



Ideas versus labor: What do children value in artistic creation?



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ABSTRACT

As scientists, we primarily award authorship, as well as legal patents, to those who generate ideas, often without formally crediting others who executed the actual experiments. However, little is known about how and when people come to value ideas. Here, we investigate whether young children also value ideas over labor. In Study 1, we found that 4 and 6 year olds preferred pictures containing their ideas to those containing their labor. In Study 2 we rule out an alternative explanation—that children simply favor pictures containing their idiosyncratic preferences—by discovering that 6 year olds, but not 4 year olds chose a picture they mistakenly believed contained their idea, over a picture that contained their idiosyncratic preferences. Consistent with these results, using a third-party design in Study 3, we found that 6 year olds, but not 4 year olds favored a person who only contributed an idea over another who only contributed labor in awarding ownership. Across three studies, these results suggest that by 6 years old, children value ideas over labor.

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1. Introduction

How much is an idea worth? In favor of inspirational adages about hard work and perseverance, people often refer to ideas as ‘a dime a dozen’, instead favoring fruitful labor and successful execution of ideas. On the other hand, people also strongly value ingenuity and creative ideas in everyday endeavors. Within the scientific community, scientists judge those who contribute original ideas as more worthy of reward compared to those who merely execute or contribute labor, at least when it comes to assigning authorship (Spiegel & Keith-Spiegel, 1970). We acknowledge individuals who come up with ideas, sometimes even at the expense of those who invested significant time and effort to successfully execute those ideas. For instance, many research assistants implement our ideas and turn these ideas into a concrete set of results. However, despite the fact that others may invest more time and physical effort into the project, they are rewarded with authorship

less often. At least in science, it appears that people generally treat ideas as more valuable than labor. Where ideas and labor comprise two qualitatively different contributions to a joint creation, deciding whether labor or ideas are more important for granting rights and credit poses a difficult dilemma that often results in social and legal conflicts.

Intellectual property law provides many instances in which coming up with an idea provides more potential for rewards than merely contributing labor to a joint creation. For instance, in patent law, individuals are only considered joint creators if they make a substantial contribution to the initial conception of an invention (Mandel, 2010). If one contributes only to the labor or execution process, they do not get to share in any of the rewards of intellectual property rights such as profits or the rights to produce, license, and distribute their intellectual property. Thus, current legal conventions prioritize ideas over labor.

Some empirical research supports the notion that lay people also highly value ideas. At least in western cultures, people condemn plagiarism as a “theft of ideas” (Hopkin, 1993), and are concerned with acquiring acknowledgement and prestige for their ideas (Goodenough & Decker,

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2009). Adults are constantly rewarded for coming up with good ideas – people get hired and promoted for having inventive solutions, and are more well-liked for telling good stories or jokes. Thus, it seems intuitive and important for people to value ideas strongly and pay attention to who comes up with good ideas. Previous studies have demonstrated that adults also value their own ideas more than others' ideas. For example, adults overestimate the validity of ideas that they come up with, and are willing to invest more time and money executing those ideas, over similar ideas that were generated by others (Ariely, 2010). Such biased valuations extend to other types of creative tasks. Painters value their paintings (Buccafusco & Sprigman, 2011) and poets value their poems (Buccafusco & Sprigman, 2010) more than people assigned to merely own or purchase the paintings or poems. On the other hand, other research suggests that adults also value effortful labor and express greater liking for work that took more effort and time to produce (Kruger, Wirtz, Van Boven, & Altermatt, 2004).

One way to gain insight into people's valuation of ideas is to investigate when and how this process emerges. Little, if any, work has sought to understand how and when young children might come to value ideas. Previous work on children's understanding of ideas shows that children dislike plagiarism by 5 years of age (Olson & Shaw, 2011). Children aged 5–6 years old, but not 3–4 years old evaluated a plagiarizer more negatively than someone who did not plagiarize, suggesting at least by age 5–6 years, children value original ideas more than copies of those ideas. Whether this is because 5–6 year olds actually value ideas or because they simply dislike unoriginal copiers of ideas is unclear.

In the current studies, we explore whether children specifically value ideas by pitting ideas against another plausible factor one could value—labor. We specifically investigate this question in 4 and 6 year old children because of the previous work described above that has suggested a possible shift from not valuing ideas at 4 years old to valuing ideas at 6 years old.

Across three studies, we pit ideas against labor for several reasons. Primarily, previous research in both adults (Ariely, 2010; Buccafusco & Sprigman, 2010) and children (Kanngiesser, Gjerroe, & Hood, 2010; Olson & Shaw, 2011) has failed to effectively disentangle ideas and labor. For instance, although adults appeared to value creative works and solutions they generated, they were also responsible for implementing (i.e. putting labor into) their ideas. Thus, it is unclear whether people valued these creations specifically because of their ideas, or rather because they exerted labor to implement them. Moreover, we know from previous research that young children at least value labor in some contexts. For instance, children appropriately reward people who do more work as opposed to less work (Hook & Cook, 1979). Finally, the previously discussed examples from the law and science suggest that labor is a particularly relevant and a plausible alternative that may influence how people perceive object value. To that end, we assess whether and when children value ideas over labor by asking if they prefer pictures containing their own ideas over pictures containing their labor, and

whether children also favor people who contribute ideas versus labor in a third-party case.

2. Study 1

To ask if children value ideas over labor, 4 and 6 year old children created two pictures with an adult confederate in Study 1. One picture contained only the child's idea, while another contained only the child's labor and children were asked to choose one picture to take home.

