CHILD DEVELOPMENT PERSPECTIVES

Interpersonal Development in Infancy: The Interconnectedness of Emotion Understanding and Social Cognition

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ABSTRACT—***Understanding emotion in interpersonal contexts involves appreciating others' relations with the environment. This ability is related fundamentally to social cognition, including understanding the actions and goals of social partners. However, the significance of infants' emotion understanding has been largely underemphasized in recent studies on infants' social-cognitive development. In this review, we highlight the interconnectedness of emotion understanding and social cognition in socioemotional development. We incorporate a relational view of emotion to bridge empirical and theoretical work on emotional and social-cognitive development, and to demonstrate the utility of this approach for advancing novel areas of inquiry.***

KEYWORDS—*emotional development; social cognition; emotion understanding*

Understanding emotion is linked inherently with social cognition. To understand others' emotions is to comprehend the significance of the relations of other individuals with their goals and environment (1, 2). Likewise, social cognition encompasses many emotion-related skills, such as understanding goal directedness (3), representing intentions (4, 5), and evaluating others' needs and coordinating helpful responses (see 6, 7). Thus, it is important to consider how the developmental processes of emotion understanding and social cognition are interrelated.

In this review, we highlight the overlap of emotion understanding and social cognition in infants from a developmental perspective. In our view, empirical and theoretical treatments of social-cognitive development frequently underemphasize the contribution of infants' emotion understanding to their appreciation of others' behavior (see 8, 9 though see also 10). The aim of this review is not to devalue research on psychological reasoning in infants, but to underscore how greater consideration of infants' emotion understanding can enrich research on social-cognitive development. In the next sections, we discuss how emotional and social-cognitive development are linked, then suggest opportunities for integrating emotion into research on infants' psychological reasoning.

EMOTION UNDERSTANDING AND SOCIAL-COGNITIVE DEVELOPMENT

Both social cognition and emotion understanding involve understanding others' goals. Yet confusion often arises when differentiating these constructs. Emotion understanding entails perceiving a significant relation between a social partner and his or her perceived environment, which may be signaled by an emotional expression (e.g., an angry face; 2) or other explicit cue (e.g., persistent and selective actions; see 11, 12), or inferred from implicit environmental cues (e.g., situational information; 13, 14). In contrast, social cognition is a broader construct in that the motivational states perceived do not have to be

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relationally significant to the social partner. For example, one can infer goal directedness when observing someone walk out of a building, but the goal may not necessarily be significant to the individual—though it could be if the building were on fire (i.e., inferring fear). Thus, emotion understanding always involves social cognition, whereas social cognition is emotionally relevant only when *significant* goal relations are perceived. Similarly, while all emotion communication is social, not all social cues are necessarily emotional.

Research on social-cognitive development can illuminate key processes inherent to the ontogeny of early emotion understanding, and vice versa. For example, infants' appreciation of others' affective expressions is likely tied to their capacity to infer others' goals (15), particularly when such goals are ambiguous (5). Consider an infant observing another individual knock over a tower of blocks. The individual's sad expression after the tower falls would indicate incongruence with her goal (i.e., the tower was knocked over accidentally), whereas a smile might indicate attainment of a goal (i.e., the tower was knocked over purposely). Identifying the emotional signal (e.g., she is happy) or the goal (e.g., she intended to topple the tower) in isolation falls short of appreciating how the two relate to the outcome (e.g., she is happy because she achieved her goal of knocking over the tower).

The study of infants' understanding of others' actions highlights the coordination of emotional and social-cognitive development. Research in this area exemplifies how investigating infants' understanding of others' emotions and behavior can lead to a richer understanding of social development.

Using Actions To Predict Emotions

Understanding others' motivational states, such as appreciating goal directedness (4, 16), is likely necessary for predicting the emotional consequences of others' actions. For example, infants demonstrate an understanding of successful goals by 6 months (16), but do not demonstrate an understanding of the emotional consequences of successful goals until 10 months (17). Similarly, infants show an understanding of failed goals as early as 8–10 months (4, 18, 19), but do not demonstrate emotional expectations for failed goals until 14–18 months (20, 21). In these studies, infants' ability to anticipate others' emotional outcomes was predicated on an emerging appreciation of the link between others' actions and goals. This suggests that the development of understanding others' emotions depends on the development of understanding others' goals.

