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Connecting the dots on the origins of social knowledge

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Abstract

Understanding what infants know about social life is a growing enterprise. Indeed, one of the most exciting developments within psychological science over the past decade is the view that infants may come equipped with knowledge about “good” and “bad,” and about “us” and “them.” At the heart of this view is a seminal set of studies indicating that infants prefer helpers to hinderers and similar to dissimilar others. What a growing number of researchers now believe is that these preferences may be based on innate (i.e., unlearned) social knowledge. Here I consider how decades of research in developmental psychology can lead to a different way to make sense of this popular body of work. As I make connections between old observations and new theorizing—and between classic findings and contemporary research—I consider how the same preferences that are thought to emanate from innate social knowledge may, instead, reflect social knowledge that infants can rapidly build as they pursue relationships with their caregivers. I offer this perspective with hopes that it will inspire future work that supports or questions the ideas sketched out here and, by doing so, will broaden an understanding of the origins of social knowledge.

Connecting the dots on the origins of social knowledge

But home isn't where you land; home is where you launch.

—Tayari Jones (as written in *An American Marriage*)

Every year on July 11, thousands of small porcelain cups are laid out in a different city in the world and filled with coffee. Created by Aida Šehović in 2006, this public monument, ŠTO TE NEMA, commemorates the Srebrenica massacre that began on July 11, 1995 and lasted only a few days. During this time, Serbian soldiers murdered thousands of Bosnians and dumped their bodies into pits in and around the town of Srebrenica. What ŠTO TE NEMA symbolizes is the 8,372 lives that were lost in this genocide and the family members left behind who wish they could have a cup of coffee with their loved ones again.

Since Srebrenica, countless survivors have come forward with their stories of the Bosnian War. Take Kada Hotić, who remembers seeing a young woman walking with her infant. As Hotić recalls, “The baby cried and a Serbian soldier told her that she had to make sure the baby was quiet. Then the soldier took the child from the mother and cut its throat.” Reading Hotić’s testimony, it’s hard not to think that the soldier was once an infant himself. And in thinking this, it becomes even harder not to wonder—how does an infant come to hate?

Born to hate?

A provocative view has taken developmental psychology by a storm—maybe infants come equipped with social knowledge that can be reflected in whom they like and whom they dislike. This view follows from a body of work indicating that infants prefer helpers to hinderers (for reviews, see Bloom, 2013; Hamlin, 2013) and similar to dissimilar others (for reviews, see Liberman, Woodward, & Kinzler, 2017; Wynn, 2016). Because these preferences are evident from the earliest months of life, researchers have considered whether rejecting those who behave

poorly may be “universal and unlearned” (Hamlin et al., 2007, p. 559), and whether rejecting those who are unlike ourselves may follow from “a predisposition for dividing the social world into us vs. them” (Spelke & Kinzler, 2007, p. 93). From the perspective of these researchers, these preferences may emanate from innate (i.e., unlearned) social knowledge that can help promote infants’ survival. That is, through this innate knowledge, infants can distinguish between appropriate (e.g., “good,” “us”) and inappropriate (e.g., “bad,” “them”) social partners.

This line of thinking has gained traction throughout psychological science (e.g., Greene, 2014; Haidt, 2012; Henrich, 2015), and it has also generated interest from popular periodicals (e.g., *New York Times Magazine*) and television programs (e.g., *60 Minutes*)—and rightfully so. If true, the view that we are born liking some people and disliking others holds the potential to explain all sorts of things, from why we find it so hard to give others a second chance (e.g., maybe our instinct is to avoid people when they have wronged) to why episodes of ethnic cleansing have been with us from time immemorial (e.g., maybe it’s just human nature to feel negatively toward people who belong to out-groups).

All of this is fascinating and deserving of additional research, but I think it is premature to conclude that (1) infants come equipped with knowledge representations of a generic, pre-imagined social world (for a related argument on representational nativism, see Newcombe, 1998), and that (2) these representations are pre-coded with valence (“good for me” vs. “bad for me” discriminations, or valuations; see Gross, 2015). Instead, what I will advance in this article is the idea that (1) infants can rapidly build knowledge representations of the social world that are based on experiences within their actual world, and that (2) these representations tend to be organized around experiences with positive responsiveness, which is at the core of many caregiver-child relationships around the world (see Rubin & Chang, 2013).

“I’ve tidied up my point of view, I’ve got a new attitude”

Like others in the past (e.g., Ainsworth, 1979; Bowlby, 1969; Small, 1998), I believe that what infants need to survive, above all else, are close relationships with their caregivers, whomever they may be. The psychoanalyst Donald Winnicott put it best when he said, “There is no such thing as a baby—meaning that if you set out to describe a baby, you will find you are describing a baby and someone. A baby can not exist alone but is essentially a part of a relationship.” Because of this, I suggest that infants’ innate machinery (e.g., attentional biases, learning mechanisms) enables them to build relationships with their caregivers. As infants build these relationships, I will consider how they can take in and process their everyday experiences, particularly experiences of positive responsiveness, to arrive at social knowledge.

