



19

Representations of Social Groups in the Early Years of Life

Talee Ziv & Mahzarin R. Banaji

At some stage in social development, we achieve recognition of ourselves as unique individuals, separate from others. Among the fundamental accompaniments of that process of forming a sense of self is the joint recognition that one is a social being, with membership in some groups and not others. Indeed, young children come to recognize and know that there are clusters of beings out there who are not only individually named but who have group labels associated with them for example, “male” or “female,” “dark” or “light,” “young” or “elderly.” Without even consciously recognizing this to be so, they come to know that these social categories have psychological and social meaning, and that membership creates a clear sense of “us” and “them.” What are the roots of full-blown and explicit knowledge about social groups and their properties that typifies the adult state? How early are they in place? What do they reveal about the social nature of our evolutionary history and about the significance of social groups in our learning and development?

In this chapter, we carve out a modest portion of the research on the development of social cognition that has scarcely been presented in compendiums of social psychology before. We select the earliest moments in human development that reveal when and how we perceive others as members of groups and even show preferences for them. By focusing on infants and young children, we not only stand to learn some surprising facts of

early social group perception but also to pose new questions about the structure of our minds, the social nature of early mental life, and how to regard the basic acts of social perception and cognition alongside other domains of core knowledge (see Spelke, Bernier, & Skerry, in press).

Let us start with the adult human state. Members of our kind appear to code and categorize people naturally and easily. The accuracy of such ability aside, there is high consensus as to who is what: male or female, dark or light, old or young, among many other groupings. But our species does far more with such knowledge. Based on a smidgen of information about another’s social origins, such as whether they are urban or rural dwellers, we feel confident making predictions about them. Will she like hip-hop or not? Eat sushi or not? Have traveled abroad or not? Be religiously observant or not? Again, the accuracy of predictions is another matter; what is astonishing is that we feel comfortable and even confident making such assessments at all. To us, the ease with which we think about other people through the lens of their groups suggests that we must regard social groups to be decent predictors of individual behavior: enough that we use them profligately, unconsciously, and with ease – whether they are useful and accurate or not.

If social groups are viewed as “good” categories to rely on and thus useful guides to social cognition, the developmental course of the ability

to perceive, categorize, and evaluate social groups, and individuals as members of them, is important to understand. In fact, the very question of whether or not this aspect of social cognition is fundamental can, to some extent, be answered by examining its presence in the youngest members of our species. Do they perceive social groups as distinct? Can they tell individual members of a group apart? Do they need experience with a group to do this? How much and how early?

A second set of questions concern whether even in the earliest years of life we prefer some individuals over others because of their inclusion in particular groups over others. What rules do these group-based preferences follow? Is similarity-to-self a sufficient rule to account for the evidence or is there a preference for that which is novel and different from self? And what if the group one belongs to has high or low social status? What wins? Ingroup-ness or group status? We do not have all the answers equally convincingly at hand, but we know a lot more than we did only a few years ago about the development of social cognition and our purpose in this chapter is to lay out the evidence on social group perception and preferences in the early years and in the interim, what it means.

In engaging with these questions, one approach posits that a limited set of innate conceptual systems serve as the basis for later emerging knowledge. Each of these “core knowledge” systems allows us to process different elements of the world around us (for example, numbers, agents, or spatial layouts) that are identified by a unique set of principles. The systems produce abstract but useful representations of these entities and guide the inferences we make about them. Thus it is, for example, that young children and monkeys may have no concrete understanding of “3” and “2,” but can nevertheless recognize that a group of 3 is larger than a group of 2. These systems have signatures that allow them to be regarded as core knowledge: they appear evolutionarily ancient, they are shared with non-human animals, they continue to unfold throughout development with minimal refinement, and are culturally universal, observable in Amazonians and New Yorkers alike (Spelke, 2000).

Even by the earliest years of life, we have clocked thousands of hours “on the job” of social cognition. Broadly speaking, social cognition refers to many dimensions of social representations, relationships, and behavior that cannot all be reviewed here. For example, a full understanding of the development of social cognition must engage, among other questions, the role of imitation and learning from others (Gergely, Bekkering, & Király, 2002), the understanding of intention and agency (Johnson, Slaughter, & Carey, 1998; Woodward,

1999), the basis of social trust and credibility (Koenig & Harris, 2005), knowing the minds of others (Baillargeon, Scott, & He, 2010; Wimmer & Perner, 1983), and the development of morality and understanding help versus harm (Hamlin, Wynn, & Bloom, 2007). In fact, an attempt at a more comprehensive review of what we know about the early years of social navigation in its broadest sense has been undertaken to cover these very questions (Banaji & Gelman, in press).

To provide an in-depth look at one central question concerning social cognition we focus our lens on how infants and young children seem to know or learn about social groups. We do so in part because of a growing sense that the capacity to reason about social partners, and in particular the us–them distinction, might constitute a separate domain of core knowledge (Banaji & Gelman, in press; Spelke & Kinzler, 2007). We parcel the evidence into two main sections concerning infants and young children because the differences in their capacities have required the invention and reliance on different forms of measures that can be used with each. Looking-time measures for instance dominate in work with infants but are not amenable for use with older children. Likewise, measures of preference that rely on choosing one of two objects can only be used with older infants who are capable of reaching. Finally, access to language provides a host of measures that can be included in research with 3-year-olds and older children.

SOCIAL GROUP CATEGORIZATION AND PREFERENCES IN INFANCY

Humans come into the world with an innate face template (Meltzoff & Moore, 1977) and a preference for face-like configurations over non-face stimuli (Johnson, Dziurawiec, Ellis, & Morton, 1991; Macchi Cassia, Turati, & Simion, 2004). While the exact mechanism driving the preference for faces is debated (see Turati, 2004, compared to Farroni, Johnson, Menon, Zulian, Faraguna, & Csibra, 2005), this innate capacity no doubt prepares us for identifying potential social partners. Newborns display a number of more nuanced face-processing capabilities as well. They are able to differentiate female faces never before seen (Pascalis & de Schonen, 1994), and are sensitive to facial attractiveness as evidenced by their preference for attractive faces over less attractive ones (Slater et al., 1998). These well-established preferences and perceptual capacities for individual faces set the stage for examining the questions raised in the introduction regarding individuals as representatives of larger social groups. In the

remainder of this section we will focus on four of the most studied social groups and what we know about how infants approach them: gender, language, age, and race.

We will be upfront about the most surprising aspect of the data from infants' perception, categorization, and preferences based on these groups. Intergroup cognition and conflict is often assumed to result from years of immersion in culture-specific attitudes. This work, however, has accumulated evidence that long before anything resembling substantial experience or practice with unfamiliar groups or out-groups is achieved, infants display interpersonal preferences that reflect group membership. In most cases, they appear to do so based on the simple rule of familiarity and on the relatively small amounts of information available to them in the first months after birth. These findings have raised questions regarding the underlying mechanisms driving early preferences, and have motivated the examination of their stability over development.

Measures of preference, categorization, and discrimination

There are three standard measures used in the research with infants, each of which seeks to tap a unique aspect of cognition. In the social domain, we can distinguish them as measures of *preference* (where preference need not reflect an evaluation but simply longer engagement with one stimulus over another), measures of *categorization* (the ability to tell two sets apart from each other, e.g., male and female), and *discrimination* (the ability to distinguish individual members of a set from each other).

Looking time serves as the main measure for inferring all three of these underlying processes in infancy. To understand the parameters of looking-time measures – i.e., what it can and cannot tell us – we preface our discussion of the work by tackling some of the basic questions typically raised when encountering data in which the dependent measure of interest is the time spent looking at x over y , typically measured in seconds.

The procedure for testing categorical representations involves familiarizing infants with multiple stimuli from a single category (for example, different photographs of White females) and then showing them a previously unseen White female and Asian female face. If during the familiarization phase infants extracted the commonality between the presented stimuli and formed a category, they should now look at the item that “breaks” the category (i.e., the Asian face) rather than the face that “continues” the familiarized

category. If no category distinctions are in place the infant should randomly look at the White or Asian face.

Most of the discrimination studies we are about to describe use a similar procedure to categorization studies with the exception that two items within the same category serve as stimuli. For example, if we would like to find out whether infants are capable of telling two Asian faces apart we would begin by presenting a single female Asian face repeatedly during familiarization. Across these trials, infants' looking time typically decreases, a pattern indicating they have fully processed the face and are essentially getting “bored.” Once a significant reduction in looking time has been achieved, discrimination is assessed via infants' response to a pair of faces consisting of a novel Asian female alongside the familiarized stimulus. Equal looking at both is taken as evidence that infants cannot distinguish the old face from the new, while increased interest in the new face leads to the inference that the difference between the faces has been detected.

In a standard preference study, each trial involves two stimuli presented side by side, simultaneously competing for the infants' attention. In the social domain, one of these stimuli could be a member of the infant's in-group (for example, a face of the same race as the infant, or a person speaking the infant's native language), while the other stimulus is an out-group member (an other-race face, or a person speaking a foreign language). Looking-time measures of this sort do not always allow for a priori interpretation, thus hypothesizing which face would receive more attention may be elusive. For instance, longer looking time at a person from one's own group may emerge from a preference for that which is familiar, whereas longer looking times for an out-group face may emerge because of a preference for the novel.