Using Emotions To Anticipate and Appreciate Others' Actions

Infants also use others' emotional communications to anticipate their actions (22, 23, though see also 24) and coordinate adaptive responses in interpersonal contexts (for a review, see 15). In research using the emotional eavesdropping paradigm (25, 26), 15- and 18-month-olds regulated their imitative behavior of a novel action as a function of whether that behavior had previously elicited an observer's emotional reaction (angry versus neutral) and whether the observer later watched the infant. These studies demonstrate that infants can apply knowledge of an observed negative emotional transaction to future scenarios in which the infant could become the target of a social partner's anger.

Work investigating infants' understanding of others' preferences also illustrates how infants use previously observed emotional information to engage in complex social interactions (27). Fourteen- and 18-month-olds observed an experimenter express positive affect after tasting one variety of food and negative affect after tasting another. Only the 18-month-olds understood the experimenter's preference and were more likely to provide her with the favored food, even when her preference differed from their own. This demonstrates that the development of infants' understanding of others' emotions plays an important role in how infants appreciate others' actions.

TOWARD FURTHER INTEGRATION OF EMOTION UNDERSTANDING AND SOCIAL COGNITION

The research we have reviewed speaks to the interconnected development of emotion understanding and social cognition, and highlights the value of this perspective for studying infants' social development. Next, we elaborate on three areas of study in which increased integration of these constructs can further such research: understanding goals, engaging in prosocial behavior, and understanding false beliefs.

Infants' Understanding of Goals

Studies often include facial and vocal expressions of emotion to manipulate how infants interpret others' goals. However, in our view, insufficient attention has been given to the potentially facilitative role such expressions might play.

Consider infants' distinct responses to adults communicating differing intentions. Nine-month-olds responded with impatience (i.e., more reaching, looking away) to an experimenter who was unwilling to share a toy, but not to an experimenter who was willing but unable to share a toy (3). The experimenter's unwilling, unable, and distracted dispositions were conveyed, in large part, by varying facial expressions accompanying the experimenter's action (e.g., unwilling = smiling while retracting an object; unable = frowning while accidentally dropping an object; distracted = neutral while pulling the object away and talking to another person). We argue that infants' perception of the experimenter's intentions (i.e., their understanding of goals) was enabled by relating the emotion signals they observed to each context.

Similarly, 14- to 18-month-olds observed an experimenter perform novel actions on objects accompanied by the vocalization, "Woops!" (accidental) or "There!" (intentional), both of which were expressed using affective intonation (5). When allowed to interact with the objects, infants were twice as likely

to perform the intentional actions than the accidental actions. These results suggest that infants use others' emotional expressions to clarify the relational significance of others' ambiguous intentions (see also 28). We would predict that infants lacking such appreciation of emotional expressions would respond similarly to these tasks regardless of which emotion they observed.

Furthermore, goal-directed behavior alone often indicates underlying relational significance, which can provide infants sufficient information to clarify uncertain action outcomes in the absence of prototypic affective cues (e.g., facial expressions). For example, relational significance can be signaled through persistent actions (see 12), as shown in studies using the behavioral reenactment procedure.

In one such study (29), 18-month-olds observed an experimenter with neutral facial affect attempt repeatedly, but fail, to perform target actions on novel objects. Infants who observed the failed attempts were significantly more likely to perform the target action than those who did not observe a demonstration, failed or otherwise. We argue that infants inferred the experimenter's true intention by interpreting the experimenter's persistent actions as frustration with a goal, a relationally significant cue, and thus imitated the intended action. In addition, because emotions often clarify the significance of others' goal-directed actions, including an expression of negative affect by the experimenter after each failed attempt could further disambiguate the experimenter's (failed) intention. As such, we would predict that incorporating negative emotion cues would facilitate increased successful imitation of the intended action, particularly for younger infants who may need more salient cues to interpret the outcomes of others' actions (see 30).

Conversely, adding positive emotion cues after each action could lead infants to believe that the experimenter's intention was to perform the so-called failed action (see 31). Indeed, in similar imitation paradigms using vocal and facial cues, infants were less likely to imitate actions perceived as accidental (5) or performed jokingly (32). Such research highlights the need to examine carefully the effect of emotion signals on infants' interpretations of others' goal-directed actions.

Infants' Engagement in Prosocial Behavior

Emotion understanding likely plays a role in the development of evaluating others' needs, a skill essential for empathic responding and instrumental helping. Although research often includes emotion signals (e.g., facial displays, vocalizations) in contexts involving overt expressions of distress, findings from studies omitting such expressions suggest that infants also rely on alternative affective cues to evaluate others' needs.

