

The development and predictors of a preference for strivers over naturals in the United States and China

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Abstract

Across three pre-registered studies ($n=221$ 4–9-year olds, 51% female; 218 parents, 80% female; working- and middle-class backgrounds; data collected during 2019–2021) conducted in the United States (Studies 1–2; 74% White) and China (Study 3; 100% Asian), we document the emergence of a preference for “strivers.” Beginning at age 7, strivers (who work really hard) were favored over naturals (who are really smart) in both cultures (R^2 ranging .03–.11). We explored several lay beliefs surrounding this preference. Beliefs about outcomes and the controllability of effort predicted the striver preference: Children who expected strivers to be more successful than naturals and believed effort was more controllable than talent preferred strivers more. Implications of the striver preference in education and beyond are discussed.

Lay perspectives on success distinguish between naturals (who are perceived to succeed because of innate talent) and strivers (who are perceived to achieve success via deliberate effort). Naturals are thought to shine in crowds and often receive enormous attention (Jackson & Nyström, 2015). People also tend to believe that naturals make important contributions to the world (Lipovetsky, 2009) and receive substantial resources in the education system, for example, via gifted and talented programs (Feldhusen, 1998). At the same time, strivers are admired and rewarded for their high effort, within schools and the workplace (Noh et al., 2019). As one of the most valued characteristics in the US culture and beyond (Ali et al., 1995; Furnham, 1984), popular cultural narratives, such as “The American Dream,” “The Little Engine that Could,” and “The Tortoise and the Hare,” often praise diligence, sometimes even over innate ability. Thus, cultural messages valuing naturals (talent) and those valuing strivers (effort) are both available to children from early on. Yet, it remains unclear how these different messages compete with each other and shape children's social preferences. Do children come to prefer naturals or strivers? If so, when and how

do children develop such preferences? How much do these preferences vary by culture?

Studying these questions in both adults and children is important for several reasons. First, adults' preferences for naturals or strivers may have important downstream consequences on policies related to allocations of educational resources (e.g., whether or not to invest more in naturals via gifted education) and hiring decisions in the workplace (for more discussions, see Tsay, 2016). Though children may not make these decisions, yet their preferences favoring naturals or strivers likely interplay with how they view and interact with individuals associated with talent or effort (e.g., Bian et al., 2018). What is more, today's children will become tomorrow's decision-makers, and their early preferences and beliefs may be carried into adulthood, further influencing important decisions (e.g., concerning the distribution of educational and professional resources). To reduce biases in these future decisions, developmental work is crucial since interventions are potentially more effective when targeted at younger ages when preferences and beliefs are just forming (see also Yang & Dunham, 2022).



Second, children's reasoning about naturals or strivers, especially their beliefs about and appreciation of effort, could relate to their behaviors. Intuitively, those who think highly of strivers and value effort may also work hard themselves, just like children who believe that exerting willpower can be energizing tend to generate more strategies to complete a self-regulation task (Haimovitz et al., 2020). More broadly, studying this topic with both children and adults can provide us with unique lens into the developing understanding of competence and achievement from childhood to adulthood. A developmental approach also helps us more closely compare children's early intuitive theories and societal input, two sources of influences that are often related to one another in complicated ways if we only study adults (Shtulman & Lombrozo, 2016). In what follows, we review the existing work on people's preferences for naturals versus strivers, as well as relevant literature on factors that might underlie such preferences, with a focus on lay beliefs surrounding the concepts of talent and effort.

Prior evidence with adults and children on whether there is a preference for naturals or strivers is mixed and dependent on contexts and methods. Studies in which adult experts evaluate other professionals (e.g., when musicians evaluate musicians) have suggested a preference for naturals. When a natural and a striver musician display identical performance, professionals evaluate the former to be more hireable and more successful than the latter (Tsay, 2016; Tsay & Banaji, 2011; they used the term "naturalness bias"). However, when either or both the evaluators and the performers are non-experts, a preference for strivers seems to surface. For example, adults hold more favorable impressions of strivers than naturals, and they choose to collaborate with ordinary people whose achievements are linked to effort more than those whose achievements are linked to natural talent (Brown et al., 2018). These studies lay the foundation for the present work, potentially suggesting that, when evaluating children (who are usually not professionals), adults may prefer strivers over naturals.

Developmental research provides initial evidence that children may shift from preferring naturals to preferring strivers. For example, 5- to 6-year-old US children tend to judge individuals who are naturally born with high intellectual, social, or physical abilities more positively than those who acquire these abilities later through effort, bribe (i.e., parents use money to reward them for developing the traits), or the use of medicine (Lockhart et al., 2013). Though not a point of focus in the original paper, such a preference for naturals appears to be weaker or even descriptively reversed in the US children older than 7 as well as in adults on some measures (Lockhart et al., 2013). Similarly, in a resource-allocation paradigm, contrasting targets who expend different amounts of effort on a task, with age children in both the United States and China increasingly provide more rewards to hard workers (Chinese children: Lin et al., 2019; the US

children: Noh et al., 2019). Although informative, these studies did not explicitly contrast naturals and strivers and did not directly measure preferences (e.g., they probed trait judgments and resource allocations).

Specifically relevant to the comparison of talent and effort, previous research on children's developing beliefs about competence and achievement may also be informative. Classic work (e.g., Nicholls, 1978) argued that unlike adults, children under age 10 conflate ability and effort (thinking that a person who spends longer time to complete the same task is smarter), suggesting developmental discontinuities in children's reasoning about competence. Recent studies have challenged this view. An increasing body of work shows that children's understanding of ability develops continually during early and middle childhood (see Cimpian, 2017 for a review). For example, even children aged 4 and 5 differentiate skill (smartness) and effort to some extent, and understand that they are two important determinants of achievements (Muradoglu & Cimpian, 2020; Zhao & Yang, 2022). The literature on children's growth versus fixed mindset is also of relevance (Dweck, 2008; Dweck & Yeager, 2019), as it focuses on whether children believe that intelligence can be improved (with effort). However, to our knowledge, no research has examined how preference for people with high talent (naturals) versus people with high effort (strivers) develops in childhood. A systematic investigation is needed to thoroughly document the developmental pattern of lay preferences between naturals and strivers. More specifically, whether and when children gradually develop a preference for strivers over naturals remains to be tested. This is the first goal of the current paper.

The second goal focuses on the lay beliefs surrounding the concepts of effort and talent, a largely underexplored question in this emerging field. The present work aims to identify these beliefs and to test whether they explain preferences. Though there can be many possible lay beliefs underlying a potential preference for strivers or naturals, based on relevant previous work we focus our investigation on three candidates. They are beliefs about future outcomes, beliefs about controllability, and beliefs about deservingness of rewards and punishments. Below we motivate hypotheses for each of these three lay beliefs.

The first candidate lay belief is belief about future outcomes, that is, whether talent or effort is more predictive of future success. This belief has been studied in prior work among adults (Brown et al., 2018; Tsay, 2016; Tsay & Banaji, 2011); however, little is known about its developmental trajectory or how these beliefs may underlie social preferences for naturals or strivers. As noted earlier, the US children as young as age 4 already perceive talent and effort as two separate determinants of success (Muradoglu & Cimpian, 2020), but it remains unknown whether they regard one of them as more influential on outcomes. Intuitively, if children think talent or effort

contributes more to outcomes (thus naturals or strivers will be more successful in the future), they may develop the respective preference.