In the examples we mentioned using race and language as social categories, babies show a familiarity preference in early infancy, making this result the standard expectation for new research. However, once a consistent looking pattern has been established, the next step requires determining what drives the infant to look in one direction or another. Here multiple factors could come into play, including differences in low-level processing demands, a preference to interact with the familiar other, or an avoidance of the unfamiliar stimulus. Disentangling these possibilities becomes a much more intricate task, and often benefits from evidence using other kinds of methodologies. While keeping these interpretive limitations in mind, we turn to describing the current state of affairs in infants' social group perception and preferences as it relates to the four types of

social groupings most studied: race, gender, age, and language. Later in this chapter we examine the expression of social preferences in childhood where measures other than looking time will help to zero in with more confidence on whether the apparent preference in the early months of life indeed carries over to approach or liking in later months and years. To the extent that the later data with new measures are consistent with the earlier data with looking time, the more faith we can have that we are observing the roots of the same preferences in early infancy.

We have chosen these four groups because the bulk of the research evidence is situated in studies of gender, language, age, and race. But each of these categories also presents unique features that allow the jigsaw of early social cognition to be fitted. Some social groups present discrete and even dichotomous social groups to infants. Gender typically is dichotomous, with infants seeing both male and female exemplars. Age is a continuum, but infants mainly interact with adults. Race and language both often present one of many possible categories, although in multilingual and multiracial cultures that is less the case. Most of the extant studies though use unilingual and monoracial cultures, with a minority focusing on the effects of degrees of exposure to varying cultural input. Another dimension along which groups vary is whether group membership is fixed (such as the case with gender or race) versus a multiplicity of options that are open as the child grows (such as with language) or the continuum along which the baby itself moves, as with age. These features of various social groups allow questions of similarity to self, familiarity in early life, and the evolutionary roots of preferences and their acquisition after birth to be examined in interesting ways.

Gender

Gender poses an interesting opportunity to understand social group perception and preference because although most babies are cared for by a female caregiver, males are not completely absent from the environment as is often the case with race, where members of other race groups are typically completely absent. If a preference for female over male is not present at birth, but emerges rapidly after that, we would have evidence that babies can form preferences for the more familiar of two known groups. Moreover, studies that look at preferences based on gender of caregiver can test whether early experience with a single caregiver (male or female) generalizes to preferences for others from that group.

Babies typically show a looking-time preference for female faces when paired alongside a male face; however, this preference is reversed if the baby is brought up by a male primary caregiver (Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002). This result is both indicative of infants' ability to differentiate male and female faces (without which preferential looking could not be obtained), and demonstrates the importance of early experience in preference formation. It also rules out to some extent the possibility of an innate female preference that is not rooted in experience.

Other work has provided evidence for gender category formation, in some cases by 23 weeks of age (e.g. Cornell, 1974; Leinbach & Fagot, 1993; Levy & Haaf, 1994). Recently, however, researchers have pointed to an asymmetry in infant's gender categories such that female faces are categorized earlier and processed more efficiently than male faces (Ramsey, Langlois, & Marti, 2005). For example, Quinn et al. (2002, experiment 6) report that infants display poorer recognition of male faces at 3–4 months of age compared to female faces. After familiarization with 8 different female faces, infants looked longer at a novel female face when paired with one of the faces they previously saw during familiarization. The same procedure with male faces did not elicit a novelty preference.

Infants' poorer task performance with male faces has been attributed to the greater processing effort they must exert when encountering male faces (Ramsey et al., 2005). For example, a meta-analysis of 15 face perception studies revealed that infants spend more time looking during studies that use male face stimuli compared to female faces and this difference increases as the complexity of the experimental task rises. Furthermore, Ramsey et al. (2005) show that 6-month-olds have considerable difficulty in forming a male face prototype compared to the ease with which they abstract a prototype from a series of female faces, even at earlier ages (de Haan, Johnson, Maurer, & Perret, 2001; Rubenstein, Kalakanis, & Langlois, 1999). The observed disadvantage with male faces, according to Ramsey et al. (2005), implies a weaker representation of the male category, at least in babies whose primary caregiver is female.

Such differences in infants' processing and categorization of gender have been attributed to different levels of experience with men and women (Ramsey et al., 2005; Ramsey-Rennels & Langlois, 2006), and indeed tracking infants' facial experience during a 1-week observation period has shown substantially higher exposure to females during the first year of life (Rennels & Davis, 2008). This exposure pattern makes the gender

case particularly interesting in comparison to race. Whereas infants' ability to differentiate other-race faces deteriorates over time (Kelly et al., 2007b, Kelly et al., 2009), male face processing improves over the first year of life and into the second. Since a female preference *and* an own-race preference both appear by the age of 3 months, the question of the connection between face processing and face preference at this early age arises. Interestingly, for gender, the initially narrow processing advantage for female faces broadens over the first year of life to include male faces as well. For race, on the other hand, it would appear that the system starts out broad, with openness to the whole spectrum, and narrows down with experience to the most familiar physiognomy.

Newborn infants brought up by a female caregiver do not show a preference for female over male faces, further supporting an experience-based account (Quinn et al., 2008). This is an important discovery because it would seem that gender could be a good candidate for innate social preference (favoring females) but that does not seem to be the case. In addition, based on previous work we reviewed on the malleability of gender preferences (depending on caregiver), we conclude that this preference is shaped after birth and based on experience, yet its precise developmental course is yet to be fully mapped because preferences based on gender have not been tested in later infancy.

Language

Language is unique in that babies are exposed to their parents' speech prenatally, and they indeed display a preference for the sound of their native language over a foreign language from birth (Mehler, Jusczyk, Lambertz, Halsted, Bertocini, & Amiel-Tison, 1988; Moon, Cooper, & Fifer, 1993). Much in parallel to the race case, newborns exposed to two languages equally prior to birth, do not exhibit a preference for either one of those languages, despite being perfectly capable of telling them apart (Byers-Heinlein, Burns, & Werker, 2010).

Infants can consistently discriminate their own language from other languages at least by 2 months of age (Bahrick & Pickens, 1988; Mehler et al., 1988) and they do so even if the two languages are phonologically very similar by 4 months of age (e.g. Spanish and Catalan; Bosch & Sebastián-Gallés, 1997).

We now know that at least by 6 months of age the native-language preference extends to a preference for the individuals speaking that language, as measured by infants' looking times

(Kinzler, Dupoux, & Spelke, 2007). Specifically, subjects were first introduced to two females, one at a time, each speaking either the infant's native language or a foreign language. When later both women reappeared on screen silently, side by side, infants spent significantly more time looking at the native-language speaker. Remarkably, even when both actresses speak in the infant's native language, but one has a foreign accent, infants will prefer the non-accented speaker.

Early manifestations of social responding based on language have been documented soon after the visual preference is observed. Using a more interactive method, infants 10 months of age were again introduced to two speakers, but this time during the silent test phase each of them appeared to be simultaneously offering the infant identical toys (while actual toys were placed within the infant's reach). The dependent measure was which of the two toys the infant will select, and results indicated a preference to take a toy offered by the native-language speaker (Kinzler et al., 2007).

A similar method has demonstrated 12-month-olds' use of language as a cue to food selection. During introductory trials, actors appeared individually on screen either speaking in a native or foreign language, each eating a different kind of food from a colored container. In the critical silent test trials both actors appeared on screen simultaneously, while the same food-filled containers were presented to the year-old infants. Findings again showed reliably more selection of the food associated with the native-language speaker (Shutts, Kinzler, McKee, & Spelke, 2009).

Such social reactions have not been tested prior to 10 months of age, but they may suggest that the earlier looking preference is a precursor of infants' affiliative predilections. More broadly, the findings on language have started to raise important questions regarding the relative status of different social categories (see Kinzler, Shutts, & Correll, 2010 for a discussion). For example, presenting 10-month-old babies with individuals who differ on race using the toy choice method does not elicit preferential selection of the toy offered by the own-race person, suggesting that language may be a more prominent social group marker at this age (Kinzler & Spelke, 2011). It has been suggested that this results from the fact that, unlike race, languages (and even more so accents) served as important markers of coalitional alliances over evolutionary times (Kinzler & Spelke, 2011). It is important to keep in mind, however, that exposure to language also occurs earlier than visually marked group distinctions like race. In this regard, it would be interesting to

find out whether newborns exhibit preferences for native-language speakers. We will return to discussing interactions of language and race when examining social preferences in the preschool years.

Language-based preferences are relatively newly studied in research on infant social cognition. Questions that have been targeted by some of the social groups described in this chapter will surely be relevant for language too. For example, how early will infants show evidence of categorization of multiple individuals based on their language (especially when those individuals differ on other dimensions such as race or gender), and what is the role of exposure in attenuating the observed social preferences in infancy?

Age

Age throws off the simple “liking for familiar” effect and forces us to consider the role of self in early social cognition. Infants are sensitive to the age of the person they interact with, at least by the time they are 4 months old, as evidenced by increased looking time at same-age (i.e. infant) faces in comparison to older children and adult faces (McCall & Kennedy, 1980). Unlike the preference for female faces, this own-age preference cannot be driven by exposure, since infants rarely spend significant amounts of time with other infants their own age and certainly not more so than they do with adults. It is also the case that the own-age preference is quite nuanced and not simply a generalized response to baby-like features of the stimuli: 6-month-olds and 9-month-olds show greater behavioral positivity (as measured by arm movements) toward static images of same-age infants (Sanefuji, Ohgami, & Hashiya, 2006).