For example, 18- and 25-month-olds observed an experimenter admire and express positive affect toward several objects (e.g., a picture, a necklace). Subsequently, infants witnessed an aggressor steal and destroy the experimenter's objects (harm condition) or a second set of objects (neutral condition). Infants were significantly more likely to respond prosocially toward the experimenter in the harm condition than in the neutral condition, even though the experimenter did not express distress overtly in either scenario (33). We contend that infants' prosocial responses resulted from appreciating the experimenter's previously expressed positive relation with the objects and the aggressor's subsequent disruption of that relation. Thus, visible distress by the experimenter was not necessary for infants at this age to infer her emotional state given the context (though such affective expressions might be necessary for younger infants). Conversely, had the experimenter expressed negative affect (e.g., disdain) toward the objects prior to the aggressor's actions, infants may have interpreted the aggressor's destruction as helpful, if not nonthreatening, and been less likely to subsequently behave prosocially.

We argue that it is not necessarily the expression of overt distress in and of itself that prompts prosocial behavior, but rather the perception that a social partner is in need, which can be inferred with or without such expressions. Furthermore, infants are less likely to respond prosocially to inauthentic distress (e.g., crying after avoiding hitting one's thumb with a hammer) than to authentic distress (e.g., crying after hammering one's thumb), suggesting that infants evaluate others' affective expressions in relation to the contexts in which they occur (34).

Studies of infants' instrumental helping also typically underemphasize the regulatory power of emotional communication. Researchers often use experimenters' frustration and disappointment, whether vocalized (e.g., 35, 36) or expressed facially (e.g., 37), to create scenarios suitable for intervening on behalf of a social partner. Although such emotional communication likely plays a role in conveying that an individual is in a state of need (see 37), direct manipulation of these signals is uncommon.

A notable exception is the pioneering work on instrumental helping (7) in which the intentionality (i.e., intended versus unintentional) of an experimenter's actions was varied as a function of emotional expression. In these studies, 14- and 18-month-olds observed an experimenter perform various actions resulting in ambiguous outcomes (e.g., dropping an object, moving a book, bumping into a cabinet). In the experimental condition, the experimenter responded to the outcomes with grunts, gasps, and repeated reaching and bumping motions, indicating that a goal was frustrated, whereas in the control condition the experimenter responded in a way suggesting that the outcome was inconsequential or intentional (e.g., with playful vocalizations; see supplementary videos in 35, 36; see also 38). We maintain that infants relied on the experimenter's communication of affect to disambiguate his intentions, assess his need, and respond accordingly, an explanation relevant to the aforementioned research on infants' understanding of intentionality (5).

Recent research has examined more explicitly the role of affective cues (i.e., sadness versus neutral) in eliciting infants' instrumental helping (39). Overall, infants responded with equal amounts of instrumental helping, regardless of which affective expressions were observed, suggesting that instrumental cues

(e.g., reaching motions) alone were sufficient to motivate infants' prosocial behavior. Although these findings could suggest that affect does not play a meaningful role in encouraging infants' instrumental helping (see 40), this interpretation depends on how emotional information is operationalized in the study. Specifically, we view the neutral condition, in which the experimenter expressed mild surprise and confusion, as laden with emotional information that infants likely used to evaluate the relational significance of the context. Thus, it is difficult to rule out whether the null effect of emotion in this paradigm actually indicates that both expressions (i.e., sadness and surprise) effectively communicated instrumental need and prompted infants' helping behavior.

To test this alternative view, we suggest examining infants' prosocial responses to an experimenter displaying instrumental cues (e.g., reaching) in conjunction with one of three emotions: affect congruent with instrumental need (e.g., sadness, frustration), affect suggesting that the outcome was intentional (e.g., joy, amusement), and neutral affect (though even a lack of affect can be expressive in some contexts; see 41). We predict that infants would respond most prosocially to negative affect and least prosocially to positive affect, whereas infants' responses to neutral affect, a more ambiguous condition, would likely depend on their developing understanding of nonfacial emotional cues, such as appreciating the situational context (see 13).

Infants' Understanding of False Beliefs

How one appraises the environment is closely linked with the emotions one experiences. However, the beliefs underlying such appraisals can be mistaken. Infants understand false beliefs implicitly by at least the end of their first year (8) and children can typically reason about others' false beliefs after age 4 (42). However, research on understanding belief-based emotions is scarce.

