

Children employ wealth cues when predicting others' sharing

Brief running title: Wealth cues and sharing

Richard E. Ahl^{1*}, Shirley Duong^{2^}, and Yarrow Dunham¹

¹ Yale University

² University of New Haven

*Current affiliation: Boston College (richard.ahl@bc.edu)

^Current affiliation: University of Pittsburgh

The authors have no conflicts of interest to declare.

This manuscript was accepted for publication in *Developmental Psychology* on 9/7/2018.

© 2018, American Psychological Association. This paper is not the copy of record and may not exactly replicate the final, authoritative version of the article. Please do not copy or cite without authors' permission. The final article will be available, upon publication, via its DOI: 10.1037/dev0000643

Acknowledgments:

We thank Kristina Olson and Kristin Shutts for sharing the house photographs we used as stimuli; these photographs were crucial for our study. We thank Rachel Yost-Dubrow for assistance with data collection, Shaina Coogan for assistance with recruitment, and Katherine McAuliffe for helpful comments on a manuscript draft. We thank the generous support of the schools and museums that served as testing sites, and the participating children, parents, teachers, staff, and administrators who made our work possible. Portions of this research were presented as a poster at the 2017 Society for Personality and Social Psychology Convention. We would like to acknowledge the generous financial support of the John Templeton Foundation (Grant #56036).

Children employ wealth cues when predicting others' sharing

Abstract

Previous research has found that even young children accurately assign wealth labels (e.g., rich or poor) to real-world wealth symbols, such as photographs of houses. However, it is unclear whether children spontaneously consider individuals' wealth status when predicting how they will behave towards others. In Study 1, children ($n = 100$, ages 4–5 and 7–8) predicted that residents of “rich” houses would be likelier to share toys than residents of “poor” houses. This effect was driven by children who viewed rich-house residents as owning more toys. Study 2 ($n = 50$) suggested that such children were not merely associating attractive objects with attractive behaviors. Rather, it seems that they possessed a conceptual understanding of wealth, which they used to make behavioral predictions. The belief that the rich are likely to share may relate to broader wealth-based preferences and may be elicited more frequently in children who spontaneously notice others' wealth status.

Keywords: Wealth cues, inequality, prosocial behavior, behavioral predictions, social cognition, sharing

The ability to use what we know about others to make predictions about their future behavior is crucial to navigating the social world. Such predictions constitute a key topic of psychological inquiry drawing on both folk psychology and folk sociology, particularly when we harness information about others' social categories to make them (Chalik, Rivera, & Rhodes, 2014; Hirschfeld, 2013). Additionally, since these predictions affect decisions such as whom to befriend or avoid, they have real-world consequences for the individuals we encounter and the broader social groups to which they belong. In this paper, we focus on a specific kind of social information, that of wealth, and test whether young children spontaneously interpret and use this information to predict whether rich versus poor individuals will engage in behavior that benefits others.

Determining whether children use information about wealth to predict others' behavior is a pressing concern. Many contemporary societies have extreme wealth inequality, which has continued to grow in recent years. Indeed, in the United States the top 10% of the population owned more than 70% of the nation's wealth in 2010 (Piketty & Saez, 2014). Such inequality has tremendous consequences for American children, a fifth of whom live below the poverty level (Duncan, Magnuson, & Votruba-Drzal, 2015). The dire effects of low socioeconomic status and wealth on the long-term health, financial, and educational outcomes of children are well-documented (Bradley & Corwyn, 2002; Evans, 2004), but recent research also indicates that children from lower-income backgrounds are viewed by their peers as less-desirable social partners than children from higher-income backgrounds. This suggests yet another domain of wealth-based disparities (Shutts, Brey, Dornbusch, Slywotzky, & Olson, 2016). However, the specific kind of social inferences young children draw from wealth differences, and how such inferences affect their interactions with others, is less clear.

Our current studies focus on children's predictions about the prosocial behavior of "rich" versus "poor" others, as prosocial behavior is a central factor in adult person perception (Fiske, Cuddy, & Glick, 2007). (While we acknowledge that the terms "rich" and "poor" are relatively coarse, we employ them here because they are readily understood by children and have frequently been used in past developmental research.) We also investigate how such predictions relate to children's knowledge of wealth symbols. People's wealth status is rarely labeled explicitly. Thus, if children are to make social inferences about the behavior of the rich or poor in real-world contexts, they must be capable of identifying wealth, perhaps most commonly by inferring wealth from material belongings. Beyond this capacity, children must view wealth as salient; it must occur to children *that* a wealth contrast is present and relevant in the given context. Finally, children must also possess some understanding of what wealth means and use prior representations of wealth-based groups to guide behavioral predictions.

Next, we will review the evidence regarding whether young children possess the requisite mental representations and cognitive processes to make wealth-based behavioral predictions. To briefly foreshadow our conclusions: Children are capable of identifying wealth symbols under certain circumscribed conditions. However, it is unclear if children *spontaneously* interpret wealth symbols as conveying "wealth" and if children's representations of wealth-based groups result in specific and consistent predictions about people's behavior.

1.1. Children's Ability to Identify Wealth Cues

Children possess an early-emerging ability to identify others' wealth status based on what they own and how they look. Wealth symbols as diverse as cars, furniture, toys, clothing, and houses convey wealth contrasts to elementary school-age children and even preschoolers. Two kinds of methods have been used to investigate this ability. The first method depicts objects or

individuals who own objects conveying wealth contrasts (e.g., a person with expensive clothing and a person with inexpensive clothing) and asks participants to guess which other objects (e.g., houses) belong to each person. Past research using this method found robust success amongst older elementary school-aged children and mixed success amongst younger children (Baldus & Tribe, 1978; Mookherjee & Hogan, 1981; Tudor, 1971), but recent research using high-quality photographs and streamlined methods found strong performance with 4–6-year-olds (Shutts et al., 2016). Notably, this method does not require children to use “rich” or “poor” labels. Success could arguably be achieved by attending to low-level visual features of the objects (e.g., matching new-looking objects to other new-looking objects), rather than by drawing upon a conceptually-based understanding of which objects are “rich” (i.e., knowing that “rich” objects cost more money). This concern is less applicable to the second method, which involves assigning “rich” and “poor” labels to individuals (based on criteria such as clothing or occupation) or objects (e.g., furniture and houses). Young elementary-schoolers (Naimark, 1983) and even preschoolers perform above-chance on such tasks (Horwitz, Shutts, & Olson, 2014; Ramsey, 1991). Thus, young children can make appropriate wealth-based matches when clearly asked to attend to wealth contrasts. However, whether children attend to wealth contrasts as such *without* being explicitly asked to do so is a separate question.

1.2. Children’s Attitudes Towards Wealthy Individuals and Understanding of Wealth

At first glance, previous research implies that even young children make favorable behavioral inferences about the wealthy. When provided with visual aids, verbal labels, or descriptions regarding wealth groups, children often mention or endorse more positive adjectives and attitudes, and fewer negative ones, regarding the rich relative to the poor (Baldus & Tribe, 1978; del Río & Strasser, 2011; Mistry, Brown, White, Chow, & Gillen-O’Neel, 2015; Roussos

& Dunham, 2016; Sigelman, 2013; Weinger, 2000). Several recent studies have documented preferences for wealthy individuals amongst preschool and elementary school-aged children. When asked to choose a preferred friend or identify the “nicer” of two individuals who vary in the number or quality of their possessions, children favor the wealthy (Dunham, Newheiser, Hoosain, Merrill, & Olson, 2014; Horwitz et al., 2014; Li, Spitzer, & Olson, 2014; Shutts et al., 2016).

Although negative attitudes towards the poor are more common in children than negative attitudes towards the rich, children do not always view the rich positively. For instance, children may describe the rich as “bossy” or arrogant, or mention shortcomings of wealth, such as the risk of theft or unwelcome attention from those who want access to desirable goods (Baldus & Tribe, 1978; Short, 1991; Weinger, 2000). Recent studies found that 8- through 14-year-olds viewed high-wealth children as more likely than low-wealth children to exclude others (Burkholder & Killen, 2017) or behave in selfish or entitled ways (Elenbaas & Killen, 2018). While negative attitudes towards the rich are more common in older than younger children (Baldus & Tribe, 1978; Short, 1991), Sigelman (2012) found that first-graders who heard vignettes about a rich man and a poor man rated the poor man as more “socially attractive” (e.g., “honest,” “friendly”) than the rich man. (Fifth-graders rated both men similarly in social attractiveness, and both first- and fifth-graders rated the rich man as more competent.) Thus, children do not unequivocally favor the rich in terms of dispositional traits. In adulthood, attitudes towards the rich are complex; the rich are often viewed as competent but cold, yet may still be favored, especially in terms of implicit attitudes (Durante & Fiske, 2017; Horwitz & Dovidio, 2015).