Before I begin, I wish to emphasize that I look forward to additional research that explores the possibility of innate social knowledge, a view that holds considerable merit and far-reaching implications. (For what it’s worth, it’s the view that I previously subscribed to.) At the same time, I think one can arrive at a different picture of how social knowledge emerges if drawing on decades of research in and throughout developmental psychology, including classic findings from infant social development that seem to have fallen out of fashion. My goal in this article is to paint this picture and, hopefully, start a new conversation within this growing and exciting enterprise.

A Look Back

To begin, it is worth considering: How did developmental psychologists arrive at the conclusion that infants come equipped with social knowledge (for overviews on why it is important to consider the sociology of scientific knowledge, see Golinski, 1998; Hacking, 2000; Jasanoff, 2004)? From my point of view, this view follows from one of the most prominent

theories in cognitive development, the core knowledge perspective (for reviews, see Carey, 2011; Kinzler & Spelke, 2007; Spelke, 2000; Spelke & Kinzler, 2007), which suggests that humans come endowed with systems for representing number, space, actions, and objects (but see also Wood & Wood, 2016, which indicates that very rapid learning can account for the appearance of knowledge of objects that is often believed to be innate). Beginning with ingenious experiments in the 1980s and 1990s showing how much infants know about the physical world—from their ability to recognize that objects exist continuously in space (e.g., Baillargeon, 1987) to their ability to compute simple arithmetic (e.g., Wynn, 1992)—scores of experimental studies with human infants now exist in support of a core knowledge perspective.

As it became clear that infants possess rich knowledge of the physical world, researchers started to wonder what infants might know about the social world. To do this, they adopted the same methods they used to uncover infants' understanding of the physical world. What is interesting is that many researchers continued to postulate innate knowledge to make sense of their new, striking findings about infants' understanding of the social world. But in my view, the idea of innate knowledge may not work as well in the social world than in the physical world. That is, the social world seems far more variable than the physical world. For example, each infant's social world can differ tremendously in how it works (e.g., how their caregivers behave), a point that will become clearer in a later section (“A Window Into Infants Building Social Knowledge”). By contrast, no matter whom an infant's caregivers are, a ball will not suddenly disappear from space, and one plus one will always equal two. Thus, it is worth considering whether infants come equipped with the machinery they need to learn about their particular world rather than come equipped with knowledge of a more generic world. To develop this proposal in more detail, I first turn to the question of what infants need.

What Do Infants Need?

I would not deny that distinguishing helpers from hinderers and/or similar from dissimilar others could potentially contribute to survival, but the view that such knowledge exists in the service of survival seems to imply that infants typically have an array of people to choose from and have the luxury of selecting the most ideal people to be their caregivers (but see Hrdy, 2009). As far as I am concerned, infants basically need one major thing to survive, and that is the involvement of the caregivers they happen to have.

To be clear, I am not suggesting that researchers who endorse the view that social knowledge is innate would deny that caregivers play a vital role in an infant's survival; I think everyone would agree that they do. Moreover, my plan here is not to challenge (and thereby imply that others think) that innate social knowledge is equally (or more) important than having caregivers for survival; I doubt anyone would think this. Instead, my purpose in this section is to remind readers just how essential caregivers are so that, in the next section, I can begin to develop the idea that virtually anything that is innate for operating in the social world would exist in the service of facilitating infants' interactions with their caregivers so that infants could build relationships with them.

Saying that infants need caregivers to survive is nothing new; theorists have long emphasized the vital role of close others in early development and human psychology more generally based on their work on affiliation (e.g., McClelland, 1987), attachment (e.g., Ainsworth, 1979; Bowlby, 1969), and belonging (e.g., Baumeister & Leary, 1995; Maslow, 1943; Stevens & Fiske, 1995). Perhaps some of the most dramatic examples for infants needing caregivers to survive come from observations of "hospitalization effects" in infancy. For example, in the early 1940s, pediatrician Harry Bawkin (1942) tried to understand why so many

infants in New York’s Bellevue Hospital died even after the hospital placed children in small cubicle rooms rather than open wards to avoid the spread of disease. Bawkin came to the conclusion that children were dying because of “psychologic neglect,” and instituted a major policy change: parents were invited to visit and play with their children, and nurses were encouraged to cuddle with the young patients. If anything, this policy increased the potential for the spread of infection—yet, following its implementation, the mortality rate fell dramatically (for related evidence, see Spitz, 1945).

What these old observations bring to light is what new theoretical work proposes—the evolutionary legacy may be the motivation to seek out caregivers and the machinery to build relationships with them (see Dweck, 2017). In the following section, I examine the contents of this machinery so that, in a later section, I can explore how this machinery enables infants to organize their everyday experiences into a mental model about social life.

What Is Innate?