Research using verbal tasks indicates that children do not accurately predict the emotional responses of an individual with a false belief until age 6 (43), whereas research using observational measures demonstrates that 2½- to 3-year-olds express suspense (e.g., increasingly opening their mouths, furrowing their brows) when observing an agent act on a false belief (44, 45). Recent research suggests that even infants may understand belief-based emotions. In one such study (46), 12- and 18-month-olds warned an experimenter of the unintended presence of an object toward which she had previously expressed disgust or pain. Interestingly, infants did not warn the experimenter if she had previously expressed positive affect toward the object, which may have signaled her lack of concern regarding potential future encounters.

Another study (6) suggests that infants can reconcile conflicting emotional information when observing a social partner with a false belief: 18-month-olds observed an experimenter express positive emotion toward an object (i.e., a plush toy). Subsequently, infants watched the experimenter express frustration after not being able to open a box that he mistakenly believed contained the object. Infants responded prosocially by redirecting the experimenter to the actual location of the toy. In addition to appreciating the experimenter's (false) belief, we propose that infants relied on the experimenter's positive affect toward the toy to infer his goal to reestablish this relation. However, had the experimenter previously expressed disgust or fear toward the object, infants may have been less likely to redirect him to its true location because doing so would have caused the experimenter distress. Additional research is needed to examine how other discrete emotions help infants respond adaptively to others' false beliefs, particularly when previously observed affect may disambiguate the mental states of a social partner with mistaken beliefs about the environment.

Research using looking-time measures provides additional evidence that infants understand belief-based emotions. Twenty-month-olds expected an agent to respond with a surprised expression instead of a neutral, satisfied, or happy expression upon realizing that she was mistaken about whether a toy made a certain sound or whether a box contained a particular object (47). However, research has yet to explore infants' expectations of others' emotional expressions as a function of ongoing false beliefs about the environment. For example, an infant with an understanding of belief-based emotions would expect an agent who mistakenly believes that she has won a game (but has unknowingly lost) to express joy (an emotion matching her beliefs) rather than sadness (an emotion matching the infant's beliefs).

CONCLUSION

Emotion understanding and social cognition are fundamentally intertwined. Studying these processes together can provide a more complete picture of how infants navigate social interactions. In this review, we have highlighted specific areas of social-cognitive research that could benefit from closer examination of the role of emotion understanding in infants' appreciation of others' mental states and actions. Our definition of emotion understanding challenges researchers to move beyond traditional methods of communicating affect (e.g., facial signals), and consider alternative, though equally viable, ways that an individual may observe and infer relational significance. As such, it is not valid to assume that omitting canonical affective expressions from a paradigm eliminates the effects of emotion. Furthermore, emotional development likely develops alongside social cognition, and research in one domain will benefit from greater acknowledgment of the other. Studies of infants' understanding of goals, engagement in prosocial behavior, and understanding of false beliefs represent only some areas in which more careful consideration of emotion understanding can be beneficial. Although some may dispute our perspective, we are confident that opening such a dialog will advance the study of social cognition and emotional development.