Significantly, children may hold positive attitudes towards individuals without necessarily using those attitudes to predict those individuals’ behavior. In the present context,

social preferences for wealthy individuals do not necessarily imply that children will attribute favorable behaviors to them. Additionally, as argued by Ahl & Dunham (2017), previous studies' findings of pro-wealth preferences could indicate preferences for the *objects* associated with wealthy people rather than the people themselves; this is a concern because recent studies have depicted images of people in close proximity to rich or poor objects and asked participants to make forced-choice judgments between them. Do children favor individuals with high-quality possessions over individuals with low-quality possessions, or do they simply favor high-quality possessions over low-quality possessions? South African children robustly choose individuals visually depicted with wealthy, rather than poor, objects as more likeable (Dunham et al., 2014) yet do not rate "rich people" as more likeable than "poor people" (Newheiser, Dunham, Merrill, Hoosain, & Olson, 2014). This finding suggests that the display of objects may elicit the appearance of wealth preferences even when the mention of wealth groups does not, complicating the notion that knowledge of the groups themselves is solely responsible for such preferences.

One cause of the aforementioned phenomenon may be that children's knowledge of wealth and those who possess it is relatively fragile and may require prompting to be elicited (paralleling a phenomenon that has been described with respect to other social categories; Dunham & Degner, 2013). In contrast to older children and adolescents, who possess sophisticated causal beliefs regarding wealth (Flanagan et al., 2014; Mistry et al., 2015; Sigelman, 2012), preschool and young school-age children know little about how wealth is attained (Danziger, 1958; Enesco & Navarro, 2003; Karniol, 1985; Leahy, 1981; Leahy, 1983; Ramsey, 1991; Short, 1991). Interview-based studies which query children's understanding of the "rich" and "poor" without using experimenter-provided descriptions of such terms find that

young children refer to these groups primarily in terms of their possessions; they rarely make spontaneous references to their dispositional traits or likely behaviors (Karniol, 1985; Leahy, 1981).

Such findings raise an important caveat to the conclusions suggested by other past work, namely that the attitudes children express when explicitly provided with labels and supporting information about wealth may diverge from attitudes in the “real-world,” in which children rarely receive explicit information about others’ wealth status, let alone what that wealth status means. For example, parents almost never use wealth labels when introducing their children to others, and parents are unlikely to describe *themselves* with such labels; American adults overwhelmingly self-identify as “middle-class,” and even objectively upper-class adults rarely describe themselves as such (Morin & Motel, 2012; Sherman, 2017). This raises the possibility that the use of verbal cues and category labels in an experimental context may cause children to make category-based inferences to a greater extent than they would otherwise. Indeed, this appears to occur in the domain of race; children can robustly identify members of a given category (e.g., White) when explicitly asked to do so but are less likely to notice and employ such categories without the use of verbal cuing (Dunham & Degner, 2013; Mandalaywala, Ranger-Murdock, Amodio, & Rhodes, 2018; Roberts & Gelman, 2017; Waxman, 2010).

Thus, previous findings that children attribute dispositional traits to others on the basis of wealth may not necessarily extend to contexts in which wealth is not labeled (but for evidence that children favor the wealthy as friends and also view them as competent and popular, even without wealth labels, see Horwitz et al., 2014, and Shutts et al., 2016). Ramsey (1991) provides convergent evidence, finding that children viewed wealth as less salient than other attributes. That is, preschoolers never used wealth-related terms when describing individuals in

photographs conveying wealth contrasts (while often mentioning features such as age or sex), but they correctly identified individuals as “rich” or “poor” at above-chance rates when asked to classify their wealth status. Consequently, some children may need reminders to look for wealth contrasts in order to notice them. Without reminders, such contrasts may not affect certain kinds of social judgments.

1.3. Current Studies

Among the only studies to test whether children use information about material wealth to predict specific social behaviors is Ahl and Dunham (2017). In this study, participants judged whether children with three or eight toys of the same kind (e.g., teddy bears) would be more likely to give away a toy to a friend. American 4- and 5-year-olds and 7- and 8-year-olds, as well as 8-, 9-, and 10-year-olds in India, robustly predicted that children with eight toys would be likelier to give than children with three toys. Participants frequently referenced the targets’ quantity of resources when explaining their predictions but rarely mentioned traits such as kindness, and occasionally expressed the concept that giving is less costly to those who have more. In summary, children expect that those with more toys are more likely to share their toys, and thus may be viewed as more attractive social partners.

These findings show that children use the quantity of resources individuals possess to predict how they will choose to share those resources. However, it is unclear whether such patterns persist when “wealth” is conveyed through subtler, ecologically-valid wealth cues rather than straightforward quantity contrasts. One’s number of teddy bears does not support strong inferences about one’s overall family wealth, let alone how such wealth affects behavior. Additionally, basic quantity contrasts are obvious to anyone who can count, whereas the real-world wealth symbols children often encounter, such as houses and cars, require some

conceptual knowledge to interpret. While wealth concepts encompass many features, we use the term “conceptual knowledge” to mean knowing what wealth signifies and enables, as well as which cues suggest its presence. Namely, wealth is about money; wealth allows one to purchase objects of greater quality and in greater quantities; wealth in one domain of objects suggests wealth in other domains; certain objects are likelier to be owned by high-wealth individuals. Children likely vary in their ability to attend to and interpret wealth symbols, particularly if they are not explicitly asked to make wealth-based evaluations.

In the current studies, we conveyed wealth through photographs depicting houses that vary in quality and condition (see Shutts et al., 2016). The lack of affordable housing plays a major role in creating and perpetuating poverty; thus, houses as wealth cues have particular real-world significance (Desmond, 2016). Housing is generally the largest single-category expense for American families (Goldstein & Vo, 2012). Because housing is so expensive and difficult to obtain, it is a fairly reliable indication of actual wealth and harder to “fake” than toys or clothing, which are acquired more easily and subject to daily variability; what one wears varies from one day to the next, but where one lives usually does not. Additionally, houses have been used in previous studies to assess children’s wealth preferences, comprehension of wealth cues, and associations between race and wealth (Dunham et al., 2014; Elenbaas & Killen, 2016; Horwitz et al., 2014; Mookherjee & Hogan, 1981; Olson, Shutts, Kinzler, & Weisman, 2012; Radke & Trager, 1950; Shutts et al., 2016; Tudor, 1971; Weinger, 2000), and are mentioned by children themselves when explaining wealth (Baldus & Tribe, 1978; Johnson & Hagerman, 2006; Mistry et al., 2015). Thus, they are culturally central and previously-validated markers of wealth status.

In Pilot Study 1, we confirm that children from our younger age range view our house pairs as conveying wealth contrasts when explicitly asked to identify wealth. Then in Study 1,

we first present photographs of children's faces along with their purported houses and ask participants to predict which children will give away a toy to a friend. This method allows us to determine whether children spontaneously use information about overall wealth to predict others' behavior. We next present similar children and house pairs but ask participants to identify which children own the most toys, as a way of assessing whether children generalize information about overall wealth, conveyed through house quality, to the domain of the quantity of valued possessions. Such a pattern is consistent with a conceptual understanding of wealth, as outlined previously. The use of this quality-to-quantity measure is a novel feature of our design. While previous studies have asked children to make wealth matches based on resource quality (e.g., quality of clothing to quality of houses), we are unaware of any studies that directly assess whether children associate resource *quality* in one domain of objects with resource *quantity* in another domain. Additionally, we analyze how children's ability to make such wealth matches (i.e., spontaneously and correctly interpret wealth symbols) relates to their wealth-based behavioral predictions; we believe this is the first study to investigate such a relation. We include photographs of children's faces for reasons of ecological validity (children routinely make decisions about people they see), emphasizing the social nature of predictions about peers. Importantly, the children's photographs are not intended to convey wealth contrasts, and each photograph is similarly likely to be matched with a rich or a poor house.

We made the following predictions: Children who identify residents of rich houses as owning more toys, and thus notice and interpret houses as wealth cues, will also identify the residents of rich houses as givers. Children who do not identify residents of rich houses as owning more toys will be less likely to identify the rich-house residents as givers, as such children do not spontaneously associate house quality with general material wealth and may not

interpret wealth cues as such without cuing. We use the same age ranges of 4- and 5-year-olds and 7- and 8-year-olds as in Ahl and Dunham (2017). We had no age-based predictions but viewed each age group as potentially subject to different influences on their performance.