In this section, I focus on the machinery (e.g., attentional biases, learning mechanisms) that encourages infants to engage with their caregivers, learn about social interactions, and build relationships with them. The presence of this machinery could be thought of (a) as heightening the probability that infants will orient toward and interact with their caregivers, (b) as providing the “tools” for building knowledge to optimize their relationships with their caregivers, and (c) as serving as the basis for social-cognitive knowledge (for a related argument, see Dweck, 2017). Thus, in contrast to the view that social knowledge simply unfolds (e.g., if adopting an experience-independent definition of innateness; see Bloom, 2012) or that there is a pre-specified trajectory for the acquisition of social knowledge (e.g., if adopting an experience-expectant definition of innateness; see Karmiloff-Smith, Plunkett, Johnson, Elman, & Bates, 1998), the

current perspective suggests that what is innate is the machinery that enables infants to build social knowledge, such that different infants can construct different knowledge representations.

I suggest that infants can build social knowledge to the point of having the kinds of knowledge they are known to display at very young ages because, from the moment they are born, infants tune into the people around them. Supporting this impression, a large literature has shown how infants are biased toward faces and voices. For example, infants orient toward stimuli that mimic face-like characteristics compared to those that do not (e.g., stimuli configured with more elements in the upper part than stimuli configured with more elements in the lower part) (e.g., Buiatti, Di Giorgio, Piazza, Polloni, Menna, Taddei, Baldo, & Vallortigara, 2019; Cassia, Simion, Umilta, 2001; Cassia, Turati, & Simion, 2004; Goren, Sarty, & Wu, 1975; Johnson, Dziurawiec, Ellis, & Morton, 1991; Mondloch, Lewis, Budreau, Maurer, Dannemiller, Stephens, & Kleiner-Gathercoal, 1999; Turati, Simion, Milani, & Umilta, 2002; Valenza, Simion, Macchi Cassia, & Umilta, 1996). This orientation toward faces helps to facilitate infants' interactions with their caregivers (for a related point, see Powell, Kosakowski, & Saxe, 2018). Moreover, infants seem to be further drawn into interactions with their caregivers because they come into the world with an interest in human voices (Vouloumanos & Werker, 2007), and particularly the one that they have had exposure to in utero. Not only do newborn infants prefer their mother's voice (DeCasper & Fifer, 1980), but they also show a preference for their native language as a whole or languages with similar speech contours, thus perhaps fostering infants' interest in others in their environment with similar speech patterns (Moon, Cooper, & Fifer, 1993; Nazzi, Bertoncini, & Mehler, 1998). Overall, these findings highlight the attentional biases that help orient infants to the relationships that can ensure their survival.

As infants tune into interactions with their caregivers, they need to figure out how these interactions typically work. Infants are well equipped to do this because they are built to engage in statistical learning, enabling them to learn, for example, patterns of what follows what or what causes what (for reviews, see Aslin & Newport, 2012; Saffran & Kirkham, 2018). Very young infants—and even newborns—are known to extract patterns of regularities from a welter of complicated input, capitalizing on repeated sequences or transitional probabilities to extract meaningful patterns including patterns in speech streams (e.g., Aslin, Saffran, & Newport, 1998; Fló, Brusini, Macagno, Nespó, Mehler, & Ferry, 2019; Saffran, Aslin, & Newport, 1996) and visual stimuli (e.g., Bulf, Johnson, & Valenza, 2011; Fiser & Aslin, 2002; Kirkham, Slemmer, & Johnson, 2002). Statistical learning not only enables infants to discover specific elements in the environment (e.g., discovering which syllables form words and which visual features form scenes), but it also allows them to infer more general principles and rules (Aslin & Newport, 2012; Saffran & Kirkham, 2018). Thus, infants can discern all sorts of structure within their environment through statistical learning (for examples of research showing how infants apply statistical learning to the social world, see Ruffman, Taumoupeau, & Perkins, 2011; Wellman, Kushnir, Xu, & Brink, 2016).

In the next section, I will explore how infants' ability to discover structure in their environment enables them to represent and understand the social worlds they happen to inhabit and come to know. To do this, I will draw on decades of research in developmental psychology that yields a convincing portrayal of infants building social knowledge through their everyday experiences.

A Window Into Infants Building Social Knowledge

I propose that by using their innate machinery, infants can organize their everyday experiences into a mental model about social life that guides how they understand and operate in their social world (cf. Bowlby, 1958, 1969; for a recent review on this issue, see Sherman, Rice, & Cassidy, 2015). For most infants studied, research points to the possibility that their mental model about social life might be built on the recognition that caregivers/others tend to be positively responsive (although I acknowledge that this may not be the model of caregiver-child relationships in every culture, past work suggests that positive responsiveness is at the core of caregiver-child relationships in many parts of the world, especially Western cultures; for a review, see Rubin & Chung, 2013; for reviews on the prevalence of secure attachment, which is believed to be based on a history of positive responsiveness, see Ainsworth, Blehar, Waters, & Wall, 1978; Mesman, van IJzendoorn, & Sagi-Schwartz, 2016; van IJzendoorn & Kroonenberg, 1988 [but see also Keller, 2018]).