Infants also display an elevated-looking pattern toward children compared to adults and produce differing behavioral reactions by age; they respond more positively (e.g., smile) to children, and react negatively (e.g., by averting their gaze or by avoidance) when presented with unfamiliar adults (Bigelow, MacLean, Wood, & Smith, 1990; Greenberg, Hillman, & Grice, 1973), leading some to propose that babies are reacting to a combination of size and facial configuration in these experiments (Brooks & Lewis, 1976).

Whereas the above studies point to early categorization of strangers by age, further evidence has been provided using the intermodal matching technique. In this particular version of the task, dynamic videos of an adult and child (matched for gender) speaking in synchrony were simultaneously presented while either an adult’s voice or a child’s voice was played in the background. Visual

matching of the face–voice pairing was present at 4 months of age (Bahrick, Netto, & Hernandez-Reif, 1998), suggesting that the infant versus adult categories are indeed in place and, remarkably, that voice associations to visual images are present.

Whether infants are better able to differentiate own-age or child faces relative to older faces, or whether they do so with a greater degree of accuracy compared to adults, has not been examined. The existing literature on children’s face processing is in fact divided on whether an advantage for similar others (i.e. own age) or for the faces children most often encounter in their environment (i.e. young adults) should be expected. One study, for instance, tested the ability of 3-year-olds to differentiate adult faces and infant faces. The task involved presentation of a target face, followed by a pair of faces – the target and a distracter of the same age. Participants received one block of trials with adult faces and another with infant faces, and discrimination was assessed by children’s ability to point to the target. The study showed that while participants with younger siblings were equally able to detect the target in both blocks, participants of the same age without younger siblings (and thus with limited experience with infant faces) showed a recognition advantage for the adult faces, providing yet another example of the effect of exposure on face-processing capabilities (Macchi Cassia, Kuefner, Picozzi, & Vescovo, 2009a). Interestingly, these effects are not limited to experience acquired during childhood, as it has been shown that maternity ward nurses display an enhanced ability to differentiate newborn faces compared to adults without regular contact with newborns (Macchi Cassia, Picozzi, Kuefner, & Casati, 2009b).

In contrast, others have argued for an own-age processing advantage in children. Using a delayed recognition task, one study showed that 5–8-year-olds were better able to remember previously seen photographs of children, compared to young, middle-aged, and older adults (Anastasi & Rhodes, 2005). Furthermore, recording event-related potentials, another study reported a larger amplitude of the face-selective N170 component when 5-year-olds passively viewed own-age faces compared to young and elderly adults, indicating an own-age advantage already present for face encoding (Melinder, Gredebäck, Westerlund, & Nelson, 2010).

While infants’ contact with own-age peers is limited, children gradually accumulate more exposure to other children of their own age, beginning in the preschool years. Therefore, it is not unreasonable to suggest that a transition occurs from superior processing of young adults (in infancy)

to an own-age processing advantage. This hypothesis is consistent with the studies reported above, as Macchi Cassia et al. (2009a) tested 3-year-olds, whereas Anastasi and Rhodes (2005) and Melinder et al. (2010) tested children from 5 years of age onwards. New research is needed, however, to establish this claim, first of all by testing infants, and later by systematically measuring the correlation between exposure levels to different age groups, and performance on face recognition tasks.

Race

Race is an arbitrary category (Werker & Tees, 1984) and there ought to be no evolutionarily rooted mechanism to distinguish and form preferences along this dimension. However, using standard looking-time measures for one of two visually presented faces, as early as 3 months of age infants from different backgrounds (African, Asian, and European infants) prefer to look at faces with origins on their own continents compared to those of another race (Bar-Haim, Ziv, Lamy, & Hodes, 2006; Kelly et al., 2007a). This early in-group preference observed in monocultural infants does not arise in a biracial environment (Bar-Haim et al., 2006) and is not displayed by newborns (aged 16–120 hours; Kelly et al., 2005).

Collectively, these findings suggest that the infant face-processing system depends on environmental input for forming an own-race preference, and that such preferences may be formed (or not at all) quite quickly. These findings also tell us that by 3 months of age infants are able to visually distinguish the two groups of faces from one another, raising the question of whether they are already forming discrete categories by race. The remainder of the research we summarize concerns this question of categorization as well as infants' ability to discriminate among instances within a group. The latter tests are particularly important because they exemplify the effect of group membership on subsequent representation of the individuals within a category.

In a direct test of categorization, Anzures and her colleagues (Anzures, Quinn, Pascalis, Slater, & Lee, 2009) showed that 9-month-old White infants treat faces from different racial backgrounds as belonging to separate categories. Anzures et al. (2009) showed that after familiarization with a group of White female faces, for example, infants showed increased looking toward an unfamiliar Asian female, but not to an unfamiliar White female. Furthermore, they demonstrated that while babies were able to differentiate individual White faces, they could not tell Asian

faces apart, suggesting that infants' own-race category is finer grained compared to the other-race category, perhaps due to enhanced experience with individual exemplars of own-race faces on a daily basis. Further support for qualitative differences between racial categories in infancy comes from a study assessing face processing by 8-month-old White infants (Ferguson, Kulkofsky, Cashon, & Casasola, 2009), which in addition to extending the own-race discrimination advantage to White relative to African faces, also showed that own-race faces are processed holistically (i.e. the relation between the external and internal features of the face are encoded) while other-race faces are processed featurally (see also Liu, Quinn, Wheeler, Xiao, Ge & Lee, 2011 showing a decline between 4 and 9 months of age in Asian infants' fixation on internal features of other-race faces).

Poor discriminability of other-race faces is a well-documented phenomenon in the adult literature, named the *other-race effect* (ORE; for a review, see Meissner & Brigham, 2001). Whether the ORE results from greater experience with own-race faces (Chiroro & Valentine, 1995; Elliott, Wills, & Goldstein, 1973; Stahl, Wiese, & Schweinberger, 2008) or from mere social categorization (Bernstein, Young, & Hugenberg, 2007; Levin, 2000; MacLin & Malpass, 2001) is currently under debate. Does this effect also have its origins early in development? Indeed there is evidence for the ORE in childhood (Pezdek, Blandon-Gitlin, & Moore, 2003; Sangrigoli & de Schonen, 2004a) and it has recently been tracked down to infancy (Kelly et al., 2007b, 2009; but see Hayden, Bhatt, Joseph, & Tanaka, 2007 and Sangrigoli & de Schonen, 2004b for slightly different results), suggesting that the homogeneity of out-groups requires very little experience to be expressed and may be a fundamental principle of social learning.

Specifically, the ORE seems to develop gradually during the first year of life, with 3-month-olds being able to differentiate faces from every racial group presented to them. That is, they can tell two faces of African descent apart with the same ease they can differentiate two Asian or two European faces. By 9 months of age, however, only differentiation of own-race faces is preserved, again presumably due to the tuning of the face-processing system in accord with infants' exposure. Likewise, Korean adults who were adopted as children into White families show enhanced processing of White faces relative to Asian faces (Sangrigoli, Pallier, Argenti, Ventureyra, & de Schonen, 2005), indicating that reversing the ORE is possible even when the onset of intense other-race exposure occurred relatively late in development. Finally, testing short-term exposure effects on face

discrimination has revealed that familiarization to only three exemplars of other-race (Asian) faces for a total duration of 120 seconds is enough for infants to regain their ability to tell these faces apart (Sangrigoli & de Schonen 2004b), an impressive result of the malleability of the learning system to input.

Such data raise two issues of interest. First, much like the ability to perceive non-native phonemes, which is lost during the first year of life due to lack of exposure, the ability to discriminate individual members of a group may initially be broad enough to effectively handle a wide range of stimuli, even ones that never appear in the environment. Over time, however, selective tuning of the system will occur at the expense of less frequently encountered groups (Scott, Pascalis, & Nelson, 2007); Second, the system has sufficient plasticity, even after some narrowing has taken place, such that later exposure to unfamiliar input can gradually reorient the system in the relevant direction. For example, we know that Asian adoptees tested earlier in development (6–14 years of age) show equivalent recognition performance for Asian and White faces (de Heering, de Liedekerke, Deboni, & Rossion, 2010), perhaps an intermediate step before the full-blown advantage for White faces is in place, as observed in adult Korean adoptees (Sangrigoli et al., 2005).

Parallels to these exposure effects on face processing have been shown in what has been known as the *other-species effect* – babies 6 months of age can easily tell monkey faces apart, an ability that disappears by the age of 9 months (Pascalis, de Haan, & Nelson, 2002). In other words, the younger the infant, the better the ability to discriminate among the individuals of another species. But by routinely exposing 6-month-olds to individually labeled monkey faces during this critical period, discrimination performance is maintained when infants are again tested at 9 months of age (Pascalis et al., 2005).

Among the most important results from such studies provides evidence for the crucial role of verbal labels in solidifying categorization. One group of infants was shown monkey faces that were paired with individualized names, another received the category label “monkey” when seeing each face repeatedly, and a third control condition passively viewed faces without labels. After 3 months of exposure, infants’ discrimination ability was maintained only when the monkeys were given individual labels (Scott & Monesson, 2009). Labels, therefore, seem to be a powerful mechanism enhancing categorization and learning and may explain the inferential richness of categories in humans. We will return to discussing the role of verbal labels in highlighting social groups when we look at findings with older children

with whom more research has been done on this question.