The second candidate lay belief that may correlate with the preference for strivers or naturals is belief in controllability of talent versus effort. To begin, one distinction often made in the literature on children's conceptions of achievement is between the uncontrollable component, talent (or skill) and the controllable component, effort (e.g., Brown et al., 2018; Muradoglu & Cimpian, 2020; Nicholls, 1978; Tsay, 2016; Tsay & Banaji, 2011). This distinction itself reflects researchers' own lay belief that effort is more controllable than talent, though this may not be a valid assumption given that the ability to regularly exert effort might in and of itself be innate (e.g., Beaver et al., 2009). Do lay people (both children and adults) also view effort as more controllable? Does this belief relate to preference? Initial evidence comes from a recent body of literature showing that with age both the US and Chinese children generally believe that one can work hard to inhibit strong desires (Kushnir et al., 2015; Zhao, Wentz, et al., 2021). In a related body of work on the attribution theory of achievement motivation (Weiner, 1979, 1985), when teenagers and adults search for causes of success and failure, controllability (i.e., how much control someone has on actions and outcomes) is among the few salient attributes that stand out. This suggests that controllability is a key lay belief in the achievement context. Relevant to the present inquiry, children's beliefs about controllability of actions are related to their preferences for those who take these actions. For instance, children who believe that one can choose to overcome constraints (e.g., a lack of educational resources) to achieve academic success also prefer those who do so over others who achieved the same level of success without having to overcome such constraints (Zhao & Yang, 2022). The present work aims to directly test the relation between controllability beliefs and preferences for naturals versus strivers. Based on the evidence reviewed above, we reason that with age children may gradually develop the belief that effort is controllable, and this may correlate with their preference for strivers who intentionally expend effort in pursuit of their goals over naturals who are simply born with talent.

The third lay belief we focused on is the sense of deservingness, that is, whether individuals deserve rewards or punishments. Research on theories of motivation and attribution shows that when adults evaluate the achievement of grade-school children, they tend to reward and punish them based on effort rather than ability (Weiner & Kukla, 1970). Children may observe these reward and punishment behaviors and gradually learn that those who put in more effort receive more resources. In a separate line of work, studies have shown that children across cultures prefer those with more resources (US children, Ahl & Dunham, 2017; Yang & Dunham, 2022; US, Turkish, and Chinese children, Yang et al., 2022a). Therefore,

following the observation described earlier, children may gradually develop preferences toward strivers based on the assumption that they have the potential to gain more resources. Indeed, recent evidence shows that with age, both the US and Chinese children increasingly believe that those who put in more effort are more deserving of rewards, and at the same time they hold more positive attitudes toward strivers (Lin et al., 2019; Noh et al., 2019). This finding is also in line with past developmental work showing that children associate praise and blame with effort rather than talent, a pattern that becomes more salient with age (Barker & Graham, 1987). Thus, we reason that with age children may gradually recognize the deservingness of effort, which may further lead children to prefer strivers. Here, we directly explored this possibility.

The present paper set out to examine the developmental trajectory of children's preference between naturals and strivers and the relevant beliefs in two different cultural contexts, the United States and China. The US culture highlights giftedness in the education practices starting from elementary school (Gladwell, 2002; Lipovetsky, 2009; Ross, 1993) and encourages hard work through popular cultural narratives (e.g., "The American Dream"), two competing pieces of information that children receive from an early age. Data from China not only served as a non-WEIRD comparison (Western, Educated, Industrialized, Rich, and Democratic; see Henrich et al., 2010) but also allowed us to explore how culture shapes lay beliefs about talent and effort. To elaborate, in the Chinese culture, effort is more salient and valued (Li, 2005; Stevenson et al., 1990; Stevenson & Stigler, 1994; Yang, 1986); and the value of effort is deeply rooted in Chinese traditional philosophies like Confucianism (Fwu et al., 2018). For example, in Chinese educational contexts, children are often explicitly taught the value of effort (Ng & Wei, 2020) and parents tend to attribute children's performance to effort (Stevenson et al., 1990; Stevenson & Stigler, 1994). Therefore, it is possible that Chinese children are more likely than the US children to value effort, to believe that effort is predictive of successful outcomes, to believe that effort is more controllable than talent, and to see effort as praiseworthy and the lack of it as blameworthy.

Evidence of relevant cultural differences between the United States and China also comes from the mindset literature. Chinese students conceptualize intelligence differently from the US students, for example, by emphasizing fluid instead of crystallized intelligence and correspondingly endorsing a more fixed mindset about intellectual abilities (Sun et al., 2021). Interestingly, unlike students in other countries including the United States, Chinese students' growth mindset about intelligence does not reliably predict academic achievements (Li & Bates, 2019; Sun et al., 2021). One possible explanation for this is that Chinese students associate academic outcomes with effort, irrespective of their mindset; even those with a fixed mindset of intelligence believe that success is attainable through hard work and devote



substantial effort to school work. Together, these findings imply potential cultural differences in lay beliefs about talent and effort between the United States and China. Hence, here we explored how different cultures might affect children's developing preferences and beliefs about naturals and strivers.

The present research

Study 1 assessed the US children's preferences toward individuals depicted as naturals versus strivers while also testing whether beliefs about future outcomes were related to these preferences. Studies 2 and 3 replicated and extended the primary findings of Study 1 as well as further explored beliefs about controllability and deservingness in both the United States and China. To operationalize the concepts of “naturals” and “strivers” in child-friendly terms, we used “really, really smart” and “works really, really hard.” We directly studied children's relative preferences between naturals and strivers, but we acknowledge that in reality a natural versus striver dichotomy may not accurately describe people.

We predicted that 7- to 9-year olds would show a preference for strivers, while 4- to 6-year olds would not, as past work suggests a potential age change on evaluations around age 7 in both cultures (e.g., in China, Lin et al., 2019; in the United States, Lockhart et al., 2013; Noh et al., 2019). We also hypothesized that the extent of the preference for strivers would be related to lay beliefs about future outcomes (i.e., strivers would be more successful), controllability (i.e., one can choose to work hard rather than to be smart), and deservingness (i.e., compared to talent, effort is more deserving of reward and the lack of effort is more deserving of punishment). Since Chinese culture more explicitly attributes performance to effort, praises effort, and blames the lack of effort, we expected that these lay beliefs might develop earlier in Chinese children compared to the US children. Throughout the studies, we also measured parents' preferences and beliefs, which served as adult comparison data to establish the developmental end point. Additionally, these data allowed us to explore the relation between parental responses and their child(ren)'s responses, as past work finds parental influences on children's beliefs and behaviors in talent- and effort-related domains. For instance, parents' beliefs about failure are related to children's intelligence mindsets (Haimovitz & Dweck, 2016), and parents who verbally praise effort have more persistent infants (Lucca et al., 2019). The parent–child relations were documented in Supplemental Materials. We are in compliance with SRCD sociocultural policy by stating dates of data collection, theoretically relevant characteristics of the particular sample studied, the place(s) from which that sample was drawn, and recruitment procedures below.

STUDY 1: THE PREFERENCE FOR “STRIVERS”

Study 1 focused on investigating the US children and their parents' preferences for naturals versus strivers and whether beliefs about outcomes predicted their preferences (note that in this paper, we used “predict” in the context of the statistical modeling approach. It does not indicate causal prediction via longitudinal studies or experimental manipulation). Research questions, study design, sample size, and data analysis plans were pre-registered at <https://aspredicted.org/2v7hv.pdf>. The Supplemental Materials, study stimuli and scripts, data, and analysis code can be found at https://osf.io/79bvr/?view_only=d154297f9c4c45809d3099d5e6224b2a. Data collection took place from June to August 2019. It took about 5 min to complete the whole study.

