

The Development of Social Group Cognition in Infancy and Childhood

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Introduction

To an adult who possesses the full-blown complexity of social cognitive capacities, the mind of an infant or young child is a curious place. In simply observing their outward behavior, the mental life of an infant or young child appears to be quite different from that of an adult. After all, babies have not yet mastered language, the primary mode of human communication around them, and they have had only limited amounts of experience with the world, especially the social world. That is, because the social world of infants and young children is fixed by their immediate family and culture, infants and children have simply not had direct experience with the vast variation of people and social groups (e.g., gender, race, age, language) that will make up their world as they develop toward adulthood (Sugden et al., 2014).

Empirical evidence only confirms this intuition: infants and young children have qualitatively different ways of seeing and thinking about their world, often humorously so. They bemuse us by perceiving inanimate human-like objects (e.g., statues) as living things, even speaking to the statues as though they were people (Carey, 1985; Jipson & Gelman, 2007). They see accidental behavior to be equally “bad” as behavior that is borne of malicious intent, showing a fundamental lack of concern with intentionality (Margoni & Surian, 2016). And they cannot even tell whether their bodies will fit into a physical space as they try to squeeze themselves into tiny toy houses or cars because they even lack a sense of relative scale (DeLoache et al., 2004). Although they provide us with a source of humor, we are hardly surprised by these observations. They confirm our sense of a system that is limited in its capacity and early in its development.

Yet, over the past several decades, a different story has emerged about the surprisingly early precursors in infant and child cognition. Far though they are from biological and social maturity, infants and children show surprising evidence of a mind that is already sophisticated,

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complex, and well on its way towards the adult form. Indeed, starting in the 1970s, developmental psychologists began questioning the Piagetian view of cognitive development (i.e., discontinuous development) with ingenious experiments that showed surprising *continuities* between how infants, children, and adults conceived of their *physical* surroundings (elaborated below; Spelke, 2000; Spelke & Kinzler, 2007). Is it possible that a similar analytic approach to *social* cognition, just as with physical cognition, will reveal the roots of deeper and more sophisticated social cognition than we have assumed? Although there were early pioneers ahead of their time in this research area (Aboud, 1988; Bigler & Liben, 1992; Killen & Stangor, 2001) there has been a recent burst of experimental and theoretical activity in understanding developmental continuity (and discontinuity) of social group cognition over just the last 15 years. In this chapter, we examine a subset of such research that has focused on how and when infants and children perceive, learn, and evaluate the social groups that are present in their environment as well as less familiar (novel) groups that experimenters introduce to them. The degree to which their behavior resembles the adults of their group is surprising and leads to a new view of the development of social cognition.

We focus on this area of *social group cognition* to maintain a reasonable scope of what can be covered in a single chapter, because coverage of the development of all aspects of social cognition would require an entire volume (see Banaji & Gelman, 2013; as well as individual reviews Dunham & Olson, 2008; Killen & Verkuyten, 2017; Liberman, Woodward, & Kinzler, 2017; Olson & Dweck, 2008; Pomerantz & Newman, 2000; Rutland, Killen, & Abrams, 2010; Rutland et al., 2016). We also focus on social group cognition because it provides a unique instance where infants and children have especially limited direct experience: 96% of the faces infants see are from their own single racial group, 81% of the faces are adults, and 70% of the

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faces are female (Sugden et al., 2014). Despite this lack of exposure to other groups, what does the evidence show? Are infants and children unheeding of variations in social groups or are they somehow prepared to detect and evaluate the presence of social group differences.

The case for developmental continuity and early precursors of knowledge

To evaluate the evidence behind early precursors of social knowledge, we first consider the case study of how developmental researchers have studied infants' and children's knowledge of *the physical world*, specifically their knowledge of objects. Infants are not formally taught explicit principles of objects such as that objects are solid (e.g., you cannot pass your hand through a teacup), continuous (e.g., if a teacup is occluded with a screen, the teacup will continue to exist on the other side of the screen), and obey the laws of gravity (e.g., a teacup cannot balance itself on a fine edge). Yet, initially unexpectedly, infants of even 2 months of age appear to hold such beliefs to be self-evident (Hespos & vanMarle, 2012). These experiments, and the hundreds more that accompanied them, led to the unmistakable conclusion that object understanding must be a core domain of knowledge: we now know it to be an evolutionarily old, even innate, capacity that is widely shared across humans and does not require input from explicit instruction (Spelke, 2000; Spelke & Kinzler, 2007). From that inference, researchers have concluded that the infant mind is far more cognitively prepared than previously assumed.

Early precursors of social group cognition

There is, of course, no reason to assume that the same continuity will be true of *social* cognition and especially *social group* cognition. After all, infants engage with physical objects in visual and tactile ways from the moment of birth. But the categories by which adults demarcate other people (e.g., female and male, elderly and young) are of seemingly less consequence to an infant or child. Yet the data here also suggest that social cognition, much like cognition about

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object, number, or agency, has early ontogenetic roots. As we review, in some cases of social group cognition, the infant or child appears to already be operating in an adult-like manner by drawing on principles of familiarity, similarity, status, and ingroup bonds. To give just a few initial examples: infants at just 2 days old prefer to look to a familiar language speaker over an unfamiliar language speaker (Moon et al., 1993); infants within their first year of life already associate certain high-status groups or ingroups with positive attributes (Pun et al., 2018; Xiao et al., 2018); and children as young as 5 years of age already behave in ways consistent with the dominant cultural stereotypes (e.g., prefer wealthy, high-status groups; Shutts, Brey, Dornbusch, Slywotzky, & Olson, 2016).

What does the presence of such early social cognitive capacities mean? As with object cognition, when we see mental processes in infants or children that imitate the adult form, we can say with greater confidence that the capacity under study, i.e., social group cognition, is a candidate for core knowledge (Spelke & Kinzler, 2007), with possible early and widespread roots in our evolutionary history. As the evidence accumulates, the field will need to adjudicate the truth of this assessment, whether social group cognition is indeed a candidate for core knowledge in the same way as object, space, number, and agency are now regarded to be core aspects of core knowledge. Whichever view is eventually supported, that social group cognition is or is not specifically a part of core knowledge, the enterprise will have been worthwhile because it will have revealed the origins of social group cognition.

In this chapter, we review the burgeoning area of research on infants' and children's social group cognition. We divide the chapter into a review of infants' and children's categorization, attitudes, and stereotypes towards four social groups – gender, race, age, and language – groups that have, thus far, received the most extensive empirical and theoretical

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study. These groups also capture unique variations in the sociocultural features or characteristics of social groups (as we elaborate below), such as whether they are seen to be evolutionarily-relevant or more recently constructed and arbitrary (Sidanius & Pratto, 1999). Ultimately, across these groups, we pay particular attention to how social group cognition unfolds in similar or different ways so as to reveal what underlying features may (and may not) be widely true of how infants and children comprehend their social world.

Studying social group cognition in infancy

Before we dive into the evidence for each of the four social groups, we provide a brief primer on the methods used by cognitive developmentalists to study infant cognition. Of course, researchers cannot simply ask preverbal infants “which group do you prefer? The ones who are light-skinned or the ones who are dark-skinned?”. Nor can they have infants and young children perform a coordinated behavioral task (young infants, after all, cannot reach or even hold their own head up). Instead, scientists have relied on where infants look and for how long, a method known as *looking time* (for a recent review of this method, see Aslin, 2007). In particular, they study: (1) *preferential looking time*, measuring the difference in infants’ looking time between two simultaneously-presented stimuli so as to infer infants’ “preference” (e.g., a preference for female over male faces); and (2) *violation of expectation* or *dishabituation*, measuring the increase in looking time to a single new event so as to infer infants’ “surprise” (e.g., a surprising change from sequentially-presented female faces to a novel male face). Although the interpretation of looking time remains somewhat fraught (Aslin, 2007), measuring where infants look, and for how long, remains the primary method of understanding how preverbal infants organize their social world.

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Below, we draw on looking time studies to examine infants' cognitions about four groups – gender, race, language, and age. We then turn to evidence from children's cognitions about the same four social groups, assessed with methods such as behavioral observations, and child-friendly adaptations of Likert scales, forced choice questions, or Implicit Association Tests.

Gender

Infants. Gender-based divisions of child-care and domestic work versus defending and breadwinning are pervasive and persistent in society (Block et al., 2019; U.S. Bureau of Labor Statistics, 2019), although perhaps less so than previously assumed (Haas et al., 2020). As a result, most infants spend the early months and years of their lives with a female primary caregiver. Indeed, among a sample of infants in Canada, approximately 70% of the faces that infants see in their first 3 months are female faces (Sugden et al., 2014). Infants, both male and female, thus achieve greater familiarity with female faces over male faces (Ramsey-Rennels & Langlois, 2006; Ramsey et al., 2005). Such familiarity may form the basis of early looking preferences: by 3 months of age, infants reliably prefer to look at female over male faces if their primary caregiver was female (e.g., Leinbach & Fagot, 1993; Quinn et al., 2010, 2008; Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002). This result holds even among male infants who prefer looking at female faces, suggesting that looking preference is more strongly guided by familiarity, over and above similarity to one's own gender group. We will return to this point of contrasting similarity and familiarity for groups of race, language, and age.

Of note, we can say with even greater confidence that infants' looking preferences are based on familiarity because the preference for female faces *flips* to a preference for male faces if the infant was raised predominantly by male caregivers. That is, infants with male caregivers show looking preferences for male over female faces (Quinn et al., 2002). Additionally, older

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infants of around 9 months old – an age when infants have accrued more equal experience with male and female faces – no longer have a looking preferences between male and female faces (Liu et al., 2015 but see Kim, Johnson, & Johnson, 2015). It is also notable that these effects of female face preferences hold only for “own race” and not for “other race” faces (Liu et al., 2015; Quinn et al., 2008) showing the specificity of familiarity with female faces may also be confined to only those *racially* familiar faces.

Such consistent looking preferences in infancy may suggest that infants at 3 months have formed a perceptual category of “female faces” that can be distinguished from “male faces”. After all, without these perceptual categories, infants would be looking between female/male faces at chance without any evidence of discriminability between the categories. Yet to be confident in this conclusion, researchers can seek corroborating evidence using *violation of expectation* or *dishabituation* procedures. In such designs, infants are sequentially presented with pictures of people from a single group (e.g., many pictures of female faces) and then presented with a new test picture that is either from the same group (e.g., another female face) or from a new group (e.g., a male face). If infants have formed discrete group categories, they are expected to be more “surprised” (indexed by longer looking times) when the new test picture shifts in category (female followed by male) versus stays within category (female followed by female).

Using the dishabituation procedure, some studies have suggested that infants (as young as 3-4 months, but reliably by 9-12 months) can categorize humans by gender: infants are surprised (i.e., dishabituate) when they see a novel female face after being presented with a series of male faces (Leinbach & Fagot, 1993; Quinn et al., 2002). And yet these same studies also report that infants do *not* look longer (i.e., do not dishabituate) when they see a novel male face after a series of female faces. At first glance, this result is difficult to interpret; a switch from category

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A to B should yield the same result as a switch from B to A. The best explanation at this time is that infants in these studies may be balancing two influences on their looking time behavior.

First, as noted earlier, most infants have a preference for female faces to begin with, resulting in longer baseline looking times. But second, infants also experience an interest in novel faces (in this case, a male face) resulting in longer looking to the male face, but only up to the previous long baseline looking towards the female face. These competing demands, as Quinn, Lee, and Pascalis, (2019) explain, could result in a one-sided dishabituation effect, although the issue remains open for further understanding.