From the data on infant perception of cross-species and cross-race faces, we know that a surprising sensitivity to race of the face is in place within the first months after birth. Not only do infants prefer faces of their own race but also they quickly form distinct categories centering on race. We also observed that cross-race exposure is a key factor both in terms of shaping the emerging own-race preference, and in terms of enhancing the perceptual discriminability of faces that do not belong to one’s own racial group. The role of experience is clear from work showing that early cross-race exposure can mute a simple familiarity-based preference. Furthermore, the role of verbal labels in enhancing category distinctions and discriminability points to a unique human mechanism by which social cognition is stamped in.

A remaining open question concerns the underlying nature of the initial own-race preference. Interestingly, it has been proposed that, in contrast to language, race-based visual preferences in infancy might be perceptually driven rather than indicative of a desire for social interaction (Kinzler & Spelke, 2011). Indeed, thus far, no evidence for race-based social preferences in later infancy has been obtained. As mentioned earlier, the toy choice method elicits equal selection of toys from own- and other-race individuals at 10 months of age, and in a similar paradigm even 2.5-year-olds do not show sensitivity to race when given the option to offer a toy to one of two novel individuals (Kinzler & Spelke, 2011). If this pattern of discontinuity is substantiated, a challenge for future research would be to account for how race eventually becomes a socially meaningful category for older children and adults.

NAVIGATING SOCIAL CATEGORIES IN EARLY CHILDHOOD

We have outlined group-based preferences along a number of social categories that appear surprisingly early in infancy. A dominant method used to draw these conclusions was looking time. A question of great interest is whether these preferences are precursors of later-developing group-based preferences. While it is difficult to establish direct links between the behavior of infants and the behavior of children and adults, we will carefully review research on social categories as observed in later childhood and what it says about the continuity of social cognition.

To organize the growing research on this topic we focus on several sets of experiments. First,

we look at those that show the use of social categories in service of self, including studies that test whom children decide to learn from to derive their own preferences or to learn culturally relevant information. We continue to draw out the evidence on which social categories might be more salient compared to others, and note that race still appears to be less relevant to children at the earlier ages. We also point to the potential role of environmental input and children's own experiences in guiding behavior.

Next we look at research on how children use their own preferences to make inferences about others; we will see that gender and ethnicity play a role, but these may be specific instantiations of a more general influence of the self on social perception because the results also obtain for minimal groups. We further examine experiments utilizing novel properties, thus allowing us to look at how category-based inductions occur when children's own personal preferences are immaterial to the task. These studies concern the role of social categories relative to personality characteristics in drawing inferences, as well as the effect of physical appearance with and without verbal labeling on drawing category-based induction.

Third, we examine preferences based on group membership, with many studies involving tasks similar to those used with adults (e.g., Implicit Association Test [IAT], memory tasks) and focusing on language, race, gender, and status. In studies using minimal groups, we show that just as in research with adults, even arbitrarily created groups shape in-group favoritism. Some of the factors influencing group bias in this context are physical markers, verbal labels, and status.

Finally, we report on a social preference that is not based on the usual demographic properties, which have been the mainstay of this research, but rather studies how children treat others who they learn are fortunate or not. These studies demonstrate how simple a model of social preference exists in young children – those who are lucky are good.

Imitation and modeling

In the previous section we learned that language serves as an important social cue to infants as they accept objects more from those who sound familiar. Tracking the developmental course of this preference, preschooler's sensitivity to accent as a social group marker was investigated by presenting participants with two distinct ways of manipulating novel objects, each demonstrated either by a person who previously spoke English with a native accent or with a foreign (Spanish)

accent. Monolingual English-speaking children endorsed the object function shown by the native English-speaking model, thus providing further evidence for continuous sensitivity to accent across different ages and context (Kinzler, Corriveau, & Harris, 2011).

Three-year-old children have been shown to spontaneously use social category information to infer their *own* preferences for novel objects and activities (Shutts, Banaji, & Spelke, 2010). Participants were introduced to still images of people differing in gender, race, or age and each member of the pair endorsed a different object or activity unfamiliar to the child. Despite never verbally labeling or highlighting the social distinctions, children went along with the preferences indicated by same-gender and same-age characters, but did not show a consistent pattern of responding based on race cues. These findings fit with other research on social categories' relative perceptual salience, which suggests that gender might be most prominent, followed by race and age (McGraw, Durm, & Durnam, 1989).

A strong demonstration of the influence of early gender identification on the maintenance of gender-based cultural stereotypes has recently been provided by Cvencek and colleagues (Cvencek, Meltzoff, & Greenwald, 2011b). Using both explicit and implicit measures they show that already by school age, boys and girls perceive math as being "for boys." Furthermore, boys (compared to girls) showed greater self-identification with a character that liked math, and showed a stronger association between "self" and math on an IAT.

Further evidence of preschool children's use of gender as a guide to one's own behavior was observed in their selective same-sex modeling of distinct physical movements produced by male and female actors. A follow-up experiment using the same paradigm further revealed preferential same-age imitation when children and adults demonstrated distinct actions. Finally, the authors were able to show that priming one or the other social category (age or gender) led to the primed category having priority on who children chose to imitate, suggesting that the hierarchy of social categories is malleable and dictated to some extent by environmental input (Grace, David, & Ryan, 2008).

While superior imitation of peers relative to adults has been shown as early as 14 months of age (Ryalls, Gul, & Ryalls, 2000), it has also been established that the *type* of knowledge preschoolers are seeking determines who they turn to for information. For example, when pondering why a certain food item is nutritional versus how to play with an unfamiliar toy, children as young as 3 will direct food questions to adults and toy questions

to peers (VanderBorghet & Jaswal, 2009). These studies do not only show the ability of the preschooler's social apparatus to absorb contextual information: the self serves as an anchor for what is appropriate behavior, but if the environment privileges another type of model or if experience suggests that expertise lies elsewhere, 3-year-olds mold their behavior accordingly.

Perceiving others

Thus far we have described the use of social category information in the service of learning or acquiring information relevant to the self; however, children are also remarkably good at drawing inferences about unfamiliar others based on their social group membership. In some cases, the self is the basis for predictions about others. For example, in a theoretically complementary study to Shutts et al. (2010), a positive correlation between children's own preferences for novel, gender-neutral toys and their predictions for how much same-gender peers would like those same toys was observed (Martin, Eisenbud, & Rose, 1995). In a similar manner, Lam and Leman (2009) found a positive correlation between children's preferences for unfamiliar food items and their predictions of whether other children from their own ethnic group would like those same foods. No relationship was found when asked to predict the preferences of peers belonging to an ethnic out-group.

We see evidence of children projecting the self even upon minimally created groups. When children (aged 5–11) were randomly assigned to "blue" or "red" teams, perceptions of their own academic and athletic competence were highly correlated with their predictions of in-group success in these domains, only 24 hours after group assignment (Patterson, Bigler, & Swann, 2010).

When subjects' personal preferences or abilities are entirely removed from the test setting, category-based inductions still arise. Diesendruck and haLevi (2006) tested which of many social group dimensions (gender, social class, religiosity, and ethnicity) or individual information (i.e., the person's personality) would rise to the top when kindergartners needed to attribute novel preferences and behaviors to different characters. While, generally, children used social category information much more than personality traits to make their inferences, ethnicity (Jewish/Arabic) and social status (rich/poor) emerged as particularly strong inductive bases. The authors ascribe this finding to the current cultural discourse in Israel, where the study was conducted. An important follow-up study established that verbal labels were the crucial factor in guiding children's deci-

sions, much more than physical similarity. When social category and personality information were conveyed only verbally (without any physical markers), children still relied on social categories, and particularly on ethnicity, more than the character's personality when drawing inferences (Diesendruck & haLevi, 2006).

Furthermore, in a recent study, Waxman (2010) gauged children's inductive inferences *only* when physical appearance cues were present, and tested the effect of adding verbal labels. She hypothesized that much like naming in the object domain (e.g. Waxman & Markow, 1995), labeling people would enable children to identify commonalities among them, and to form distinct categories (Waxman, 2010). Specifically, 4-year-olds were shown a target picture (e.g. a White woman), which was either described using a novel social group marker (e.g. "This one is a *Wayshyan*"), or a general statement (e.g. "This one *eats big lunches*"). A novel property was then attributed to the target (e.g. likes to go *glaving*), and participants were asked to judge which of a series of test photographs shared this novel property. In one version of the task the test items were pictures of people who matched the gender of the target but differed on race (e.g. Black and White females) and in a second version test items matched the target on race but differed on gender (e.g. White males and females). In both versions test items also included pictures of non-human animals. Results showed that labels enhanced group-based inductions. In the race condition, when no social category marker was given, generalization of the novel property was very broad and encompassed all people (irrespective of race), but excluded non-human animals. However, once group membership was highlighted via labeling, children extended the novel property exclusively to other exemplars of the same race as the target. Interestingly, in the gender condition, even when no label was provided, gender-matching inductions still arose, but this effect became significantly stronger after labeling. Waxman (2010) explains the baseline gender finding as indicative of preschooler's already-developing sensitivity to gender categories, perhaps due to the ample labeling of gender that is already occurring in children's daily life.

