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Priorities in social categories

KATHERINE D. KINZLER[1]*, KRISTIN SHUTTS[2]**
AND JOSHUA CORRELL[1]
[1]*University of Chicago, Chicago, USA*
[2]*University of Wisconsin-Madison, Madison, USA*

Abstract

In this paper we review evidence from social, developmental, and evolutionary psychology to raise a common question: Are there priorities in how humans categorize their social world? Are some social groupings more prominent in childhood, and more resilient in adulthood than others? We review and compare evidence from each field, with a particular emphasis on exploring the relative robustness of gender, race, age, and language as social categories. We highlight the value of developmental approaches for characterizing the origins and nature of social categories in adults, and provide suggestions for how collaborative research from social, developmental, and evolutionary psychology could inform our understanding of potential priorities in social categorization. Copyright © 2010 John Wiley & Sons, Ltd.

Social cognition is characterized not only by our thinking about individuals, but also by our thinking about groups of individuals. Psychologists from multiple subfields have investigated how we detect, represent, and reason about social categories, or distinctions that connote social group membership. In this paper we draw on evidence from social, developmental, and evolutionary psychology to raise a common question: Do some social distinctions carry more weight than others in guiding our divisions of the social world? Put more simply, are some social categories more important to us than others? Developmental, social, and evolutionary psychologists have addressed this question, though often with different tools and methodologies, and sometimes resulting in divergent conclusions. Here we review key literature from each field, with a particular emphasis on illustrating the value of developmental approaches to characterizing the origins and nature of social categories in adults. Finally, we provide examples of how synergistic research in developmental, social, and evolutionary psychology can shed light on potential priorities in social categorization.

SOCIAL PSYCHOLOGY

Social psychologists have long investigated mechanisms of social categorization and social group-based preferences. Notable in this tradition of research is the finding that the variables used to create group distinctions are remarkably flexible. Beginning with the research of Tajfel, countless studies have shown that almost any group division—regardless of how seemingly arbitrary—can foster relative preferences for novel ingroup over outgroup members. "Minimal group" divisions can be based on completely arbitrary grouping assignments, such as the random assignment of individuals to

*Correspondence to: Katherine D. Kinzler, Department of Psychology, University of Chicago, 5848 S. University Ave. Chicago, IL 60637, USA.
E-mail: kinzler@uchicago.edu
**Correspondence to: K. Shutts, Department of Psychology, University of Wisconsin-Madison, 1202 West Johnson Street, Madison, WI 53706, USA.
E-mail: kshutts@wisc.edu

groups of "over-estimators" and "under-estimators" on a dot estimation task (Tajfel, Billig, Bundy, & Flament, 1971; but see Rabbie & Horwitz, 1969). The apparent ease with which humans divide the social world into groups is not limited to laboratory settings. Rather, differential treatment of others based on their social category membership is widely visible in modern society based on a multitude (and seemingly endless number) of factors, such as religious beliefs (Altemeyer, 2003), political affiliation (Kaplan, Freedman, & Iacoboni, 2007), and sports team allegiance (Crisp, Heuston, Farr, & Turner, 2007), to name but a few. Social categorization has numerous cognitive, social, and affective consequences, such as biasing perceptions of within-group and between-group differences (Rothbart, Davis-Stitt, & Hill, 1997), memory processes (e.g., Meissner & Brigham, 2001), reasoning and decision-making capacities (Glick, Zion, & Nelson, 1988; Hodson, Dovidio, & Gaertner, 2002), and day-to-day social interactions with other people (e.g., Dovidio, Kawakami, & Gaertner, 2002; Pettigrew & Meertens, 1995).