Nevertheless, it seems clear that, at least by 10 months of age, infants have formed a rudimentary concept of females and males as separate groups and can use those groupings to track what females/males are regularly *associated* with in the world. For instance, in an early study by Levy and Haaf (1994), 10-month-old infants viewed just *three* pairings of female faces with female-typed objects (i.e., blow dryer, scarf, frying pan), and three pairings of male faces with male-typed objects (i.e., hammer, football, shoe). After this limited “training” period, infants looked longer (were surprised) when the category-object associations were violated, such as when a new female face was paired with a male-typed object. Obviously, infants do not arrive in the world with a knowledge that female wield frying pans and males wield hammers, but the result does inform the understanding that infants (a) perceive the category boundary between male and female faces, and (b) need only very limited experience (only 6 total pairings) to rapidly form expectations of specific gender-typed attributes¹. Such findings reveal the powerful early precursors of gender-based cognitions in infancy.

¹ To our understanding, the original study from Levy and Haaf (1994) did not explore an interesting boundary on such paired associates learning: were 10-month-olds just as able to detect these violations of category-object associations when the “trained” associations were already counterstereotypical? That is, if infants had been trained with 6 pairings of female faces+male objects and 6 pairings of male faces+female objects would they then have been

Early Childhood. Infants' early attention to gender as a social category continues to gain traction throughout early childhood, when gender becomes one of the most reliable and potent social categories used in guiding children's behaviors and preferences, even over and above information about other social groups (Shutts et al., 2010, 2013; Weisman et al., 2015). At least part of this overwhelming attention to gender in early childhood could be attributed to the fact that gender is (a) perceptually salient (i.e., markers of gender identity are clear in dress and physical appearance), (b) reinforced by explicit group labelling (e.g., when a teacher says, "Good morning *boys and girls*," Bigler & Liben, 2006, 2007), and (c) continuously used to organize children's environments (Martin & Ruble, 2004). Indeed, in a recent large-scale study of the presence of gender stereotypes in children's language environments, Charlesworth and colleagues (in press) found that stereotypes about traits, occupations, and broad roles (e.g., home/work) are widely pervasive across child-directed speech, child-directed books, and child-directed TV and movies (Charlesworth, Yang, Mann, Kurdi, & Banaji, *in press*). Indeed, such gendered cues appear to be so pervasive in children's environments that even gender-neutral schooling (in Sweden) – where teachers avoid using gendered labels and modify stories to be counter-stereotypical – is not sufficient to erase children's use of gender in their social judgments (Shutts et al., 2017). Likely as a consequence, at just 2 years old, the majority of children spontaneously use gendered labels in their speech (Weinraub et al., 1984; Zosuls et al., 2009).

Such early categorization and labelling also translates into early *preferences* in childhood. By preschool, children have preferences for their own gender on both explicit measures (Heyman, 2001; Verkuyten & Thijs, 2001; Yee & Brown, 1994) and implicit measures (e.g.,

surprised to see the "violation" of female faces paired with female objects? The answer can reveal how early infants may be incorporating the broader domains of gender-object stereotypes from their culture versus incorporating only the unique gender-object associations experienced during training.

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Cvencek, Greenwald, & Meltzoff, 2011; Dunham, Baron, & Banaji, 2016). That is, girls associate girls with positive attributes and say that girls are “good” and “better” than boys, whereas young boys associate boys with positive attributes and say that boys are “good” and “better” than girls. Of note, explicit and implicit own-gender preferences in childhood diverge from the aforementioned findings in infancy, wherein both male and female preferred looking at female faces (Quinn et al., 2002). Thus, there appears to be a transition between infancy and early childhood towards a preference for the *similar* over the familiar.

With increasing age, children’s gender preferences appear to undergo yet another period of qualitative change. On explicit and behavioral measures (e.g., self-reports about who is seen to be “better” or “good”), own-gender preferences decline in strength among both boys and girls (Verkuyten & Thijs, 2001). This decline is more notable among boys: on implicit measures such as the Implicit Association Test, boys initially show an ingroup preference of *male-good/female-bad* but, with age, boys gradually move to neutral implicit preferences (Dunham et al., 2016). Girls, in contrast, continue to maintain a strong implicit ingroup preference of *female-good/male-bad* association throughout childhood and adolescence. The pattern is similar for explicit measures (Dunham et al., 2016): girls show strong *female-good/male-bad* attitudes from early in childhood and continuously through adulthood, while boys gradually shift from a *male-good/female-bad* attitude to an explicit outgroup preference (*female-good/male-bad*).

At first glance, the finding that children and adolescents associate *women* with positivity may be surprising. Particular negative stereotypes of women (e.g., views of women as weak, incompetent, and passive) as well as the obvious discrimination of women across many occupations led to the assumption that there must also be negative attitudes and evaluations of women. However, Eagly and Mladinic (1989, 1994) offered the conceptual clarification that

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attitudes (feelings of liking, pleasantness, and goodness) should be distinguished from stereotypes (specific beliefs such as strong, competent, and agentic). With this distinction in hand, the data clearly showed that *attitudes* toward “female” are, in fact, strongly positive, leading to a phenomenon known as the “women are wonderful” effect (Eagly & Mladinic, 1989, 1994). The sources of such an effect may be the links between motherhood (and hence women) with positivity, as well as between masculinity and aggression or violence (Rudman & Goodwin, 2004). Ultimately, children, both male and female, appear to internalize this cultural notion associating female-good/male-bad, as they grow up through middle childhood and adolescence.

Alongside the emergence of these gender preferences, children around 3-6 years of age also develop gender *stereotypes* about the capacities, qualities, and roles of men and women. In general, these stereotypes begin as relatively rigid rules and gradually gain nuance as children enter later childhood and adolescence (Bigler & Liben, 1992; Signorella et al., 1993; Trautner et al., 2005). The precise timing of stereotype emergence and change appears to depend on the domain of the stereotypes. Here, we focus on two widely studied domains in children’s gender stereotypes: (1) beliefs about gendered roles and activities (e.g., who belongs at home versus at work) and (2) beliefs about intellectual ability, and aptitude in math and science.

First, with respect to gender-role stereotypes, toddler girls as young as 2 years of age reliably make a female doll perform female-typed activities (e.g., vacuuming) and a male doll perform male-typed activities (e.g., shaving), suggesting early knowledge of the types of activities men and women are expected to perform (Poulin-Dubois et al., 2002). With increasing age, these early stereotypes about individual gender-typed activities (e.g., vacuuming versus shaving) coalesce into stereotypes about broader gender roles that meld the concept of *female* with *home* and *male* with *work*. By age 6, children hold explicit gender role beliefs, such as that

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“women are more likely than men to do household tasks”, and even hold stereotypical aspirations about their own future roles, such as that “girls will grow up to be more family-oriented than career-oriented” (Croft, Schmader, Block, & Baron, 2014). These stereotypical role aspirations are, in turn, predicted by children’s internalized stereotypes about societal values, with boys raised to value agency while girls are raised to value communion (Block, Gonzalez, Schmader, & Baron, 2018). Finally, children at these ages already seem to appreciate that stereotypes of activities, roles, and values are prescriptive and will therefore disapprove of those who violate gender roles (especially men who enter female-typical roles; Blakemore, 2003; see also Eagly & Diekmann, 2000; Wilbourn & Kee, 2010).

Gender stereotypes of math, science, and intelligence appear to emerge slightly later than such beliefs about broad gendered roles, likely because children are exposed to gendered divisions in specific domains, such as math/reading, later than gendered divisions between general domains of home/work. Nevertheless, multiple measures – ranging from “draw-a-scientist” tests to self-reports to IATs – consistently show that children’s gender-math, gender-science, and gender-brilliance stereotypes emerge around the ages of 6-7 years, and increase in magnitude through middle childhood (e.g., Bian, Leslie, & Cimpian, 2017a; Cvencek, Meltzoff, & Greenwald, 2011; Miller, Nolla, Eagly, & Uttal, 2018). For instance, at age 6, but not earlier, children explicitly report that boys are “really, really smart,” whereas girls are “really, really nice” (Bian et al., 2017b). By 9 years of age, boys and girls also hold the implicit association of men=super smart/women=super creative, indicating the early emergence of an implicit “brilliance=male” stereotype (Storage et al., 2020). Also at age 6, both boys and girls in the U.S. report that boys like math more than girls, with similar associations revealed on implicit measures (Cvencek, Meltzoff, et al., 2011). This implicit association of “math=male” is even

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found amongst children in Singapore, a country where girls objectively outperform boys on standardized math tests (Cvencek et al., 2014). Evidently, children's implicit gender-science and gender-math stereotypes do not necessarily reflect objective reality, but instead reflect the subjective beliefs embedded in their broader societies.

So far, our review has focused on children's gender stereotypes within the sociocultural binary of male and female. However, psychologists have also begun to appreciate the evidence that gender is a non-binary variable, with a spectrum of other gender expressions and identities. Recent studies have considered the attitudes and beliefs both held by, and directed towards, non-binary and transgender individuals (Dunham & Olson, 2016; Olson & Gülgöz, 2018). In examining the cognitions held by children who are non-binary and transgender, three results are notable. First, transgender children (ages 5-12) show gender identification (both implicit and explicit) in line with their expressed gender, rather than their sex assigned at birth (Olson et al., 2015), indicating that transgender children, like cisgender children, clearly experience their gender to be what it is rather than what is assumed. Second, transgender children (ages 3-11) are just as likely as cisgender children to essentialize gender and see it as a stable social category (Gülgöz et al., 2019). And third, transgender children, and siblings of transgender children (ages 6-8), are nevertheless more accepting of gender-role violations (Olson & Enright, 2018). Thus, although transgender children often appear quite similar to cisgender children in their gender identity and essentialism of gender, they may still conceptualize gender *roles* as more malleable.

From the perspective of other children's attitudes and beliefs *towards* non-binary and transgender children, own-gender preferences are clear: cisgender children (ages 5-10) strongly prefer own-gender targets (e.g., cisgender girls prefer cisgender and transgender girls over cis or trans boys), with a smaller preference for cisgender over transgender children in general

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(Gülgöz, Gomez, DeMeules, & Olson, 2018). Such a finding is notable in suggesting that young children are guided more by own-gender preferences than by the division of cisgender vs. transgender and may not yet have internalized the widespread anti-transgender attitudes seen among adults (Norton & Herek, 2013). This may therefore offer a unique opportunity to target interventions at these young ages and reduce societal anti-transgender attitudes.

In concluding this section, we emphasize that the overwhelming evidence for the early use of gender groupings in infant and social cognition aligns with the argument that gender is a ubiquitous division in human societies, although the binary of male/female, which may have been less rigid in some cultures and in some historic time periods, is now explicitly contested. Indeed, every single society contains both female and male categories and institutionalizes these categories into systems of social practices (Ridgeway & Correll, 2004). As a result, every infant, child, and adult experiences gender as a consequential category and will use gender on a daily basis to structure their interactions and behaviors. We point this out primarily to contrast the ubiquity of gender with the more arbitrary and idiosyncratic nature of social grouping based on race and ethnicity.

Race

Race as a social category has been perceived and constructed by humans. In fact, Linnaeus's incorrect 18th century taxonomy of Europeans, Asians, Africans, and Native Americans (with accompanying essentialist beliefs) is how we perceive racial groups today despite now knowing clearly that race differences lack a genetic or biological basis (Keita et al., 2004; Yudell et al., 2016). By this we simply mean that, since the coding of the human genome, we know that a person identified as European may be genetically more similar to a person identified as Asian than they may be to another European, leading Venter to proclaim in the

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White House in 2000 that “the concept of race has no genetic or scientific basis”. Moreover, race as a category was not present and therefore not necessary in the social world of our ancestors who largely resided in racially homogeneous groupings (Baker et al., 2017). Thus, in early human history, exposure to racial differences was rare, meaning that the use of racial categories or labels was uninformative for detecting social allegiances (Pietraszewski et al., 2014).