Taken together, the evidence thus far suggests that preschool children will readily make inferences based on gender, ethnicity, and age; they will privilege social category information over personality traits as the basis for predictions about novel individuals, and their inductions are strongly influenced by labels for social groups. More generally, this pattern of results has been treated as evidence for "psychological essentialism" (Gelman, 2003; Medin & Ortony, 1989), suggesting that children

even at this young age see members of certain social categories as sharing unobservable intrinsic properties, assuming that they are likely innate and stable over time, and denoting “distinct kinds of people” (Waxman, 2010). (For further discussion of this issue and how it relates to the categories of race and gender, see Gil-White, 2001; Hirschfeld, 1995; Taylor, 1996; Taylor, Rhodes, & Gelman, 2009.)

Us and them

So far we have considered how social group categories guide children’s behaviors, preferences, and inductions, and have left the question of group evaluation untouched. However, there is ample evidence of own-group preference, especially in the domains of race and gender (e.g. Black-Gutman & Hickson, 1996; McGlothlin & Killen, 2010; Powlisha, Serbin, Doyle, & White, 1994; Yee & Brown, 1994). Children’s playmate selections have often provided evidence for own-group affiliations (e.g. Aboud, Mendelson, & Purdy, 2003; Fishbein & Imai, 1993; Graham & Cohen, 1997; Martin & Fabes, 2001; Martin, Fabes, Evans, & Wyman, 1999).

Recently, testing friendship preferences in White English-speaking 5-year-olds, Kinzler and colleagues (Kinzler, Shutts, DeJesus, & Spelke, 2009) found preferential selection of native-language speakers over foreign-language (French) speakers and foreign-accented speakers (French-accented English). Furthermore, when no language information was given, children chose White as opposed to Black targets as their friends; however, when race and language were put in conflict such that the own-race target spoke with a foreign accent, while the other-race target spoke in familiar English, children showed language-based preference, indicating that, in parallel to the findings with 10-month-old infants, language similarity seems to be more important than race similarity.

In another example, Asian children 3–11 years of age were asked: “Who would you like to play with?” in reference to three photographs of an Asian, a White, and a Black child matched for subjects’ gender (Kowalski & Lo, 2001). While, as expected, significantly more Asian selections were evident, a couple of additional findings are worth noting. First, the authors ran two trials in which the target photographs were presented and children were instructed to select the one that looks most like them. Across all ages the Asian photograph was selected significantly more often than chance, and an increase in correct responses with age was also observed. Importantly, whether this self-identification task was administered

before or after children made their playmate choices had an influence on the results. Specifically, children who were asked to self-identify at the beginning of the study produced Asian playmate choices more often (when the target photographs were not labeled) than children who received the self-identification task last, presumably due to the increased salience of group membership. In a related manner, Bigler (1995) has shown that the functional use of gender categories in the classroom increases gender stereotyping in elementary school children, particularly those who have low classification skills (see also Hilliard & Liben, 2010 for equivalent findings with even younger children).

Kowalski and Lo (2001) additionally observed that the *least* own-race playmate selections were made in the oldest age group tested, 10–11-year-olds (for similar findings on reduction of bias across age, see Aboud, 1988; Powlisha et al., 1994). This may be due to increased awareness of social norms requiring suppression of biased responses (Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008; Rutland, Cameron, Milne, & McGeorge, 2005) or perhaps increased attention to individual characteristics (Kowalski & Lo, 2001).

The automaticity of us and them

Measures of implicit attitudes allow us to overcome the demand characteristics described above and, in fact, reveal no reduction in intergroup bias with age. For example, using a child version of the Implicit Association Test (Ch-IAT), Baron and Banaji (2006) showed that implicit pro-White/anti-Black attitudes were identical in magnitude in their White 6-year-old and adult participants. Moreover, a gradual dissociation between the implicit task and an explicit preference task was observed; when asked which of two targets (differing on race) they preferred, 6-year-olds selected the White target 84% of the time, a preference that was attenuated at age 8 (with 68% own-race selection), and completely non-existent in adulthood.

In contrast, the same Ch-IAT comparing own-race to a *high-status* out-group in two different populations (American and Japanese) revealed a lack of implicit racial bias in adults. At age 6, children’s in-group preference was equally strong, irrespective of out-group status, but by the age of 10, sensitivity to status seems to be visible as the magnitude of children’s implicit own-race bias was greater for low- compared to high-status groups (Dunham, Baron, & Banaji, 2006). In line with this result, Hispanic children (tested in the United States where they are a relatively disadvantaged minority) exhibited implicit pro-Hispanic attitudes only when

the comparison group was another disadvantaged out-group (African Americans), and not when compared to the White majority. Responses on the explicit preference measure again diverged from the implicit findings as children exhibited an in-group bias irrespective of the comparison out-group (Dunham, Baron, & Banaji, 2007).

Until recently, the IAT was limited to data collection on adults and on children approximately 6 years of age. To assess the preferences of younger children, Dunham and Banaji (2008) adapted a task established in previous research with adults by Hugenberg and Bodenhausen (2004) that even a 3-year-old could perform. Participants were shown ambiguous race faces (intermediate between Black and White) displaying happy and angry facial expressions, and their task was to answer the question: Is this face like this one (pointing to an unambiguously Black face) or like this one (pointing to an unambiguously White face)? Racially ambiguous angry faces were more often categorized as Black than White if the child was able to categorize unambiguous faces by race. These results show how prepared the mind is to make “us and them” distinctions, and that in-group preference is visible just as soon as intergroup categorization is possible. Such studies also potentially explain recently discussed findings (e.g. Kowalski & Lo, 2001; Waxman, 2010), as presumably the processes of labeling and self-categorization in those studies enhanced children’s attention to the relevant category distinctions, which then automatically enabled them to make inductions and preference choices based on those categories.

Implicit racial stereotypes have also been revealed using tasks requiring recall of information, with young children generally remembering stereotypical descriptions better than counter-stereotypical descriptions of targets differing in race (e.g., Bigler & Liben, 1993). In one particularly strong example of top-down effects pertaining to *face* memory, young White children were shown ambiguous race target faces that were constructed by morphing a Black face with a White face. During the task, the ambiguous race target face was named and introduced as the sibling of either the Black or the White face that was used in its construction. Immediately after, children were presented with a test slide displaying the target paired with a distractor (a different Black/White morphed face) and were asked to point to the target. Results revealed that faces paired with their White “sibling” were remembered significantly more often (Shutts & Kinzler, 2007).

Encoding of gender follows the same pattern, with children remembering stereotypical information more accurately (Koblinsky, Cruse, & Sugawara, 1978; Martin & Halverson, 1983; Signorella &

Liben, 1984: for a review, see Signorella, Bigler, & Liben, 1997), and recently it has been shown using the Preschool IAT that by the age of 4, children already display implicit gender attitudes which mimic the adult data, with girls showing a stronger implicit own-gender bias compared to boys (Cvencek, Greenwald, & Meltzoff, 2011a).

Minimal groups

In addition to race, gender, and language, children consistently exhibit in-group preferences even when groups are arbitrarily created. For example, one study (Bigler, Jones, & Lobliner, 1997) manipulated the functional use of social grouping in summer school classrooms of 6–9-year-olds by assigning children to either a “yellow” or “blue” group marked by T-shirt color. In the experimental conditions, teachers regularly referred to the two color groups when organizing the class (e.g. lining up by T-shirt color). In the control condition, children wore colored T-shirts but these were ignored by the teacher. After 4 weeks intergroup attitudes were evaluated, and findings showed that children in the experimental conditions (but not in the control condition) attributed more positive traits to members of the in-group and negative traits to the out-group, perceived the two color groups as more dissimilar from each other, and members of each group as more similar to each other. Despite the visual salience of T-shirt color in the control condition, group bias did not arise, presumably because group membership was irrelevant for classroom functioning (for comparison, see Patterson & Bigler, 2006 with 3–5-year-old subjects showing some in-group bias in the control condition).

Dunham and colleagues (Dunham, Baron, & Carey, 2011) replicated these findings using a much more stringent minimal group paradigm. In their experimental session, 5-year-old subjects were individually tested, randomly assigned to an explicitly labeled color group, given a matching colored T-shirt, and asked to make judgments about target own- and out-group members presented on a computer screen. Adopting these stringent criteria revealed greater explicit liking of own-group members over out-group targets, an own-group preference in resource allocation, as well as a strong implicit own-group bias as measured by the Ch-IAT (which in turn correlated with attribution of positive behavior to the in-group). Significantly weaker effects were found when the colored shirts were described but not referred to as markers of group membership. A final experiment revealed biased memorization even using this minimal manipulation, such that positive information was better recalled when it was attributed to the in-group compared to the out-group.

Similarly, Bigler and her colleagues (Bigler, Brown, & Markell, 2001) randomly assigned group status based on T-shirt color (blue or yellow). In both experimental conditions group status was implicitly conveyed via posters depicting novel group members and their various achievements (e.g., pictures of the winners of an athletic contest, the majority of whom were wearing yellow shirts). Reference to these posters was only made once on the first day of school. The teachers then either avoided emphasizing group membership throughout the study, or made functional use of group labels in addition to displaying the posters. Evaluation of group bias after 4 weeks indicated that only children assigned to a *high-status* group in this latter experimental condition displayed in-group favoritism, while children in the low-status group did not (an effect which was significantly stronger in the younger participants). No preference was observed in either status group when only posters were displayed, again indicating that visual information alone is not sufficient for intergroup attitudes to arise.