In this section, I illustrate how infants build these mental models from the earliest weeks and months of life and how these mental models appear to guide infants' representations and actions in their social world. Although I will document individual differences in this section to support the idea highlighted in the previous section that infants construct (different) mental models from their (differing) experiences, in the subsequent section, I will home in on the most prevalent mental model as the basis for two popular and important findings in the social-cognitive development literature that have been viewed as innate social knowledge.

Supporting the impression that infants build social knowledge from the earliest weeks of life, classic research shows that 20-day-olds become distressed when their caregiver stops responding during a face-to-face interaction and shifts to unresponsiveness (Tronick, Als, Adamson, Wise, & Brazelton, 1978). A meta-analysis indicates that this "still face" effect is

robust among infants beginning at around one month of age and continuing throughout the first year of life (Mesman, van IJzendoorn, & Bakermans-Kranenburg, 2009). What is more, this meta-analysis indicates that history of caregiver responsiveness influences how infants respond when their mother suddenly assumes a still-face. For example, by three months of age, infants of depressed mothers are less disturbed when their mother becomes expressionless compared to infants of non-depressed mothers, perhaps because infants of depressed mothers have come to learn that their mothers tend to be less positively responsive and/or unresponsive (e.g., Field, 1984; Field, Healy, Goldstein, Perry, Bendell, Schanberg, Zimmerman, & Kuhn, 1988).

For the current perspective to have merit, infants' everyday experiences should result in more general mental models (i.e., expectations and representations about how the world unfolds above and beyond their own interactions), and research provides direct evidence for the existence of these mental models (Johnson, Dweck, & Chen, 2007; Johnson, Dweck, Chen, Stern, Ok, & Barth, 2010). For example, in one study (Johnson et al., 2007), infants between the ages of 12 to 16 months were first administered the Strange Situation procedure, which is used to identify an infant's attachment style (see Ainsworth et al., 1978). As noted above, the quality of responsiveness that infants typically receive from their caregivers is believed to influence their attachment style (but note that infant temperament is believed to be a predictor too; see Belsky & Rovine, 1987; Goldsmith & Alansky, 1987). For example, securely attached infants are believed to have histories of high positive responsiveness whereas insecurely attached infants are believed to have histories of lower or less consistent positive responsiveness (for a recent examination of what kinds of caregiving behaviors may or may not predict infant attachment security, see Woodhouse, Scott, Hepworth, & Cassidy, 2019).

Following the Strange Situation procedure, infants in this study (Johnson et al., 2007) were shown an animated video involving a “mother” figure (a large circle) and a “child” figure (a small circle). The animation began with both figures standing side by side at the bottom of an incline. The mother then traveled up the incline, leaving her child behind at which point the child started to cry. Infants were then shown two different endings, a responsive one in which the mother returned to the distressed child and a nonresponsive one in which the mother continued moving up the hill away from the distressed child. Securely attached infants were more surprised (i.e., looked longer) when the caregiver was unresponsive versus responsive, but insecurely attached infants were not. In other words, these two groups of infants appeared to have built different mental models about the social world. One group of infants seemed to have represented (expected) a world in which caregivers respond in a positive, attentive way to the distress of their infants, whereas the other group of infants had not.

If caregivers are, in large part, responsible for showing infants what their social world is like and how people operate in it, then the kinds of treatment that caregivers provide to their infants should also influence the kinds of treatment that infants provide to others. One study (Main & George, 1985) examined this issue among one- to three-year-olds in their actual day care environments. What this work sought to address was whether toddlers who experienced abuse from their caregivers would respond differently to their peers in distress (e.g., when a peer was afraid, crying, or panicked) than toddlers who did not experience abuse.

Most non-abused toddlers (who presumably experienced higher positive responsiveness from their caregivers) responded to their distressed peers by initiating contact and physically comforting them, much like the care they likely received from their own caregivers when they experienced distress. By contrast, none of the abused toddlers (who by definition experienced

low or highly inconsistent positive responsiveness from their caregivers) responded in a concerned or empathic way. In fact, over a third responded in angry and aggressive ways, from verbally threatening to slapping and kicking the child in distress—perhaps echoing the kinds of treatment they received in relevant situations. Although this study involved a small sample size, similar findings have been documented in other research exploring how abused and non-abused toddlers (Howes & Eldredge, 1985) and preschoolers (Klimes-Dougan & Kistner, 1990) respond to their peers. These findings provide additional support for the idea that infants build social knowledge from the environments they belong to and come to represent.

If infants build social knowledge from their everyday experiences, then modifying caregiver responsiveness should be reflected in the mental models about social life that infants build. Thus, intervention work may provide a test of the current perspective. And indeed, interventions have shown that increasing positive responsiveness can result both in changes in attachment patterns and long-term effects on social behavior (e.g., Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Landry, Smith, & Swank, 2007; van den Boom, 1994). For example, in one study (van den Boom, 1995), a training program was implemented to enhance maternal responsiveness to infants from six months of age until nine months of age. Mothers were encouraged to engage with their infants in a positive and responsive way, and remarkably, this modification was shown to have a clear impact on attachment patterns, as well as relatively enduring effects on the quality of the infants' later relationships, including relationships with their peers three years later. From initiating positive interactions with peers to sharing toys with them, children who experienced enhanced maternal responsiveness before their first birthday were more likely to engage in positive and responsive peer relationships as they approached their fourth birthday. Thus, children who were given more positive, responsive experiences with

caregivers appeared to form different representations of relationships and to use them as a model for other social interactions.