REFERENCES

1. Campos, J. J., Mumme, D. L., Kermoian, R., & Campos, R. G. (1994). A functionalist perspective on the nature of emotion. *Monographs of the Society for Research in Child Development*, *59*, 284–303. doi:10.2307/1166150
2. Saarni, C., Campos, J. J., Camras, L. A., & Witherington, D. (2006). Emotional development: Action, communication, and understanding. In N. Eisenberg, W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (Vol. *3*, pp. 226–299). Hoboken, NJ: John Wiley & Sons. doi: 10.1002/9780470147658.chpsy0305
3. Behne, T., Carpenter, M., Call, J., & Tomasello, M. (2005). Unwilling versus unable: Infants' understanding of intentional action. *Developmental Psychology*, *41*, 328–337. doi:10.1037/0012-1649.41.2.328
4. Brandone, A. C., & Wellman, H. M. (2009). You can't always get what you want: Infants understand failed goal-directed actions. *Psychological Science*, *20*, 85–91. doi:10.1111/j.1467-9280.2008.02246.x
5. Carpenter, M., Akhtar, N., & Tomasello, M. (1998). Fourteen- through 18-month-old infants differentially imitate intentional and accidental actions. *Infant Behavior and Development*, *21*, 315–330. doi:10.1016/S0163-6383(98)90009-1
6. Buttelmann, D., Carpenter, M., & Tomasello, M. (2009). Eighteen-month-old infants show false belief understanding in an active helping paradigm. *Cognition*, *112*, 337–342. doi:10.1016/j.cognition.2009.05.006
7. Warneken, F., & Tomasello, M. (2009). The roots of human altruism. *British Journal of Psychology*, *100*, 455–471. doi:10.1348/000712608X379061
8. Baillargeon, R., Scott, R. M., & Bian, L. (2016). Psychological reasoning in infancy. *Annual Review of Psychology*, *67*, 159–186. doi:10.1146/annurev-psych-010213-115033
9. Woodward, A. L., & Gerson, S. A. (2014). Mirroring and the development of action understanding. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *369*, 20130181. doi:10.1098/rstb.2013.0181
10. Meltzoff, A. N. (2007). 'Like me': A foundation for social cognition. *Developmental Science*, *10*, 126–134. doi:10.1111/j.1467-7687.2007.00574.x
11. Hernik, M., & Southgate, V. (2012). Nine-month-old infants do not need to know what the agent prefers in order to reason about its goals: On the role of preference and persistence in infants' goal-attribution. *Developmental Science*, *15*, 714–722. doi:10.1111/j.1467-7687.2012.01151.x
12. Premack, D., & Premack, A. J. (1994). Moral belief: Form versus content. In L. A. Hirschfeld & S. A. Gelman (Eds.), *Mapping the mind: Domain specificity in cognition and culture* (pp. 149–168). New York, NY: Cambridge University Press. doi: 10.1017/CBO9780511752902.007
13. Gnepp, J., McKee, E., & Domanic, J. A. (1987). Children's use of situational information to infer emotion: Understanding emotionally equivocal situations. *Developmental Psychology*, *23*, 114–123. doi:10.1037/0012-1649.23.1.114
14. Thompson, R. A. (1987). Development of children's inferences of the emotions of others. *Developmental Psychology*, *23*, 124–131. doi:10.1037/0012-1649.23.1.124
15. Walle, E. A., & Campos, J. J. (2012). Interpersonal responding to discrete emotions: A functionalist approach to the development of affect specificity. *Emotion Review*, *4*, 413–422. doi:10.1177/1754073912445812
16. Woodward, A. L. (1998). Infants selectively encode the goal object of an actor's reach. *Cognition*, *69*, 1–34. doi:10.1016/S0010-0277(98)00058-4
17. Skerry, A. E., & Spelke, E. S. (2014). Preverbal infants identify emotional reactions that are incongruent with goal outcomes. *Cognition*, *130*, 204–216. doi:10.1016/j.cognition.2013.11.002
18. Brandone, A. C., Horwitz, S. R., Aslin, R. N., & Wellman, H. M. (2014). Infants' goal anticipation during failed and successful reaching actions. *Developmental Science*, *17*, 23–34. doi:10.1111/desc.12095
19. Hamlin, J. K., Newman, G. E., & Wynn, K. (2009). Eight-month-old infants infer unfulfilled goals, despite ambiguous physical evidence. *Infancy*, *14*, 579–590. doi:10.1080/15250000903144215
20. Chiarella, S. S., & Poulin-Dubois, D. (2013). Cry babies and Pollyannas: Infants can detect unjustified emotional reactions. *Infancy*, *18*, E81–E96. doi:10.1111/infa.120289
21. Hepach, R., & Westermann, G. (2013). Infants' sensitivity to the congruence of others' emotions and actions. *Journal of Experimental Child Psychology*, *115*, 16–29. doi:10.1016/j.jecp.2012.12.013
22. Barna, J., & Legerstee, M. (2005). Nine-and twelve-month-old infants relate emotions to people's actions. *Cognition and Emotion*, *19*, 53–67. doi:10.1080/02699930341000021
23. Phillips, A. T., Wellman, H. M., & Spelke, E. S. (2002). Infants' ability to connect gaze and emotional expression to intentional action. *Cognition*, *85*, 53–78. doi:10.1016/S0010-0277(02)00073-2
24. Vaish, A., & Woodward, A. (2010). Infants use attention but not emotions to predict others' actions. *Infant Behavior and Development*, *33*, 79–87. doi:10.1016/j.infbeh.2009.11.003
25. Repacholi, B. M., Meltzoff, A. N., & Olsen, B. (2008). Infants' understanding of the link between visual perception and emotion: "If she can't see me doing it, she won't get angry". *Developmental Psychology*, *44*, 561–574. doi:10.1037/0012-1649.44.2.561
26. Repacholi, B. M., Meltzoff, A. N., Rowe, H., & Toub, T. S. (2014). Infant, control thyself: Infants' integration of multiple social cues to regulate their imitative behavior. *Cognitive Development*, *32*, 46–57. doi:10.1016/j.cogdev.2014.04.004
27. Repacholi, B. M., & Gopnik, A. (1997). Early reasoning about desires: Evidence from 14-and 18-month-olds. *Developmental Psychology*, *33*, 12–21. doi:10.1037/0012-1649.33.1.12
28. Striano, T., & Vaish, A. (2006). Seven-to 9-month-old infants use facial expressions to interpret others' actions. *British Journal of Developmental Psychology*, *24*, 753–760. doi:10.1348/026151005X70319
29. Meltzoff, A. N. (1995). Understanding the intentions of others: Re-enactment of intended acts by 18-month-old children. *Developmental Psychology*, *31*, 838–850. doi:10.1037/0012-1649.31.5.838
30. Bahrick, L. E., & Lickliter, R. (2000). Intersensory redundancy guides attentional selectivity and perceptual learning in infancy. *Developmental Psychology*, *36*, 190–201. doi:10.1037/0012-1649.36.2.190
31. Meltzoff, A. N., Gopnik, A., & Repacholi, B. M. (1999). Toddlers' understanding of intentions, desires, and emotions: Explorations of the dark ages. In P. D. Zelazo, J. W. Astington, & D. R. Olson (Eds.), *Developing theories of intention: Social understanding and self-control* (pp. 17–41). Mahwah, NJ: Erlbaum.
32. Hoicka, E., & Gattis, M. (2008). Do the wrong thing: How toddlers tell a joke from a mistake. *Cognitive Development*, *23*, 180–190. doi:10.1016/j.cogdev.2007.06.001
33. 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