Yet for the past few centuries, and beginning in earnest with the advent of trade and colonialism, the idea of “race” as perceived and evaluated has been with us. Treatment of humans along race and ethnic lines have been among the most severe of intergroup conflicts marked by genocide and ethnic cleansing, slavery, and concentration camps. Today, race is treated as if it were a biologically sound construct and similar to gender in its palpability in subjective experience. Humans have, in a sense, formed an “arbitrary” category around what they see as race (Sidanius & Pratto, 1999), but have imbued this arbitrariness with such meaning that it seems to have the same influence as a grouping like gender. Given such a unique positioning of race it is of interest to understand whether the development of infants’ and children’s racial cognition: (a) unfolds slowly over prolonged development, requiring the incorporation of cultural teachings that give meaning to an otherwise arbitrary category; or (b) unfolds at a similar pace to other group cognitions (e.g., gender), suggesting that general social and cognitive processes (e.g., the perceptual ability to detect difference, or a preference for familiarity) may underwrite early cognition, regardless of the group category.

Infancy. In line with the latter possibility, the early trajectory of infants’ racial cognition closely follows the timing of infants’ gender cognition. First, like gender, infants by 3 months of age show reliable looking preferences for the faces from their most familiar racial group: White infants raised by White families prefer to look at White faces, and Black infants raised by Black

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families prefer to look at Black faces (Bar-Haim et al., 2006; Kelly et al., 2005). Importantly, this looking preference is eliminated with multiracial exposure (Bar-Haim et al., 2006). Although 3-month-old Black infants of Ethiopian origin raised in predominantly Black environments (i.e., in Ethiopia) have a looking preference to familiar Black faces, Black infants of Ethiopian origin raised in multiracial communities in Israel do *not* have a looking preference between White and Black faces, reflecting their equal exposure to both White and Black faces.

Second, like gender, these early looking preferences suggest that infants by 3 months already have perceptual categories distinguishing two racial groups. Yet complementary evidence from dishabituation studies once again faces a problem of interpretation due to the competition between baseline looking preferences for familiar, own-race faces and looking to novel other-race faces. For instance, a White infant presented with a series of White faces followed by a novel Black face may not appear to look longer to the novel Black face because they were already looking so long at their ingroup White faces. Interestingly, in the domain of race, this interpretational problem can be overcome by examining infants' categorization between *two other-race* groups, without competing against a baseline looking preference for the familiar own-race group (Quinn et al., 2016). In one such study, White infants at 6 months of age showed dishabituation between faces from two other-race groups, both when a Black face followed a series of East Asian faces, as well as when an East Asian face followed a series of Black faces. Interestingly, this ability narrowed with age. By 9 months of age White infants no longer distinguished between Black and East Asian faces, presumably lumping faces of both groups into a single "outgroup" category (Quinn et al., 2016). These findings have implications for the "other-race effect" observed in adults, whereby adults are less likely to notice differences among individual faces from an outgroup race than they are to notice differences among

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individual faces from their ingroup race (Meissner & Brigham, 2001). That is, the “other-race effect” appears to have its roots in early infant cognition, emerging as young as 6-9 months of age (Anzures et al., 2013; Kelly et al., 2007).

Recently, researchers have found that this narrowing in other-race face perception can be prevented, and even reversed, by training infants to notice the differences between other-race faces (Anzures et al., 2012; Delaney et al., 2011). Such interventions are promising in demonstrating that early biases in outgroup perception are malleable. Among the more interesting possibilities raised by such work is that interventions targeted purely at improving perception (i.e. the ability to notice individual differences among faces from an outgroup) may shift downstream outcomes in attitudes and stereotypes (i.e., increased outgroup preference). So far, such perceptual training has proven effective in reducing implicit and explicit race attitudes among preschool children (Qian et al., 2017b, 2017a). The question remains, however, whether even earlier perceptual training in *infancy* could have more lasting or large effects in disrupting early social preferences.

The importance of disrupting early preferences becomes all the more potent given recent studies showing that infants around 9 months of age already associate certain racial groups with positive and negative attributes. For instance, at 9 months,² but not at 3 months or 6 months, infants appear to associate own-race faces with happy music and other-race faces with sad music (Xiao et al., 2018). Additionally, around these ages, infants also show selective learning from

² The careful reader may observe the simultaneous emergence of both narrowing in racial categorization (at 9 months of age) and association of own-race faces with positive stimuli/selective learning (also at 9 months of age). What does this co-occurrence in development mean? One recent perspective proposes that narrowing in the ability to perceptually categorize racial groups leads to the development of racial preferences, and associations of own-race faces with positive stimuli (Lee, Quinn, & Pascalis, 2017). However, an alternative perspective is that learned associations of own-race faces with positive stimuli results in less motivation to disambiguate between other-race faces and therefore to perceptual narrowing. The answer can shed light on the fundamental question of the directional relationship between categorization and preference that has long preoccupied social psychologists (Allport, 1954; Dovidio & Gaertner, 2010).

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own-race faces (Weatherhead & White, 2018) and gaze following of own-race faces (Pickron et al., 2017), implying that they may perceive own-race faces (more than other-race faces) to be trustworthy sources of information. Thus, as with gender, infants in their first year of life show the early scaffolding for the rich social understanding of racial groups – a surprising finding given the arbitrary nature of this particular social grouping. Such consistency reinforces that general social and cognitive processes may underlie group cognition, even regardless of the group in question.

Early Childhood. Because race is an arbitrary social category that varies in meaning across cultures and time (Sidanius & Pratto, 1999) a child's understanding of the deeper *cultural* significance of race may take more time to learn. Even if infants are able to perceptually distinguish between White and Black faces and show patterns of associations between such faces and evaluative attributes (as discussed above), they may still need prolonged development to understand exactly what the adults in their culture mean when they talk about "race". Indeed, decades of developmental work shows that children's understanding of the cultural significance of race remains tenuous until at least middle or later childhood (Allport, 1954; Lam, Guerrero, Damree, & Enesco, 2011; cf. Hirschfeld, 1995). A child may have discrete, disconnected concepts of perceptual differences (e.g., "Black and White faces look different"), labels (e.g., "there are *Black Americans* and *White Americans*"), and knowledge of attributes (e.g., "there is my own group and there is a *bad* other group"), but not yet have connected these individual concepts into a cohesive adult-like idea of "race". Thus, unlike the early and ubiquitous knowledge that children appear to have of gender groups, their understanding of race does not show clear patterns of categorization and is profoundly shaped by cultural context.

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Consider, for instance, the evidence on children's racial *categorization*. Some studies show that White preschoolers can categorize Black/White racial group members in accordance with adult judgments (Aboud, 2003; Nesdale & Flesser, 2001). Yet when the task is made more complex by involving Asian, White, and Black target faces, only 35% of 3-5-year-old children offer spontaneous correct classifications by race (Lam et al., 2011). In line with this finding, studies that examine children's racial attitudes with measures that draw attention to category boundaries (e.g., the IAT that draws attention to a binary comparison of White vs. Black; Baron & Banaji, 2006) are more likely to find evidence of children's racial attitudes than measures that do not draw attention to category boundaries (e.g., the Affect Misattribution Procedure that allows for evaluations of single targets at a time; A. Williams & Steele, 2017). Moreover, it is only at around 9-10 years of age that White children correctly predict that a White child will grow up to be a White adult, and a Black child will grow up to be a Black adult (Roberts & Gelman, 2016). Before this age, it appears that White children often do not conceive of racial categories as *stable* (Kinzler & Dautel, 2012; Pauker et al., 2010).

Additionally, children's racial cognition, especially their attitudes to their own and other groups is not a simple, ubiquitous manifestation of own-group preference. Rather, it is shaped both by one's own racial group membership (i.e., minority or majority group membership), as well as by how one's race is treated in the broader culture. For instance, children from racial minority groups generally have an earlier understanding of race and racism than children from racial majority groups (McKown, 2004). For instance, 5-6-year-old Black children appear to understand that race is a stable category (i.e., that a Black child will grow up to be Black), an understanding that is only achieved by 9-10 years of age among White children (Kinzler & Dautel, 2012; Roberts & Gelman, 2016). Additionally, children's racial categorizations and

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labeling practices are dependent on the diversity of their local environment. In Hawaii, for example, multiracial diversity is more prevalent and children thus describe monoracial targets using 3-4 labels; in the continental U.S., children tend to use only one label (Pauker, Williams, & Steele, 2016; Pauker, Xu, Williams, & Biddle, 2016).

Although children's understanding of race as a stable and meaningful social category seems tenuous until middle childhood, when children are made aware of race (i.e., attention is drawn to the category boundary), children from 3 years of age will nevertheless show preferences for own-race targets on both explicit (e.g., Aboud, 2003; for a review, see Hailey & Olson, 2013) and implicit measures (e.g., Dunham, Chen, & Banaji, 2013; Qian et al., 2016). Explicit racial attitudes then decline in strength across development, moving towards more neutral intergroup attitudes (Raabe & Beelmann, 2011), most likely as a result of the gradual internalization of social norms to conceal prejudice (Rutland et al., 2005). In contrast, *implicit* own-race preferences generally remain high and stable across development (Baron & Banaji, 2006; Dunham et al., 2006, 2008; Newheiser & Olson, 2012).

Notably, these developmental trajectories of implicit race attitudes depend on the social status of the child's own racial group. Children from high-status racial groups (e.g., White American children) maintain their implicit ingroup preferences across their lifespan. In contrast, children from low-status racial groups (e.g., Hispanic American children) move to a neutral implicit preference around middle childhood that persists into adulthood (e.g., Dunham, Baron, & Banaji, 2007; Gibson, Rochat, Tone, & Baron, 2017; Qian, Heyman, Quinn, Fu, & Lee, 2019). This attention to the social status of one's own and other racial groups reveals that, early in life, children are forming status-based stereotypes linked to race. Indeed, in South Africa, 3-year-old children have been shown to match high-status wealth cues (e.g., expensive-looking houses,

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cars) with high-status racial groups and low-status wealth cues (e.g., cheap-looking houses, cars) with low-status racial groups (Olson et al., 2012). Children (ages 6-12) even extend these race-status stereotypes to infer the social status of novel occupations: novel occupations described as predominantly African American (a relatively low-status racial group in the U.S.) are perceived as lower in status than identical occupations described as predominantly European American (Bigler et al., 2003).

In addition to race-status stereotypes, children also develop stereotypes about the traits and qualities of different racial groups. Early in childhood (ages 3-6), race stereotypes are predominantly evaluative, with children generally attributing only negative traits and roles to other-race targets (e.g., Blake & Dennis, 1943). However, with age, outgroup race stereotypes become more “mixed” or ambivalent in content (Bar-Tal, 1996; Corenblum, 2003; Pauker et al., 2010). For example, children (ages 6-10) will select African American targets as “playing basketball well” (a positive trait), but also as “acting aggressively” or “underperforming academically” (both negative traits), and will describe Asian American targets as “excelling in math” (positive trait), but also as “being shy” (negative trait; Pauker et al., 2010). Similar developmental trajectories towards more ambivalent content of racial stereotypes have been observed among Jewish Israeli children evaluating Arab Israeli targets (Bar-Tal, 1996), and among European Canadian children judging Indigenous Canadian targets (Corenblum, 2003). Thus, as children continue to experience and explore their racialized worlds, they learn both general (e.g., high vs. low status) and specific stereotypes (e.g., shy, strong, athletic).

Recently, research on children’s racial categorizations, attitudes, and stereotypes has been further nuanced by considering the beliefs of, and the beliefs about, biracial and multiracial populations (e.g., Dunham & Olson, 2016; Gaither, Fan, & Kinzler, 2020; Roberts & Gelman,

2017; Tham, Bremner, & Hay, 2017). As just one example of these findings: even young children have been found to follow similar rules as adults when categorizing biracial targets, and are particularly likely to mis-categorize White/Black biracials as Black (Roberts & Gelman, 2017). Even complex and problematic social practices like “hypodescent” may therefore have early roots in how children are socialized around race (Chen et al., 2018; Ho et al., 2015).