Namely, preschoolers have a weaker understanding of wealth and may be less likely to notice wealth cues. Older children have a better understanding of wealth and seem more likely to notice wealth cues but are also more likely to hold negative views towards rich people. Also, they may be reluctant to show wealth-based favoritism, due to self-presentation concerns.

2. Pilot Study 1

2.1. Method

2.1.1. Participants. Our final sample consisted of 22 four- and 5-year-olds (8 boys, $M_{\text{age}} = 60.27$ months, $SD = 7.25$, range = 48 to 73 months, rounded to the nearest month). We only tested younger children because we did not have concerns about older children's wealth-labeling abilities. Fifteen participants were White, 3 were Asian, one was Hispanic/Latino, one was Black, and two were biracial. Participants were tested in our lab ($n = 11$), private preschools ($n = 2$), and parochial schools ($n = 9$). Three additional participants were excluded due to experimenter error ($n = 1$) or severe inattention ($n = 2$). In accordance with our Institutional Review Board protocol (approved by Yale University, Protocol # 1305012100, The Development of Social Category Knowledge), parental consent and child assent were obtained. When parents gave their permission, we made video recordings of testing sessions.

Data collection took place in New England for all studies reported here. We lack income and educational attainment reporting regarding individual participants, which is a limitation of this project. However, we believe children at our research sites came from predominantly middle- or upper-income families residing in suburban or low-density urban areas, for all studies

reported here. This supposition was based on the relative affluence of our data collection sites: Fee-charging science museums, tuition-charging preschools and elementary schools, public schools in middle- and upper-income school districts, and our research laboratory, to which visits generally require spare time and easy access to one's own transportation.

To estimate required sample size and power for all studies reported here we used a simulation-based approach in which we simulated data from various numbers of participants, assuming that each participant made the number of trials a child would eventually make in the study. For Pilot Study 1 we made an *a priori* determination (based in part on the results of stimulus piloting in Horwitz, Shutts, & Olson, 2014) that a house that was consensually viewed as rich versus poor should be identified with $\geq 70\%$ accuracy. Thus, we set the baseline probability of accuracy for a given trial at .7. For each participant we then simulated data for that participant's 4 trials, aggregated at the participant level, and calculated power to detect this effect (corresponding to $d = 1.1$) in a *t*-test at $p < .05$ for various sample sizes, repeating the simulation 1000 times for each sample size. This demonstrated that we had greater than 90% power to detect an effect with $N = 20$, so we set this as our target sample size, eventually enrolling 22 participants.

2.1.2. Materials and procedure. Stimuli were presented using an Apple iPad and the Qualtrics Offline app, for all studies reported here. Data were recorded using Qualtrics and live-coded using paper records, with video serving as an additional check. The study began with a warm-up task designed to test for basic attention, minimize a perseverative side bias, and familiarize participants with responding to images displayed on the iPad screen (see Ahl & Dunham, 2017, and Supplementary Material 1). Following the warm-up task, the experimenter explained that participants would see pictures of different houses and guess whether they

belonged to rich or poor people. Because of their young age, we deemed it necessary to define the terms “rich” and “poor”; we slightly modified the definitions presented in Horwitz et al. (2014; p. 4), contrasting the rich and poor in terms of purchasing power, amount of money, and ability to go on vacation.

Next, participants were shown pairs of photographed houses (Shutts et al., 2016), presented laterally, with the left-right positioning of each house randomized for each trial. Unfortunately, due to copyright restrictions, we cannot display the houses here, but in each pair, both houses were of similar sizes and architectural styles yet differed in their quality and level of upkeep (e.g., new vs. chipped paint), in ways that unambiguously convey wealth contrasts to adults (Shutts et al., 2016). Holding size constant, while varying quality, was important because Study 1 asks participants to guess how many toys the residents of the houses own. Had the rich houses been larger, participants could have employed a simple perceptually-based strategy of matching larger houses with a greater number of toys (i.e., matching more with more) rather than considering wealth apart from size-based cues.

The Rich Block and Poor Block consisted of four trials each, with block order counter-balanced across participants. Two unique sets of four house pairs were used; whether a given set was used for the Rich or Poor Block was counter-balanced. Each participant saw each house pair only once, as a different set was used for each block (e.g., if Set A was used for the Rich Block, Set B was used for the Poor Block). The presentation order of individual house pairs within a given block was randomized for each participant. In the Rich and Poor Blocks, participants were asked to identify “the house where the [rich/poor] family lives;” children identified “rich” houses in the Rich Block and “poor” houses in the Poor Block. On each trial, participants received a

score of 0 or 1 based on whether they correctly labeled the houses. Total scores per block could range from 0 to 4.

2.2. Results and Discussion

We conducted one-sample *t*-tests to compare participants' mean scores on the Rich Block ($M = 3.05$, $SD = 1.13$) and Poor Block ($M = 3.23$, $SD = .97$) to the chance-level score of 2.0. Participants scored significantly above chance on both the Rich Block, $t(21) = 4.33$, $p < .001$, and the Poor Block, $t(21) = 5.92$, $p < .001$. To determine the best-performing house pairs, we calculated the percentage of participants receiving correct scores for a given pair, regardless of whether the pair was presented during the Rich or Poor Block. Success rates per pair ranged from 59.1% to 90.9%. We chose the six best-performing pairs (ranging from 72.7% to 90.9% success) for inclusion in Study 1. Our piloting indicates that preschool-age children drawn from our local population can accurately apply rich and poor labels to houses. In Study 1, we explore whether children spontaneously interpret houses as indicating wealth contrasts and attend to such contrasts when predicting others' giving.

3. Study 1

3.1. Method

3.1.1 Participants. Our final sample consisted of 50 four- and 5-year-olds (29 boys, $M = 60.20$, $SD = 5.43$, range = 51 to 73) and 50 seven- and 8-year-olds (21 boys, $M = 94.08$, $SD = 6.58$, range = 84 to 106). Seventy-eight participants were White, 8 were Asian, 5 were Hispanic/Latino, 4 were biracial, and 3 were Black. Race was unreported for two participants. Participants were tested in museums ($n = 28$), public schools ($n = 28$), private schools and preschools ($n = 18$), parochial schools ($n = 14$), or our lab ($n = 12$). Twenty-one additional

participants were excluded due to experimenter error ($n = 2$), participant fatigue ($n = 1$), warm-up task failure ($n = 4$), or comprehension check failure ($n = 14$).

For Study 1 we made an *a priori* determination (based in part on observed data from our prior work in this area, Ahl & Dunham, 2017) that a practically meaningful effect would constitute selecting rich-house residents as givers on $\geq 60\%$ of trials, and that approximately half of our sample would achieve high Wealth Matching scores and show a larger effect, $\geq 70\%$. For each participant we then simulated data for that participant's 3 trials, aggregated at the participant level, and calculated power to detect an effect in a *t*-test at $p < .05$ for various sample sizes, repeating the simulation 1000 times for each sample size. This demonstrated that we had greater than 90% power to detect the overall effect (corresponding to $d = .36$) with $N = 100$ and greater than 90% power to detect the larger effect (corresponding to $d = .70$) with $N = 50$, so we set $N = 100$ as our target sample size.

3.1.2. Materials and procedure. After the aforementioned warm-up task, participants were introduced to a “give card,” depicted with an open palm, and then a “keep card” or “won’t give card,” depicted with a closed fist. Whether the second card was explained as “keep” or “won’t give” was counter-balanced across participants. For simplicity’s sake, and because this element of the study did not affect participants’ scores, we will refer to this card as the keep card. The give and keep cards were used to indicate predictions of giving and keeping, respectively. A comprehension check tested whether participants understood the meaning of the cards, and the data from participants who failed this check were excluded; please see Supplementary Material 1 for more details. Because general attention or language comprehension difficulties would increase the likelihood of comprehension check failures, we cannot rule out the possibility that included participants had better abilities in such domains than excluded participants.

For each trial in the following tasks, participants saw a pair of children's faces above a pair of houses, displayed on an iPad. The six face pairs were drawn from the CAFE set (Lobue, 2014; LoBue & Thrasher, 2015) and consisted of high-quality photographs of smiling, White children matched by sex, age, and overall physical appearance. We only used White faces, as previous research suggests that children use information about race to infer individuals' wealth (e.g., Dunham et al., 2014); the photographed children's race would have been an additional source of variance had non-White faces been used. The six house pairs were found to convey wealth contrasts to young children, as shown in Pilot Study 1. Detailed information about the faces and houses is provided in Supplementary Material 2. For each stimulus item, whether a given face was shown with either house, and on the left or right side of the screen, was randomized across participants, as was the order in which the items were shown.