The diversity and ubiquity of social category-based biases suggest that priorities in social categories often depend on context. If living in Boston, being a Red Sox fan may be a notable social category; if living in a religious community, religion rather than sports team affiliation may function as a defining characteristic. Human social cognition, thus, is adaptively flexible in terms of prioritizing social categories that may have functional significance (Bernstein, Young, & Hugenberg, 2007). Although there are infinite ways in which humans might create group distinctions, existing literature points to three particularly psychologically prominent and superordinate social categories: gender, age, and race (Fiske, 1998; Fiske & Neuberg, 1990; Messick & Mackie, 1989; Stangor, Lynch, Duan, & Glass, 1992). Researchers have argued that adults automatically categorize novel individuals' gender, age, and race with speed and ease, and have difficulty suppressing attention to those categories even in situations where the information is irrelevant (e.g., Brewer, 1988; Fiske, Lin, & Neuberg, 1999; Taylor, Fiske, Etcoff, & Ruderman, 1978). Studies have indeed found that participants differentiate faces in terms of both race and gender within 200 milliseconds even when the dimensions are irrelevant to the task at hand (Ito & Urland, 2003). Further, exposure to race-, gender-, and age-related cues can bias subsequent behavior even when researchers take steps to minimize controlled processing (Blair & Banaji, 1996; Cesario, Plaks, & Higgins, 2006; Donders, Correll, & Wittenbrink, 2008; Wittenbrink, Judd, & Park, 1997). In sum, though social categorization may be flexible, social psychologists frequently converge in finding that gender, race, and age are particularly psychologically robust and universal social dimensions, which may result in part from the three categories' visual prominence (Fiske et al., 1999).

DEVELOPMENTAL PSYCHOLOGY

As in research on adults' social categorization, research in developmental psychology has emphasized both the flexibility with which children divide their social world, as well as the importance of gender, race, and age in guiding children's social preferences and thinking about others. Like adults, children rapidly learn and develop preferences based on arbitrary minimal group distinctions, such as random division into summer camp groups (Sherif, Harvey, White, Hood, & Sherif, 1961) or random assignment of t-shirt groupings in classroom settings (Bigler, Jones, & Lobliner, 1997). Nevertheless, gender, race, and age feature most prominently in existing research on children's social categorization. Numerous studies have shown that at least by the end of the preschool years, children perceive information that connotes others' gender, race, and age, and express social preferences and draw inferences based on these categories (Aboud, 1988; Baron & Banaji, 2006; Cameron, Alvarez, Ruble, & Fuligni, 2001; French, 1987; Gelman, Collman, & Maccoby, 1986; Hirschfeld, 1996; Katz & Kofkin, 1997; Kircher & Furby, 1971; Kowalski & Lo, 2001; Maccoby & Jacklin, 1987; Martin, Fabes, Evans, & Wyman, 1999). Moreover, recent research suggests that attention to social categories may be present as early as infancy, as reflected in infants' looking preferences between faces in different categories. Young infants look longer at faces that are of the same gender as their primary caregiver (Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002), at faces that are of the same race as those seen most often (Bar-Haim, Ziv, Lamy, & Hodes, 2006; Kelly, Quinn, Slater, Lee, Gibson, Smith, Ge, & Pascalis, 2005), and at faces of peers over faces of adults (Bahrick, Netto, & Hernandez-Reif, 1998; McCall & Kennedy, 1980; Sanefuji, Ohgami, & Hashiya, 2006).

For adults, much of the psychological import of age, gender, and race has been attributed to each category's perceptual (and notably visual) salience (Fiske, 1998; Fiske et al., 1999). Traditionally, it has been argued that children's social category formation is also largely reliant on visual observations of properties that differ among

individuals, since these factors are noticeable with minimal effort (Aboud, 1988; Goodman, 1970; Clark & Clark, 1940, Holmes, 1995). As illustration, children demonstrate ingroup biases based on minimal groupings for ''blue'' and ''yellow'' groups created by labeling and a visual cue to group membership (different colored t-shirts that are randomly assigned) (Bigler et al., 1997), but not based on labeling the groups by name in the absence of supporting visible distinctions (Bigler, 1995). Nonetheless, verbal labeling has noteworthy consequences for social categorization as well. Children make more inductive inferences based on gender and racial categories when they are provided with a novel label for those categories, than when the categories are visually depicted yet unlabeled (Waxman, 2010); similarly, categories that are visually marked (e.g., t-shirt color), but not functionally used, do not foster robust ingroup social preferences in children (Bigler et al., 1997).