Language

Infancy. Of the four social groups considered in this chapter, language is unique in that infants can be exposed to sounds even before they are born – they can hear their caregivers speaking while still in the womb. We know that the looking preferences and categorization of gender or race must be learned rapidly after birth through visual experience. But because language can be experienced before birth, newborn infants already come into the world with a recognition of which language group is familiar and which is unfamiliar. As a result, at just 2 days old, infants with English-speaking mothers preferred to listen to English over Spanish (the infants would suck on a soother longer to make the sound continue), while infants with Spanish-speaking mothers preferred to listen to Spanish over English (Moon, Cooper, & Fifer, 1993). Similarly, by 5-6 months of age, infants surrounded by English speakers preferred to look at faces that previously spoke English over faces that spoke Spanish (Kinzler et al., 2007).

Extending beyond looking preferences, Kinzler and colleagues (2007) also found that infants at 10 months of age were more likely to accept a toy from a familiar-language speaker: French-speaking children accepted a toy from French speakers (over English speakers), and English-speaking children accepted a toy from English speakers (over French speakers). At 11 months, infants are also more likely to expect to learn from a familiar language speaker than from an unfamiliar language speaker (Begus et al., 2016). And infants between 6-12 months are

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even found to habituate faster when familiar (vs. unfamiliar) language speakers are associated with positive stimuli (e.g., pictures of fruit, smiley faces), suggesting an overlap between the categories “familiar language speaker” and “good” (Pun, Ferera, Diesendruck, Hamlin, & Baron, 2018). Of note, these patterns of behavior and looking preferences become all the more impressive when we remember that infants often have no clear perceptual cues to distinguish speakers – they have to remember who said what and use that memory to inform their future behaviors. Even to a preverbal infant, language thus seems to be a social category that is sufficiently important to be tracked and recalled in their social environments.

Early Childhood. Early preferences and stereotypes based on familiar language and accent groups continue to fundamentally shape children’s, and even adults’, social group categorizations, attitudes, and stereotypes (e.g., Gluszek & Dovidio, 2010). Children at 5-6-years-old categorize speakers of familiar languages and accents (e.g., speaking English with an American accent) as separate from speakers of unfamiliar languages or accents (e.g., speaking French, or speaking English with a French accent; Kinzler et al., 2007). Children at these ages (5-6 year-olds) also already expect language groups to be more stable across an individual’s lifespan than one’s racial group, suggesting that they not only categorize by language but also infer it to be a more essential social category than race (Dautel & Kinzler, 2018; Kinzler & Dautel, 2012)³. In this same vein, language groupings have also been found to be prioritized over race in guiding children’s preferences and friendship choices (Kinzler et al., 2009).

In fact, children’s language-based preferences appear so robust that they do not appear to be weakened even for children exposed to linguistic diversity. Even children who live in places

³ Of note, categorizing by familiar and unfamiliar *languages* (e.g., French vs. English) appears easier than categorizing by dialects or *accents* (e.g., Irish- vs. French- vs. British-accented English). Accent categorization may not emerge until at least age 7 (Floccia et al., 2009; Girard et al., 2008) and results are sometimes inconsistent for monolingual versus bilingual children (DeJesus, Hwang, Dautel, & Kinzler, 2017; but see Souza et al., 2013).

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like South Africa or Toronto and have daily language exposure to non-native languages still show preferences for their familiar language group (Kinzler, Shutts, & Spelke, 2012; Paquette-Smith, Buckler, White, Choi, & Johnson, 2019). This finding may be of particular interest given the aforementioned finding that exposure to language diversity can reduce language-based looking preferences in *infancy* (Kitamura et al., 2013). There may therefore be a “critical period” in infancy when exposure to linguistic diversity can alter children’s language-based preferences. Taken together, these findings show that preschool children are able to categorize by language groups, perceive language to be a meaningful social category in organizing society, and use familiar language and accents to guide social preferences.

At these same ages, children are also developing concurrent stereotypes about speakers of different languages or accents. For instance, beginning around age 6, children use language and accent to develop general stereotypes about geographic locality or nationality (DeJesus et al., 2018; McCullough et al., 2019), as well as stereotypes about traits of honesty, intelligence or kindness (Kinzler & DeJesus, 2013; McCullough et al., 2019). For instance, children (ages 5-6) develop an association between “English-speaker” and “American,” even before they develop the association between “White” and “American,” reinforcing the precedence of language over race (DeJesus et al., 2018). Additionally, when it comes to trait stereotypes of intelligence and kindness, by 9-10 years of age, children from both Illinois (i.e., Northern-speakers) and Tennessee (i.e., Southern-speakers) stereotype Northern-accented speakers as “smart” (but not nice) and Southern-accented speakers as “nice” (but not smart; Kinzler & DeJesus, 2013). Thus, as with gender and race, preschoolers appear to incorporate information from broader cultural stereotypes about their own and other language groups (Gluszek & Dovidio, 2010), even when such stereotypes are negative or disadvantageous to their own group.

Age

Infancy. For social groups defined by gender, race, and language the evidence from infancy reveals a consistent early-emerging preference for the *familiar*, even when contrasted with the similar (see, for example, the finding that male infants show a female looking-preference; Quinn et al., 2002). When it comes to age preferences, however, infants often show an uncanny preference for those who appear *similar* to them. Although it is unlikely that infants are aware of their own birthday, infants at 9 months of age prefer looking at faces of other 9-month-old infants (similar others), even over faces of adults that are presumably far more familiar (Sanefuji et al., 2006). In a similar vein, 4 month old infants prefer looking at faces of 6-month-olds over the faces of older children or adults (McCall & Kennedy, 1980). Nevertheless, this looking preference for similarly-aged infants is not consistent across all ages or all studies (Macchi Cassia, 2011). For instance, infants at 6 months do not appear to show a looking preference to other 6-month-olds (Sanefuji et al., 2006), and infants at 12 months preferred watching older children over 12-month-olds or adults (Zmyj et al., 2012).

Despite these inconsistencies, it is surprising that few studies have revealed clear evidence for a looking preference for the familiar category of adult faces, even though adult faces comprise 81% of the faces infants see in their environments (Sugden et al., 2014). Indeed, to our knowledge, only one study shows infant looking preferences towards adult faces: 3.5 month olds and 6 month olds preferred looking to adult over infant faces when presented with both faces simultaneously (although only when the faces were from a familiar racial group; Heron-Delaney et al., 2017). Additional research showing that 9 month old infants more easily recognize adult versus infant faces provides some convergent evidence for the operation of familiarity in age-based cognition (Macchi Cassia et al., 2014). But the question remains: why do

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familiarity preferences so clearly and consistently characterize early looking preferences for gender, race, and language but less so for age? What is unique about the domain of age that familiarity may not be as poignant? So far, the study of infants' perception and cognition of age groups has been relatively sparse compared to the study of gender, race, and language. Thus, there remain many burning questions, including how and when infants contrast similarity versus familiarity, and how and when they form age-related categories (as revealed from dishabituation studies) and associate those categories with positive or negative attributes.

Early Childhood. Children's age-based cognition provides a unique opportunity to examine children's beliefs about *dynamic* social categories where group membership is constantly changing, and where children themselves are even transforming in their group membership across the lifespan. For this reason, children's views on aging seem especially important to understand because stereotypes about the elderly eventually become *self*-stereotypes with negative consequences for one's own mental and physical health (B. R. Levy, 1996, 2009; B. R. Levy & Langer, 1994; Nelson, 2002). And yet, a recent review (Mendonça et al., 2018) reported only 16 studies that have examined children's age attitudes and stereotypes, indicating that this area is much less studied than the other groups of gender, race, or language.

Despite being understudied, there is evidence to suggest that even young children see age differences as meaningful and important. For instance, 3-year-old children use age information (but not racial information) to guide their preferences: they are more likely to prefer a novel object or activity endorsed by someone from their own age group (i.e., another child) than from a different age group (i.e., an adult; Shutts et al., 2010).

More broadly, investigations of children's age attitudes and stereotypes have often yielded contradictory findings. On the one hand, children are often found to have negative

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perceptions of the elderly by at least 3 years old (Middlecamp & Gross, 2002). Children associate older adults with traits such as “helplessness” (Pinquart et al., 2000) or physical slowness and dependence (Flamion et al., 2020). These negative attitudes about older adults are widespread and appear across children from many western countries, including Australia, England, Sweden, and North America (Goldman & Goldman, 1981). Children at these ages are also likely to hold negative perceptions of their *own* aging process and are concerned about “getting old” (Seefeldt et al., 1977). Of note, such negative perceptions of aging and the elderly are largely found among the youngest children, and largely when using implicit measures (e.g., word associations, drawing tasks, behavioral measures; see Mendonça et al., 2018).

On the other hand, children sometimes also hold positive perceptions of the elderly: 85% of older children (8-12 years old) were found to draw happy and healthy elderly people (Robinson et al., 2015). However, these positive drawings were most frequently obtained when the children were asked to draw a *familiar* older person (e.g., a grandparent) and may not capture children’s broader views about the social category. Furthermore, such positive views of the elderly are almost exclusively found on more explicit self-report measures, and almost entirely in later childhood/adolescence (Mendonça et al., 2018). These positive views about older individuals may therefore be driven largely by older children’s emerging concerns about fairness and social desirability (e.g., Rutland et al., 2016). Evidently, the area of children’s (and infants’) age-based cognition remains an area for many new explorations and discoveries.

General themes and remaining questions

Social group cognition in infancy

With few exceptions, infants' social group cognition appears to be characterized by a *preference for the familiar*, even over and above similarity or ingroup status. In line with the

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most frequent groups to which they are exposed, infants with female primary caregivers prefer to look at female faces over male faces, but infants with male primary caregivers prefer to look at male over female faces. Infants also show a preference for familiar own-race faces if such faces dominate in their social environment, but not if they are exposed to a more racially diverse set of faces. And infants even show a preference for individuals who speak their familiar language over those speaking an unfamiliar tongue. Over and over again, studies have pointed out the crucial role of familiarity in shaping social cognition. A curious exception is age, where the familiar category of adult faces does not consistently guide preferences. However, the small number of such studies and the occasionally mixed results suggest we must await further evidence before drawing firm conclusions about this social group target.

A second noteworthy theme that emerges in infant group cognition is the consistency of developmental trajectories that emerged across social group targets. Looking preferences emerged between 3-6 months of age, clear categorization abilities (uncovered with dishabituation methods) emerged between 6-9 months, and associations between faces and attributes appeared around 9-12 months of age. This consistency in timing suggests that domain-general developmental milestones (e.g., in perceptual and cognitive abilities, or in neural architecture) may provide the scaffolding for infants' social group cognition, regardless of the group (i.e., gender, race, language, age)

Numerous questions remain for researchers seeking to understanding the infant state of group cognition. First, although initial studies have begun to probe the associations infants hold between *evaluative* attributes and social groups (e.g., positive/negative music and racial groups, or positive/negative pictures and language groups; Pun et al., 2018; Xiao et al., 2018), it is possible that infants may already hold rudimentary *semantic* associations with certain groups,

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including associations about roles (e.g., male-career/female-home), or traits (e.g., male-loud/female-quiet). Considering the possibility that such rich associations may already have roots in infancy would be crucial to understand the social and cognitive inputs that later give rise to semantically-laden stereotypes. Second, given the consistency in developmental timing that takes children from looking preferences around 3-6 months to attribute associations around 9-12 months, it would be fruitful to examine the possible longitudinal and directional relationships between looking, categorization, and evaluative associations (e.g., alongside the "perceptual social linkage" hypothesis; Lee et al., 2017). Does one ability scaffold the others? How do individual differences in looking preferences predict later differences in preferences? Do infants that retain their ability to distinguish between outgroups later show weaker outgroup biases? The answers to such questions will be helpful for understanding the optimal timing and method of interventions to disrupt social preferences early in life.