Children will also judge others based on criteria that might not mark group boundaries so explicitly in adults. An example of this comes from studies on luck preference (Olson, Banaji, Dwek, & Spelke, 2006; Olson, Dunham, Dwek, Spelke, & Banaji, 2008). Specifically, 5–7-year-old children liked others who experienced an uncontrollable positive event (e.g., finding \$5 on the sidewalk) significantly more than those who experienced an uncontrollable negative event (e.g., being rained on while walking to school).

Moreover, mere group membership will produce these effects, such that a novel individual who belongs to a group (marked by T-shirt color) whose members mostly experienced lucky events will be preferred to a novel member of a group that mostly experienced unlucky events, despite never hearing any specific information about the target (Olson et al., 2006). Further testing has produced evidence for the luck preference cross-culturally (in Japanese children), and in children as young as 3 years of age. Also, children not only believe that an unlucky person is more likely to later perform an *intentional* bad action but also predict that the sibling of someone who experienced an uncontrollable negative event is more likely to perform an intentional bad action (Olson et al., 2008).

CONCLUSION

Returning to the questions presented at the outset, we have learned from studies on the social cognition capacities of infants that group-based

preferences develop early – gender and race preference by 3 months of age, age preference by 4 months, and language preference by 6 months. These social group preferences are, in most cases, shaped by the predominant environmental input (with the possible exception of age), and do not appear to need extensive intergroup interaction in order to emerge. Now that these preferences have been uncovered, research has turned to determining what drives the looking-time findings, and whether some group distinctions are more significant to infants than others. Future research will better characterize the natural developmental trajectories of these preferences later on in infancy, and study their malleability, for example, by exposing infants to unfamiliar group members even after a preference has been established.

Studies of categorization – the ability of an infant to recognize that all instances of group X belong to a single set which is distinct from set Y – have been conducted with older infants, showing the ability to categorize age by 4 months, race by 9 months, and an asymmetry in the emergence in infants' gender categories. As in the case with preferences, it is yet unclear whether these categories are solely perceptually driven or whether they are conceptual and could promote further inferences about the individual exemplars within a set, and as such these questions will benefit from future research. Furthermore, there remains a theoretically important question of the relationship between categorization and preference formation: Is this a two-step process, or do preferences co-occur with the formation of categories? The early years provide a natural place to test this question about the intertwining of perceptual and affective learning and development.

As infants turn into toddlers and young children, their social interactions multiply, and begin to involve a greater number of social groups. Groups that had no relevance early in life such as class, ethnicity, and religion now become markers of one's own group membership within the hierarchy of groups in the larger social world. In addition, the greater cognitive and social abilities present in young children allow a variety of measures to be used that rely on language using both self-report as well as implicit measures of cognition. From the early years of childhood we know that some of the preferences observed on more basic measures like looking time in infancy continue on the same path in early childhood (e.g., age preference). In addition, childhood also provides information that us–them divides that are so much an explicit part of adult life, are present early in life. Unlike measures of looking time, we know, for instance, from measures of actual interpersonal approach and choice behavior that these are true forms of preference. On the other hand,

looking-time preferences on some dimensions like race in infancy do not seem to show continuity in childhood, supporting evolutionary accounts of race as an arbitrary category. Among the most striking effects seen in early childhood is the role that language plays in taking otherwise irrelevant social categories and turning them into meaningful ones that seem to be rich in inference. When labels are used to categorize groups, young children show implicit preferences that are similar to those of adults, a surprising result given assumptions that sustained experience over development is necessary input to the development of implicit intergroup attitudes.

Although the question of how much social cognition represents a domain of core knowledge remains open, the research reviewed here makes it clear that social cognition as it pertains to discriminating, recognizing, and forming attitudes toward individuals as members of social groups is visible in the earliest days and months after birth and unfolds along the dimensions of familiarity and similarity to self in the early years. As the globe shrinks socially, so much of adult social life requires being able to cut across group boundaries both for work and for assuring personal happiness. It is clear that people who differ from us in nationality, language, race, and age are ones we interact with, learn from, grow to love, and work with. Yet shaking off group distinctions, even when adult humans wish to do so, and even when such shaking off is in our individual and group interest, is difficult perhaps because it is such an entrenched aspect of social development. To do so, as the growing new context of modern social life demands, seems to be a task for conscious, adult minds.

ACKNOWLEDGMENT

We thank Steve Lehr and Susan Fiske for valuable feedback on an early draft. The writing of this chapter was supported by the E. J. Safra Center for the Study of Ethics at Harvard University.

REFERENCES

- Aboud, F.E. (1988). *Children and prejudice*. New York: Blackwell.
- Aboud, F.E., Mendelson, M.J., & Purdy, K.T. (2003). Cross-race peer relations and friendship quality. *International Journal of Behavioral Development, 27*(2), 165–173.
- Anastasi, J.S., & Rhodes, M.G. (2005). An own-age bias in face recognition for children and older adults. *Psychonomic Bulletin and Review, 12*(6), 1043–1047.
- Anzures, G., Quinn, P.C., Pascalis, O., Slater, A.M., & Lee, K. (2009). Categorization, categorical perception, and asymmetry in infants' representation of face race. *Developmental Science, 13*(4), 553–564.
- Apfelbaum, E.P., Pauker, K., Ambady, N., Sommers, S.R., & Norton, M.I. (2008). Learning (not) to talk about race: When older children underperform in social categorization. *Developmental Psychology, 44*(5), 1513–1518.
- Bahrack, L.E., Netto, D., & Hernandez-Reif, M. (1998). Intermodal perception of adult and child faces and voices by infants. *Child Development, 69*(5), 1263–1275.
- Bahrack, L.E., & Pickens, J.N. (1988). Classification of bimodal English and Spanish language passages by infants. *Infant Behavior and Development, 11*, 277–296.
- Baillargeon, R., Scott, R.M., & He, Z. (2010). False-belief understanding in infants. *Trends in Cognitive Sciences, 14*(3), 110–118.
- Banaji, M.R., & Gelman, S.A. (in press). *Navigating the social world: The early years*. Oxford, UK: Oxford University Press.
- Bar-Haim, Y., Ziv, T., Lamy, D. & Hodes, R.M. (2006). Nature and nurture in own-race face processing. *Psychological Science, 17*(2), 159–163.
- Baron, A.S., & Banaji, M.R. (2006). The development of implicit attitudes: Evidence of race evaluations from ages 6 and 10 and adulthood. *Psychological Science, 17*(1), 53–58.
- Bernstein, M.J., Young, S.G., & Hugenberg, K. (2007). The cross-category effect: Mere social categorization is sufficient to elicit an own-group bias in face recognition. *Psychological Science, 18*(8), 706–712.
- Bigelow, A., MacLean, J., Wood, C., & Smith, J. (1990). Infants' responses to child and adult strangers: An investigation of height and facial configuration variables. *Infant Behavior and Development, 13*, 21–32.
- Bigler, R.S. (1995). The role of classification skill in moderating environmental influences on children's gender stereotyping: A study of the functional use of gender in the classroom. *Child Development, 66*, 1072–1087.
- Bigler, R.S., Brown, C.S., & Markell, M. (2001). When groups are not created equal: Effects of group status on the formation of intergroup attitudes in children. *Child Development, 72*(4), 1151–1162.
- Bigler, R.S., Jones, L.C., & Lobliner, D.B. (1997). Social categorization and the formation of intergroup attitudes in children. *Child Development, 68*(3), 530–543.
- Bigler, R.S., & Liben, L.S. (1993). A cognitive-developmental approach to racial stereotyping and reconstructive memory in Euro-American children. *Child Development, 64*, 1507–1518.
- Black-Gutman, D., & Hickson, F. (1996). The relationship between racial attitudes and social-cognitive development in children: An Australian study. *Developmental Psychology, 32*(3), 448–456.
- Bosch, L., & Sebastián-Gallés, N. (1997). Native language recognition abilities in 4-month-old infants from monolingual and bilingual environments. *Cognition, 65*, 33–69.
- Brooks, J., & Lewis, M. (1976). Infants' responses to strangers: Midget, adult, and child. *Child Development, 47*, 323–332.