Though children are capable of attending to multiple social category distinctions, past literature also suggests that some distinctions may be more easily acquired than others. Gender has been shown to be a particularly robust and early guide to children's playmate choices, preferences for objects and activities, and reasoning about others (see Ruble, Martin, & Berenbaum, 2006, for a comprehensive review). By comparison, race—while certainly salient to older children (e.g., Aboud, 1988)—may not be as important to young children early in development. For example, though children show social preferences for same-gender children by 2–3 years of age (e.g., Jacklin & Maccoby, 1978; LaFreniere, Strayer, & Gauthier, 1984), race-based attitudes may not emerge until closer to 4 or 5 years of age (Aboud, 2003; Aboud & Skerry, 1984; Kircher & Furby, 1971).

In sum, it does not take a lifetime (or even a decade) for seemingly mature social categorization to emerge in childhood (Dunham, Baron, & Banaji, 2008). Research exploring priorities in the developmental emergence of social categories may inform our understanding of social categorization throughout the lifespan. Methods to assess these early priorities, as well as the relationship between visual preferences exhibited by infants and social preferences and categories observed in children and adults, will be discussed later in this paper.

EVOLUTIONARY PSYCHOLOGY

Evolutionary psychologists have similarly addressed both the flexibility with which adults form social categories, as well as potential priorities in adults' social categorization. This research often has two goals: (1) Developing hypotheses concerning how cognitive evolution may have shaped our social cognition; (2) developing empirical tests to try to investigate signatures of evolved aspects of social reasoning that are present in modern-day adults.

Regarding flexibility, evolutionary theorists have proposed that humans' attention to some social groups may be supported by a system that evolved in response to the survival value of effectively tracking coalitions and alliances (Cosmides, Tooby, & Kurzban, 2003). Empirical studies provide evidence that adults readily encode and track dynamic patterns of cooperation in their environment (e.g., Seinen & Schram, 2006), and that a population of individuals can use what were previously arbitrary markers of group membership to guide their coordination with, and preferences for, ingroup over outgroup members (Efferson, Lalive, & Fehr, 2008).

A theoretical evolutionary approach posits that though we may be flexible in monitoring properties that denote patterns of cooperation or competition, certain social categories may nevertheless be more deeply rooted in cognitive evolution due to their functional significance. For example, adults automatically encode and categorize others based on their kinship relationships, which would have had significance for predicting both within- and between-group social interactions throughout our evolutionary history (Lieberman, Oum, & Kurzban, 2008). Research in evolutionary psychology has also explored adults' social categorization of others based on their gender, race, and age. All societies in all times would have had variance in the gender and age of its occupants. Accordingly, it would make sense for humans to have evolved mechanisms for rapidly and automatically encoding individuals' gender and age. Racial diversity, in contrast, would not likely have been present in human societies prior to the onset of long-distance migration, and therefore differences in skin color or physiognomy would not have been a reliable indicator of group membership prior to modern times (Cosmides et al., 2003). This theoretical approach breeds an experimental approach with the hypothesis that priorities set by evolutionary time may be visible in adults today. To test this suggestion empirically—using measures like those used by social psychologists to probe automatic encoding of person variables (e.g., Taylor et al., 1978)—Kurzban and colleagues presented adults with a paradigm in which they read a series