Third, an emerging area of developmental social cognition centers around the study of intersectional social groups (e.g., the intersection of race and gender), as well as more ambiguous social categories such as multiracial, transgender, and non-binary groups. Although some such studies consider children's behaviors and cognitions towards such targets, very few studies have extended this study back into infancy. The pursuit can provide further insights into topics ranging from how infants incorporate prototypicality cues (e.g., if only prototypical female faces are preferred) to the role of familiarity (e.g., if female or age-based looking preferences are only observed among own-race faces; Heron-Delaney et al., 2017; Kim et al., 2015).

Social group cognition in early childhood

Across all four social groups examined – gender, race, language and age – and across both implicit and explicit measures, children showed an internalization of culturally-dominant beliefs

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and norms. For instance, with respect to gender attitudes, children gradually internalized the cultural attitude that “women are wonderful” (Eagly & Mladinic, 1989, 1994) even though they began childhood with own-gender preferences. Or with respect to race attitudes, children from lower-status racial groups gradually internalize a prejudice against their own group (e.g., Dunham et al., 2007). More generally, children’s internalization of cultural beliefs about social groups has two consequences. First, internalizing the nuanced cultural beliefs transforms the content and specificity of children’s stereotypes. In early childhood, stereotypes appear to be broad and predominantly evaluative beliefs, with the ingroup being unanimously preferred over the outgroup on all attributes. However, in later childhood, children’s stereotypes develop into more nuanced, mixed, and ambivalent representations: for instance, children see women as wonderful (Dunham et al., 2016) but nevertheless as relatively less intelligent than boys (Bian et al., 2017b; Storage et al., 2020).

Second, internalizing culturally-dominant beliefs can be particularly harmful if they lead to negative representations of one’s own *ingroup*. This is seen across all four social groups examined in this chapter. Take gender, for instance: although young girls show no stereotypes associating men or women with genius, older girls hold the belief that men, not women, are “very very smart” (Bian et al., 2017b), and although young boys prefer their own gender, adolescent boys gradually transition to an other-gender preference (e.g., Dunham et al., 2016). Similarly, when it comes to race, although young children show explicit and implicit preferences for their own racial group, older children from low-status racial groups (e.g., Hispanic Americans) shift to a neutral preference or even a preference for high-status racial groups (e.g., White Americans; Dunham et al., 2007). Or take language: while infants preferred speakers of their own accent/language, Northern-English accented children in the U.S. gradually stereotype

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their group as “smart” but not “nice,” and Southern-English accented children in the U.S. gradually stereotype their group as “nice” but not “smart” (Kinzler & DeJesus, 2013). And, lastly, in the case of age: younger children generally have negative perceptions of the elderly and the aging process (Mendonça et al., 2018), despite the fact that they themselves will become elderly. Altogether, these data reinforce that children’s beliefs about themselves and their social groups are shaped by the preferences and stereotypes expressed by the adults in their environments, with potentially harmful consequences for their own self-esteem, and group identification. Greater understanding of whether, when, and how such negative internalizations could be prevented remains an important area for future research.

A second theme concerns the process of internalizing norms of *societal fairness* and social desirability in middle to late childhood (e.g., Fitzroy & Rutland, 2010; Rutland et al., 2005, 2016). This is visible in the divergence between indirect (implicit) and direct (explicit) measures of group cognition, such that direct, explicit measures often move towards greater neutrality (i.e., lower bias) across middle childhood, while indirect, implicit measures maintain strong ingroup preferences and stereotypes (e.g., Baron & Banaji, 2006). Continued investigations using both indirect and direct measures of children’s social group cognition will remain important to identify and understand the interactive processes that shape how children think about, and behave towards, the social groups in their globalized world.

Finally, we used a comparative lens to examine the trends across four relatively well-studied social groups (gender, race, language, age). In so doing, a theme has emerged to show a general prioritization of the use of gender, language, and age information over and above race. This prioritization could arise from children’s relatively more tenuous understanding of race as a meaningful and stable social category (e.g., Roberts & Gelman, 2016), the fact that race is

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arguably more arbitrary and less evolutionarily relevant than other groupings (Kurzban et al., 2001; Sidanius & Pratto, 1999), or even that children may be particularly sensitive to fairness concerns surrounding race (Apfelbaum et al., 2008; Charlesworth & Banaji, 2019). Whatever the sources, the fact of such prioritization indicates that, even in their early lives, children are adept at detecting whichever social categorizations are most visible, essentialized, verbally labelled, and used throughout their social worlds.

Conclusion

Social groups, as we represent them in our minds, are rich concepts imbued with cultural meaning. The processes by which such representations are created, maintained and utilized are shaped by how group cognition emerged both in the early evolution of our species as well as in our individual sociocultural history and life trajectory. Owing to such a long history, the processes of social group cognition are understandably complex: every individual we encounter is a member of a myriad of social groups that must be simultaneously perceived, categorized, remembered, understood, and used for further evaluative and semantic inferences. Indeed, throughout this Handbook, researchers have revealed the many nuances behind adults' representations and judgments of social groups. And yet, despite this complexity, the research reviewed here has shown clearly that even infants and young children possess the scaffolding to represent and judge the social groups around them. By just 3 months of age (or sometimes earlier), infants show looking preferences to the gender, race, and language group that is most familiar; and by 3 years of age, children express preferences on both explicit and implicit measures for ingroups and high-status groups. Among the surprising results is the degree to which group cognition (especially implicit group cognition) in early childhood uncannily matches that of the adult state. As a result, the work we reviewed suggests that social cognition

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will indeed be taken seriously as a candidate for core knowledge. More generally, it is clear that continuing to bring developmental tools to the study of social group cognition will shed light on the critical social and cognitive precursors required to navigate a globalizing society of social groups who must work and live together on an unprecedented scale.

References

- About, F. E. (1988). *Children and prejudice*. Blackwell.
- About, F. E. (2003). The Formation of In-Group Favoritism and Out-Group Prejudice in Young Children: Are They Distinct Attitudes? *Developmental Psychology*, 39(1), 48–60.
<https://doi.org/10.1037/0012-1649.39.1.48>
- Allport, G. W. (1954). *The Nature of Prejudice*. Addison-Wesley.
- Anzures, G., Quinn, P. C., Pascalis, O., Slater, A. M., Tanaka, J. W., & Lee, K. (2013). Developmental Origins of the Other-Race Effect. *Current Directions in Psychological Science*, 22(3). <https://doi.org/10.1177/0963721412474459>
- Anzures, G., Wheeler, A., Quinn, P. C., Pascalis, O., Slater, A. M., Heron-Delaney, M., Tanaka, J. W., & Lee, K. (2012). Brief daily exposures to Asian females reverses perceptual narrowing for Asian faces in Caucasian infants. *J Exp Child Psychol*, 112(4), 484–495.
<https://doi.org/10.1016/j.jecp.2012.04.005>
- 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. <https://doi.org/10.1037/a0012835>
- Aslin, R. N. (2007). What's in a look? *Developmental Science*, 10(1), 48–53.
- Baker, J. L., Rotimi, C. N., & Shriner, D. (2017). Human ancestry correlates with language and reveals that race is not an objective genomic classifier. *Scientific Reports*, 7(1).
<https://doi.org/10.1038/s41598-017-01837-7>
- Banaji, M. R., & Gelman, S. A. (2013). *Navigating the social world: what infants, children, and other species can teach us*. Oxford University Press.
- Bar-Haim, Y., Ziv, T., Lamy, D., & Hodes, R. M. (2006). Nature and Nurture in Own- Race

DEVELOPMENT OF SOCIAL GROUP COGNITION

Face Processing. *Psychological Science*, 17(2), 159–163. <https://doi.org/10.1111/j.1467-9280.2006.01679.x>

Bar-Tal, D. (1996). Development of social categories and stereotypes in early childhood: The case of “the Arab” concept formation, stereotype and attitudes by Jewish children in Israel. *International Journal of Intercultural Relations*, 20(3–4), 341–370. [https://doi.org/10.1016/0147-1767\(96\)00023-5](https://doi.org/10.1016/0147-1767(96)00023-5)

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. <https://doi.org/10.1111/j.1467-9280.2005.01664.x>

Begus, K., Gliga, T., & Southgate, V. (2016). Infants’ preferences for native speakers are associated with an expectation of information. *Proceedings of the National Academy of Sciences of the United States of America*, 113(44), 12397–12402. <https://doi.org/10.1073/pnas.1603261113>

Bian, L., Leslie, S.-J., & Cimpian, A. (2017a). Gender stereotypes about intellectual ability emerge early and influence children’s interests. *Science*, 355(6323), 389–391. <https://doi.org/10.1126/science.aah6524>

Bian, L., Leslie, S. J., & Cimpian, A. (2017b). Gender stereotypes about intellectual ability emerge early and influence children’s interests. *Science (New York, N.Y.)*, 355(6323), 389–391. <https://doi.org/10.1126/science.aah6524>

Bigler, R. S., Averhart, C. J., & Liben, L. S. (2003). Race and the Workforce: Occupational Status, Aspirations, and Stereotyping Among African American Children. *Developmental Psychology*, 39(3), 572–580. <https://doi.org/10.1037/0012-1649.39.3.572>

Bigler, R. S., & Liben, L. S. (1992). Cognitive Mechanisms in Children’s Gender Stereotyping :

DEVELOPMENT OF SOCIAL GROUP COGNITION

- Theoretical and Educational Implications of a Cognitive-Based Intervention. *Child Development*, 63(6), 1351–1363. <https://doi.org/http://www.jstor.org/stable/1131561>
- Bigler, R. S., & Liben, L. S. (2006). A developmental intergroup theory of social stereotypes and prejudice. *Advances in Child Development and Behavior*, 34(May), 39–89.
[https://doi.org/10.1016/S0065-2407\(06\)80004-2](https://doi.org/10.1016/S0065-2407(06)80004-2)
- Bigler, R. S., & Liben, L. S. (2007). Developmental Intergroup Theory. *Current Directions in Psychological Science*, 16(3), 162–166. <https://doi.org/10.1111/j.1467-8721.2007.00496.x>
- Blake, R., & Dennis, W. (1943). The development of stereotypes concerning the Negro. *Journal of Abnormal and Social Psychology*, 38(4), 525–531. <https://doi.org/10.1037/h0057081>
- Block, K., Croft, A., De Souza, L., & Schmader, T. (2019). Do people care if men don't care about caring? The asymmetry in support for changing gender roles. *Journal of Experimental Social Psychology*, 83(July 2018), 112–131. <https://doi.org/10.1016/j.jesp.2019.03.013>
- Block, K., Gonzalez, A. M., Schmader, T., & Baron, A. S. (2018). Early Gender Differences in Core Values Predict Anticipated Family Versus Career Orientation. *Psychological Science*, 29(9), 1540–1547. <https://doi.org/10.1177/0956797618776942>
- Carey, S. (1985). *Conceptual Change in Childhood*. MIT Press.
- Charlesworth, T. E. S., & Banaji, M. R. (2019). Face-Trait and Face-Race Cues in Adults' and Children's Social Evaluations. *Social Cognition*, 37(4), 357–388.
<https://doi.org/10.1521/soco.2019.37.4.357>
- Charlesworth, T. E. S., Yang, V., Mann, T. C., Kurdi, B., & Banaji, M. R. (n.d.). Gender Stereotypes in Natural Language: Word embeddings show robust consistency across child and adult language corpora of 65+ million words. *Psychological Science*.
- Chen, J. M., Pauker, K., Gaither, S. E., Hamilton, D. L., & Sherman, J. W. (2018). Black +