- Byers-Heinlein, K., Burns, T.C., & Werker, J.F. (2010). The roots of bilingualism in newborns. *Psychological Science*, 21(3), 343–348.
- Chiroro, P., & Valentine, T. (1995). An investigation of the contact hypothesis of the own-race bias in face recognition. *The Quarterly Journal of Experimental Psychology*, 48A(4), 879–894.
- Cornell, E.H. (1974). Infants' discrimination of photographs of faces following redundant presentations. *Journal of Experimental Child Psychology*, 18, 98–106.
- Cvencek, D., Greenwald, A.G., & Meltzoff, A.N. (2011a). Measuring implicit attitudes of 4-year-olds: The Preschool Implicit Association Test. *Journal of Experimental Child Psychology*, 109, 187–200.
- Cvencek, D., Meltzoff, A.N., & Greenwald, A.G. (2011b). Math-gender stereotypes in elementary school children. *Child Development*, 82(3), 766–779.
- Diesendruck, G., & haLevi, H. (2006). The role of language, appearance, and culture in children's social category-based inductions. *Child Development*, 77(3), 539–553.
- Dunham, Y., & Banaji, M.R. (2008). *Invariance of intergroup attitudes across the lifespan*. Unpublished manuscript, Harvard University.
- Dunham, Y., Baron, A.S., & Banaji, M.R. (2006). From American city to Japanese village: A cross-cultural investigation of implicit race attitudes. *Child Development*, 77(5), 1268–1281.
- Dunham, Y., Baron, A.S., & Banaji, M.R. (2007). Children and social groups: A developmental analysis of implicit consistency in Hispanic Americans. *Self and Identity*, 6, 238–255.
- Dunham, Y., Baron, A.S., & Carey, S. (2011). Consequences of "minimal" group affiliations in children. *Child Development*, 82(3), 793–811.
- de Haan, M., Johnson, M.H., Maurer, D., & Perrett, D.I. (2001). Recognition of individual faces and average face prototypes by 1- and 3-month-old infants. *Cognitive Development*, 16, 659–678.
- de Heering, A., de Liedekerke, C., Deboni, M., & Rossion, B. (2010). The role of experience during childhood in shaping the other-race effect. *Developmental Science*, 13(1), 181–187.
- Elliott, E.S., Wills, E.J., & Goldstein, A.G. (1973). The effects of discrimination training on the recognition of white and oriental faces. *Bulletin of the Psychonomic Society*, 2(2), 71–73.
- Farroni, T., Johnson, M.H., Menon, E., Zulian, L., Faraguna, D., & Csibra, G. (2005). Newborns' preference for face-relevant stimuli: Effects of contrast polarity. *Proceedings of the National Academy of Sciences*, 102(47), 17245–17250.
- Ferguson, K.T., Kulkofsky, S., Cashon, C.H., & Casasola, M. (2009). The development of specialized processing of own-race faces in infancy. *Infancy*, 14(3), 263–284.
- Fishbein, H.D., & Imai, S. (1993). Preschoolers select playmates on the basis of gender and race. *Journal of Applied Developmental Psychology*, 14, 303–316.
- Gelman, S. A. (2003). *The essential child: Origins of essentialism in everyday thought*. New York : Oxford University Press.
- Gergely, G., Bekkering, H., & Király, I. (2002). Rational imitation in preverbal infants. *Nature*, 415(6873), 755.
- Gil-White, F.J. (2001). Are ethnic groups biological "species" to the human brain? Essentialism in our cognition of some social categories. *Current Anthropology*, 42(4), 515–554.
- Grace, D.M., David, B.J., & Ryan, M.K. (2008). Investigating preschoolers' categorical thinking about gender through imitation, attention, and the use of self-categories. *Child Development*, 79(6), 1928–1941.
- Graham, J.A., & Cohen, R. (1997). Race and sex as factors in children's sociometric ratings and friendship choices. *Social Development*, 6(3), 355–372.
- Greenberg, D.J., Hillman, D., & Grice, D. (1973). Infant and stranger variables related to stranger anxiety in the first year of life. *Developmental Psychology*, 9(2), 207–212.
- Hamlin, J.K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature*, 450, 557–559.
- Hayden, A., Bhatt, R.S., Joseph, J.E., & Tanaka, J.W. (2007). The other-race effect in infancy: Evidence using a morphing technique. *Infancy*, 12(1), 95–104.
- Hilliard, L.J., & Liben, L.S. (2010). Differing levels of gender salience in preschool classrooms: Effects on children's gender attitudes and intergroup bias. *Child Development*, 81(6), 1787–1798.
- Hirschfeld, L.A. (1995). Do children have a theory of race? *Cognition*, 54, 209–252.
- Hugenberg, K., & Bodenhausen, G.V. (2004). Ambiguity in social categorization: The role of prejudice and facial affect in race categorization. *Psychological Science*, 15(5), 342–345.
- Johnson, M.H., Dziurawiec, S., Ellis, H., & Morton, J. (1991). Newborns' preferential tracking of face-like stimuli and its subsequent decline. *Cognition*, 40, 1–19.
- Johnson, S., Slaughter, V., & Carey, S. (1998). Whose gaze will infants follow? The elicitation of gaze following in 12-month-olds. *Developmental Science*, 1(2), 233–238.
- Kelly, D.J., Liu, S., Ge, L., Quinn, P.C., Slater, A.M., Lee K., et al. (2007a). Cross-race preferences for same-race faces extend beyond the African versus Caucasian contrast in 3-month-old infants. *Infancy*, 11(1), 87–95.
- Kelly, D.J., Liu, S., Lee, K., Quinn, P.C., Pascalis, O., Slater, A.M., et al. (2009). Development of the other-race effect during infancy: Evidence toward universality? *Journal of Experimental Child Psychology*, 104, 105–114.
- Kelly, D.J., Quinn, P.C., Slater, A.M., Lee, K., Ge, L., & Pascalis, O. (2007b). The other-race effect develops during infancy: Evidence of perceptual narrowing. *Psychological Science*, 18(12), 1084–1089.
- Kelly, D.J., Quinn, P.C., Slater, A.M., Lee, K., Gibson, A., Smith, M., et al. (2005). Three-month-olds, but not newborns, prefer own-race faces. *Developmental Science*, 8(6), F31–F36.
- Kinzler, K.D., Corriveau, K.H., & Harris, P.L. (2011). Children's selective trust in native-accented speakers. *Developmental Science*, 14(1), 106–111.
- Kinzler, K.D., Dupoux E., & Spelke, E.S. (2007). The native language of social cognition. *Proceedings of the National Academy of Sciences*, 104(30), 12577–12580.

- Kinzler, K.D., Shutts, K., & Correll, J. (2010). Priorities in social categories. *European Journal of Social Psychology, 40*, 581–592.
- Kinzler, K.D., Shutts, K., DeJesus, J., & Spelke, E.S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27*(4), 623–634.
- Kinzler, K.D., & Spelke, E.S. (2011). Do infants show social preferences for people differing in race? *Cognition, 119*, 1–9.
- Koblinsky, S.G., Cruse, D.F., & Sugawara, A.I. (1978). Sex role stereotypes and children's memory for story content. *Child Development, 49*, 452–458.
- Koenig, M.A., & Harris, P.L. (2005). The role of social cognition in early trust. *Trends in Cognitive Sciences, 9*(10), 457–459.
- Kowalski, K., & Lo, Y.-F. (2001). The influence of perceptual features, ethnic labels, and sociocultural information on the development of ethnic/racial bias in young children. *Journal of Cross-Cultural Psychology, 32*(4), 444–455.
- Lam, V., & Leman, P. (2009). Children's gender- and ethnicity-based reasoning about foods. *Social Development, 18*(2), 478–496.
- Leinbach, M.D., & Fagot, B.I. (1993). Categorical habituation to male and female faces: Gender schematic processing in infancy. *Infant Behavior and Development, 16*, 317–332.
- Levin, D.T. (2000). Race as a visual feature: Using visual search and perceptual discrimination tasks to understand face categories and the cross-race recognition deficit. *Journal of Experimental Psychology, 129*(4), 559–574.
- Levy, G.D., & Haaf, R.A. (1994). Detection of gender-related categories by 10-month-old infants. *Infant Behavior and Development, 17*, 457–459.
- Liu, S., Quinn, P.C., Wheeler, A., Xiao, N., Ge, L., & Lee, K. (2011). Similarity and difference in the processing of same- and other-race faces as revealed by eye tracking in 4- to 9-month-olds. *Journal of Experimental Child Psychology, 108*, 180–189.
- Macchi Cassia, V., Kuefner, D., Picozzi, M., & Vescovo, E. (2009a). Early experience predicts later plasticity for face processing: Evidence for the reactivation of dormant effects. *Psychological Science, 20*(7), 853–859.
- Macchi Cassia, V., Picozzi, M., Kuefner, D., & Casati, M. (2009b). Why mix-ups don't happen in the nursery: Evidence for an experience-based interpretation of the other-age effect. *The Quarterly Journal of Experimental Psychology, 62*(6), 1099–1107.
- Macchi Cassia, V., Turati, C., & Simion, F. (2004). Can a nonspecific bias toward top-heavy patterns explain newborns' face preference? *Psychological Science, 15*(6), 379–383.
- MacLin, O.H., & Malpass, R.S. (2001). Racial categorization of faces: The ambiguous race face effect. *Psychology, Public Policy, and Law, 7*(1), 98–118.
- Martin, C.L., Eisenbud, L., & Rose, H. (1995). Children's gender-based reasoning about toys. *Child Development, 66*, 1453–1471.
- Martin, C.L., & Fabes, R.A. (2001). The stability and consequences of young children's same-sex peer interactions. *Developmental Psychology, 37*(3), 431–446.
- Martin, C.L., Fabes, R.A., Evans, S.M., & Wyman, H. (1999). Social cognition on the playground: Children's beliefs about playing with girls versus boys and their relations to sex segregated play. *Journal of Social and Personal Relationship, 16*(6), 751–771.
- Martin, C.L., & Halverson, C.F. (1983). The effects of sex-typing schemas on young children's memory. *Child Development, 54*, 563–574.
- McCall, R.B., & Kennedy, C.B. (1980). Attention of 4-month infants to discrepancy and babyishness. *Journal of Experimental Child Psychology, 29*, 189–201.
- McGlothlin, H., & Killen, M. (2010). How social experience is related to children's intergroup attitudes. *European Journal of Social Psychology, 40*, 625–634.
- McGraw, K.O., Durm, M.W., & Durnam, M.R. (1989). The relative salience of sex, race, age, and glasses in children's social perception. *Journal of Genetic Psychology, 150*(3), 251–267.
- Medin, D., & Ortony, A. (1989). Psychological essentialism. In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning* (pp. 179–195). New York: Cambridge University Press.
- Mehler, J., Jusczyk, P., Lambertz, G., Halsted, N., Bertoincini, J., & Amiel-Tison, C. (1988). A precursor of language acquisition in young infants. *Cognition, 29*, 143–178.
- Meissner, C.A., & Brigham, J.C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology, Public Policy, and Law, 7*(1), 3–35.
- Melinder, A., Gredebäck, G., Westerlund, A., & Nelson, C.A. (2010). Brain activation during upright and inverted encoding of own- and other-age faces: ERP evidence for an own-age bias. *Developmental Science, 13*(4), 588–598.
- Meltzoff, A.N., & Moore, M.K. (1977). Imitation of facial and manual gestures by human neonates. *Science, 198*(4312), 75–78.
- Moon, C., Cooper, R.P., & Fifer W.P. (1993). Two-day-olds prefer their native language. *Infant Behavior and Development, 16*, 495–500.
- Olson, K.R., Banaji M.R., Dweck, C.S., & Spelke E.S. (2006). Children's biased evaluations of lucky versus unlucky people and their social groups. *Psychological Science, 17*(10), 845–846.
- Olson, K.R., Dunham, Y., Dweck, C.S., Spelke, E.S., & Banaji M.R. (2008). Judgments of the lucky across development and culture. *Journal of Personality and Social Psychology, 94*(5), 757–776.
- Pascalis, O., de Haan, M. & Nelson, C.A. (2002). Is face processing species-specific during the first year of life? *Science, 296*, 1321–1323.
- Pascalis, O., & de Schonen, S. (1994). Recognition memory in 3- to 4-day-old human neonates. *NeuroReport, 5*, 1721–1724.
- Pascalis, O., Scott, L.S., Kelly, D.J., Shannon, R.W., Nicholson, E., Coleman, M., et al. (2005). Plasticity of face processing in infancy. *Proceedings of the National Academy of Sciences, 102*(14), 5297–5300.
- Patterson, M.M., & Bigler R.S. (2006). Preschool children's attention to environmental messages about groups: Social