Overall, a number of lines of research spanning several decades of work converge on a picture of infants as organizing their everyday experiences into a mental model about social life that guides their thinking and behavior. In the next section, I consider whether these mental models can shed light on two phenomena that are widely studied today and often thought to reflect innate social knowledge.

Reconsidering Representational Nativism

Here I consider how the most prevalent mental model about social life—which, as noted above, is built on the recognition that caregivers/others tend to be high on positive responsiveness—may provide a new way to think about two popular findings that are thought to reflect innate social knowledge: (1) infants' preference for helpers over hinderers and (2) infants' preference for similar over dissimilar others. Two points are worth emphasizing before I provide this analysis. First, what follows cannot rule out an important alternative explanation: experience can alter or even reverse innate social knowledge. Second, cross-cultural work is vital to an understanding of both of these lines of research. The work described below—much like the majority of research in the social-cognitive development literature—has been conducted on populations from Western backgrounds (for a recent review confirming this point, see Nielsen, Haun, Kärtner, & Legare, 2017). In other words, if the task at hand is to identify core mechanisms and/or universal aspects of social cognition, then sampling diversity is needed.

Helpers versus Hinderers

For more than a decade, researchers have been introducing infants to a variety of “morality plays” that involve helpers and hinderers (cf. Premack & Premack, 1997; Buon, Jacob,

Margules, Brunet, Dutat, Cabrol, & Dupoux, 2014; Hamlin & Wynn, 2011; Hamlin, Wynn, & Bloom, 2007; Scola, Holvoet, Arciszewski, & Picard, 2015). In one of these plays, infants see a character struggling to climb a hill and slipping back down; a helper responds by boosting the character up whereas a hinderer responds by pushing the character down (e.g., Hamlin et al., 2007). In another play, infants see a character struggling to open a box to retrieve a toy; a helper responds by opening the box up whereas a hinderer responds by slamming the box shut (e.g., Hamlin & Wynn, 2011). And in another play, infants see a character struggling to grab a ball they dropped; a helper responds by passing the ball back whereas a hinderer takes the ball and runs away with it (e.g., Scola et al., 2015). In each of these plays, a character is struggling to accomplish some kind of goal, and after several failed attempts, a helper responds with a positive, supportive action whereas a hinderer responds with a negative, thwarting action. Across this body of work, infants tend to prefer a helper to a hinderer (for a meta-analysis, see Margoni & Surian, 2018), which lends support to the idea that infants come equipped with representations of who is an appropriate social partner (a helper) and who is not (a hinderer) (for reviews, see Bloom, 2013; Bloom & Wynn, 2016; Hamlin, 2013; Van de Vondervoort & Hamlin, 2016).

That infants prefer helpers to hinderers is certainly impressive, but perhaps even more impressive is their ability to *figure out* what is going on in the above scenarios, from identifying that an agent has a goal (e.g., they want to climb a hill) to placing valuations on the helping and hindering actions to recruiting this information when choosing between a helper and a hinderer. If we are willing to grant that infants can do all of this in a matter of moments, why not grant the possibility that infants can build social knowledge over the earliest weeks and months of life? After all, infants are “hooked” into interactions with their caregivers from the moment they are born (in part because of their bias toward faces and voices). And recall that, for most infants

studied, their caregivers tend to respond to them/others in a positive and responsive way (a regularity they are able to extract because they are built to engage in statistical learning). It becomes interesting, then, to consider whether infants' preference for helpers to hinderers may emanate from their everyday experiences with positive responsiveness.

But three-month-olds show this preference!

One of the most compelling pieces of evidence in support of the view that social knowledge is innate comes from the finding that three-month-olds prefer helpers to hinderers (Hamlin, Wynn, & Bloom, 2010). In this research (Hamlin et al., 2010), infants were shown the hill scenario described above; however, rather than introduce all infants to a helper and a hinderer, half of the infants were introduced to a helper and a neutral character, and the other half of infants were introduced to a hinderer and a neutral character. For all infants, the neutral character simply “danced” at the bottom of the incline. Whereas infants exhibited an aversion toward the hinderer (as indexed by their longer [preferential] looking at the neutral character compared to the hinderer), they did not exhibit an attraction toward the helper (as indexed by their equal looking at the neutral character and the helper).