DEVELOPMENT OF SOCIAL GROUP COGNITION

- White = Not White: A minority bias in categorizations of Black-White multiracials. *Journal of Experimental Social Psychology*, 78, 43–54. <https://doi.org/10.1016/j.jesp.2018.05.002>
- Corenblum, B. (2003). What children remember about ingroup and outgroup peers: Effects of stereotypes on children's processing of information about group members. *Journal of Experimental Child Psychology*, 86(1), 32–66. [https://doi.org/10.1016/S0022-0965\(03\)00105-X](https://doi.org/10.1016/S0022-0965(03)00105-X)
- Croft, A., Schmader, T., Block, K., & Baron, A. S. (2014). The Second Shift Reflected in the Second Generation: Do Parents' Gender Roles at Home Predict Children's Aspirations? *Psychological Science*, 25(7), 1418–1428. <https://doi.org/10.1177/0956797614533968>
- Cvencek, D., Greenwald, A. G., & Meltzoff, A. N. (2011). Measuring implicit attitudes of 4-year-olds: The Preschool Implicit Association Test. *Journal of Experimental Child Psychology*, 109(2), 187–200. <https://doi.org/10.1016/j.jecp.2010.11.002>
- Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011). Math-Gender Stereotypes in Elementary School Children. *Child Development*, 82(3), 766–779. <https://doi.org/10.1111/j.1467-8624.2010.01529.x>
- Cvencek, D., Meltzoff, A. N., & Kapur, M. (2014). Cognitive consistency and math-gender stereotypes in Singaporean children. *Journal of Experimental Child Psychology*, 117(1), 73–91. <https://doi.org/10.1016/j.jecp.2013.07.018>
- Dautel, J. B., & Kinzler, K. D. (2018). Once a French Speaker, Always a French Speaker? Bilingual Children's Thinking About the Stability of Language. *Cognitive Science*, 42, 287–302. <https://doi.org/10.1111/cogs.12572>
- DeJesus, J. M., Hwang, H. G., Dautel, J. B., & Kinzler, K. D. (2017). Bilingual children's social preferences hinge on accent. *Journal of Experimental Child Psychology*, 164, 178–191.

DEVELOPMENT OF SOCIAL GROUP COGNITION

<https://doi.org/10.1016/j.jecp.2017.07.005>

DeJesus, J. M., Hwang, H. G., Dautel, J. B., & Kinzler, K. D. (2018). “American = English Speaker” Before “American = White”: The Development of Children’s Reasoning About Nationality. *Child Development*, 89(5), 1752–1767. <https://doi.org/10.1111/cdev.12845>

Delaney, M., Anzures, G., Herbert, J. S., Quinn, P. C., & Slater, A. M. (2011). Perceptual Training Prevents the Emergence of the Other Race Effect during Infancy. *PLoS ONE*, 6(5), 19858. <https://doi.org/10.1371/journal.pone.0019858>

DeLoache, J. S., Uttal, D. H., & Rosengren, K. S. (2004). Scale Errors Offer Evidence for a Perception-Action Dissociation Early in Life. *Science*, 304(5673), 1027–1029. <https://doi.org/10.1126/science.1093567>

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. <https://doi.org/10.1111/j.1467-8624.2006.00933.x>

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(2–3), 238–255. <https://doi.org/10.1080/15298860601115344>

Dunham, Y., Baron, A. S., & Banaji, M. R. (2008). The development of implicit intergroup cognition. *Trends in Cognitive Sciences*, 12(7), 248–253. <https://doi.org/10.1016/j.tics.2008.04.006>

Dunham, Y., Baron, A. S., & Banaji, M. R. (2016). The development of implicit gender attitudes. *Developmental Science*, 19(5), 781–789. <https://doi.org/10.1111/desc.12321>

Dunham, Y., Chen, E. E., & Banaji, M. R. (2013). Two Signatures of Implicit Intergroup Attitudes. *Psychological Science*, 24(6), 860–868.

DEVELOPMENT OF SOCIAL GROUP COGNITION

<https://doi.org/10.1177/0956797612463081>

Dunham, Y., & Olson, K. R. (2008). The Importance of Origins: Why Cognitive Development is Central to a Mature Understanding of Social Cognition. In *The Open Psychology Journal* (Vol. 1).

Dunham, Y., & Olson, K. R. (2016). Beyond Discrete Categories: Studying Multiracial, Intersex, and Transgender Children Will Strengthen Basic Developmental Science. *Journal of Cognition and Development, 17*(4), 642–665.

<https://doi.org/10.1080/15248372.2016.1195388>

Eagly, A. H., & Diekmann, A. (2000). Stereotypes as dynamic constructs: Women and men of the past, present, and future. *Personality and Social Psychology Bulletin, 26*(10), 1171–1188.

<https://doi.org/10.1177/0146167200262001>

Eagly, A. H., & Mladinic, A. (1989). Gender Stereotypes and Attitudes Toward Women and Men. *Personality and Social Psychology Bulletin, 15*(4), 543–558.

<https://doi.org/10.1177/0146167289154008>

Eagly, A. H., & Mladinic, A. (1994). Are people prejudiced against women? some answers from research on attitudes, gender stereotypes, and judgments of competence. *European Review of Social Psychology, 5*(1), 1–35. <https://doi.org/10.1080/14792779543000002>

Fitzroy, S., & Rutland, A. (2010). Learning to control ethnic intergroup bias in childhood. *European Journal of Social Psychology, 40*(4), 679–693. <https://doi.org/10.1002/ejsp.746>

Flamion, A., Missotten, P., Jennotte, L., Hody, N., & Adam, S. (2020). Old Age-Related Stereotypes of Preschool Children. *Frontiers in Psychology, 11*(April), 1–13.

<https://doi.org/10.3389/fpsyg.2020.00807>

Floccia, C., Butler, J., Girard, F., & Goslin, J. (2009). Categorization of regional and foreign

- accent in 5- to 7-year-old British children. *International Journal of Behavioral Development*, 33(4), 366–375. <https://doi.org/10.1177/0165025409103871>
- Gaither, S. E., Fan, S. P., & Kinzler, K. D. (2020). Thinking about multiple identities boosts children's flexible thinking. *Developmental Science*, 23(1). <https://doi.org/10.1111/desc.12871>
- Gibson, B. L., Rochat, P., Tone, E. B., & Baron, A. S. (2017). Sources of implicit and explicit intergroup race bias among African-American children and young adults. *PLoS ONE*, 12(9), e0183015. <https://doi.org/10.1371/journal.pone.0183015>
- Girard, F., Floccia, C., & Goslin, J. (2008). Perception and awareness of accents in young children. *British Journal of Developmental Psychology*, 26, 409–433. <https://doi.org/10.1348/026151007X251712>
- Gluszek, A., & Dovidio, J. F. (2010). The way they speak: A social psychological perspective on the stigma of nonnative accents in communication. *Personality and Social Psychology Review*, 14(2), 214–237. <https://doi.org/10.1177/1088868309359288>
- Goldman, R. J., & Goldman, J. D. G. (1981). How children view old people and ageing: A developmental study of children in four countries. *Australian Journal of Psychology*, 33(3), 405–418. <https://doi.org/10.1080/00049538108254708>
- Gülgöz, S., DeMeules, M., Gelman, S. A., & Olson, K. R. (2019). Gender essentialism in transgender and cisgender children. *PLoS ONE*, 14(11). <https://doi.org/10.1371/journal.pone.0224321>
- Gülgöz, S., Gomez, E. M., DeMeules, M. R., & Olson, K. R. (2018). Children's Evaluation and Categorization of Transgender Children. *Journal of Cognition and Development*, 19(4), 325–344. <https://doi.org/10.1080/15248372.2018.1498338>

DEVELOPMENT OF SOCIAL GROUP COGNITION

- Haas, R., Watson, J., Buonasera, T., Southon, J., Chen, J. C., Noe, S., Smith, K., Llave, C. V., Eerkens, J., & Parker, G. (2020). Female Hunters of the Early Americas. *Science Advances*, 6. <http://advances.sciencemag.org/>
- Hailey, S. E., & Olson, K. R. (2013). A Social Psychologist's Guide to the Development of Racial Attitudes. *Social and Personality Psychology Compass*, 7(7), 457–469. <https://doi.org/10.1111/spc3.12038>
- Heron-Delaney, M., Damon, F., Quinn, P. C., Meary, D., Xiao, N. G., Lee, K., & Pascalis, O. (2017). An adult face bias in infants that is modulated by face race. *International Journal of Behavioral Development*, 41(5), 581–587. <https://doi.org/10.1177/0165025416651735>
- Hespos, S. J., & vanMarle, K. (2012). Physics for infants: characterizing the origins of knowledge about objects, substances, and number. *Wiley Interdisciplinary Reviews: Cognitive Science*, 3(1), 19–27. <https://doi.org/10.1002/wcs.157>
- Heyman, G. D. (2001). Children's Interpretation of Ambiguous Behavior: Evidence for a 'Boys are Bad' Bias. *Social Development*, 10(2), 230–247. <https://doi.org/10.1111/1467-9507.00161>
- Hirschfeld, L. A. (1995). Do children have a theory of race? *Cognition*, 54(2), 209–252. [https://doi.org/10.1016/0010-0277\(95\)91425-R](https://doi.org/10.1016/0010-0277(95)91425-R)
- Ho, A. K., Roberts, S. O., & Gelman, S. A. (2015). Essentialism and Racial Bias Jointly Contribute to the Categorization of Multiracial Individuals. *Psychological Science*, 26(10), 1639–1645. <https://doi.org/10.1177/0956797615596436>
- Jipson, J. L., & Gelman, S. A. (2007). Robots and rodents: Children's inferences about living and nonliving kinds. *Child Development*, 78(6), 1675–1688. <https://doi.org/10.1111/j.1467-8624.2007.01095.x>

DEVELOPMENT OF SOCIAL GROUP COGNITION

- Keita, S. O. Y., Kittles, R. A., Royal, C. D. M., Bonney, G. E., Furbert-Harris, P., Dunston, G. M., & Rotimi, C. N. (2004). Conceptualizing human variation. *Nature Genetics*, 36(11S), s17–s20. <https://doi.org/10.1038/ng1455>
- Kelly, D. J., Quinn, P. C., Slater, A. M., Lee, K., Ge, L., & Pascalis, O. (2007). The other-race effect develops during infancy: Evidence of perceptual narrowing. *Psychological Science*, 18(12), 1084–1089. <https://doi.org/10.1111/j.1467-9280.2007.02029.x>
- Kelly, D. J., Quinn, P. C., Slater, A. M., Lee, K., Gibson, A., Smith, M., Ge, L., & Pascalis, O. (2005). Three-month-olds, but not newborns, prefer own-race faces. *Developmental Science*, 8(6), F31–F36. <https://doi.org/10.1111/j.1467-7687.2005.0434a.x>
- Killen, M., & Stangor, C. (2001). Children's social reasoning about inclusion and exclusion in gender and race peer group contexts. *Child Development*, 72(1), 174–186. <https://doi.org/10.1111/1467-8624.00272>
- Killen, M., & Verkuyten, M. (2017). The importance of social-cognitive development and the developmental context for group dynamics. *Group Processes & Intergroup Relations*, 20(5), 707–718. <https://doi.org/10.1177/1368430217711771>
- Kim, H. I., Johnson, K. L., & Johnson, S. P. (2015). Gendered race: are infants' face preferences guided by intersectionality of sex and race? *Frontiers in Psychology*, 6. <https://doi.org/10.3389/fpsyg.2015.01330>
- Kinzler, K. D., & Dautel, J. B. (2012). Children's essentialist reasoning about language and race. *Developmental Science*, 15(1), 131–138. <https://doi.org/10.1111/j.1467-7687.2011.01101.x>
- Kinzler, K. D., & DeJesus, J. M. (2013). Northern = smart and Southern = nice: The development of accent attitudes in the United States. *Quarterly Journal of Experimental Psychology*, 66(6), 1146–1158. <https://doi.org/10.1080/17470218.2012.731695>

DEVELOPMENT OF SOCIAL GROUP COGNITION

Kinzler, K. D., Dupoux, E., & Spelke, E. S. (2007). The native language of social cognition.

