

Acknowledgments

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References

- 1 Christakis, D.A. (2009) The effects of infant media usage: what do we know and what should we learn? *Acta Paediatr.* 98, 8–16
- 2 Council on Communications and Media (2011) Media use by children younger than 2 years. *Pediatrics* 128, 1040–1045
- 3 Bavelier, D. *et al.* (2010) Children, wired: for better and for worse. *Neuron* 67, 692–701
- 4 Christakis, D.A. *et al.* (2012) Overstimulation of newborn mice leads to behavioral differences and deficits in cognitive performance. *Sci. Rep.* 2, 546
- 5 Chadman, K.K. *et al.* (2009) Criteria for validating mouse models of psychiatric diseases. *Am. J. Med. Genet. B Neuropsychiatr. Genet.* 150B, 1–11
- 6 Hensch, T.K. (2004) Critical period regulation. *Annu. Rev. Neurosci.* 27, 549–579
- 7 Baroncelli, L. *et al.* (2010) Nurturing brain plasticity: impact of environmental enrichment. *Cell Death Differ.* 17, 1092–1103
- 8 Won, H. *et al.* (2011) GIT1 is associated with ADHD in humans and ADHD-like behaviors in mice. *Nat. Med.* 17, 566–572
- 9 Sagvolden, T. *et al.* (2005) Rodent models of attention-deficit/hyperactivity disorder. *Biol. Psychiatry* 57, 1239–1247
- 10 Biederman, J. (2005) Attention-deficit/hyperactivity disorder: a selective overview. *Biol. Psychiatry* 57, 1215–1220

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Social categories are shaped by social experience

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A new study by Rhodes and colleagues offers insight into the development of social essentialism – the belief that members of social categories share essential properties (e.g., attitudes, psychological capacities). The challenge now is to consider these issues in children raised in the more diverse social environments that constitute the range of human experience.

A recent paper by Rhodes, Leslie and Tworek (henceforth, RLT) [1] offers insight into issues at the core of developmental cognitive science. Inspired by groundbreaking developmental work on psychological essentialism [2–4], they set their sight more specifically on social essentialism – the belief that members of certain social categories (e.g., gender- or race-based categories) share essential properties that run deeper than the eye can see (e.g., attitudes, dispositions, psychological and moral capacities). Bringing together insights from the psychological, philosophical, and linguistic traditions, RLT reveal the powerful effect of language in the development and transmission of a belief in social essentialism (a belief tied closely to social stereotyping and prejudice).

RLT's approach highlights the intricate interaction between the cognitive endowments of the child and the shaping role of the environment. This dynamic balance between nature and nurture, which runs through all of the social and biological sciences, has consequences not only for which ideas people hold true, but also for their understanding and treatment of themselves and others. RLT raise provocative questions about how social essentialism is fueled by natural endowments (including a cognitive bias to essentialize people and other objects), the environment, and the relation between these twin engines of development across the lifespan and across cultures. Their work

also adds importantly to a rapidly growing effort to build bridges between cognitive and social development [5].

A powerful and innovative aspect of RLT's design is the manipulation (via linguistic information) of parents' beliefs about a novel social category, a manipulation that provides a window into how parents form essentialist beliefs and transmit them unwittingly to their children. RLT document that whether and how social categories are marked in the language is instrumental in children's and adults' tendency to develop and to transmit stereotypic or essentialist information. This illustrates the power of naming, and especially naming with generic language, in essentializing kinds of people.

In the remainder of this commentary, I point to some of the very real challenges that lie ahead. If the goal is to describe, predict, and explain the origins of social categories, how these are shaped by experience, and how they gain inductive force, then currently the field is perched on precipitously narrow ground. After all, the social categories that one forms, and the inductive potential that these categories ultimately hold, are highly inflected by one's experience with members of one's own social group(s) and others. Therefore, a key challenge will be to broaden the empirical base in order to examine the developmental pathways of children raised in a more diverse set of circumstances that reflect more fully the range of human social experience [6].

Children from minority groups may establish race-based categories earlier than those from majority groups

The evidence that social categories based on race emerge later than those based on gender [4,7,8] comes from predominantly white middle-class children raised in the US. From both a theoretical and practical standpoint, it is essential that we ascertain whether children from minority

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groups, by dint of their social experiences, establish racial and ethnic categories earlier than their majority-culture counterparts, especially because the contrast (both implicit and explicit) between their own in-group and the majority is likely more tangible and the consequences of category membership more apparent.