Participants completed three trials of the Giving Prediction Task. On each trial, participants saw two face-house pairs as the experimenter showed a laminated card depicting a single toy (with unique toys for each trial), explained that the toy type (e.g., sidewalk chalk) is the children's "favorite thing to play with," and then removed the toy card from view. Next, to ensure that the participants noticed the children's houses, the experimenter explained that each child lives in the house shown below his or her photograph and asked the participant to look at each house. Then, the experimenter explained that "both children are having friends over at their houses, and [one child] will give away [a toy of the given type] to [their] friend," while the other child "will keep all [their] toys instead of giving." Participants were asked to use the give and keep cards, oriented vertically below the iPad, to indicate their predictions of what each child will do. The choices were mutually exclusive; a single child could be chosen as only the giver or the keeper. On each trial, participants received a 0 for choosing the rich-house child as the keeper

and a 1 for choosing the rich-house child as the giver. (We did not use “rich” and “poor” labels with the participants.) Here, high scores indicate alignment with our predictions, as opposed to objectively “correct” or desirable performance. This procedure was repeated twice. After the last of the three trials, participants were asked to explain their final-trial choice.

Next, participants completed the Wealth Matching Task, which consisted of two trials with new faces, houses, and toys. Again, participants were told that the toys were the children’s favorites and were asked to look at the houses where the children lived. Then, the participants were shown one laminated card depicting eight identical images of the same kind of toy (e.g., boxes of Legos) and another card depicting three, oriented vertically below the iPad. The experimenter explained that one child has “eight ... [he] has so many ... that’s a whole lot,” and one child has “three ... [he] doesn’t have many ... that’s not a lot.” Whether the card with three or eight objects was shown first was randomized. The experimenter reminded the participants of where the children live by gesturing towards each child’s house and then asked them to indicate how many toys of the given type each child owns by using the cards, e.g., placing the eight-object card below the child who has eight. On each trial, participants received a 0 for choosing the rich-house child as the owner of three objects and a 1 for choosing that child as the owner of eight objects. Here, high scores indicate “correct,” adult-like performance. Participants were asked to explain their final-trial choice after the second trial.

3.2. Results

3.2.1. Giving Prediction Task. We conducted one-sample *t*-tests comparing participants’ mean Giving Prediction Task scores to the chance-level score of 1.5, with higher scores indicating a belief that residents of rich houses are likelier to give. Overall, as shown in Figure 1, participants were significantly more likely to choose the rich-house children as givers than

chance would predict, $t(99) = 3.14$, $p = .002$, $d = .31$. Separate analyses for each age group found that 4- and 5-year-olds significantly favored the rich-house residents as givers, $t(49) = 2.59$, $p = .013$, $d = .37$, and 7- and 8-year-olds did so marginally, $t(49) = 1.88$, $p = .067$, $d = .27$. There were no significant differences between each age group's scores, $t(98) = .32$, $p = .75$. Additional non-parametric analyses are reported in Supplementary Material 3.

3.2.2. Giving Prediction Task explanations. Two coders independently analyzed transcriptions of participants' explanations and achieved 85.96% agreement. Unfortunately, many participants ($n = 36$) either did not provide any explanation or did not provide intelligible explanations that could be coded. Because this reduces power and raises the possibility that observed patterns are subject to selection bias, we consider these findings exploratory and present them only briefly here, with a fuller treatment in Supplementary Material 4 and Supplementary Material Tables S1, S2, and S3. References to overt wealth stereotypes were rare (only 3 responses total), expressed negative beliefs about the rich relative to the poor, and were always used by 7- and 8-year-olds on trials for which residents of poor houses were chosen as givers (Table S1). Clear references to wealth-related concepts were relatively infrequent (21 children provided explanations that referenced wealth, the number of toys targets were believed to own, and/or the houses), while the most common references (made by 34 children) related to the appearance, inferred emotions, or inferred personality of the targets. Given this relatively sparse data, we suspect that self-generated explanations may not reveal the factors actually considered during the task. Results from the Wealth Matching Task, described next, provide greater clarity on the extent to which individual children attended to and successfully interpreted the houses as indicating broader resource wealth contrasts.

3.2.2. Wealth Matching Task. Wealth Matching scores were analyzed to determine whether participants were likelier to view residents of rich houses as owning more toys than chance would predict. A chi-square goodness of fit test found that the distribution of Wealth Matching scores (values of 0, 1, or 2) differed from chance (25%, 50%, 25%), $\chi^2(2, N = 100) = 16.86, p < .001$. Additionally, participants were significantly more likely to receive a score of 2 than 0, $\chi^2(1, N = 51) = 16.49, p < .001$. Separate analyses found that 4- and 5-year-olds' scores ($M = 1.02, SD = .65$) did not differ from a chance distribution, $\chi^2(2, N = 50) = 1.32, p = .52$, while 7- and 8-year-olds' scores ($M = 1.56, SD = .54$) differed from a chance distribution, $\chi^2(2, N = 50) = 33.36, p < .001$, with scores of 2 significantly more common than scores of 0, $\chi^2(1, N = 30) = 26.13, p < .001$.

Of central interest was whether performance on the Giving Prediction Task differed as a function of performance on the Wealth Matching Task. An independent-samples *t*-test comparing Giving Prediction scores of participants with scores of 0 or 1 (whom we considered non-matchers) vs. 2 (whom we considered successful wealth matchers) on the Wealth Matching Task found significantly higher Giving Prediction scores in the latter group, $t(98) = 2.59, p = .011, d = .53$. These participants were more likely to choose the rich-house children as givers than chance would predict, $t(39) = 3.97, p < .001, d = .63$. In contrast, participants who received scores of 0 or 1 on the Wealth Matching Task had chance-level Giving Prediction scores, $t(59) = .87, p = .39, d = .11$. Separate age-based analyses revealed that participants with Wealth Matching scores of 2 had above-chance Giving Prediction scores (4- and 5-year-olds: $p = .013$, 7- and 8-year-olds: $p = .007$); participants with Wealth Matching scores of 0 or 1 had chance-level Giving Prediction scores (4- and 5-year-olds: $p = .13$, 7- and 8-year-olds: $p = .54$).

3.2.3. Wealth Matching Task explanations. Two coders independently analyzed transcriptions of participants' explanations and achieved 91.67% agreement. Again, we consider these findings exploratory, especially given the high number of unusable responses ($n = 39$). Here, 31 children referenced wealth and/or the houses of the targets, while 18 children referenced the targets' appearance, inferred emotions, or inferred personality (Table S2).

3.3 Discussion

Overall, children predicted that residents of rich houses would be likelier to give to others than residents of poor houses. This pattern of results was driven by the participants who viewed rich-house children as owning more toys in the Wealth Matching Task. As a group, children who made such matches were significantly more likely to have viewed the rich-house children as givers than 1) chance would predict and 2) children who did not consistently make such matches.

Our results extend the findings of Ahl and Dunham (2017), which found that children expected individuals who owned more toys to be likelier to give than individuals who owned fewer toys. Here, we show that wealth-based predictions extend to situations in which wealth is conveyed through real-world wealth symbols and that conceptual knowledge of wealth symbols is important for such predictions. It is worth considering how children with high Wealth Matching scores (i.e., children who viewed residents of rich houses as owning more toys) might differ from children with lower Wealth Matching scores (i.e., children who did not do so). To organize our discussion, which is based on the supposition that children with high Wealth Matching scores used conceptual knowledge of wealth symbols during the task (i.e., viewed rich houses not merely as attractive objects but as *indicating material wealth*), we will revisit the relevant factors outlined in the Introduction.

First and foremost, to perform well on Wealth Matching, children must correctly view the house pairs as conveying quality contrasts and use such contrasts to make inferences about the wealth of their residents. Pilot Study 1 showed that children can do so under certain conditions, but their performance was not at ceiling-level, and some children made mistakes or behaved idiosyncratically. For instance, in Study 1, one child commented that “old-looking” houses (which were intended as poor) are where rich people live.

Additionally, children must view the houses, and their accompanying wealth concepts, as salient and relevant to the decision-making task; a given child who might be able to identify wealth contrasts when asked to do so could nonetheless fail to notice such contrasts on their own. Salience was a particular concern given the inclusion of children’s photographs; participants may have preferred to infer traits such as kindness and happiness from those photographs (and frequently mentioned doing so in their explanations) and then predict behavior or toy ownership using this information.