of statements, each paired with a photo of the person who had made the statement. In a surprise recall test, participants were asked to remember ''who said what'' (method from Taylor et al., 1978). This study relies on the rationale that, if a participant pays attention to a given social category (e.g., gender), he or she should be more likely to confuse the statements of two women (attributing Jessica's statement to Michelle) than to confuse the statement of one woman and one man (attributing Jessica's statement to Michael). Kurzban and colleagues examined attention to both racial and gender categories in the presence (or absence) of a salient alternative coalitional cue. They found that attention to a speaker's race, but not his or her gender, could be ''erased'' in the face of contrasting information denoting coalitional alliance (Kurzban, Tooby, & Cosmides, 2001; see also Van Bavel, Packer, & Cunningham, 2008). These empirical findings are consistent with theories on social hierarchies suggesting that gender is a more stable, universal, and ancient category, whereas hierarchies based on race are less stable and more dependent on societal contexts (Sidanius & Pratto, 1999).

Research in evolutionary psychology suggesting that attention to race is unstable in adults contrasts with research from social psychology suggesting that attention to race influences the very earliest stages of person perception (e.g., Ito & Urland, 2003). One explanation for these divergent findings is that tests of memory and online processing relate differently to social categorization (Hastie & Park, 1986). We return to a discussion of this point of contention between subfields below.

INTEGRATING ACROSS FIELDS

Looking across three fields, the question of how (and whether) we prioritize certain dimensions of social categorization over others appears unresolved. Research in social psychology finds that social categories are flexible, yet some social distinctions—namely age, race, and gender—are particularly salient, and critical to person perception. Developmental psychology reports that infants can visually distinguish individuals along each of these three category lines, and that children demonstrate social preferences based on each by the end of the preschool years; nonetheless, social preferences based on gender appear to emerge prior to social preferences based on race in early childhood. Findings from evolutionary psychology argue that evolution by natural selection may have favored attention to certain social categories over others—for example, gender over race—and that this relative weighting is continually visible in adulthood. How do we integrate and reconcile these findings across fields?

We present here ongoing research that seeks to further investigate priorities in social categories using tools and insights from developmental, evolutionary, and social psychology. We propose that this investigation is particularly fruitful in several regards: First, we argue that a reliance on the ''big three'' social categories may be incomplete, and that a fourth category—attention to the language or accent with which someone speaks—is robust early in development, and persists into adulthood. Second, we propose that developmental psychology can offer valuable insights concerning priorities in social categories both across evolutionary time, and in adults today. This latter goal is accomplished through use of methods that directly test priorities in the emergence of social category awareness over developmental time, as well as priorities in the robustness with which different social categories guide children's social reasoning. Third, we explore open questions concerning continuities and discontinuities in priorities in social categories across the lifespan, and stress the value of research that cuts across disciplines. This research is in the early stages, and we hope to foster links with researchers from different fields.

LANGUAGE AS A SOCIAL CATEGORY

Though less often studied in literature on social groups, recent evidence from developmental psychology provides evidence that language provides a critical, and potentially primary way in which we divide the social world. For adults, the language and accent with which someone speaks provides a wealth of information about his or her social group membership, such as information about nationality, regional origins, ethnic group, and social status (Labov, 2006). Adolescents and adults will rate the *same individual*, speaking the *same content* as having a vastly

different personality type and physical appearance based on the accent or language with which he or she speaks (see Giles & Billings, 2004, for a review). Often in these studies, social evaluations based on language or accent are thought to reflect knowledge of cultural stereotypes about different linguistic communities. Recent evidence, however, suggests that social preferences based on language and accent emerge remarkably early in development, are present even prior to a child's explicit awareness of linguistic stereotypes, and surpass young children's social preferences based on race.