The presence of this “negativity bias” among three-month-olds is consistent with a large body of work (for reviews on how a negativity bias characterizes social judgments across development, see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001; Vaish, Grossmann, & Woodward, 2008), and it is also consistent with the current perspective. That is, because most infants routinely experience positive responsiveness and come to know and expect it, it should come as no surprise that violating this expectation would be unappealing to

them¹. But what if infants have not experienced a rich diet of positive responsiveness from their caregivers? Recall that, by three months of age, infants of depressed mothers are less disturbed in the still-face paradigm compared to infants of non-depressed mothers (Field, 1984; Field et al., 1988), indicating that ninety days may provide ample time for infants to build social knowledge from their everyday experiences. With these findings in mind, it becomes all the more tempting to ask: Might infants' experiences with positive responsiveness give rise to their preference for helpers over hinderers?

Testing the current perspective

One relatively straightforward test of the current perspective would be to study the relationship between an infant's attachment style and their preference for helpers. Earlier I mentioned that an infant's attachment style may index their history with positive responsiveness—that is, securely attached infants are believed to have histories of higher positive responsiveness than insecurely attached infants. Assuming this is so, are insecurely attached infants, compared to securely attached infants, less likely to prefer helpers to hinderers? It should be noted that a preference for helpers to hinderers can be documented far earlier in development (e.g., three months of age) than an infant's attachment style can be measured (e.g., around one year of age if using the Strange Situation procedure). If future work finds that infants are not less likely to display a secure attachment if they do not show a preference for helpers to hinderers during the

¹ It is important to note that this aversion is not absolute; indeed, infants will sometimes prefer someone who hinders a hinderer (Hamlin, Wynn, Bloom, & Mahajan, 2011). But whereas 8-month-olds prefer someone who *hinders* a hinderer, 5-month-olds prefer someone who *helps* a hinderer. Importantly, if 5-month-olds are habituated to these events (i.e., they have more time to learn about them), they will prefer someone who hinders a hinderer (Hamlin, 2014). Such “higher-order” evaluations go beyond the scope of the current perspective. Moreover, although there are over two-dozen studies on infants' preference for helpers over hinderers (for a meta-analysis, see Margoni & Surian, 2018), these are the only two studies, to my knowledge, on this issue, and the findings are mixed.

earliest months of life (as in the Hamlin et al., 2010 work), then such a finding would pose a problem for the current perspective.

How else might infants' everyday experiences be reflected in their social choices? A preference for helpers over neutral characters, for example, does not seem to emerge until six months of age (as shown in Hamlin et al., 2007), which raises the question of whether securely attached infants would prefer a helper to a neutral character, whereas insecurely attached infants would not. However, another pattern is possible—perhaps insecurely attached infants would prefer a neutral character to a helper. Support for this possibility comes from research alluded to above (Johnson et al., 2010). In that work, securely and insecurely attached infants were introduced to a “child” figure (a small shape) in distress. On alternating trials, infants were introduced to one of two “caregivers” (two large shapes): a responsive caregiver (who returned to the distressed child and offered support) and a nonresponsive caregiver (who moved away from the distressed child and did not offer support). After these events, infants watched the child approach one of the two caregivers. Whereas securely attached infants looked longer (i.e., were more surprised) when the child approached the unresponsive versus the responsive caregiver, insecurely attached infants looked longer when the child approached the responsive versus the unresponsive caregiver. In other words, infants' own experiences seem to color their expectations about others' social choices. Would the same be true about infants' *own* choices? *But how do you explain...*

At this point, a reader may be wondering: How does the current perspective account for the fact that caregivers will sometimes “hinder” their infants? Consider, for example, an infant that is struggling to grab an object that is out of reach (e.g., a knife); it is likely that their caregiver will take this object away (much like the hinderer in the ball show described above).

Or consider an infant trying to open a cabinet filled with pots and pans; it is likely that their caregiver will close the door (much like the hinderer in the box show described above). Thus, it may seem inconsistent that, on the one hand, I argue that infants draw on the mental models they build up from their everyday experiences when preferring helpers to hinderers but, on the other hand, I acknowledge that caregivers sometimes hinder their infants. Importantly, by the time that caregivers start to hinder their infants (e.g., perhaps when they start to crawl, which becomes increasingly prevalent between the ages of five to eight months; see Adolph, Hoch, & Cole, 2018), most infants have likely extracted positive responsiveness as the norm within their environment, in which case they would require *a lot* of counterevidence to re-evaluate its veracity. Thus, even though hindering sometimes happens, positive responsiveness continues to be the norm.

But if positive responsiveness is the norm for most infants, why aren't infants more surprised (i.e., look longer) following hindering events than helping events (see Hamlin & Sitch, in press)? To address this question, it may be helpful to consider what it means for an infant to look longer at something (see Kidd, Piantadosi, & Aslin, 2012). For example, infants may look longer at things they find *surprising* (e.g., $5 + 5 = 5$; see McCrink & Wynn, 2004). Infants may also look longer at things they find *appealing* (e.g., faces of people who match the gender of their primary caregiver; see Quinn, Yahr, Kuhn, Slater, & Pascalis, 2003). And let's not forget that infants may also look longer at things they find *threatening* (e.g., spiders; see Rakison & Derringer, 2008). In other words, infants may attend to hindering events because they find them surprising, and they may also attend to helping events because they find them appealing. Thus, helping and hindering may recruit infants' attention at similar rates, albeit for different reasons.

