [↑](#footnote-ref-3)
4. The basic idea of mental simulation is simple and intuitive, but the details of how this happen are quite nuanced (Spaulding 2012, 2015). [↑](#footnote-ref-4)
5. In addition to the classic False Belief task described in the main text, there are now less demanding non-linguistic versions of these tasks which children pass at much younger ages, some before 12 months old. For a recent overview, see Scott and Baillargeon (2017) and Baillargeon, Buttelmann, and Southgate (2018). See Apperly and Butterfill (2009), Heyes (2014), and Rakoczy (2012) for a skeptical take on these experiments. [↑](#footnote-ref-5)
6. See Debes (2017) for a similar argument. [↑](#footnote-ref-6)
7. This finding reveals an ambiguity in the data. It could be that damage to a mirror neuron systems for a certain emotion results in an impaired ability to recognize that emotion. Or it could be that the lesions damage mechanisms that relay input to mirror neuron systems. However, perhaps it is wise to not overgeneralize from a study on two subjects. [↑](#footnote-ref-7)
8. Elsewhere, Spaulding (2012) argues that mirror neurons are a *contributory* (or enabling)cause of low-level mindreading (i.e., rapid, non-conscious attribution of mental states). That is, though it is neither nomologically necessary nor sufficient for low-level mindreading, it nevertheless it contributes to bringing about (or enables) mindreading. This hypothesis implies that the activation of mirror neurons precedes some episodes of mindreading, and that interventions on mirror neuron systems will affect mindreading. However, attributing emotions, intentions, and other mental states is possible without the contribution of mirror neurons at least in adults. [↑](#footnote-ref-8)
9. See Spaulding (2012) for an argument that mirror neurons are *not* in fact evidence for the Simulation Theory. [↑](#footnote-ref-9)