- categorization and the origins of intergroup bias. *Child Development*, 77(4), 847–860.
- Patterson, M.M., Bigler, R.S., & Swann, W.B. (2010). When personal identities confirm versus conflict with group identities: Evidence from an intergroup paradigm. *European Journal of Social Psychology*, 40, 652–670.
- Pezdek, K., Blandon-Gitlin, I., & Moore, C. (2003). Children's face recognition memory: More evidence for the cross-race effect. *Journal of Applied Psychology*, 88(4), 760–763.
- Powlishta, K.K., Serbin, L.A., Doyle, A.-B., & White, D.R. (1994). Gender, ethnic, and body type biases: The generality of prejudice in childhood. *Developmental Psychology*, 30(4), 526–536.
- Quinn, P.C., Uttley, L., Lee, K., Gibson, A., Smith, M., Slater, A.M., et al. (2008). Infant preference for female faces occurs for same- but not other-race faces. *Journal of Neuropsychology*, 2, 15–26.
- Quinn, P.C., Yahr, J., Kuhn, A., Slater, A.M., & Pascalis O. (2002). Representation of the gender of human faces by infants: A preference for female. *Perception*, 31, 1109–1121.
- Ramsey, J.L., Langlois, J.H., & Marti, N.C. (2005). Infant categorization of faces: Ladies first. *Developmental Review*, 25, 212–246.
- Ramsey-Rennels, J.L., & Langlois, J.H. (2006). Infants' differential processing of female and male faces. *Current Directions in Psychological Science*, 15(2), 59–62.
- Rennels, J.L., & Davis, R.E. (2008). Facial experience during the first year. *Infant Behavior and Development*, 31, 665–678.
- Rubenstein, A.J., Kalakanis, L., & Langlois, J.H. (1999). Infant preferences for attractive faces: A cognitive explanation. *Developmental Psychology*, 35(3), 848–855.
- Rutland, A., Cameron, L., Milne, A., & McGeorge, P. (2005). Social norms and self-presentation: Children's implicit and explicit intergroup attitudes. *Child Development*, 76(2), 451–466.
- Ryalls, B.O., Gul, R.E., & Ryalls, K.R. (2000). Infant imitation of peer and adult models: Evidence for a peer model advantage. *Merrill-Palmer Quarterly*, 46(1), 188–202.
- Sanefuji, W., Ohgami, H., & Hashiya, K. (2006). Preference for peers in infancy. *Infant Behavior and Development*, 29, 584–593.
- Sangrigoli, S., & de Schonen, S. (2004a). Effect of visual experience on face processing: A developmental study of inversion and non-native, effects. *Developmental Science*, 7(1), 74–87.
- Sangrigoli, S., & de Schonen, S. (2004b). Recognition of own-race and other-race faces by three-month-old infants. *Journal of Child Psychology and Psychiatry*, 45(7), 1219–1227.
- Sangrigoli, S., Pallier, C., Argenti, A.-M., Ventureyra, V.A.G., & de Schonen, S. (2005). Reversibility of the other-race effect in face recognition during childhood. *Psychological Science*, 16(6), 440–444.
- Scott, L.S., & Monesson, A. (2009). The origin of biases in face perception. *Psychological Science*, 20(6), 676–680.
- Scott, L.S., Pascalis, O., & Nelson, C.A. (2007). A domain-general theory of the development of perceptual discrimination. *Current Directions in Psychological Science*, 16(4), 197–201.
- Shutts, K., Banaji, M.R., & Spelke, E.S. (2010). Social categories guide young children's preferences for novel objects. *Developmental Science*, 13(4), 599–610.
- Shutts, K., & Kinzler, K.D. (2007). An ambiguous-race illusion in children's face memory. *Psychological Science*, 18(9), 763–767.
- Shutts, K., Kinzler, K.D. McKee, C.B., & Spelke E.S. (2009). Social information guides infants' selection of foods. *Journal of Cognition and Development*, 10(1–2), 1–17.
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge, UK: Cambridge University Press.
- Signorella, M.L., Bigler, R.S., & Liben, L.S. (1997). A meta-analysis of children's memories for own-sex and other-sex information. *Journal of Applied Developmental Psychology*, 18, 429–445.
- Signorella, M.L., & Liben, L.S. (1984). Recall and reconstruction of gender-related pictures: Effects of attitude, task difficulty, and age. *Child Development*, 55, 393–405.
- Slater, A., Von der Schulenburg, C., Brown, E., Badenoch, M., Butterworth, G., Parsons, S., et al. (1998). Newborn infants prefer attractive faces. *Infant Behavior and Development*, 21, 345–354.
- Spelke, E.S. (2000). Core knowledge. *American Psychologist*, 55(11), 1233–1243.
- Spelke, E.S., Bernier, E., & Skerry, A. (in press). Core social cognition. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: The early years*. New York: Oxford University Press.
- Spelke E.S., & Kinzler, K.D. (2007). Core knowledge. *Developmental Science*, 10(1), 89–96.
- Stahl, J., Wiese, H., & Schweinberger, S.R. (2008). Expertise and own-race bias in face processing: An event-related potential study. *NeuroReport*, 19(5), 583–587.
- Taylor, M.G. (1996). The development of children's beliefs about social and biological aspects of gender differences. *Child Development*, 67, 1555–1571.
- Taylor, M.G., Rhodes M., & Gelman, S.A. (2009). Boys will be boys; cows will be cows: Children's essentialist reasoning about gender categories and animal species. *Child Development*, 80(2), 461–481.
- Turati, C. (2004). Why faces are not special to newborns: An alternative account of the face preference. *Current Directions in Psychological Science*, 13(1), 5–8.
- VanderBorghst, M., & Jaswal, V.K. (2009). Who knows best? Preschoolers sometimes prefer child informants over adult informants. *Infant and Child Development*, 18, 61–71.
- Waxman, S.R. (2010). Names will never hurt me? Naming and the development of racial and gender categories in preschool-aged children. *European Journal of Social Psychology*, 40, 593–610.
- Waxman, S.R., & Markow, D.B. (1995). Words as invitations to form categories: Evidence from 12- to 13-month-old infants. *Cognitive Psychology*, 29, 257–302.

- Werker, J.F., & Tees, R.C. (1984). Cross-language speech perception: Evidence for perceptual reorganization during the first year of life. *Infant Behavior and Development*, *7*, 49–63.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition*, *13*, 103–128.
- Woodward, A.L. (1999). Infants' ability to distinguish between purposeful and non-purposeful behaviors. *Infant Behavior and Development*, *22*(2), 145–160.
- Yee, M., & Brown, R. (1994). The development of gender differentiation in young children. *British Journal of Social Psychology*, *33*, 183–196.