Finally, children must possess a conceptual understanding of wealth to understand the link between house quality and toy quantity (i.e., a rich house indicates wealth, which indicates the ability to purchase more toys), or at least understand how wealth transfers from one domain of objects (houses) to another (possessions). Children with high Wealth Matching scores presumably utilized their understanding of wealth during the previous Giving Prediction Task also, although high Giving Prediction scores imply additional inferences about how wealth influences behavior, and the nature of such inferences may vary across age groups; we return to this important topic in the General Discussion.

However, one alternative explanation for why children with high Wealth Matching scores predicted prosocial behavior from those in rich houses does not posit a stronger conceptual

understanding of wealth. Rather, it is possible that some children simply liked the rich houses more than other children without viewing them as “rich” per se, and then extended that positivity to residents of those houses, who were then predicted to own more toys and behave more positively in the Giving Prediction Task. On this account, individual differences regarding the perceived positivity of the rich houses, rather than a conceptual understanding of wealth, drove the association between Wealth Matching and Giving Prediction scores. Thus, in Study 2, we directly test the extent to which children view rich houses as “nicer” than poor houses using the same stimulus materials as in Study 1. If children consistently identify rich houses as nicer, it suggests that variation across children in Study 1 performance is unlikely to be attributable to individual differences in whether the rich or poor houses are deemed more appealing. However, if children do not consistently identify rich houses as nicer, it suggests that children differ in their appraisal of the house images; such individual differences could then account for the association between Wealth Matching and Giving Prediction scores in Study 1.

4. Study 2

4.1. Method

4.1.1. Participants. Our final sample consisted of 25 four- and 5-year-olds (13 boys, $M = 61.24$, $SD = 7.03$, range = 50 - 71) and 25 seven- and 8-year-olds (11 boys, $M = 98.88$, $SD = 5.77$, range = 88 – 107). Thirty-four participants were White, 4 were Asian, four were Hispanic/Latino, four were Black, two were biracial, and one was Middle Eastern. Race was not reported for one participant. Participants were tested in private schools and preschools ($n = 13$), museums ($n = 30$), and our lab ($n = 7$). Six additional participants were excluded due to failure on the warm-up task ($n = 2$) or card comprehension check ($n = 4$).

Based on our past work, we anticipated that niceness judgments would be considerably clearer to children than judgments of wealth or giving behavior. Thus, we made an *a priori* determination that rich houses would be identified as nicer on $\geq 80\%$ of trials. Pursuing the simulation approach described in prior studies, with 3 trials per participant, yielded greater than 90% power to detect this effect (corresponding to $d = 1.4$) with $N = 50$, and so we set this as our target sample size.

4.1.2. Materials and procedure. Participants first completed the warm-up task then moved to the core dependent measures. In the House Preference Task, the same faces and houses from Study 2's Giving Prediction Task were depicted here. After being asked to look at the houses where the children lived, participants were asked to "point to which house looks the nicest" for three trials. On each trial, participants received a score of 0 for identifying the poor house as nicer and a 1 for identifying the rich house as nicer. Subsequently, participants completed the training and comprehension check portion of the card task from Study 1. Because some participants were excluded from Study 1 due to comprehension check failures (which could indicate general inattention), we deemed it important to exclude participants for similar reasons here as well, even though the cards were not used during this study.

4.2. Results

We conducted one-sample *t*-tests to compare participants' mean scores on the House Preference Task to the chance-level score of 1.5. Overall, as shown in Figure 2, participants were significantly more likely to choose the rich houses as nicer than chance would predict, $t(49) = 15.14, p < .001, d = 2.14$. Separate age-based analyses found that both 4- and 5-year-olds, $t(24) = 6.74, p < .001, d = 1.35$, and 7- and 8-year-olds (all participants scored 3.0) showed such a pattern. Participants had significantly higher House Preference scores than Study 1 Giving

Prediction scores, $t(148) = 6.27, p < .001, d = 1.17$. Of special importance, 4- and 5-year-olds chose the rich-house children as owning more toys on an average of 1.02 out of 2 trials in the Wealth Matching Task and chose rich-house children as givers on 1.82 out of 3 trials in the Giving Prediction Task of Study 1, yet chose the rich houses as nicer on 2.36 out of 3 trials on the House Preference Task. While it is unsurprising that children preferred the rich houses, we are unaware of any previous studies that have straightforwardly asked children to indicate whether high- vs. low-wealth houses (or other kinds of enduring wealth symbols) are “nicer.”

4.3. Discussion

Both age groups of children robustly favored the rich houses as nicer. House Preference scores were higher than Study 1's Giving Prediction scores. One limitation of directly comparing these results is that Study 2 was conducted after Study 1; the participants in both studies were recruited from a similar geographical area, but we cannot be certain how the exact Study 1 sample would have scored on Study 2, or vice-versa. With that caveat in mind, individual differences in Wealth Matching Scores in Study 1 seem best attributable to individual differences in whether children understand wealth or view it as salient, as opposed to whether children view rich houses as visually-appealing (which children in Study 2 overwhelmingly did). Our results suggest that children's Study 1 scores were not only driven by how nice children thought the houses were (although this is not to say that niceness judgments had *no* influence on giving predictions); children can deem rich houses as nice without necessarily viewing residents of rich houses as owning more toys or being more likely to share toys than residents of poor houses. This suggests an emerging understanding of the specific ways in which wealth, as opposed to mere positive valence, relates to prosocial behavior.

We speculate that the mere positivity of rich houses themselves (which could emerge from the visual appearance of the houses even in the absence of conceptual knowledge regarding their meaning as wealth symbols) is insufficient to lead to more complex inferences about how *individuals* who reside in those houses will *behave*. This is particularly true if such behavioral inferences stem from beliefs about individuals' overall wealth status or how many objects individuals own, as opposed to mere associations with positive-valence images (i.e., rich houses). We will return to issues surrounding variation in Giving Prediction scores in the General Discussion.

5. General Discussion

Our results indicate that children who understand and attend to wealth cues view the rich as likelier to share than the poor. Such children generally view wealth as affecting sharing in ways that lead to favorable predictions about the rich. Their ability to recognize that houses convey information about resource wealth suggests an ability to interpret wealth cues. However, the understanding that individuals with expensive houses own more toys does not on its own imply that such individuals are also more likely to share; therefore, additional beliefs must drive that further inference. What are those additional beliefs and how might they change across development? Next, we outline what we consider the most plausible possibilities.

Children may view the rich as having kinder and more generous personalities than the poor, consistent with pro-wealth stereotypes. If true, children should also expect the rich to behave well under a variety of other circumstances. Alternatively, children may view the rich as simply having a greater material capacity to share and thus being more likely to do so (see Ahl & Dunham, 2017). From this view, children understand that one's overall wealth in resources affects whether sharing is costly; people with more can share with others and still satisfy their

own needs, while people with less must balance these competing concerns. Thus, the rich may be viewed as likely to give even by children who lack wealth-based behavioral stereotypes. These possibilities are not mutually exclusive. Both could have affected children's performance and we cannot distinguish between them; no clear patterns pertaining to these concepts emerged from children's explanations. However, it is worth noting that the only wealth-based stereotypes expressed by children in our study were negative stereotypes about the rich, who were viewed as greedy (see also Elenbaas & Killen, 2018), speaking against a purely stereotype-based explanation for why the rich were chosen as givers. Perhaps some children view the wealthy as givers despite ambivalent beliefs about their dispositions. The finding that children frequently choose morally neutral individuals offering more material benefits over individuals with strong records of kindness when making social decisions (Tasimi, Johnson, & Wynn, 2017) supports the proposition that wealth-based favoritism can emerge in children who do not view the rich as predisposed to kindness.

Ahl & Dunham (2017) found that children expected individuals with more toys to be likelier to share than individuals with fewer toys; our pattern of results was similar but with weaker effects. In the present study, making predictions based on wealth entails spontaneously and correctly interpreting the houses as wealth symbols, which may be difficult. For instance, a few children apparently viewed the houses we intended as "poor" as indicating wealth. Such children may use wealth to predict others' giving, but in ways that do not align with real-world wealth groups (see Dunham & Olson, 2016, for related concerns regarding other social categories). Further, even children who accurately interpret wealth cues may have complex, contradictory, or negative beliefs about how "rich children" will behave; predictions based on such wealth cues may be less consistent than those based on the straightforward cue of resource

quantity. Negative beliefs about the rich are rarely expressed by younger children but are occasionally expressed by older children (Baldus & Tribe, 1978; Short, 1991). We believe that age-based differences in wealth-related stereotypes could explain why 7- and 8-year-olds did not have higher Giving Prediction scores than younger children even though they had higher Wealth Matching scores. Specifically, older children who successfully interpreted the houses as wealth symbols were perhaps likelier than younger children to be making behavioral predictions in the midst of mixed information about the dispositions of rich and poor people. It is worth noting that mixed or even negative beliefs about the behavioral dispositions of rich people can still lead to predictions that they will share, via knowledge that the act of sharing is less costly for the rich. Additionally, social desirability concerns would be more likely to affect older than younger children (see Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008 for findings regarding race); we discuss such concerns next.