From birth, newborn infants prefer to listen to speech of their maternal language, and can even discriminate two foreign languages provided they cross a rhythmic class boundary (Mehler, Jusczyk, Lambertz, Halsted, Bertoncini, & Amiel-Tison, 1988; Nazzi, Bertoncini, & Mehler, 1998). Prior to speaking themselves, infants preferentially interact with and accept toys from native speakers of their native language, and selectively eat foods that are endorsed by speakers of their native language (Kinzler, Dupoux, & Spelke, 2007; Shutts, Kinzler, McKee, & Spelke, 2009). Thus, an early linguistic faculty generates not just language-learning but also social preferences for native speakers of one's native language. In one study, for instance, 10-month-old infants saw movies in which a native and a foreign speaker each spoke, and then, silently and in synchrony, held up two identical toys and offered the toys to the baby. Just as the toys disappeared off screen, two real toys appeared for the baby to grasp, giving the illusion that they came from the screen. Infants reached for the toys offered by the native speaker, though the toys were identical and the ''offering events'' non-linguistic in nature (Kinzler et al., 2007).

Early preferences for native speakers are certainly based on familiarity. Humans do not innately speak one language over another; rather, a familiarity with a certain type of speech generates social preferences for speakers who speak in that way. Nonetheless, critical to a discussion of priorities, not all dimensions of familiarity have equal effects on infants' and children's early preferences. Though infants selectively take toys from native-language over foreign-language speakers (Kinzler et al., 2007), when tested with the same experimental paradigm, infants accept toys equally from own- and other-race individuals (Kinzler, Dupoux, & Spelke, 2008). Children's privileged attention to language over race continues throughout early childhood. At 5 years of age, children's social judgments reflect preferences for both own-race and native-accented individuals, when each category is tested in isolation (e.g., Aboud, 1988; Kinzler, Shutts, DeJesus, & Spelke, 2009). Nonetheless, when accent is pitted against race such that someone of the child's race speaks in a foreign accent, and someone of a different race speaks in the child's native accent, White children in the US choose to be friends with native-accented, other-race individuals (Kinzler et al., 2009). Together, this research provides evidence that attention to the manner in which others speak provides a critical, and potentially primary, way in which children divide the social world.

Attention to language and accent as markers of group membership has widespread modern-day significance for human social interactions (Lippi-Green, 1997) and group identity (Henrich & Henrich, 2007). Language as a social category may also have a long evolutionary history. Evolutionary psychologists have argued that neighboring groups in ancient times likely did not look different in terms of physiognomy or skin color (Cosmides et al., 2003); language and accent, in contrast, can evolve over very short temporal and geographic distances, and thus may have been a good predictor of group membership in ancient times (Baker, 2001; Kurzban et al., 2001). Thus, infants and young children may be predisposed to grant particular attention to the language with which others speak in guiding their early social interactions. Children certainly come to categorize others based on other factors that are valid predictors of coalitional membership in their society (e.g., race, or even way of dress), but research suggests that not all social group distinctions are equally robust guides to young children's social preferences.

Children's early social reliance on language and accent raises questions concerning the type of information that children use to categorize others more generally. In particular, children's social attention to accent over race provides evidence against the assertion that children's early awareness of social categories is primarily dependent on visual salience. Rather, this finding is consistent with research that roots the development of social categories in more abstract distinctions and predispositions that are not simply reliant on visual differences among individuals (e.g., Diesendruck & haLevi, 2006; Gelman et al., 1986; Hirschfeld, 1996). For example, while gender is often communicated by perceptual cues, young children prioritize category membership (e.g., labeling as a ''boy'' or ''girl'') over conflicting visual information in inferring non-obvious properties (Gelman et al., 1986). When perceptually neutral pictures of children are labeled with different ethnic labels (e.g., Arab vs. Jew), children generalize novel properties along ethnic category lines, and this generalization is just as robust as

when children are provided with both verbal labels and visual cues to ethnicity (Diesendruck & haLevi, 2006). Accent, though not visually perceptible, may provide a critical basis for dividing the social world. Researchers from diverse fields will hopefully continue to investigate human's attention to accent and language as social group markers.