Summary

Overall, I propose that because most infants build mental models about social life on the recognition that caregivers/others are high on positive responsiveness, it follows that infants prefer helpers to hinderers. That said, between 20-day-olds exhibiting distress when their caregiver assumes a still-face (Tronick et al., 1978) to 3-month-olds disliking those who engage in negative behaviors (Hamlin et al., 2010), it may be that “avoiding bad” is what is innate. This is certainly possible, but so is another possibility that these same findings bring to light—maybe “approaching good” is what is innate. And indeed, insights from developmental neuroscience suggest that infants’ innate machinery—namely, their bias toward faces—may exist in the service of encouraging infants to engage in positive social interactions (see Powell, Kosakowski, & Saxe, 2018). Importantly, this tendency should not be taken as evidence for innate *knowledge*; instead, it may reflect an innate *reward* that further encourages infants to engage in interactions with their caregivers.

Similar versus Dissimilar Others

In addition to documenting a preference for helpers over hinderers, a growing body of work has shown that infants prefer similar to dissimilar others (see Liberman, Woodward, & Kinzler, 2017). It has been argued that this preference may follow from a predisposition to carve the world into “us” and “them” (Wynn, 2016), perhaps because such divisions can help infants identify safe (“us”) from unsafe (“them”) social partners (Spelke & Kinzler, 2007). In this section, I consider whether infants’ reasoning about similar and dissimilar others may, instead, emanate from their everyday experiences with positive responsiveness.

The origins of value conflict?

To illustrate the kind of findings researchers have used to promote the view that infants are built to like similar others and to dislike dissimilar ones (see Wynn, 2016), consider the

following study (Mahajan & Wynn, 2012). In it, 11-month-olds were first encouraged to choose between two options (e.g., Cheerios or graham crackers). Afterwards, infants were introduced to two characters, a “similar” character and a “dissimilar” one. The similar character reacted positively to the infant’s preferred option (“Mmmm, yum, I like that!”) and they also reacted negatively to the infant’s rejected option (“Ewww, yuck, I don’t like that!”). The dissimilar character, by contrast, displayed the opposite pattern (i.e., they negatively reacted to the infant’s preferred option and positively reacted to the infant’s rejected option). When asked to choose between the two characters, most 11-month-olds chose the similar character to the dissimilar one.

Keep in mind that the similar character in the above procedure is positively responsive toward the infant by *embracing* their preference; this positive responsiveness echoes the kind of treatment that most infants likely receive from caregivers/others. By contrast, the dissimilar character is negatively responsive toward the infant by *rejecting* their preference. Such negative responsiveness stands in stark contrast to what most infants have likely come to know and expect from their caregivers/others. Thus, a strong test of whether infants are built to dislike dissimilar others would pit a character that simply responds positively toward an infant’s preferred option (“similar”) versus a character that simply responds positively toward an infant’s rejected option (“dissimilar”). Would infants continue to prefer similar to dissimilar others in this case, even when the study procedures are stripped of negative responsiveness altogether?

Assuming that infants dislike dissimilar characters in the above procedure only when they engage in acts of rejection, then this could help explain why infants will sometimes prefer those who hinder dissimilar others (Hamlin, Mahajan, Liberman, & Wynn, 2013). In this series of experiments, 9- and 14-month-olds were first introduced to a similar character and a dissimilar

character, conveyed in the same manner as the research described above. Afterwards, one group of infants saw positive and negative actions directed toward the similar character (e.g., the similar character dropped a ball that they were playing with, which was either returned or taken by someone else); the other group of infants saw positive and negative actions directed toward the dissimilar character. Both age groups preferred someone who treated a similar character kindly, and they also preferred someone who treated a dissimilar character unkindly.

If a dissimilar character simply happens to like something different than what an infant likes, it seems unlikely that infants would prefer someone who hinders a dissimilar character. However, should future research indicate otherwise, then the proposal that infants are built to dislike dissimilar others would be all the more convincing.

Language as a window onto the roots of intergroup conflict?

Now consider language, which represents another social group that infants may be born knowing about (for more on this issue, see Spelke & Kinzler, 2007). In the case of language, the ability to distinguish between a native-language speaker and a foreign-language speaker could be thought of as a way for infants to distinguish between a potential cooperator and a potential defector, respectively. This idea started to gain traction following an important study indicating that infants seek out social partners on the basis of the language that they speak (Kinzler, Dupoux, & Spelke, 2007). In this work, ten-month-olds were shown videos of a native-language speaker and a foreign-language speaker, and the experimenters created the illusion that both speakers offered the infant a toy. Most ten-month-olds opted to accept the toy from the native-language speaker than the foreign-language speaker.