In addition to differences in quantitative scores, children's explanations for their responses were quite different from those in Ahl and Dunham (2017), in which over two-thirds of participants referenced the children's toy quantity when explaining their responses. Here, less than one quarter of participants' Giving Prediction explanations referenced houses or general wealth, our analog of toy quantity, and many participants provided none. Because many children did not generate usable explanations, we hesitate to draw strong conclusions from this pattern. However, we suspect that the rates and kinds of explanations in the present study differed from those of Ahl and Dunham (2017) for two main reasons. First, the contrasts between the houses we used were less salient than contrasts between 3 vs. 8 toys, particularly for children who have a fragile understanding of houses as wealth cues and so would be unlikely to draw on it when justifying their decision. Second, social desirability concerns may have led children who *did*

notice the house contrasts to avoid mentioning them. Houses are more closely linked to overall family wealth than contrasts of toy quantity; children who notice house-to-wealth links may hesitate to discuss them but would not necessarily show such hesitation regarding more-benign contrasts of toy quantity. As shown in the domain of race (Apfelbaum et al., 2008; Rutland, Cameron, Milne, & McGeorge, 2005), children (including those as young as 5; Tai, Mandalaywala, & Rhodes, 2017) may mask their beliefs under certain conditions due to self-presentation concerns (e.g., not wanting to blatantly favor others based on race or wealth). Such concerns may have led children to avoid providing genuine explanations to the experimenters, in addition to affecting their Giving Prediction scores.

One reason to suspect that self-presentation concerns at least influenced the terms children used to discuss wealth is that several children mentioned the size of the houses in their explanations, assigning the label of “big,” but not “wealthy,” to rich houses. The use of such descriptors is technically inaccurate, since the houses in each pair were roughly equivalent in size. It is possible that children used size terms, rather than wealth labels, as a more socially-acceptable way of differentiating the houses. Research that uses comprehensive interview-based methods (see Mistry et al., 2015) or reduces the salience of an adult experimenter (see Elenbaas & Killen, 2018) may minimize social desirability concerns and encourage children to articulate their true beliefs. Going forward, this might be a valuable strategy.

Our decisions to use houses that did not depict extreme wealth contrasts, and to include photographs of children, were design choices with both strengths and limitations. The main strength was that of ecological validity. Our “rich” houses were not extravagant or indicative of tremendous wealth. We believe they reflect the kinds of houses children are likely to see themselves, and they did convey wealth contrasts to preschoolers in Pilot Study 1. The use of

children's photographs helps to approximate decisions about actual social partners and is also common in developmental research (e.g., Shutts et al., 2016).

However, the use of children's photographs and our particular house pairs may have reduced Giving Prediction and Wealth Matching scores, especially for younger children. The photographed faces may have been more salient and less cognitively-demanding to interpret than the houses, and so children may have attended to them at the expense of the houses. This would lead to chance-level scores, since the matching of faces to houses was randomized, and could explain the poor ability to match houses with toy quantity in younger children. Perhaps some young children view the *consequences* of owning more toys (reflected by happier facial expressions) as better indications of toy ownership than overall wealth (the underlying *cause* of toy ownership) and thus focus on facial expressions when making inferences about how many toys children have. Had we increased the salience of wealth cues relative to the face photographs, conveyed wealth through multiple cues (e.g., cars in addition to houses), or made the wealth contrasts between the houses more extreme, children may have obtained higher scores. Regardless, these concerns do not change our key findings: In the midst of multiple sources of information regarding who will share, children who focus more on wealth are more likely to predict giving from the rich than other children. We believe our use of houses as wealth symbols was appropriate given our local population. However, houses may be less effective as wealth symbols for children who live in population-dense cities, where many people live in large apartment buildings rather than single-family homes. For such populations, perhaps children would be more adept at detecting wealth contrasts when conveyed through the interiors of dwellings rather than exteriors.

Aside from the aforementioned limitations, the scope of our conclusions is limited by the range of behaviors we tested. It is unclear whether children use information about wealth to predict behaviors apart from sharing. Additionally, we do not know the extent to which our results generalize to populations that differ from our sample of middle-income, majority-White suburban children. The extent of generalizability to less-affluent samples may seem like a notable concern. Children's ability to detect wealth cues may differ across populations, along with exposure to wealth-related stereotypes. Children also expect greater giving from ingroup members (DeJesus, Rhodes, & Kinzler, 2014; Renno & Shutts, 2015); perhaps wealthy children view other wealthy children as ingroup members and deem them likely to share because of their ingroup status. However, research on wealth-based preferences and behavioral expectations has found consistency amongst children from a range of economic backgrounds, ethnicities, and nationalities; pro-wealth preferences are strong in both affluent *and* lower-income samples (Ahl & Dunham, 2017; Dunham et al., 2014; Shutts et al., 2016). We therefore predict that our pattern of results may hold for children from a range of economic backgrounds. However, children from lower-income backgrounds may reason about wealth in different, and perhaps more comprehensive, ways than children from wealthier backgrounds; this is a vital topic for future research (see Heberle, Kaplan-Levy, Warner, & Carter, 2018).

Because children associate White individuals with wealth (Elenbaas & Killen, 2016; Olson et al., 2012; Shutts et al., 2016), we chose to avoid confounds with our primary topic of wealth-based inferences by using only White faces as stimuli. However, further research could vary the race of the children presented in the study and recruit more racially-diverse participants. For example, information about wealth could mitigate baseline racial biases in behavioral predictions if such information is inconsistent with children's prior associations between wealth

and race. For instance, children might expect more giving from Black individuals who live in rich houses than White individuals who live in poor houses. Also, children's own race might affect their expectations regarding the giving of other individuals when combined with information about their wealth.

In addition to factors such as an individual's quantity of resources (Ahl & Dunham, 2017), gender and race (Renno & Shutts, 2015), and group membership (DeJesus, Rhodes, & Kinzler, 2014), our results indicate that children consider one's overall wealth, as conveyed through houses, as affecting the likelihood that one will share. Such a pattern has implications for social categories beyond those of "rich" and "poor." Perhaps children who strongly associate race with wealth would also predict more giving from White individuals than those who do not. Finally, expectations about giving may be implicated in children's social preferences for rich and high-status individuals, including those who are White (see Newheiser & Olson, 2012, and Newheiser et al., 2014, on race-based preferences), as children may seek to form social ties with individuals who can enrich them. The desire to affiliate with the materially-advantaged does not disappear in adulthood; adults preferentially reciprocate the giving of resource-rich over resource-poor cooperative partners by sharing more with them, and also recommending them to others (Hackel & Zaki, 2018; see also Raihani & Barclay, 2016).

Inequality is a part of children's lives; it affects their education, health, access to opportunities, and social decisions. As inequality continues to rise, it becomes even more important for developmental scientists to study how children reason about others based on information about wealth. To attain a mature understanding of the world, and to combat social injustice, it is crucial for children to learn about wealth differences. Our findings suggest an unfortunate consequence of such learning: Understanding wealth and attributing certain

favorable behaviors to the wealthy are positively correlated. Further research can explore when, and for whom, pro-wealth biases will be elicited and how they can be remedied through interventions.