METHODS FOR STUDYING PRIORITIES IN DEVELOPMENT

As discussed above, past literature investigating children's attention to gender and race suggests that gender awareness precedes preferences based on race in developmental time (Aboud, 2003; Aboud & Skerry, 1984; Jacklin & Maccoby, 1978; Kircher & Furby, 1971; LaFreniere et al., 1984). Nonetheless, many developmental studies target children's attention to either gender or race, and do not directly compare the relative importance of the two categories. Thus, in addition to examining social category emergence and importance in developmental time across different studies, one may also profitably investigate questions about priorities in children's social categories by directly comparing the influence of more than one category with the same method and population of children. For example, in a recent study Shutts, Banaji, and Spelke (in press) used an identical procedure to assess and compare the influence of gender, race, and age on children's preferences for novel items. In this study, 3-year-old White children were asked to choose between objects or activities that were endorsed by unfamiliar people who differed in gender, race (White, Black), or age (child, adult). The findings indicated that gender and age were more robust guides to children's preferences than race. Another recent study compared 5-year-old children's reasoning about the categorization of others based on their gender and race (e.g., are two people considered the "same kind" or "different kinds"?). In this study, children viewed gender as a naturalized category that is objectively determined, which is similar to how children reason about animal kinds. Race, in contrast, was seen by young children as flexibility determined, which is more similar to how children reason about artifacts (Rhodes & Gelman, 2009). Taken together, these studies provide evidence that the use of identical experimental methods to test children's attention to gender, race, and age find that gender and age are used more robustly and consistently than race early in childhood. These findings parallel research by evolutionary psychologists suggesting that race may be a less privileged marker of social category membership than gender or age, even in adulthood (Kurzban et al., 2001).

Finally, developmental research can be fruitful in investigating the relative strength and developmental trajectory of different social categories in guiding children's preferences, even at times in development when children attend to and use multiple social categories. The example provided above of children choosing native-accented speakers as friends, even when they are of a different race (Kinzler et al., 2009) provides one example of this type of inquiry. To give another example, Degner & Wentura (2010) presented older children with a variant of the "Who said what" paradigm (Klauer & Wegener, 1998; Taylor et al., 1978), in which 9–12-year-old children's spontaneous recall of novel individuals' age and ethnicity was assessed. Children at this age made both within-age and within-ethnicity errors, suggesting that they categorized individuals based on their membership to both categories. Nonetheless, though children's categorization based on age (child vs. adult) was constant across development, children's categorization based on ethnicity increased with age, suggesting that person perception based on ethnicity may be the result of a relatively protracted developmental trajectory. Methods in developmental psychology that compare both the emergence of social category awareness across developmental time, and also the relative robustness of different categories at the same point in time, can further our understanding of the ontogenetic origins of our attention to social categories. Furthermore, we can test how the relative weighting of different social categories may adjust or even transform throughout the lifespan, in response to different social contexts.

LOOKING FORWARD

Findings from studies of priorities in children's social categorization naturally raise the question of how developmental priorities are related to, and can inform our understanding of, adults' social categorization (see also

Dunham & Olson, 2008; Olson & Dweck, 2009). On the one hand, adults' relative weighting of different social categories could be continuous with children's analyses of the social world. This position is consistent with the idea that just as gender is more psychologically potent than race in childhood, race encoding, but not gender encoding, can be erased in adults (Kurzban et al., 2001). On the other hand, it could be the case that children's social categories are initially guided by ''better guesses'' about universally relevant social dimensions (e.g., gender, language, and age), but that humans are ultimately flexible in representing and reasoning about social categories. Thus, if red t-shirts and green t-shirts defined one's local social environment, t-shirt color might prevail as a critical social category, carrying all the weight and inductive potential of other social categories such as gender and age. Along these lines, attention to race as a social category may not be as meaningful as gender or language to infants and young children, but if a child's society uses race as a primary grouping variable, that child may grow to see race as one of, or even the most, pre-eminent social category by adulthood. These potential differences between categories highlight the necessity for cross-cultural research. One possibility is that our understanding of race as a potent social category stems primarily from studies of individuals in Northern America and Western Europe, and that not all societies would view skin color as being equally critical in person perception (and may instead focus on other dimensions such as ethnicity that are not always visually depicted; Gil-White, 2001). Categories such as gender, age, and language, in contrast, might be socially perceptible across all cultures. Further studies of the malleability of children and adults' perception of different social categories across different cultural contexts will help to inform this discussion.