Methods

Participants

We adopted a similar power analysis plan across all studies. Power analyses indicated that at least a sample size of 60 was required to detect a small-to-medium effect with >80% power (linear multiple regression in a random model, two tails, up to three predictors, $\alpha = .05$, $\rho^2 = .2$; using G*Power). To increase power (while also stay within resource limits) and ensure that we had enough sample after potential exclusions, we targeted a slightly larger sample during data collection, aiming to test at least 72 children per study.

In Study 1, child participants were 36 4- to 6-year olds ($M = 5.39$ years, $SD = .86$, range 4.19–6.61, 25 females, 11 males) and 37 7- to 9-year olds ($M = 8.54$ years, $SD = .83$, range 7.03–9.92, 27 females, 10 males). Among the 64% of children ($n = 47$) whose parents provided racial information, there were 31 European American, 8 Asian, 4 Hispanic, 3 Multiracial, and 1 African American participant(s). One additional child was tested but excluded from data analyses because they declined to provide answers.

As an exploratory analysis, we also collected data from one parent of each child on the same measures to establish adult results (total $n = 57$; 45 females, 11 males, and 1 did not provide answer; 3 additional parents whose child(ren) were tested did not complete the study; children outnumbered parents because there were siblings in the sample). We examined parent–child correlations across measures and reported these results in Supplemental Materials. Among these parents, there were 36 European American, 7 Asian, 5 Hispanic, and 4 African American participants (5 chose “Other” or did not provide answers). The median age was 39 (range 25–53; 3 did not provide answers). Most of them (70%) had at least a bachelor's degree, and there were more liberals than

conservatives (29 liberals, 9 conservatives, 10 neither, and 9 did not provide answers).

For Studies 1 and 2 (studies conducted in the United States), participants were tested in the lab or at local museums in New England. We recruited participants by emailing families in the university's developmental research database and participating in local museums' live science programs. Family income for individual participants was not available, but given the demographic profiles of our data collection sites, most participants came from middle-class families. Studies reported in this paper were approved by Yale University Institutional Review Boards, project title "Development of Social Category Knowledge," protocol #1305012100. Written parental consent was obtained in advance of all testing; children also provided verbal assent prior to beginning the procedures.

Design and procedure

We used the survey platform Qualtrics to administer the studies (on a laptop or an iPad). In Studies 1 and 2, children were tested in-person by the first author or trained research assistants while their parents answered the same questions on their own. Parents also completed a separate demographics form. The stimuli used in these studies were head-to-chest photos of White American children between the ages of 4 and 10, and they were approximately equal in attractiveness (LoBue & Thrasher, 2015; Yang et al., 2022b). This study consisted of three experimental blocks (totaling nine main questions) and one screener question at the end.

Measures

Participants received three experimental blocks. In each block, participants were introduced to two child characters (gender-matched to participants), one described as "really really smart" (natural) and the other as "works really really hard" (striver). We also further explained the meaning of these two traits using one of these three definition pairs at a time: "learns things really fast" versus "practices a lot," "figures things out really quickly" versus "puts a lot of effort into everything they do," and "can always answer even the hardest questions from the teacher" versus "never gives up even on the hardest tasks they get" (adapted from Bian et al., 2017). The order of presenting these definition pairs was randomized across participants, and across the three blocks, all three pairs were presented to each participant. Within each block, we asked three questions in a randomized order: "Which kid do you like more" (*preference*), "Which kid do you think will become more successful when they grow up" (beliefs about outcomes, or *outcome*), and "Which kid is more similar to you" (*similarity*). We included a

similarity measure to address the possibility that participants simply preferred naturals or strivers because they saw themselves as more similar to them. Across all studies, whether the natural or the striver character was mentioned first was kept the same within each participant but randomized across participants.

To ensure that participants understood the outcome question, in the end we asked participants to predict who would become more successful between a child who "is really really smart, and also works really really hard" and a child who "is not smart, and does not work hard" (order randomized). Both children (99%; one participant failed) and parents (100%) passed this screener question by selecting the child who was both smart and hardworking; excluding the participant who failed this question from analyses did not change our conclusions.

Analytical approach

Data were analyzed using R *lmerTest* package (Kuznetsova et al., 2017). For most analyses, we fit binomial linear mixed effects models with trials nested within participants (i.e., with a random intercept for participant); we ran linear logistic models when there was one trial per participant. One main predictor in these models was age group: We compared 4–6-year olds and 7–9-year olds because past work suggests a potential age change on evaluations of naturals and strivers around age 7 (e.g., in China, Lin et al., 2019; in the United States, Lockhart et al., 2013; Noh et al., 2019). Analyses treating age as a continuous variable (e.g., 5.33 years or 64 months) resulted in similar conclusions. Following our preregistration, we started from the full model (with the interaction term where applicable) and dropped the term if it was not significant via a likelihood ratio test (LRT) using the `drop1()` function. We also interpreted the intercept where applicable (e.g., whether younger children show a preference for strivers for naturals, or were they at chance) by setting the predictor variables (e.g., age group and measure) at specific levels and comparing each level to chance. We first reported results for children and then included parents' data in the analyses.

Next, we reported whether other measures (e.g., *lay belief measures*) predicted *preference* (over and above age effects). As an exploratory analysis, we examined whether parents' responses were related to their own child(ren)'s responses on the same measures (parent–child correlations were not consistent across studies; for details, see Supplemental Materials). In addition to unstandardized betas and their 95% confidence intervals, we also reported effect sizes for model terms via partial R^2 (adapted for mixed models following Nakagawa & Schielzeth, 2013). Unless otherwise mentioned, the results of all studies revealed no significant effect of gender (participant gender or target gender) or testing orders (e.g., presenting the

natural or striver first and question order); therefore, we collapsed the data across these factors.

Analyses presented in the current work included both exploratory and confirmatory testing. Analyses focusing on preference were more confirmatory; We drew more closely from relevant past literature and had done extensive piloting prior to the pre-registered studies reported below. Analyses of lay beliefs were relatively more exploratory, as we connected different lines of work to shed light on possible cognitive correlates of preference.

Results

Preference, beliefs about outcomes, and similarity judgments

We fit a binomial linear mixed effects model predicting choice (0=natural, 1=striver) as a function of measure (*preference, outcome, and similarity*), age group (4–6 years and 7–9 years), and their interaction, with trials nested within participants. The interaction between measure and age group was not significant, $\chi^2(2, N=73)=2.00, p=.37$. We found a significant main effect of age group, with older children selecting strivers more than younger children across measures, $B=0.97, 95\% \text{ CI}=[.35, 1.59], p=.002, R^2=.03$. We also found a significant main effect of measure, $\chi^2(2, N=73)=14.86, p<.001$, which was driven by children selecting the striver more on the preference and outcome measures as compared to similarity (preference vs. similarity, $B=0.67, 95\% \text{ CI}=[.24, 1.09], p=.002,$

$R^2=.01$; outcome vs. similarity, $B=0.78, 95\% \text{ CI}=[.35, 1.21], p<.001, R^2=.02$). Children were more likely to prefer the striver and predict that the striver would be more successful than to see themselves as strivers (see Figure 1).