Proceedings of the National Academy of Sciences of the United States of America, 104(30), 12577–12580. <https://doi.org/10.1073/pnas.0705345104>

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.

<https://doi.org/10.1521/soco.2009.27.4.623>

Kinzler, K. D., Shutts, K., & Spelke, E. S. (2012). Language-based Social Preferences among Children in South Africa. *Language Learning and Development*, 8(3), 215–232.

<https://doi.org/10.1080/15475441.2011.583611>

Kitamura, C., Panneton, R., & Best, C. T. (2013). The development of language constancy:

Attention to native versus nonnative accents. *Child Development*, 84(5), 1686–1700.

<https://doi.org/10.1111/cdev.12068>

Kurzban, R., Tooby, J., & Cosmides, L. (2001). Can race be erased? Coalitional computation and social categorization. *Proceedings of the National Academy of Sciences*, 98(26), 15387–

15392. <https://doi.org/10.1073/pnas.251541498>

Lam, V., Guerrero, S., Damree, N., & Enesco, I. (2011). Young children's racial awareness and affect and their perceptions about mothers' racial affect in a multiracial context. *British*

Journal of Developmental Psychology, 29(4), 842–864. <https://doi.org/10.1348/2044-835X.002013>

Lee, K., Quinn, P. C., & Pascalis, O. (2017). Face Race Processing and Racial Bias in Early

Development: A Perceptual-Social Linkage. *Current Directions in Psychological Science*,

26(3), 256–262. <https://doi.org/10.1177/0963721417690276>

Leinbach, M. D., & Fagot, B. I. (1993). Categorical habituation to male and female faces:

DEVELOPMENT OF SOCIAL GROUP COGNITION

Gender schematic processing in infancy. *Infant Behavior and Development*, 16(3), 317–332.

[https://doi.org/10.1016/0163-6383\(93\)80038-A](https://doi.org/10.1016/0163-6383(93)80038-A)

Levy, B. R. (1996). Improving Memory in Old Age Through Implicit Self-Stereotyping. *Journal of Personality and Social Psychology*, 71(6), 1092–1107. <https://doi.org/10.1037/0022-3514.71.6.1092>

Levy, B. R. (2009). Stereotype embodiment: A psychosocial approach to aging. *Current Directions in Psychological Science*, 18(6), 332–336. <https://doi.org/10.1111/j.1467-8721.2009.01662.x>

Levy, B. R., & Langer, E. (1994). Aging free from negative stereotypes: Successful memory in China among the American deaf. *Journal of Personality and Social Psychology*, 66(6), 989–997. <https://doi.org/10.1037/0022-3514.66.6.989>

Levy, G. D., & Haaf, R. A. (1994). Detection of gender-related categories by 10-month-old infants. *Infant Behavior and Development*, 17(4), 457–459. [https://doi.org/10.1016/0163-6383\(94\)90037-X](https://doi.org/10.1016/0163-6383(94)90037-X)

Lieberman, Z., Woodward, A. L., & Kinzler, K. D. (2017). The Origins of Social Categorization. *Trends in Cognitive Sciences*, 21(7), 556–568. <https://doi.org/10.1016/j.tics.2017.04.004>

Liu, S., Xiao, N. G., Quinn, P. C., Zhu, D., Ge, L., Pascalis, O., & Lee, K. (2015). Asian infants show preference for own-race but not other-race female faces: The role of infant caregiving arrangements. *Frontiers in Psychology*, 6(MAY). <https://doi.org/10.3389/fpsyg.2015.00593>

Macchi Cassia, V. (2011). Age biases in face processing: The effects of experience across development. *British Journal of Psychology*, 102, 816–829. <https://doi.org/10.1111/j.2044-8295.2011.02046.x>

Macchi Cassia, V., Bulf, H., Quadrelli, E., & Proietti, V. (2014). Age-related face processing

DEVELOPMENT OF SOCIAL GROUP COGNITION

- bias in infancy: Evidence of perceptual narrowing for adult faces. *Developmental Psychobiology*, 56(2), 238–248. <https://doi.org/10.1002/dev.21191>
- Margoni, F., & Surian, L. (2016). Explaining the U-shaped development of intent-based moral judgments. In *Frontiers in Psychology* (Vol. 7). Frontiers Media S.A. <https://doi.org/10.3389/fpsyg.2016.00219>
- Martin, C. L., & Ruble, D. (2004). Children's Search for Gender Cues. *Current Directions in Psychological Science*, 13(2), 67–70. <https://doi.org/10.1111/j.0963-7214.2004.00276.x>
- McCall, R. B., & Kennedy, C. B. (1980). Attention of 4-month infants to discrepancy and babyishness. *Journal of Experimental Child Psychology*, 29(2), 189–201. [https://doi.org/10.1016/0022-0965\(80\)90015-6](https://doi.org/10.1016/0022-0965(80)90015-6)
- McCullough, E. A., Clopper, C. G., & Wagner, L. (2019). The Development of Regional Dialect Locality Judgments and Language Attitudes Across the Life Span. *Child Development*, 90(4), 1080–1096. <https://doi.org/10.1111/cdev.12984>
- McKown, C. (2004). Age and ethnic variation in children's thinking about the nature of racism. *Journal of Applied Developmental Psychology*, 25(5), 597–617. <https://doi.org/10.1016/j.appdev.2004.08.001>
- Meissner, C. A., & Brigham, J. C. (2001). Own-Race bias in memory for faces: A Meta-Analytic Review. *Psychology, Public Policy, and Law*, 7(1), 3–35. <https://doi.org/10.1037//1076-8971.7.1.3>
- Mendonça, J., Marques, S., & Abrams, D. (2018). Children's Attitudes toward Older People: Current and Future Directions. In L. Ayalon & C. Tesch-Romer (Eds.), *Contemporary Perspectives on Ageism* (pp. 517–548). https://doi.org/10.1007/978-3-319-73820-8_30
- Middlecamp, M., & Gross, D. (2002). Intergenerational daycare and preschoolers' attitudes

DEVELOPMENT OF SOCIAL GROUP COGNITION

about aging. *Educational Gerontology*, 28(4), 271–288.

<https://doi.org/10.1080/036012702753590398>

Miller, D. I., Nolla, K. M., Eagly, A. H., & Uttal, D. H. (2018). The Development of Children's Gender-Science Stereotypes: A Meta-analysis of 5 Decades of U.S. Draw-A-Scientist Studies. *Child Development*, 89(6), 1943–1955. <https://doi.org/10.1111/cdev.13039>

Moon, C., Cooper, R. P., & Fifer, W. P. (1993). Two-day-olds prefer their native language. *Infant Behavior and Development*, 16(4), 495–500. [https://doi.org/10.1016/0163-6383\(93\)80007-U](https://doi.org/10.1016/0163-6383(93)80007-U)

Nelson, T. D. (2002). *Ageism: Stereotyping and prejudice against older persons*.

Nesdale, D., & Flesser, D. (2001). Social identity and the development of children's group attitudes. *Child Development*, 72(2), 506–517. <https://doi.org/10.1111/1467-8624.00293>

Newheiser, A. K., & Olson, K. R. (2012). White and Black American children's implicit intergroup bias. *Journal of Experimental Social Psychology*, 48(1), 264–270. <https://doi.org/10.1016/j.jesp.2011.08.011>

Norton, A. T., & Herek, G. M. (2013). Heterosexuals' Attitudes Toward Transgender People: Findings from a National Probability Sample of U.S. Adults. *Sex Roles*, 68(11–12), 738–753. <https://doi.org/10.1007/s11199-011-0110-6>

Olson, K. R., & Dweck, C. S. (2008). A Blueprint for Social Cognitive Development. *Perspectives on Psychological Science*, 3(3), 193–202. <https://doi.org/10.1111/j.1745-6924.2008.00074.x>

Olson, K. R., & Enright, E. A. (2018). Do transgender children (gender) stereotype less than their peers and siblings? *Developmental Science*, 21(4), e12606. <https://doi.org/10.1111/desc.12606>

DEVELOPMENT OF SOCIAL GROUP COGNITION

- Olson, K. R., & Gülgöz, S. (2018). Early Findings From the TransYouth Project: Gender Development in Transgender Children. *Child Development Perspectives*, 12(2), 93–97. <https://doi.org/10.1111/cdep.12268>
- Olson, K. R., Key, A. C., & Eaton, N. R. (2015). Gender Cognition in Transgender Children. *Psychological Science*, 26(4), 467–474. <https://doi.org/10.1177/0956797614568156>
- Olson, K. R., Shutts, K., Kinzler, K. D., & Weisman, K. G. (2012). Children Associate Racial Groups With Wealth: Evidence From South Africa. *Child Development*, 83(6), 1884–1899. <https://doi.org/10.1111/j.1467-8624.2012.01819.x>
- Owen Blakemore, J. E. (2003). Children’s beliefs about violating gender norms: Boys shouldn’t look like girls, and girls shouldn’t act like boys. *Sex Roles*, 48(9–10), 411–419. <https://doi.org/10.1023/A:1023574427720>
- Paquette-Smith, M., Buckler, H., White, K. S., Choi, J., & Johnson, E. K. (2019). The effect of accent exposure on children’s sociolinguistic evaluation of peers. *Developmental Psychology*, 55(4), 809–822. <https://doi.org/10.1037/dev0000659>
- Pauker, K., Ambady, N., & Apfelbaum, E. P. (2010). Race Salience and Essentialist Thinking in Racial Stereotype Development. *Child Development*, 81(6), 1799–1813. <https://doi.org/10.1111/j.1467-8624.2010.01511.x>
- Pauker, K., Williams, A., & Steele, J. R. (2016). Children’s Racial Categorization in Context. *Child Development Perspectives*, 10(1), 33–38. <https://doi.org/10.1111/cdep.12155>
- Pauker, K., Xu, Y., Williams, A., & Biddle, A. M. (2016). Race Essentialism and Social Contextual Differences in Children’s Racial Stereotyping. *Child Development*, 87(5), 1409–1422. <https://doi.org/10.1111/cdev.12592>
- Pickron, C. B., Fava, E., & Scott, L. S. (2017). Follow My Gaze: Face Race and Sex Influence

DEVELOPMENT OF SOCIAL GROUP COGNITION

Gaze-Cued Attention in Infancy. *Infancy*, 22(5), 626–644.

<https://doi.org/10.1111/infa.12180>

Pietraszewski, D., Cosmides, L., & Tooby, J. (2014). The content of our cooperation, not the color of our skin: An alliance detection system regulates categorization by coalition and race, but not sex. *PLoS ONE*, 9(2). <https://doi.org/10.1371/journal.pone.0088534>

Pinquart, M., Wenzel, S., & Sörensen, S. (2000). Changes in attitudes among children and elderly adults in intergenerational group work. *Educational Gerontology*, 26(6), 523–540. <https://doi.org/10.1080/03601270050133883>

Pomerantz, E. M., & Newman, L. S. (2000). Looking in on the Children: Using Developmental Psychology as a Tool for Hypothesis Testing and Model Building in Social Psychology. *Personality and Social Psychology Review*, 4(4), 300–316.