References

- Burkholder, A. R., & Killen, M. (2017, October). Social exclusion in intergroup contexts: Disentangling wealth and race. In A. Meltzoff & A. Skinner (Chairs), *New contributions to the development of intergroup attitudes in childhood*. Symposium conducted at the Meeting of the Cognitive Development Society, Portland, OR.
- Ahl, R. E., & Dunham, Y. (2017). "Wealth makes many friends": Children expect more giving from resource-rich than resource-poor individuals. *Child Development*. Advance online publication. doi: 10.1111/cdev.12922
- 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, 1513-1518. doi: 10/1037/a0012835
- Baldus, B., & Tribe, V. (1978). The development of perceptions and evaluations of social inequality among public school children. *Canadian Review of Sociology/Revue Canadienne De Sociologie*, 15, 50-60. doi: 10.1111/j.1755-618X.1978.tb00570.x
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53, 371-399. doi: 10.1146/annurev.psych.53.100901.135233
- Chalik, L., Rivera, C., & Rhodes, M. (2014). Children's use of categories and mental states to predict social behavior. *Developmental Psychology*, 50, 2360-2367. doi: 10.1037/a0037729
- Danziger, K. (1958). Children's earliest conceptions of economic relationships (Australia). *The Journal of Social Psychology*, 47, 231-240. doi: 10.1080/00224545.1958.9919242

- DeJesus, J. M., Rhodes, M., & Kinzler, K. D. (2014). Evaluations versus expectations: Children's divergent beliefs about resource distribution. *Cognitive Science*, 38, 178-193. doi: 10.1111/cogs.12093
- del Río, M. F., & Strasser, K. (2011). Chilean children's essentialist reasoning about poverty. *British Journal of Developmental Psychology*, 29, 722-743. doi: 10.1348/2044-835X.002005
- Desmond, M. (2016). *Evicted: Poverty and Profit in the American City*. New York, NY: Broadway Books.
- Duncan, G. J., Magnuson, K., & Votruba-Drzal, E. (2015). Children and socioeconomic status. *Handbook of Child Psychology and Developmental Science*, 4, 1-40. doi: 10.1002/9781118963418.childpsy414
- Dunham, Y., & Degner, J. (2013). From categories to exemplars (and back again). In S. Gelman and M. R. Banaji (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 275-280). New York, NY: Oxford University Press.
- Dunham, Y., Newheiser, A., Hoosain, L., Merrill, A., & Olson, K. R. (2014). From a different vantage: Intergroup attitudes among children from low-and intermediate-status racial groups. *Social Cognition*, 32, 1-21. doi: 10.1521/soco.2014.32.1.1
- 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, 642-665. doi: 10.1080/15248372.2016.1195388
- Durante, F., & Fiske, S. T. (2017). How social-class stereotypes maintain inequality. *Current Opinion in Psychology*, 18, 43-48. doi: 10.1016/j.copsyc.2017.07.033

Elenbaas, L., & Killen, M. (2016). Children rectify inequalities for disadvantaged groups.

Developmental Psychology, 52, 1318-1329. doi: 10.1037/dev0000154

Elenbaas, L., & Killen, M. (2018). Children's perceptions of economic groups in a context of

limited access to opportunities. *Child Development*. Advance online publication. doi:

10.1111/cdev.13024

Enesco, I., & Navarro, A. (2003). The development of the conception of socioeconomic mobility

in children from Mexico and Spain. *The Journal of Genetic Psychology*, 164, 293-317. doi:

10.1080/00221320309597985

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist*, 59, 77-92.

doi: 10.1037/0003-066X.59.2.77

Fiske, S. T., Cuddy, A. J., & Glick, P. (2007). Universal dimensions of social cognition: Warmth

and competence. *Trends in Cognitive Sciences*, 11, 77-83. doi: 10.1016/j.tics.2006.11.005

Flanagan, C. A., Kim, T., Pykett, A., Finlay, A., Gallay, E. E., & Pancer, M. (2014).

Adolescents' theories about economic inequality: Why are some people poor while others

are rich? *Developmental Psychology*, 50, 2512-2525. doi: 10.1037/a0037934

Goldstein, J., & Vo, L. (2012, August 1). *How the poor, the middle class, and the rich spend*

their money. Retrieved from

<https://www.npr.org/sections/money/2012/08/01/157664524/how-the-poor-the-middle-class-and-the-rich-spend-their-money>

Hackel, L.M. & Zaki, J. (2018). Propagation of economic inequality through reciprocity and

reputation. *Psychological Science*, 29, 604-613. doi: [10.1177/0956797617741720](https://doi.org/10.1177/0956797617741720)

Heberle, A. E., Kaplan-Levy, S. A., Warner, J.N., & Carter, A. S. (2018). Young children's

reasoning about the effects of poverty on people experiencing it: A qualitative thematic

analysis. *Children and Youth Services Review*, 86, 188-199. doi:

[10.1016/j.childyouth.2018.01.036](https://doi.org/10.1016/j.childyouth.2018.01.036)

Hirschfeld, L. A. (2013). The myth of mentalizing and the primacy of folk sociology. In S.

Gelman and M. R. Banaji (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 101-106). New York, NY: Oxford University Press. doi:

10/1093/acprof:oso/9780199890712.001.0001

Horwitz, S. R., & Dovidio, J. F. (2015). The rich—love them or hate them? Divergent implicit and explicit attitudes toward the wealthy. *Group Processes & Intergroup Relations*, 20, 3-

31. doi: 10.1177/1368430215596075

Horwitz, S. R., Shutts, K., & Olson, K. R. (2014). Social class differences produce social group preferences. *Developmental Science*, 17, 991-1002. doi: 10.1111/desc.12181

Johnson, H. B., & Hagerman, M. (2006). *Kids' talk about class divides: Privileged children's perspectives on social class inequality*. Paper presented at the Annual Meeting of the

American Sociological Association, Montreal, Canada. Retrieved from [http://www.](http://www.Allacademic.com/meta/p104804_Index.html)

[Allacademic.com/meta/p104804_Index.html](http://www.Allacademic.com/meta/p104804_Index.html)

Karniol, R. (1985). Children's causal scripts and derogation of the poor: An attributional

analysis. *Journal of Personality and Social Psychology*, 48, 791-798. doi: [10.1037/0022-](https://doi.org/10.1037/0022-3514.48.3.791)

[3514.48.3.791](https://doi.org/10.1037/0022-3514.48.3.791)

Leahy, R. L. (1981). The development of the conception of economic inequality: I. Descriptions

and comparisons of rich and poor people. *Child Development*, 52, 523-532. doi:

10.2307/1129170

- Leahy, R. L. (1983). Development of the conception of economic inequality: II. explanations, justifications, and concepts of social mobility and change. *Developmental Psychology*, 19, 111-1125. doi: 10.1037/0012-1649.19.1.111
- Li, V., Spitzer, B., & Olson, K. R. (2014). Preschoolers reduce inequality while favoring individuals with more. *Child Development*, 85, 1123-1133. doi: 10.1111/cdev.12198
- LoBue, V. (2014). The Child Affective Facial Expression (CAFE) set. *Databrary*.
<http://doi.org/10.17910/B7301K>
- LoBue, V., & Thrasher, C. (2015). The Child Affective Facial Expression (CAFE) set: Validity and reliability from untrained adults. *Frontiers in Psychology*, 5(1532). doi: 10.3389/fpsyg.2014.01532
- Mandalaywala, T. M., Ranger-Murdock, G., Amodio, D. M., & Rhodes, M. (2018). The nature and consequences of essentialist beliefs about race in early childhood. *Child Development*. Advance online publication. doi: 10.1111/cdev.13008
- Mistry, R. S., Brown, C. S., White, E. S., Chow, K. A., & Gillen-O'Neel, C. (2015). Elementary school children's reasoning about social class: A mixed-methods study. *Child Development*, 86, 1653-1671. doi: 10.1111/cdev.12407
- Mookherjee, H. N., & Hogan, H. W. (1981). Class consciousness among young rural children. *The Journal of Social Psychology*, 114, 91-98. doi: 10.1080/00224545.1981.9922730
- Morin, R., & Motel, S. (2012, September 10). A third of Americans now say they are in the lower classes. Retrieved from <http://www.pewsocialtrends.org/2012/09/10/a-third-of-americans-now-say-they-are-in-the-lower-classes/#>
- Naimark, H. (1983, April). *Children's understanding of social class differences*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Detroit, MI.

Newheiser, A., Dunham, Y., Merrill, A., Hoosain, L., & Olson, K. R. (2014). Preference for high status predicts implicit outgroup bias among children from low-status groups.