Variations in experience may matter more in carving out social categories based on race and ethnicity than those based on gender

Across cultures, categories based on race, ethnicity, and gender are tenaciously held and readily imbued with inductive force. But variations in experience may matter more for racial and ethnic categories than for gender categories.

First, consider experience. With rare exception, young children observe and interact with males and females on a daily basis. However, their exposure to members of distinct racial and ethnic groups varies widely. Some children grow up with little or no first-hand exposure to members of racial or ethnic groups other than their own. Others are raised in more diverse communities; in some, individuals from different racial groups participate jointly in the social milieu, but in others, children are exposed to different racial groups within sharply segregated communities. This variation is likely to have significant impact on the social categories children form and the valence that these hold.

Next, consider language. Gender-based categories (e.g., ‘boy’, ‘girl’) are named more explicitly, more ubiquitously, and less self-consciously than racial- or ethnic-based distinctions. For example, teachers often use gender names to address their classrooms (‘Boys and girls, please line up quietly for gym’; [9]), but there is a clear prohibition against invoking racial or ethnic names in such circumstances (‘Whites and Blacks, please settle down’; [10]). If naming is instrumental in forming and essentializing social categories, this may have unanticipated, but far-reaching consequences.

What is the scope of children’s initial social categories, and how are these shaped by experience?

Do children initially make a binary partition, distinguishing their own ‘in-group’ from all others? How do we come to make finer partitions within our ‘own’ social category than others? How do factors such as native language, dialect, or behavioral practices contribute to the establishment of such distinctions?

How do children integrate the range of correlated characteristics – including differences in dispositional properties, physical features (e.g., skin color), native language (or dialect), and cultural practices – that constitute social category membership?

Although any one characteristic may serve as an entry point, the racial and ethnic categories that individuals

ultimately form cannot be reduced to single features alone. Instead, in the natural course of social experience, variations in dispositional properties and physical features, coupled with variation in native language, dialect, or speech register, and cultural practices are all part and parcel of the ‘diversity’ experience. How do these come together as children carve out distinct kinds of people and their valences?

What criteria determine which category serves as the appropriate inductive base?

If any individual is a member of many social categories (e.g., woman, African-American, physician, grandmother), then how can the range of extension for a given property applied to a given individual be determined? The answer will likely depend upon the property in question, the social category in question, and the child’s experiences with a range of social groups.

In closing, RLT’s provocative piece invites readers to consider how social categories, emerging early in development and tuned by experience in the social world, come to serve as vessels for culturally-transmitted information about kinds of people. Accepting this invitation will require a broader reach to include infants and young children raised in a more diverse set of circumstances that reflect more fully the range of human social experience.

References

- 1 Rhodes, M. *et al.* (2012) Cultural transmission of social essentialism. *Proc. Natl. Acad. Sci. U.S.A.* 109, 13526–13531
- 2 Gelman, S.A. *et al.* (2010) Effects of generic language on category content and structure. *Cogn. Psychol.* 61, 273–301
- 3 Diesendruck, G. and haLevi, H. (2006) The role of language, appearance, and culture in children’s social category-based induction. *Child Dev.* 77, 539–553
- 4 Rhodes, M. and Gelman, S.A. (2009) A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cogn. Psychol.* 59, 244–274
- 5 Banaji, M.R. and Gelman, S.A., eds *Navigating the Social World: What Infants, Children, and Other Species Can Teach Us*, Oxford University Press (in press)
- 6 Waxman, S. Building a better bridge: In *Navigating the Social World: What Infants, Children, and Other Species Can Teach Us* (Banaji, M. and Gelman, S.A., eds), Oxford University Press (in press)
- 7 Shutts, K. *et al.* (2011) Race preferences in children: insights from South Africa. *Dev. Sci.* 14, 1283–1291
- 8 Waxman, S. (2010) Names will never hurt me? Naming and the development of racial and gender categories in preschool-aged children. *Eur. J. Soc. Psychol.* 40, 593–610
- 9 Bigler, R.S. (1995) The role of classification skill in moderating environmental influences on children’s gender stereotyping: a study of the functional use of gender in the classroom. *Child Dev.* 66, 1072–1087
- 10 Pahlke, E. *et al.* (2012) Relations between colorblind socialization and children’s racial bias: Evidence from European American mothers and their preschool children. *Child Dev.* 83, 1164–1179