Beyond documenting the developmental trajectory of children's attention to different social categories, we can design studies to investigate mechanisms supporting the development and acquisition of social categories, as well as examine how early environments may shape this process. By bringing together the perspectives of social, developmental and evolutionary psychology, such an approach has the potential to yield dramatic and novel insights. As documented above, the influences of language, race, age, and gender seem to fluctuate over the course of ontogeny. Young children show robust preferences based on gender and language, but seem less influenced by racial information (Kinzler et al., 2009; Shutts et al., in press). By the end of the preschool years, though, children begin to use racial categories to guide their social judgments. It seems unlikely that children wake up on their fourth or fifth birthday with a brand new capacity to process racial information and use it to guide social behavior and reasoning. Rather, it is perhaps more reasonable to suggest that early environments shape the emergence of preschool-age children's race-based social awareness, even if this development is subtle. A child's early environment might influence attention to race (as well as other social categories) through verbal discussions and labeling, as well as children's perceptions of their parents' social relationships and preferences, even if communicated unintentionally (Castelli, Zogmaister, & Tomelleri, 2009). Differing exposure to diversity (e.g., different racial and linguistic groups) may also play a formative role in the development of children's social categories. For example, diversity of schooling environment influences children's evaluative judgments of members of different racial groups (McGlothlin & Killen, 2006); this may also be true of children's earliest social environments.

Future attempts to bridge across social and developmental psychology might clarify the relationship between early visual preferences, and later social preferences. A number of studies suggest that in the first year of life infants' patterns of visual attention reflect social category variables. Three-month-olds preferentially attend to faces that match the gender of their primary caregiver (Quinn et al., 2002), as well as faces of a familiar racial group (Bar-Haim et al., 2006; Kelly et al., 2005). These social category variables can also interact—infants only demonstrate visual preferences based on gender when viewing familiar-race faces (Quinn et al., 2008). Additionally, infants begin to show decrements in outgroup face recognition in the first year of life (Kelly, Quinn, Slater, Lee, Ge, & Pascalis, 2007; Sangrigoli & de Schonen, 2004), a phenomenon that persists into childhood and adulthood (Meissner & Brigham, 2001; Shutts & Kinzler, 2007). These studies provide some evidence that face processing is ''tuned'' to dimensions of gender and race very early in infancy. More generally, infants seem to develop representations of prototypical faces, reflecting the social environment in which they are raised (de Haan, Johnson, Maurer, & Perrett, 2001). A stable prototype may increase both the capacity to cognitively represent prototypical faces (Corneille, Hugenberg, & Potter, 2007) as well as the perceived social relevance of such faces (Pascalis & Kelly, 2009).

From one perspective, early biases in visual preferences and face memory may reflect a perceptual system that is becoming ''tuned'' to an infant's early environment, but has no automatic or mandatory impact on social preferences. On this hypothesis, infants' visual preferences may reflect perceptual processing that favors the familiar, and bears no

necessary relationship to older children's and adults' social preferences. From another perspective, developmental refinements in perception and cognition might influence the emergence of biases based on social category distinctions. For example, the existence of a facial prototype that privileges the processing of more familiar individuals (typically ingroup members) may facilitate the formation of stereotypic or prejudicial generalizations about members of an outgroup that emerge later in life. Finally, it is possible that processing faces of ingroup and outgroup members, and developing social preferences based on group membership, are related later in life, but not necessarily in infancy or early childhood. In accordance with this possibility, recent research provides evidence that the own-race face memory advantage for ingroup faces and racial bias are statistically independent in 6-year-old children, yet correlated in 10-year-old children and adults (Golarai, Wu, Gabrieli, & Eberhardt, 2006).