Developmental Psychology, 50, 1081-1090. doi: 10.1037/a0035054

Newheiser, A., & Olson, K. R. (2012). White and Black American children's implicit intergroup bias. *Journal of Experimental Social Psychology*, 48, 264-270. doi:

10.1016/j.jesp.2011.08.011

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, 1884-1899. doi:

10.1111/j.1467-8624.2012.01819.x

Piketty, T., & Saez, E. (2014). Inequality in the long run. *Science*, 344, 838-843.

doi:10.1126/science.1251936

Radke, M. J., & Trager, H. G. (1950). Children's perceptions of the social roles of Negroes and Whites. *The Journal of Psychology*, 29, 3-33. doi: 10.1080/00223980.1950.9712770

Raihani, N. J., & Barclay, P. (2016). Exploring the trade-off between quality and fairness in human partner choice. *Royal Society Open Science*, 3, 160510. doi: 10.1098/rsos.160510

Ramsey, P. G. (1991). Young children's awareness and understanding of social class differences. *The Journal of Genetic Psychology*, 152, 71-82. doi: 10.1080/00221325.1991.9914679

Renno, M. P., & Shutts, K. (2015). Children's social category-based giving and its correlates: Expectations and preferences. *Developmental Psychology*, 51, 533-543. doi:

10.1037/a0038819

Roberts, S. O., & Gelman, S. A. (2017). Now you see race, now you don't: Verbal cues influence children's racial stability judgments. *Cognitive Development*, 43, 129-141. doi:

10.1016/j.cogdev.2017.03.003

- Roussos, G., & Dunham, Y. (2016). The development of stereotype content: The use of warmth and competence in assessing social groups. *Journal of Experimental Child Psychology, 141*, 133-144. doi: 10.1016/j.jecp.2015.08.009
- Rutland, A., Cameron, L., Milne, A., & McGeorge, P. (2005). Social norms and self-presentation: Children's implicit and explicit intergroup attitudes. *Child Development, 76*, 451-466. doi: 10.1111/j.1467-8624.2005.00856.x
- Sherman, R. (2017). *Uneasy street: The anxieties of affluence*. Princeton, NJ: Princeton University Press.
- Short, G. (1991). Perceptions of inequality: Primary school children's discourse on social class. *Educational Studies, 17*, 89-106. doi: 10.1080/0305569910170107
- Shutts, K., Brey, E. L., Dornbusch, L. A., Slywotzky, N., & Olson, K. R. (2016). Children use wealth cues to evaluate others. *PloS One, 11*, e0149360. doi: 10.1371/journal.pone.0149360
- Sigelman, C. K. (2012). Rich man, poor man: Developmental differences in attributions and perceptions. *Journal of Experimental Child Psychology, 113*, 415-429. doi: 10.1016/j.jecp.2012.06.011
- Sigelman, C. K. (2013). Age differences in perceptions of rich and poor people: Is it skill or luck? *Social Development, 22*, 1-18. doi: 10.1111/sode.12000
- Tai, C., Mandalaywala, T., & Rhodes, M. (2017). *Egalitarian beliefs affect the expression of stereotypes in older (but not younger) children*. Poster session presented at the Meeting of the Cognitive Development Society, Portland, OR.
- Tasimi, A., Johnson, M. K., & Wynn, K. (2017). Children's decision-making: When self-interest and moral considerations conflict. *Journal of Experimental Child Psychology, 161*, 195-201. doi: 10.1016/j.jecp.2017.03.008

Tudor, J. F. (1971). The development of class awareness in children. *Social Forces*, 49, 470-476.

doi: 10.2307/3005738

Waxman, S. R. (2010). Names will never hurt me? naming and the development of racial and gender categories in preschool-aged children. *European Journal of Social Psychology*, 40,

593-610. doi: 10.1002/ejsp.732

Weinger, S. (2000). Economic status: Middle class and poor children's views. *Children &*

Society, 14, 135-146. doi: 10.1111/j.1099-0860.2000.tb00161.x

Figures

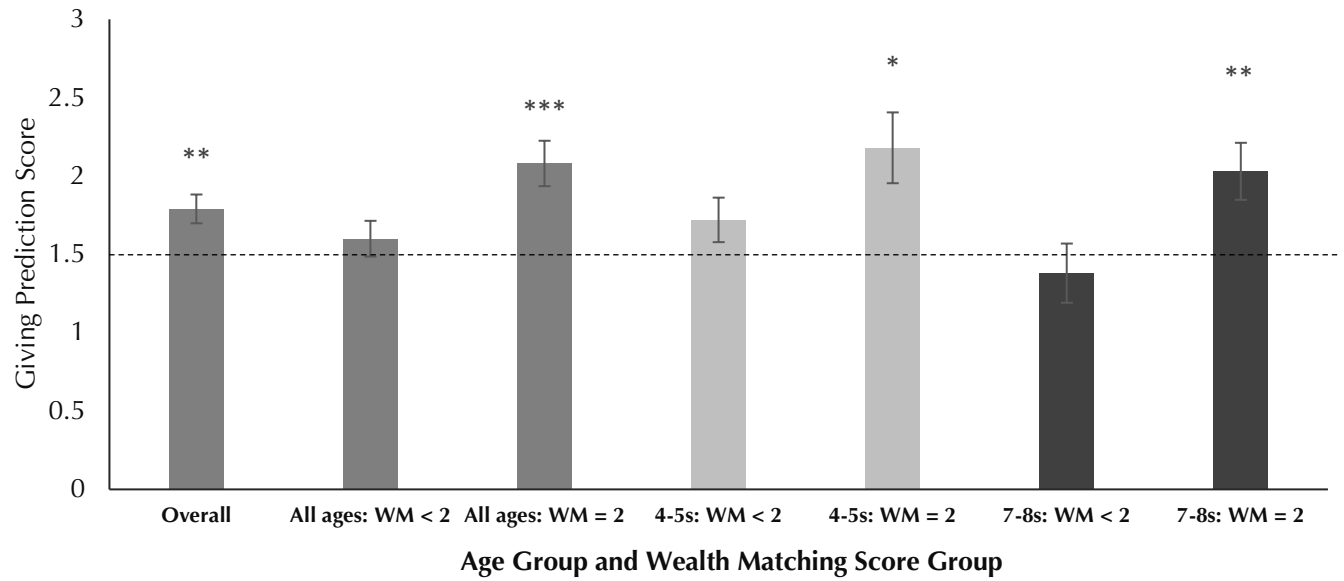


Figure 1. Giving Prediction scores for Study 1, divided by age and Wealth Matching score. Asterisks indicate scores that differ from chance (a score of 1.5, shown with a dashed line) according to one-sample *t*-tests. Errors bars indicate ± 1 SEM.

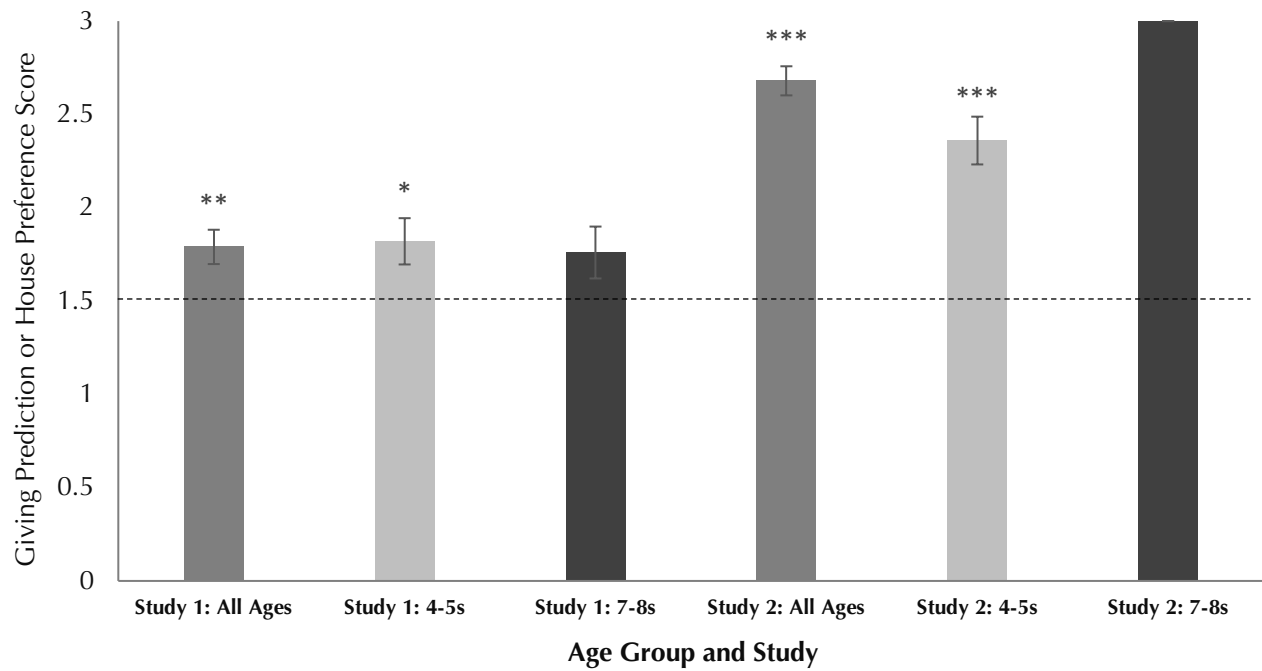


Figure 2. Giving Prediction (Study 1) and House Preference (Study 2) scores, divided by age. Asterisks indicate scores that differ from chance (a score of 1.5, shown with a dashed line) according to one-sample *t*-tests. Errors bars indicate ± 1 SEM.