Breaking down the results by measure and age group, on *preference*, 4–6-year olds were at chance ($M=.41, SD=.49, B=-.37, 95\% \text{ CI}=[-.87, .13], p=.15$), while 7–9-year olds preferred the striver ($M=.63, SD=.48, B=0.60, 95\% \text{ CI}=[.09, 1.10], p=.02$). On *outcome*, 4–6-year olds were at chance ($M=.44, SD=.50, B=-.25, 95\% \text{ CI}=[-.75, .25], p=.32$), while 7–9-year olds predicted that the striver would become more successful ($M=.65, SD=.48, B=0.72, 95\% \text{ CI}=[.21, 1.22], p=.006$). On *similarity*, 4–6-year olds saw themselves as more similar to the natural ($M=.33, SD=.47, B=-1.04, 95\% \text{ CI}=[-1.55, -.52], p<.001$), while 7–9-year olds did not see themselves as more similar to either ($M=.45, SD=.50, B=-.07, 95\% \text{ CI}=[-.57, .43], p=.79$).

Next, we included parent data in the analyses (three age groups: 4–6-year olds, 7–9-year olds, and parents). Parents selected the striver more than the natural on all three measures (preference: $M=.81, SD=.39, B=2.11, 95\% \text{ CI}=[1.51, 2.70], p<.001$; outcome: $M=.80, SD=.40, B=2.16, 95\% \text{ CI}=[1.56, 2.75], p<.001$; similarity: $M=.67, SD=.47, B=1.24, 95\% \text{ CI}=[.68, 1.81], p<.001$). There was a significant effect of age group, $\chi^2(2, N=130)=35.55, p<.001$; notably, parents selected the striver more than children did across measures (compared to both younger and older children, $ps<.001$). In the combined sample, we found a similar effect of measure as described above ($\chi^2(2, N=130)=31.47, p<.001$). The measure by age group interaction was also not significant, $\chi^2(4, N=130)=3.52, p=.47$.

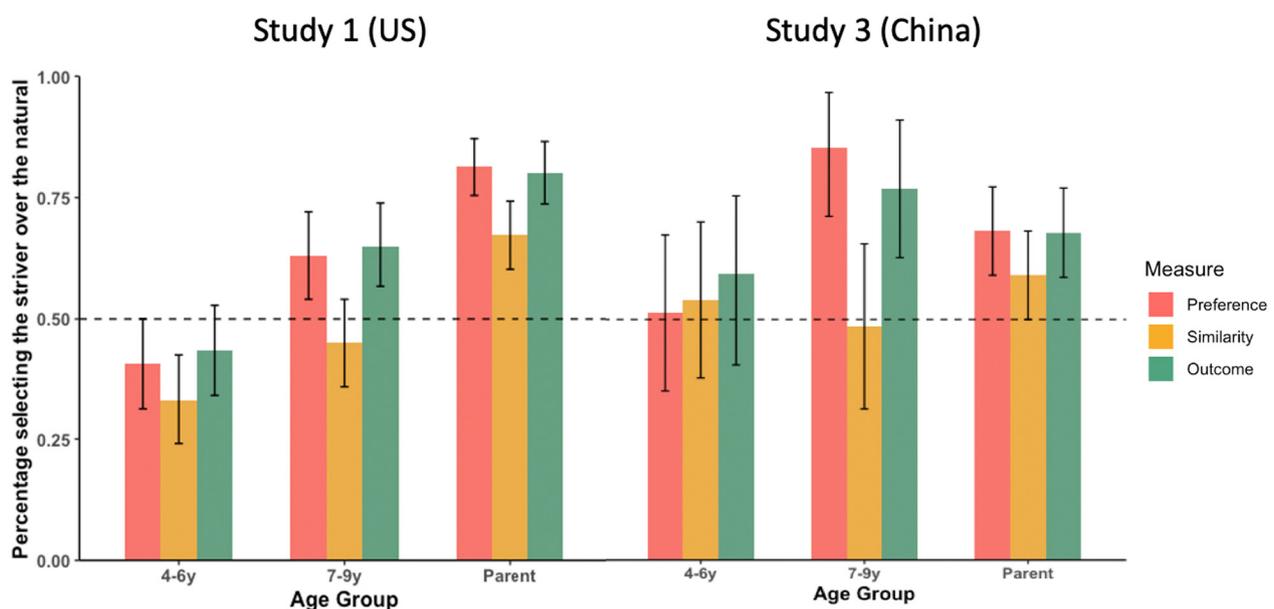


FIGURE 1 Study 1 (US; left) and Study 3 (China; right): Percentage selecting the striver over the natural across age groups and samples on preference (red), outcome (yellow), and similarity (green) measures. Error bars represent 95% bootstrapped confidence intervals.

Which belief(s) predicted preference?

Controlling for age group, children's and parents' preference was predicted by their outcome beliefs ($B=0.40$, 95% CI=[.26, .55], $p<.001$; when only including children's data: $B=0.47$, 95% CI=[.26, .67], $p<.001$). Similarity responses did not consistently predict children's and parents' preference ($B=0.26$, 95% CI=[.14, .39], $p<.001$; when only including children's data: $B=0.14$, 95% CI=[-.06, .33], $p=.18$). These results suggested that beliefs about outcomes, but not similarity judgments, explained children's preference.

Discussion

Taken together, the US children developed a preference for strivers around ages 7–9, and this preference continues to develop after childhood. We found that both children and their parents preferred the striver and expected the striver to be more successful. This “striver” preference was predicted by the belief that strivers would become more successful in the future.

STUDY 2: FURTHER EXAMINATION OF POTENTIAL PREDICTORS OF THE STRIVER PREFERENCE

Study 2 aimed to replicate the developmental trend of the preference for strivers found in Study 1 and to further explore the cognitive correlates of this preference. We focused on testing two more lay beliefs surrounding the concepts of talent and effort. They were beliefs about controllability (i.e., is effort seen as more controllable than talent?) and beliefs about deservingness (i.e., is effort seen as more deserving of reward and the lack of it as more deserving of punishment?). We first explored age-related changes on the preference measure and on the two lay belief measures. Then, we examined whether the two lay belief measures predicted preference. In this study, we also included two more exploratory measures which we detail in Supplemental Materials. The preregistration can be found at <https://aspredicted.org/x64kd.pdf>. Data collection took place from October 2019 to January 2020. It took 6–8 min for each participant to complete this study.

Methods

Participants

Child participants were 38 4- to 6-year olds ($M=5.45$ years, $SD=.84$, range 4.14–6.91, 13 females, 25 males) and 38 7- to 9-year olds ($M=8.47$ years, $SD=.97$, range 7.05–9.94, 19 females, 19 males). Among the 71% of children ($n=54$)

whose parents provided racial information, there were 47 white, 4 multiracial, 2 Black, and 1 Asian participant(s). Four additional children were tested but excluded from data analyses because of failure to complete the study ($n=3$) or technical error ($n=1$). We also collected data from parents ($n=63$; 2 parents did not complete the study). Among all parents tested, there were 43 females and 20 males, 51 white, 4 East Asian, 2 Black, 1 multiracial, and 5 other race or unspecified participant(s); the median age was 40 (range 28–54); most of them (84%) had at least a bachelor's degree; and there were more liberals than conservatives (38 liberals, 11 conservatives, 8 neither, and 6 did not answer).

Design and procedure

At the beginning of the study, we offered the same definitions of naturals and strivers as in Study 1; but different from Study 1, we mentioned all three pairs of definitions at once to make sure the participants understood the meanings before we presented the measures. Then, we presented five measures (order randomized), *preference*, *controllability beliefs*, *deservingness beliefs*, and two more explorative measures (these two measures did not reveal age-related changes between the two age groups of children; for details on these measures and results, see Supplemental Materials). All participants saw gender-matched stimuli of child characters.

Measures

Preference (1 question). Same as Study 1 except that we mentioned the definitions of being smart and hardworking at the beginning of the study.