34. Walle, E. A., & Campos, J. J. (2014). The development of infant detection of inauthentic emotion. *Emotion*, *14*, 488–503. doi:10.1037/a0035305
35. Warneken, F., & Tomasello, M. (2006). Altruistic helping in human infants and young chimpanzees. *Science*, *311*, 1301–1303. doi:10.1126/science.1121448
36. Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy*, *11*, 271–294. doi:10.1111/j.1532-7078.2007.tb00227.x
37. Dunfield, K. A., & Kuhlmeier, V. A. (2013). Classifying prosocial behavior: Children's responses to instrumental need, emotional distress, and material desire. *Child Development*, *84*, 1766–1776. doi:10.1111/cdev.12075
38. Vaish, A., & Warneken, F. (2012). Social-cognitive contributors to young children's empathic and prosocial behavior. In J. Decety (Ed.), *Empathy: From bench to bedside* (pp. 131–146). Cambridge, MA: MIT Press. doi: 10.7551/mitpress/9780262016612.003.0008
39. Newton, E. K., Goodman, M., & Thompson, R. A. (2014). Why do some toddlers help a stranger? Origins of individual differences in prosocial behavior. *Infancy*, *19*, 214–226. doi:10.1111/infa.12043
40. Hepach, R., Vaish, A., Grossmann, T., & Tomasello, M. (2016). Young children want to see others get the help they need. *Child Development*, *87*, 1703–1714. doi:10.1111/cdev.12633
41. Frijda, N. (1986). *The emotions*. Cambridge, England: Cambridge University Press.
42. Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, *72*, 655–684. doi:10.1111/1467-8624.00304
43. Harris, P. L., Johnson, C. N., Hutton, D., Andrews, G., & Cooke, T. (1989). Young children's theory of mind and emotion. *Cognition and Emotion*, *3*, 379–400. doi:10.1080/02699938908412713
44. Moll, H., Kane, S., & McGowan, L. (2016). Three-year-olds express suspense when an agent approaches a scene with a false belief. *Developmental Science*, *19*, 208–220. doi:10.1111/desc.12310
45. Moll, H., Khalulyan, A., & Moffett, L. (2017). 2.5-year-olds express suspense when others approach reality with false expectations. *Child Development*, *88*, 114–122. doi:10.1111/cdev.12581
46. Knudsen, B., & Liszkowski, U. (2013). One-year-olds warn others about negative action outcomes. *Journal of Cognition and Development*, *14*, 424–436. doi:10.1080/15248372.2012.689387
47. Scott, R. M. (2017). Surprise! 20-month-olds understand the emotional consequences of false beliefs. *Cognition*, *159*, 33–47. doi:10.1016/j.cognition.2016.11.005