The finding that infants prefer to accept offerings from native-language speakers is consistent with the idea that infants may come equipped with representations of native-language

speakers as “good” and foreign-language speakers as “bad.” And this possibility makes sense, especially if considering popular thinking in evolutionary psychology. Within this line of thought, it has been argued that neighboring groups in ancestral environments were unlikely to differ on the basis of visual appearance (e.g., race; see Cosmides, Tooby, & Kurzban, 2003) because long-distance migration was rare, so maybe groups differed—and were able to distinguish one from the other—on the basis of language (e.g., dialect; see Baker, 2001).

This evolutionary perspective makes a relatively straightforward prediction—infants should be more likely to expect positive behavior from a native-language speaker than a foreign-language speaker, and they should also be more likely to expect negative behavior from a foreign-language speaker than a native-language speaker. And yet, new research (Pun, Ferera, Diesendruck, Hamlin, & Baron, 2017) finds that while infants are more likely to expect positive behavior from a native-language speaker than a foreign-language speaker, they are *equally* likely to expect negative behavior from a native-language speaker and a foreign-language speaker. It seems like infants have learned that native-language speakers (e.g., their caregivers) tend to engage in positive behaviors, but what is striking is that these same everyday experiences did not lower their expectation of negative behavior among native-language speakers (at least relative to foreign-language speakers).

I would not deny that infants’ attraction toward native-language speakers is driven by expectations about positive responsiveness (especially given the above findings), but it is hard not to wonder whether infants attach any other value to language. For example, might infants’ motivation to learn about the social world from their caregivers have any influence on their preference for native-language speakers? This question was at the heart of a recent study (Begus, Gliga, & Southgate, 2016). In this work, infants exhibited higher EEG theta activity, which is a

neural signature of information expectation, when presented with a native-language speaker versus a foreign-language speaker. Put another way, infants' brains were "on fire" when they encountered someone who spoke the same language as their caregivers, the people they have been learning from since the moment they were born (and maybe even long before).

Of course, none of the findings reviewed thus far provide evidence against the idea that language serves as a vehicle for infants to carve the world into social groups (for more on this point, see Kinzler & Liberman, 2017). And indeed, existing research makes it pretty clear that infants identify and reason about social groups on the basis of language (e.g., Buttelmann, Zmyj, Daum, & Carpenter, 2013; Howard, Henderson, Carrazza, & Woodward, 2014; Kinzler, Dupoux, & Spelke, 2012; Liberman, Woodward, Sullivan, & Kinzler, 2016; Shutts, Kinzler, McKee, & Spelke, 2009). For example, in one study (Liberman, Kinzler, & Woodward, 2017), infants were more likely to expect two people to affiliate if they spoke the same language than different languages. What is interesting, though, is that while infants were more surprised when two people speaking different languages affiliated than disengaged, they looked just as long at two speakers of the same language disengaging than two speakers of different languages disengaging.

Moving forward, a critical goal for future research would be to determine when and why infants begin to make negative valuations of foreign-language speakers, especially because history abounds with examples of conflicts induced by linguistic differences (see Shell, 2001). Studies of bilingual infants would be informative in this respect because their everyday experiences should support different inferences about language-based social categories than monolingual infants. Consistent with this idea, recent work indicates that bilingual infants expect two people speaking different languages to react positively to the same food whereas

monolingual infants do not (see Liberman et al., 2016). Thus, exposure to multiple languages may support more promiscuous inferences about positive responsiveness between people, in which case negative valuations about foreign-language speakers may emerge later in development for bilingual infants than monolingual infants. Future research is needed to address this issue.

Summary

In sum, I propose that infants' reasoning about similar and dissimilar others on the above tasks may emanate from their everyday experiences with positive responsiveness. Of course, research may provide evidence suggesting otherwise; that is, perhaps infants are born with a skeletal framework that enables them to organize the world into social groups. Such a finding would only bolster the view of innate social knowledge, as would the finding that this framework comes pre-coded with valence (e.g., dissimilar = bad), especially because existing research has yet to convincingly show that infants (a) make negative valuations of dissimilar others and (b) hold *any* expectations about negative behaviors when reasoning about social groups.

A Look Forward

There is no better time to study what infants know about social life than now. Advances in neuroscience, for example, hold the power to bring us one step closer to a mechanistic understanding of social cognitive development (e.g., Begus et al., 2016). Movements toward open, collaborative, and replicable science (e.g., Frank et al., 2017) are giving us bigger and richer data. And although much progress remains to be made on studying diverse populations, one can only hope that recent calls to action (e.g., Nielsen et al., 2017) are steering us in that direction, which would put us in a better position to make claims about universality.

In conclusion, I see the current perspective as sketching out the beginnings of a framework for future theory and research. Although it is fascinating to consider that social knowledge is innate, that view may actually *underestimate* the innate capacities of infants—especially their ability to actively process and organize their everyday experiences into a mental model about social life. By illustrating the survival needs and the innate machinery that may set the stage for the acquisition of social knowledge, this perspective holds the potential to shed new light on when social knowledge may begin, what it may involve, and how it may manifest itself over time.

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