Controllability beliefs (1 question). This question measured lay beliefs about the relative extent of control in changing effort or talent (adapted from literature on children's free will beliefs, e.g., Kushnir et al., 2015). Participants were told about one child (Emma or Eric) who was not smart and did not work hard, but they really wanted to make a change. Children then heard the following question: “*What can Emma choose to change? Can she choose to work hard, or can she choose to be smart?*” The order of mentioning effort and talent was randomized.

Deservingness beliefs (2 scenarios in a randomized order; 4 questions in each scenario). This measure assessed whether effort or talent deserved more reward, and the lack of which deserved more punishment. In the reward scenario, there were two students: one was smart while the other worked hard, and both got good grades on a test. Their teacher needed to reward one student by giving them a sticker. In the punishment scenario, one student was not smart and the other did not work hard, and both got bad grades on a test. Their teacher

needed to punish one student by taking a sticker away from them. In each scenario, after asking participants two separate questions on how fair or unfair it was for the teacher to reward (or punish) either student on a 4-point scale, we asked a forced-choice question on “Which way is more fair?”. We also asked an exploratory question on norm perception, “What do most kids of your age (or most parents, in the parent version) think is more fair?”. Participants answered all four questions in one scenario before moving to the next scenario.

Analytical approach

Our main analyses focused on the developmental patterns of the preference measure and two lay belief measures, controllability and deservingness beliefs. For each measure, we first reported results on children's data and then results combined with parents' data. We coded and analyzed the preference measure in the same way as in Study 1. For controllability beliefs, we fitted a binomial linear model predicting response (0=one can choose to be smart, 1=one can choose to work hard) as a function of age group. For deservingness beliefs, we fitted a binomial mixed effects model predicting response to the forced-choice questions (0=reward or punishment based on talent is more fair, 1=reward or punishment based on effort is more fair) as a function of scenario (reward or punishment), age group, and their interaction (with trials nested within participants). Analyses using the 4-point ratings resulted in similar conclusions; we reported these results and the exploratory norm-perception questions for the deservingness belief measure in Supplemental Materials.

To explore how lay beliefs predicted preference over-and-above the effect of age group, we included one indicator per lay belief measure (since there were two main questions on deservingness beliefs, we averaged the two scores; final scores ranged from 0 to 1).

Results

Preference

Replicating Study 1, we found a significant effect of age group, with older children favoring the striver more than younger children, $B=1.11$, 95% CI=[.16, 2.06], $p=.02$, $R^2=.07$ (see Figure 2). More specifically, older children preferred the striver ($M=.71$, $SD=.46$, $B=0.90$, 95% CI=[.20, 1.60], $p=.01$), while younger children did not ($M=.45$, $SD=.50$, $B=-.21$, 95% CI=[-.85, .43], $p=.52$). Combining with parent data, we again found that parents favored the striver more than the natural ($M=.85$, $SD=.36$, $B=1.77$, 95% CI=[1.07, .248], $p<.001$), and more strongly than both 4- to 6-year olds ($p<.001$, $R^2=.10$) and 7- to 9-year olds ($p=.08$, $R^2=.02$), suggesting that the preference

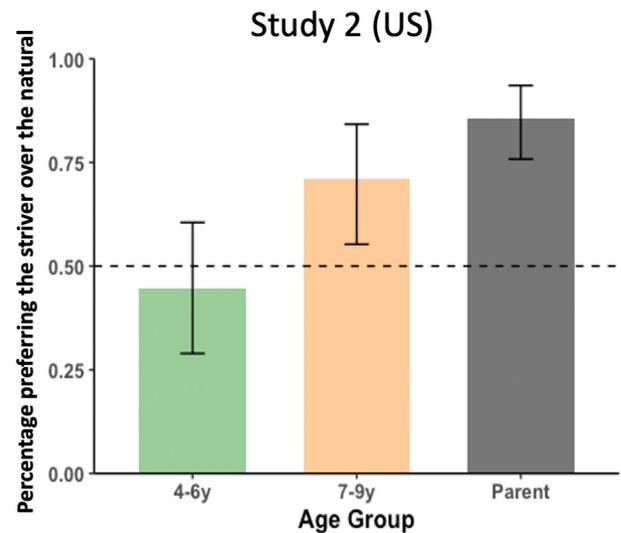


FIGURE 2 Study 2 Preference: Percentage preferring the striver over the natural across age groups. Error bars represent 95% bootstrapped confidence intervals.

for strivers emerges in middle childhood but might still develop beyond it.

Controllability beliefs

These analyses focused on participants' beliefs about what people could choose to change: How hard people work versus how smart people are. As shown in Figure 3, children in both age groups responded at chance (4–6 year: $M=.53$, $SD=.51$; 7–9 year: $M=.61$, $SD=.50$), $B=0.26$, 95% CI=[-.19, .72], $p=.25$. There was no significant difference between the two age groups ($p=.49$). However, parents believed that people could choose to work hard as opposed to be smart, $M=.95$, $SD=.21$, $B=3.00$, 95% CI=[1.84, 4.16], $p<.001$ (different from both children age groups, $ps<.001$, $R^2=.10$ and $.08$). Together, it seems that the belief that working hard is more controllable than being smart emerges late in development in the US cultural context.

Deservingness beliefs

These analyses focused on whether effort or talent was seen as more deserving of rewards (or the lack of it as more deserving of punishments). As shown in Figure 4, we found a significant effect of age group in children, $B=0.69$, 95% CI=[.02, 1.36], $p=.04$, $R^2=.03$. Older children believed that it was more fair to reward and punish others based on effort ($M=.71$, $SD=.46$, $B=0.90$, 95% CI=[.40, 1.39], $p<.001$), while younger children did not ($M=.55$, $SD=.50$, $B=0.21$, 95% CI=[-.24, .66], $p=.36$). Combining with parents' data, we found a continuing age-related increase in thinking that it is more fair to reward and punish others based on effort than talent

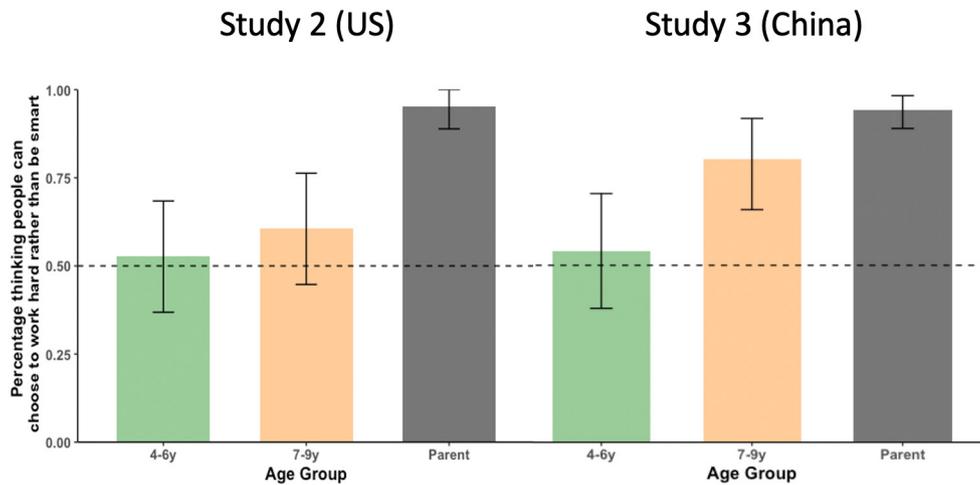


FIGURE 3 Study 2 (US; left) and Study 3 (China; right) Controllability beliefs: Percentage thinking that people can choose to work hard rather than choose to be smart across age groups and samples. Error bars represent 95% bootstrapped confidence intervals.