In considering methods to address priorities in social category reasoning in adulthood, the current discussion overlaps in substantial ways with research on crossed categorization. This research tradition has focused on ameliorating intergroup bias by identifying cross-cutting similarities between individuals. For example, a participant in Bangladesh may be relatively critical of an individual in India (relative to a target who is a fellow Bangladeshi). Crossed categorization research seeks to determine whether that bias can be reduced by finding some form of common ground between the participant and the target. For example, if the participant and target share a common religious affiliation (e.g., both are Hindu), does the participant respond more favorably? The simple answer seems to be, ''yes'' (Hewstone, Islam, & Judd, 1993). A substantial body of work has addressed this type of question with a diverse array of group dimensions and theoretical models (e.g., Brown & Turner, 1979; Crisp, Hewstone, & Rubin, 2001; Urada, Stenstrom, & Miller, 2007). For the most part, however, cross-categorization research has tested the effects of one or more common group memberships without worrying about differences between specific *kinds* of groups. Similar to cross-categorization research, the current paper is intimately concerned with the effects of multiple social dimensions. But, in direct contrast to cross-categorization research, most of the work we have discussed has focused exclusively on comparing the different *kinds* of groups, without systematically manipulating the number of common groups between participant and target. Though these streams of research have each progressed independently, future research that begins to unite these perspectives may provide great insight into the psychological meaning of group membership.

In bridging across methods and fields, future research should also consider the signatures in performance that are used as evidence of prioritization in social categories throughout development. For instance, Kurzban et al. (2001) relied on cross-category memory errors to make inferences about encoding and categorization, in finding that attention to race in adults can be ''erased.'' Other researchers, however, find that race and gender influence very early stages of person perception (with effects emerging in the first 200–300 milliseconds; Ito & Urland, 2003), suggesting that long-term memory errors may provide a different level of analysis from online processing (Hastie & Park, 1986). Providing an example of a connection between evolutionary and social psychology, recent research has extended Kurzban's work, pitting race against other situationally salient coalitional cues, yet using measures of more instantaneous processing (Van Bavel & Cunningham, 2009). These data support the contention that coalitional cues can reduce race-based processing, by finding that White participants extend ingroup treatment to all members of their coalition, regardless of their race. However, the participants also respond more favorably to White than Black outgroup members, providing evidence that race can still be processed in spite of a competing cue to group membership. Future research should continue to address signatures and limitations of different methods, ranging from looking-time in infancy to automatic and controlled processes in adults, with the goal of providing multi-faceted assessments of social categorization at different points across the lifespan.

Finally, research from multiple areas of cognitive development suggests that a child's formative environment from birth to age five or six is particularly critical for many areas of development, such as early language and number skills, and that early development sets the trajectory for a child's later achievement (Alexander, Entwisle, & Olson, 2007; Dickinson & Tabors, 2001; Duncan et al., 2007). Future research might investigate whether the same is true for the development of social cognition, with a particular focus on exploring differences in the type of input required to engender attention to various social categories at different points in development. For example, social preferences for native speakers of a child's native language are certainly predicated on a child being exposed to a native language, but we know less about how children's attention to language as a social category may vary as a result of being raised in a multilingual environment. Additionally, although early preferences for familiar-race faces require differential exposure to some races over others, development of evaluative biases may depend on signals that race is a culturally relevant dimension which guide children's

attention to the category (e.g., cultural labels or race-based patterns of cooperation or status). Children attend to gender early in development, nevertheless their caregivers' and society's treatment and labeling of gender may also impact the development of children's reasoning about gender (Gelman, Taylor, & Nguyen, 2004). Furthermore, novel culturally dependent social categories may be differentially adopted at different points in development. Research that spans across disciplines will further our understanding of the nature of human reasoning about social categories, and the importance of early childhood cognition and environment for later adult social processes.

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