Poulin-Dubois, D., Serbin, L. A., Eichstedt, J. A., Sen, M. G., & Beissel, C. F. (2002). Men don't put on make-up: Toddlers' knowledge of the gender stereotyping of household activities. *Social Development*, 11(2), 166–181. <https://doi.org/10.1111/1467-9507.00193>

Pun, A., Ferera, M., Diesendruck, G., Hamlin, J. K., & Baron, A. S. (2018). Foundations of infants' social group evaluations. *Developmental Science*, 21(3), 1–13. <https://doi.org/10.1111/desc.12586>

Qian, M. K., Heyman, G. D., Quinn, P. C., Fu, G., & Lee, K. (2019). *Developmental Psychology Differential Developmental Courses of Implicit and Explicit Biases for Different Other-Race Classes*. <https://doi.org/10.1037/dev0000730>

Qian, M. K., Heyman, G. D., Quinn, P. C., Messi, F. A., Fu, G., & Lee, K. (2016). Implicit Racial Biases in Preschool Children and Adults From Asia and Africa. *Child Development*, 87(1), 285–296. <https://doi.org/10.1111/cdev.12442>

- Qian, M. K., Quinn, P. C., Heyman, G. D., Pascalis, O., Fu, G., & Lee, K. (2017a). A Long-term effect of perceptual individuation training on reducing implicit racial bias in preschool children. *Child Development*, 1–16. <https://doi.org/http://dx.doi.org/10.1037/dev0000290>
- Qian, M. K., Quinn, P. C., Heyman, G. D., Pascalis, O., Fu, G., & Lee, K. (2017b). Perceptual individuation training (but not mere exposure) reduces implicit racial bias in preschool children. *Developmental Psychology*, 53(5), 845–859. <https://doi.org/10.1037/dev0000290>
- Quinn, P. C., Conforto, A., Lee, K., O’Toole, A. J., Pascalis, O., & Slater, A. M. (2010). Infant preference for individual women’s faces extends to girl prototype faces. *Infant Behavior and Development*, 33(3), 357–360. <https://doi.org/10.1016/j.infbeh.2010.03.001>
- Quinn, P. C., Lee, K., & Pascalis, O. (2019). Face Processing in Infancy and Beyond: The Case of Social Categories. *Annu. Rev. Psychol*, 70, 165–189. <https://doi.org/10.1146/annurev-psych-010418>
- Quinn, P. C., Lee, K., Pascalis, O., & Tanaka, J. W. (2016). Narrowing in categorical responding to other-race face classes by infants. *Developmental Science*, 19(3), 362–371. <https://doi.org/10.1111/desc.12301>
- Quinn, P. C., Uttley, L., Lee, K., Gibson, A., Smith, M., Slater, A. M., & Pascalis, O. (2008). Infant preference for female faces occurs for same- but not other-race faces. *Journal of Neuropsychology*, 2(Pt 1), 15–26. <https://doi.org/10.1348/174866407X231029>
- 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(9), 1109–1121. <https://doi.org/10.1068/p3331>
- Raabe, T., & Beelmann, A. (2011). Development of ethnic, racial, and national prejudice in childhood and adolescence: A multinational meta-analysis of age differences. *Child*

DEVELOPMENT OF SOCIAL GROUP COGNITION

- Development*, 82(6), 1715–1737. <https://doi.org/10.1111/j.1467-8624.2011.01668.x>
- 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. <https://doi.org/10.1111/j.0963-7214.2006.00407.x>
- Ramsey, J. L., Langlois, J. H., & Marti, N. C. (2005). Infant categorization of faces: Ladies first. *Developmental Review*, 25(2), 212–246. <https://doi.org/10.1016/j.dr.2005.01.001>
- Ridgeway, C. L., & Correll, S. J. (2004). Unpacking the gender system a theoretical perspective on gender beliefs and social relations. In *Gender and Society* (Vol. 18, Issue 4, pp. 510–531). <https://doi.org/10.1177/0891243204265269>
- Roberts, S. O., & Gelman, S. A. (2016). Can White children grow up to be Black? Children's reasoning about the stability of emotion and race. *Developmental Psychology*, 52(6), 887–893. <https://doi.org/10.1037/dev0000132>
- Roberts, S. O., & Gelman, S. A. (2017). Multiracial Children's and Adults' Categorizations of Multiracial Individuals. *Journal of Cognition and Development*, 18(1), 1–15. <https://doi.org/10.1080/15248372.2015.1086772>
- Robinson, T., Zurcher, J., & Callahan, C. (2015). Youthful Ideals of Older Adults: An Analysis of Children's Drawings. *Educational Gerontology*, 41(6), 440–450. <https://doi.org/10.1080/03601277.2014.983372>
- Rudman, L. A., & Goodwin, S. A. (2004). Gender differences in automatic in-group bias: Why do women like women more than men like men? *Journal of Personality and Social Psychology*, 87(4), 494–509. <https://doi.org/10.1037/0022-3514.87.4.494>
- 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. <https://doi.org/10.1111/j.1467-8624.2005.00856.x>

Rutland, A., Killen, M., & Abrams, D. (2010). A New Social-Cognitive Developmental

Perspective on Prejudice. *Perspectives on Psychological Science*, 5(3), 279–291.

<https://doi.org/10.1177/1745691610369468>

Rutland, A., Killen, M., Abrams, D., Perspectives, S., May, N., Rutland, A., Killen, M., &

Abrams, D. (2016). *Morality and Group Identity: A New Social-Cognitive Developmental*

Perspective on Prejudice : The Interplay Between Morality and Group Identity. 5(3), 279–291.

Sanefuji, W., Ohgami, H., & Hashiya, K. (2006). Preference for peers in infancy. *Infant*

Behavior & Development, 29, 584–593. <https://doi.org/10.1016/j.infbeh.2006.07.007>

Seefeldt, C., Jantz, R. K., Galper, A., & Serock, K. (1977). Children's attitudes toward the

elderly: Educational implications. *Educational Gerontology*, 2(3), 301–310.

<https://doi.org/10.1080/0360127770020308>

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.

<https://doi.org/10.1111/j.1467-7687.2009.00913.x>

Shutts, K., Brey, E. L., Dornbusch, L. A., Slywotzky, N., & Olson, K. R. (2016). Children use

wealth cues to evaluate others. *PLoS ONE*, 11(3).

<https://doi.org/10.1371/journal.pone.0149360>

Shutts, K., Kenward, B., Falk, H., Ivegran, A., & Fawcett, C. (2017). Early preschool

environments and gender: Effects of gender pedagogy in Sweden. *Journal of Experimental*

Child Psychology, 162, 1–17. <https://doi.org/10.1016/j.jecp.2017.04.014>

Shutts, K., Roben, C. K. P., & Spelke, E. S. (2013). Children's Use of Social Categories in

DEVELOPMENT OF SOCIAL GROUP COGNITION

- Thinking About People and Social Relationships. *Journal of Cognition and Development*, 14(1), 35–62. <https://doi.org/10.1080/15248372.2011.638686>
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge University Press. <https://doi.org/10.2307/2655372>
- Signorella, M. L., Bigler, R. S., & Liben, L. S. (1993). Developmental differences in children's gender schemata about others: A smeta-analytic review. *Developmental Review*, 13(2), 147–183. <https://doi.org/10.1006/drev.1993.1007>
- Souza, A. L., Byers-Heinlein, K., Poulin-Dubois, D., Hannon, E. E., Floccia, C., & Van Heugten, M. (2013). *Bilingual and monolingual children prefer native-accented speakers*. <https://doi.org/10.3389/fpsyg.2013.00953>
- Spelke, E. S. (2000). Core knowledge. *American Psychologist*, 55(11), 1233–1243. <https://doi.org/10.1037/0003-066X.55.11.1233>
- Spelke, E. S., & Kinzler, K. D. (2007). Core knowledge. *Developmental Science*, 10(1), 89–96. <https://doi.org/10.1111/j.1467-7687.2007.00569.x>
- Storage, D., Charlesworth, T. E. S., Banaji, M. R., & Cimpian, A. (2020). Adults and children implicitly associate brilliance with men more than women. *Journal of Experimental Social Psychology*. <https://doi.org/10.1016/j.jesp.2020.104020>
- Sugden, N. A., Mohamed-Ali, M. I., & Moulson, M. C. (2014). I spy with my little eye: Typical, daily exposure to faces documented from a first-person infant perspective. *Developmental Psychobiology*, 56(2), 249–261. <https://doi.org/10.1002/dev.21183>
- Tham, D. S. Y., Bremner, J. G., & Hay, D. (2017). The other-race effect in children from a multiracial population: A cross-cultural comparison. *Journal of Experimental Child Psychology*, 155, 128–137. <https://doi.org/10.1016/j.jecp.2016.11.006>

DEVELOPMENT OF SOCIAL GROUP COGNITION

Trautner, H. M., Ruble, D. N., Cyphers, L., Kirsten, B., Behrendt, R., & Hartmann, P. (2005).

Rigidity and flexibility of gender stereotypes in childhood: developmental or differential?

Infant and Child Development, 14(4), 365–381. <https://doi.org/10.1002/icd.399>

U.S. Bureau of Labor Statistics. (2019). *American time use survey - 2018 results*.

www.bls.gov/tus/data.htm.

Verkuyten, M., & Thijs, J. (2001). Ethnic and Gender Bias among Dutch and Turkish Children

in Late Childhood: The Role of Social Context. *Infant and Child Development*, 10(4), 203–

217. <https://doi.org/10.1002/icd.279>

Weatherhead, D., & White, K. S. (2018). And then I saw her race: Race-based expectations

affect infants' word processing. *Cognition*, 177, 87–97.

<https://doi.org/10.1016/j.cognition.2018.04.004>

Weinraub, M., Clemens, L. P., Sockloff, A., Ethridge, T., Gracely, E., & Myers, B. (1984). The

Development of Sex Role Stereotypes in the Third Year: Relationships to Gender Labeling,

Gender Identity, Sex-Types Toy Preference, and Family Characteristics. *Child*

Development, 55(4), 1493. <https://doi.org/10.2307/1130019>

Weisman, K., Johnson, M. V., & Shutts, K. (2015). Young children's automatic encoding of

social categories. *Developmental Science*, 18(6), 1036–1043.

<https://doi.org/10.1111/desc.12269>

Wilbourn, M. P., & Kee, D. W. (2010). Henry the nurse is a doctor too: Implicitly examining

children's gender stereotypes for male and female occupational roles. *Sex Roles*, 62(9),

670–683. <https://doi.org/10.1007/s11199-010-9773-7>

Williams, A., & Steele, J. R. (2017). Examining Children's Implicit Racial Attitudes Using

Exemplar and Category-Based Measures. *Child Development*, 90(3), e322–e338.

DEVELOPMENT OF SOCIAL GROUP COGNITION

<https://doi.org/10.1111/cdev.12991>

Xiao, N. G., Quinn, P. C., Liu, S., Ge, L., Pascalis, O., & Lee, K. (2018). Older but not younger infants associate own-race faces with happy music and other-race faces with sad music.

Developmental Science, 21(2). <https://doi.org/10.1111/desc.12537>

Yee, M., & Brown, R. (1994). The development of gender differentiation in young children.

British Journal of Social Psychology, 33(2), 183–196. <https://doi.org/10.1111/j.2044-8309.1994.tb01017.x>

Yudell, M., Roberts, D., DeSalle, R., & Tishkoff, S. (2016). Science and society: Taking race out of human genetics. In *Science* (Vol. 351, Issue 6273, pp. 564–565).

<https://doi.org/10.1126/science.aac4951>

Zmyj, N., Daum, M. M., Prinz, W., & Aschersleben, G. (2012). Infants' attentional preference for object-related actions of older children compared to object-related actions of peers and adults. *Infant Behavior and Development*, 35(3), 533–542.

<https://doi.org/10.1016/j.infbeh.2012.03.003>

Zosuls, K. M., Ruble, D. N., Tamis-LeMonda, C. S., Shrout, P. E., Bornstein, M. H., & Greulich, F. K. (2009). The acquisition of gender labels in infancy: Implications for sex-typed play
NIH Public Access. *Dev Psychol*, 45(3), 688–701. <https://doi.org/10.1037/a0014053>