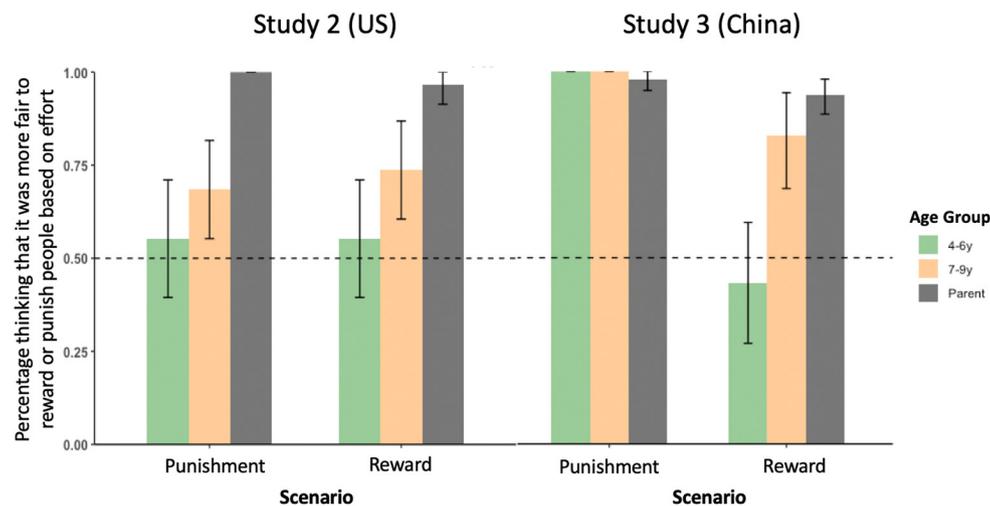


FIGURE 4 Study 2 (US; left) and Study 3 (China; right) Deservingness beliefs: Reward and punishment judgments (forced-choice). Percentage thinking that it was more fair to reward or punish people based on effort across age groups and samples. Error bars represent 95% bootstrapped confidence intervals.

(parent data: $M = .98$, $SD = .13$, $B = 4.07$, 95% $CI = [2.67, 5.47]$, $p < .001$; different from both younger and older children, $ps < .001$, $R^2 = .11$ and $.08$). Neither the effect of scenario (reward or punishment) nor the interaction between age group and scenario reached significance ($ps > .20$).

Which belief(s) predicted preference?

Controlling for age group, children's and parents' preference was predicted by their controllability beliefs ($B = 1.27$, 95% $CI = [.30, 2.24]$, $p = .01$; when only including children's data: $B = 1.03$, 95% $CI = [.01, 2.06]$, $p = .049$). Those who believed that one could choose to work hard rather than to be smart were more likely to prefer strivers over naturals. However, this preference was not predicted

by deservingness beliefs ($B = 0.52$, 95% $CI = [-.93, 1.97]$, $p = .48$; when only including children's data: $B = 0.50$, 95% $CI = [-.96, 1.95]$, $p = .50$).

Discussion

Study 2 replicated the preference for strivers, again finding that it emerged around ages 7 to 9. With new lay belief measures focusing on conceptions of talent and effort, we documented interesting developmental changes: With age, the US children increasingly thought rewarding and punishing others based on effort were more fair, and parents showed stronger patterns. Lay beliefs about controllability appeared to emerge after age 9 in the United States: Only parents believed effort was more controllable than talent. Importantly, controllability

beliefs, but not the sense of deservingness, predicted the striver preference: Children who believed that effort was more controllable also preferred strivers more. This finding suggests that beliefs of controllability (or free will, intention) may underlie the preference for strivers.

STUDY 3: EXTENDING TO A DIFFERENT CULTURE

Study 3 extended the test of the preference for strivers to China, a culture that is different from WEIRD – Western, Educated, Industrialized, Rich, and Democratic cultures (Henrich et al., 2010). As reviewed above, relative to the US culture, the Chinese culture places stronger emphasis on effort both implicitly and explicitly (Fwu et al., 2018; Li, 2005; Sun et al., 2021; Yang, 1986). The cross-cultural work would help us explore how development of preferences and beliefs about naturals and strivers may vary across cultures. The preregistration can be found at <https://aspredicted.org/xm6pr.pdf>. Data collection took place from July 2020 to January 2021. It took 6–8 min for each participant to complete this study.

Methods

Participants

Child participants were 37 4- to 6-year olds ($M=5.43$ years, $SD=.89$, range 4.16–6.97, 16 females, 21 males) and 35 7- to 9-year olds ($M=8.23$ years, $SD=.79$, range 7.02–9.74, 12 females, 23 males). They were all Chinese and spoke Mandarin as their first language, located in mainland China, 98% had at least one parent with a Bachelor's degree or above (among the 69% who we had this information, only one child did not have a parent with a bachelor's degree), and were from working- to middle-class backgrounds. Fourteen additional children were tested but excluded from data analyses because of distraction ($n=4$), failure to answer all questions ($n=3$), internet connection issues ($n=5$), or parent interference ($n=2$). Different from previous studies, due to COVID-19, families were recruited via ads posted on an online social platform (WeChat), tested online via Zoom or TencentMeeting (the Chinese counterpart of Zoom) by trained research assistants (for recent studies that validated the effectiveness of online testing, see Schidelko et al., 2021; Tsuji et al., 2022).

We also collected data from a group of parents via survey links sent in emails in advance. There were 98 parents who completed the study (outnumbering children because some parents whose children were not tested also completed the study online ahead of time). Among all parents tested, there were 87 females and 11 males, they were all Chinese, and the median age was 36 (range 22–56, among the 86% who reported this information). This study was also approved by University Committee

on Human Research Protection at East China Normal University (title: Children's Understanding of Choice, Protocol Number HR 554–2019). Electronic parental consent was obtained in advance of all testing (through a weblink, using the Chinese counterpart of Qualtrics, [Sojump.com](https://www.sojump.com)); children also provided verbal assent prior to beginning the procedures.

Design, procedure, and measures

The design was identical to Study 2 except that in the block with the preference question, we also included the same outcome and similarity questions as in Study 1 (three questions in a randomized order), constituting a complete set of measures. Two native Chinese speakers who were fluent in English translated and back-translated the script. The stimuli were head-to-chest photos of East Asian children between the ages of 4 and 10. Adult ratings (from a separate group of Chinese adults) showed that these children were approximately equal in attractiveness.

Analytical approach

The analytical approach was identical to that of Studies 1 (for preference, outcome, and similarity measures) and 2 (for controllability beliefs and deservingness belief measures).

Results

Preference, outcome, and similarity

On *preference*, similar to the US children in Studies 1 and 2, there was a significant effect of age group, $B=1.74$, 95% $CI=[.59, 2.88]$, $p=.003$, $R^2=.11$ (see Figure 1): Older children preferred the striver ($M=.86$, $SD=.36$, $B=1.79$, 95% $CI=[.84, 2.74]$, $p<.001$), while younger children did not trend toward either direction ($M=.51$, $SD=.51$, $p=.87$). There were a few cultural variations concerning the other two measures. On *outcome*, Chinese children overall predicted that the striver would be more successful in the future compared to the natural, $M=.68$, $SD=.47$, $B=0.76$, 95% $CI=[.26, 1.25]$, $p=.003$. There was no effect of age group, $p=.11$ (note that there was an age effect in the US data, where only older children predicted that the striver would be more successful but younger children were at chance). On *similarity*, Chinese children did not trend in either direction ($M=.51$, $SD=.50$, $p=.81$). The effect of age group was not significant, $p=.64$ (recall that there was an age effect in the US data, where younger children actually perceived themselves as more similar to naturals than strivers and older children did not trend in either direction). Analyses on measure differences

revealed a significant age group by measure interaction ($\chi^2(2, N=72)=7.77, p=.02$): Younger children did not respond differently across the three measures ($ps>.46$; unlike younger children in the United States), while older children selected the striver more on the preference and the outcome measures than on the similarity measure, $p=.001$ and $.01$ (preference and outcome measures did not differ, $p=.35$; similar to older children in the United States).

Similar to the US parents, Chinese parents favored the striver more than the natural ($M=.68, SD=.47, B=0.77, 95\% CI=[.34, 1.20], p<.001$), predicted that the striver would be more successful ($M=.68, SD=.47, B=0.76, 95\% CI=[.33, 1.18], p<.001$), and thought they were slightly more similar to the striver ($M=.59, SD=.49, B=0.37, 95\% CI=[-.03, .77], p=.07$). On *outcome* and *similarity* measures, parents did not respond differently than children ($ps>.27$), but on *preference*, parents favored the striver slightly more than younger children ($p=.069, R^2=.02$), but slightly less than older children ($p=.054, R^2=.03$).

Controllability beliefs

We found a significant effect of age group ($B=1.22, 95\% CI=[.17, 2.27], p=.02, R^2=.07$): As shown in Figure 3, older children thought that people could choose to work hard rather than be smart ($M=.80, SD=.41, B=1.39, 95\% CI=[.56, 2.21], p=.001$, while younger children did not hold a significant pattern toward either response ($M=.54, SD=.51, p=.62$). Comparisons between the US and Chinese 7- to 9-year olds showed a marginally significant difference ($p=.07$): Chinese 7- to 9-year-old children were slightly more likely than their US counterparts to think people could choose to work hard rather than be smart. Chinese parents also believed that people can choose to work hard than to be smart ($M=.94, SD=.24, B=2.72, 95\% CI=[1.89, 3.55], p<.001$, at a higher level even compared to older children ($B=1.33, 95\% CI=[.16, 2.50], p=.03, R^2=.02$). Considering the results of Study 2, Chinese children appeared to show adult-like beliefs on the controllability measure at an earlier age than the US children.

Deservingness beliefs

Chinese children also showed adult-like beliefs on deservingness earlier than the US children. Again, we reported results for the main forced-choice question here for simplicity (see Figure 4). In the reward scenario, similar to the US children, we found a main effect of age group, $B=1.85, 95\% CI=[.75, 2.94], p<.001, R^2=.13$. Older children thought it was more fair to reward others based on effort than talent ($M=.83, SD=.38, B=1.58, 95\% CI=[.70, 2.45], p<.001$, while younger children did not ($M=.43, SD=.50, p=.41$). However, in the

punishment scenario, in contrast with the US children, we found that all Chinese children in our sample (100%, at a much higher level than the US children) thought it was more fair to punish others based on effort than talent ($M=1.00, SD=.00$). Comparisons between the US and Chinese children showed a significant difference ($p<.001$): Chinese children were more likely than their US counterparts to believe that it was more fair to punish others based on effort than talent. Just like the US parents, Chinese parents also believed that it was more fair to reward ($M=.94, SD=.24$) and punish ($M=.98, SD=.14$) others based on effort than talent, $B=3.29, 95\% CI=[2.48, 4.10], p<.001$ (similar to older children, $p=1.00$).

Which belief(s) predicted preference?

Controlling for age group, similar to Studies 1 and 2 in the United States, Chinese children's and parents' preference was predicted by their beliefs about future outcomes ($B=1.43, 95\% CI=[.67, 2.19], p<.001$; when only including children's data: $B=1.26, 95\% CI=[.00, 2.52], p=.050$) and controllability beliefs ($B=1.13, 95\% CI=[.11, 2.16], p=.03$; when only including children's data: $B=1.32, 95\% CI=[.08, 2.56], p=.04$). Those who predicted strivers to be more successful and thought that effort was more controllable were more likely to prefer strivers. Preference was not consistently predicted by deservingness beliefs ($B=1.82, 95\% CI=[-.18, 3.81], p=.075$; when only including children's data: $B=2.02, 95\% CI=[-.53, 4.57], p=.12$) or similarity judgments ($B=0.95, 95\% CI=[.19, 1.70], p=.03$; when only including children's data: $B=0.70, 95\% CI=[-.56, 1.97], p=.27$; note that in the US data, these measures also did not predict preference).

Discussion

Extending this work to a non-WEIRD culture (China), we found a consistent preference for strivers at similar ages (ages 7–9). Confirming our expectations, Chinese children developed *earlier* adult-like lay beliefs about effort and talent compared to the US children: They believed that those who put in effort were more likely to be successful than those with talent (as young as ages 4–6), that effort was more controllable than talent (around ages 7–9), and that it was more fair to reward and punish others based on effort than talent (already at ceiling for punishment judgments at age 4). These differences might be due to the fact that Chinese children are often explicitly instructed on the value of effort (Ng & Wei, 2020) and are frequently praised and blamed when referencing effort (or the lack thereof). Similar to the US counterparts, Chinese children's beliefs about outcomes and controllability predicted their preference for strivers: Those who predicted strivers to be more successful and

believed that effort was more controllable also preferred strivers more, suggesting that beliefs about outcomes and controllability underlay children's preference for strivers in both cultures.

GENERAL DISCUSSION

Across three studies, we document the emergence of a “striver preference,” a preference for strivers over naturals across development and in both the United States and China. Although the two categories likely do not provide an accurate categorization of people, our results speak to the tendency of children and adults to view others in terms of “naturals” and “strivers” and to hold different beliefs and preferences for them. Indeed, beginning around age 7, both the US and Chinese children preferred strivers over naturals; they also expected strivers to be more successful in the future, which positively predicted their preference for strivers.

We also found developmental changes and cultural variations in lay beliefs about controllability and deservingness surrounding the concepts of talent and effort. With respect to controllability beliefs, parents in both cultures believed that effort was more controllable than talent. Chinese children around ages 7–9, but not their US counterparts, developed adult-like controllability beliefs, suggesting earlier understanding of the controllability of effort in Chinese children. Moreover, controllability beliefs positively predicted children's preference for strivers in both cultures: Those who believed that effort was more controllable than talent also preferred strivers more. With respect to beliefs about deservingness, the idea that effort deserves reward more than talent and that a lack of effort deserves more punishment than a lack of talent, we found a similar developmental pattern in both cultures. These beliefs seemed to emerge in 7–9 years and were stronger in parents. Notably, Chinese children thought that a lack of effort deserved punishment at an earlier age than their US counterparts; indeed, they were already at ceiling from age 4. As discussed above, these cultural differences might be due to the fact that praise for effort and blame for the lack of effort are more consistently present in China. For example, Chinese teachers and parents reference effort much more than natural talent when praising or punishing children (Ng & Wei, 2020). These messages are likely to be picked up by Chinese children early in development.

To our knowledge, this is the first systematic examination of the development of the preference for strivers and the related lay beliefs across cultures. We showed that starting around middle childhood, children evaluated strivers more favorably than naturals. These findings are consistent with the cultural narratives in both cultures that children might gradually internalize (Fwu et al., 2018; Li, 2005; Yang, 1986; and “The American

Dream”). Extending past work with adults (with ordinary people evaluating ordinary targets, Brown et al., 2018) and consistent with scattered evidence of the developmental change (Lin et al., 2019; Lockhart et al., 2013; Noh et al., 2019), here we found that the preference for strivers emerged in 7–9-year olds and increased in strength after middle childhood.

Why did children show a preference for strivers? Our studies systematically examined several possible predictors of the striver preference across cultures, consistently revealing that it was predicted by lay beliefs that strivers would be more successful than naturals and that effort was more controllable than talent. These lay beliefs dovetail with work on people's preference for potential, for example, preferring those who will achieve a certain level of success over those who already achieved the same level of success (see Tormala et al., 2012), as well as their appreciation of personal cost, for example, positively evaluating someone who incurs more costs to themselves to pursue something good (see Kraft-Todd & Rand, 2019; Zhao & Kushnir, 2022; but see findings on do-gooder derogation, a case when such prosocial actions lead to the opposite effect, e.g., Minson & Monin, 2012; Tasimi et al., 2015). It is thus possible that strivers are seen as having more potential (e.g., thinking that more effort leads to higher future success) and more willing to pay personal cost (e.g., considering costs of time and mental energy in expending effort), a fruitful avenue for future studies. For example, future work may probe expectations of strivers' and naturals' potential, or the amount of costs (e.g., time and mental energy) they take to achieve the same outcomes and examine if such expectations correlate with the preferences and beliefs we revealed here. Additionally, the preference for strivers and the belief that effort is controllable might be early predictors of the growth mindset, that is, believing that abilities are not fixed but can be developed with time and effort. If so, exploring the potential connection among these preferences and striver-related beliefs could have critical implications for helping children navigate failures and frustrations.

Our data reveal developmental changes in how children reason about naturals and strivers around middle childhood. Both the US and Chinese children begin to prefer strivers over naturals after age 7. Lay beliefs that are related to the preference for strivers also show a similar developmental pattern. These beliefs include beliefs about future outcomes (that strivers will be more successful than naturals), controllability (that effort is more controllable than talent), and deservingness (e.g., effort is more praiseworthy than talent; though we note that deservingness beliefs did not seem to predict the striver preference in the current study). This developmental trajectory mirrors recent findings where Chinese children around middle childhood start to evaluate those who overcome internal constraints (i.e., the lack of talent) to achieve academic success

more highly than those who achieve the same success without such constraints (Zhao & Yang, 2022). Together, these findings illuminate children's developing appreciation for effort. What contributes to this development? We think the following factors may play a role: Children's own experience of expending effort toward a goal, children's observation of their peers' hard work and success, as well as adults' explicit emphasis on effort through pedagogy. As children begin to learn slightly more complex subjects at school during middle childhood, they may gain more direct experience of the value of effort. Also, since these factors are likely generalizable across cultures, we may expect to see similar developmental patterns (i.e., the development of a preference for strivers) in other cultures as well. That said, the specific timetables may be subject to specific cultural influences, for example, how much the general cultural value emphasizes effort.

In the present study, strivers were preferred over naturals—but are there contexts where the opposite is true? As we reviewed earlier, past research finds a preference for naturals when adult experts evaluate other professionals. Besides levels of expertise, we think the *domain* of expertise may matter as well. Perhaps in domains that lay people think greatly value natural talent, such as mathematics and philosophy, preferences for naturals may increase (Bian et al., 2018; Leslie et al., 2015). Also, naturals and strivers may be preferred in different ways. For instance, people may feel admiration and jealousy for naturals, while when they look at strivers, there is more appreciation and moral approval (see also Celniker et al., 2022). Exploring the emotional reactions associated with children's preference for naturals versus strivers is a fruitful future direction. Further, merely preferring naturals or strivers may be benign—on a personal level, one simply likes a type of individual. But if society starts to preferentially treat one type of individual (e.g., allocating more resources to naturals via gifted education or hiring for talent), it raises questions concerning the unintended consequences of these actions. Is it fair or unfair to allocate more resources to strivers or naturals? Should talent and effort be used as a basis for resource allocation? These are difficult and yet important questions for our society.

Our work opens the door to many interesting questions. To begin with, as children gradually learn to express what is culturally appropriate, in order to distinguish children's true thinking from the endorsed norm, it is important to also explore the preference for strivers and related beliefs with age-appropriate implicit measures. It would be interesting to explore any implicit–explicit discrepancy in development (see Dunham et al., 2008 for such a discrepancy in implicit–explicit ingroup bias) and its behavioral implications. Moreover, we explored whether children's evaluations and beliefs aligned with their parents' but found largely

inconsistent results (see Supplemental Materials). It is possible that our measures did not fully capture parents' reasoning, especially considering previous work on mindset theories that finds that parents' views of *failures* rather than their views of intelligence predict their children's views of *intelligence* (Haimovitz & Dweck, 2016). Future studies can employ a more nuanced set of parental measures (e.g., asking about parents' values, how they talk about effort and talent with their children, whether they would want their children to be naturals or strivers, etc.) to explore parent–child correlates. It is also possible that children are influenced more by their peers and teachers than by their parents (especially for school-aged children); it would be helpful to explore these other influences.

In the current work, we found a preference for strivers as well as lay beliefs that strivers would be more successful and effort was more controllable and praiseworthy. However, this is not to say that these evaluations and beliefs are uncontroversially beneficial; in fact, too much emphasis on effort may backfire, for example, by blaming the person instead of the system for unsatisfiable outcomes and thus further perpetuating inequalities (Gonzalez et al., 2022; Hussak & Cimpian, 2015). Such blame might be even more problematic if the capacity for hard work is not as controllable as lay people assume. In many cases, it is helpful for individuals to expend effort rationally, to put in effort when more effort leads to better outcomes but not simply persist for the sake of persistence (i.e., engaging in adaptive persistence that optimizes outcomes; Lucca et al., 2020).

Another important future direction is to investigate whether and how preference for strivers versus naturals may relate to children's growth versus fixed mindset (i.e., how much they view intelligence or ability as malleable; see Dweck, 2008; Dweck & Yeager, 2019). Theoretically, mindset and preference map onto different aspects of children's understanding of competence and motivation. Mindsets regarding intelligence concern whether one believes ability can improve (via effort, strategies or mentorship), while in the present work we measure how children socially evaluate those with high natural ability against those with high effort. Their underlying constructs can certainly be related; intuitively, both growth mindset and preference for strivers recognize the value of effort. However, a growth mindset may not necessarily translate to a preference for strivers. Children with a growth mindset may instead prefer naturals because it is desirable to possess high ability that one does not have to work hard for. Relatedly, children with a fixed mindset may appreciate those who still choose to expend high levels of effort (i.e., strivers) despite the slim chance that ability can be improved. Future work can empirically test the relation between growth versus fixed mindset and preference for naturals versus strivers.

In closing, across three studies we document a preference for strivers over naturals and the surrounding lay beliefs including that strivers are more successful in the future, and that effort is more controllable and praiseworthy (with the lack of it being more blameworthy) in both the United States and China. Importantly, beliefs about outcomes and the controllability of effort predicted the striver preference in both cultures. These studies lay the groundwork for future investigations into lay conceptions of effort and talent as well as how these conceptions may help children thrive academically and beyond.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

Data, code, materials, and the preregistration for this research are available at the following URLs: Data, code, and materials: https://osf.io/79bvr/?view_only=d154297f9c4c45809d3099d5e6224b2a; Preregistration for Study 1: <https://aspredicted.org/2v7hv.pdf>; Preregistration for Study 2: <https://aspredicted.org/x64kd.pdf>; Preregistration for Study 3: <https://aspredicted.org/xm6pr.pdf>; Preregistration for Study S1: <https://aspredicted.org/9a5pk.pdf>

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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