Children aged 4–6 years old were selected for several reasons. First, consistent with previous evidence suggesting a developmental difference in the understanding of ideas between 3–4 year olds and 5–6 year olds (Olson & Shaw, 2011), we tested children in these two age groups. We predicted a potential age difference that perhaps older, but not younger children appreciate the value of ideas over labor. Second, children at both ages had the fine motor skills necessary for the task, and are old enough to pass standard false belief tasks (which is necessary in Study 2).

2.1. Method

2.1.1. Participants

We tested thirty 4 year olds ($M = 52.68$ months, $SD = 3.07$ months; 11 female) and thirty-one 6 year olds ($M = 76.63$ months, $SD = 5.73$ months; 14 female). Participants were recruited from a child development lab or through local preschools and elementary schools. One participant was excluded due to experimenter error.

2.1.2. Procedure

Children were presented with two identical sets of craft materials containing five paper shapes and two cotton balls that could be pasted into a simple design on a piece of background paper. Relatively generic materials were used because we wanted the resulting pictures to be of similar quality and appearance (the latter is most relevant in Study 2). See Fig. 1 for examples of pictures created in each condition. An experimenter told children that each set of materials would be used to create a picture with an adult confederate in the following conditions:

2.1.3. Idea condition

"Think of an idea for a picture you want to make using all of these materials. Then, you will tell <adult confederate> where to glue all the shapes down to make the picture."

2.1.4. Labor condition

"Now, <adult confederate> is going to think of an idea for a picture she wants to make, and she will tell you where to glue all the shapes down to make it."

After each phase, the experimenter provided scripted positive feedback for the pictures, and conditions were counterbalanced across participants to control for order effects.

When both pictures were completed, the adult confederate left the room. The experimenter then presented participants with the two pictures, and asked the child, "You

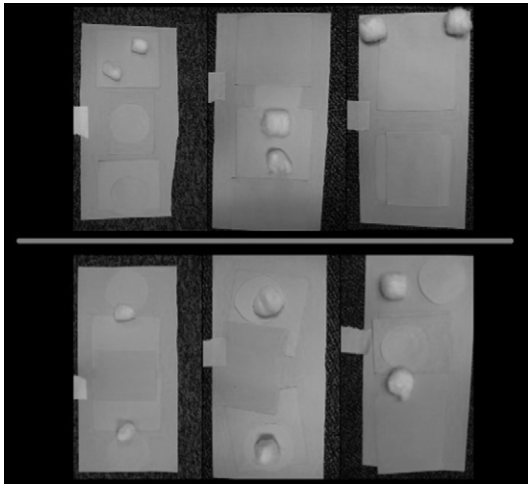


Fig. 1. Three pairs of pictures from Study 1. Pictures on the top are from the Idea condition, containing children's ideas and adults' labor. Pictures on the bottom are from the Labor condition, containing adults' ideas, and children's labor.

get to pick one of these pictures to take home today – which one do you want to take?”.

2.2. Results

Children were more likely to choose the picture that contained their idea (68%, $n = 41$), over the picture that contained their labor (32%, $n = 19$), Sign Test, $p = .006$. See Fig. 2 for the results by age. Both 4 year olds (70%, $n = 21$), Sign Test, $p = .043$ and 6 year olds (67%, $n = 20$), Sign Test, $p = .008$, tended to select the picture containing their idea, and importantly these two age groups did not differ from one another, $\chi^2(1, N = 60) = .077$, $p = .781$. See Fig. 2 for the results by age.

One possible reason for these results might be that coming up with an idea was simply more time consuming than pasting objects onto a piece of paper and therefore children were valuing the time spent on each task more than the type of task involved. To test this prediction, we analyzed the time spent by subjects in the two roles (idea creator, laborer) for the first 10 of the sessions that were videotaped within each age group.¹ We found that 6 year olds spent considerably more time working in the Labor condition ($M = 126.90$ s) than generating an idea in the Idea condition ($M = 27.50$ s), $t(9) = 7.75$, $p < .001$. Similarly, 4 year olds also spent substantially more time on the labor ($M = 196.90$ s) rather than on the idea ($M = 18.00$ s), $t(9) = 4.87$, $p = .001$. Thus, our results suggest that children not only valued ideas more than labor, but they did so in spite of the labor phase being much more time-consuming.

A second possible explanation for these results is that the adult experimenter's labor may have resulted in better quality pictures, such that children chose the picture they

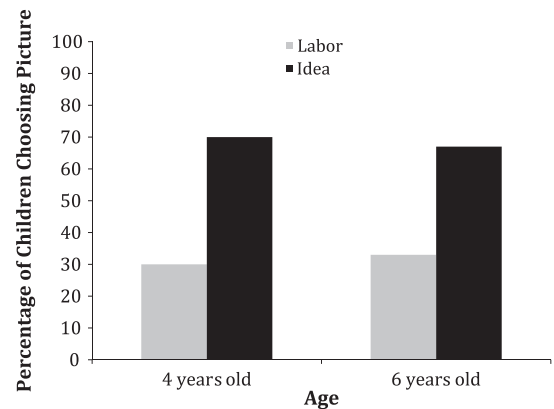


Fig. 2. Choice of picture by age. Percentage of 4 and 6 year olds in Study 1 who chose pictures containing their idea versus pictures containing their labor.

came up with an idea for because the adult did a better job gluing the pieces (i.e., the final product looked objectively nicer), and not because it contained their idea. To test this possibility, we presented an additional ten 4 year olds ($M = 54.34$ months, $SD = 3.22$ months, 5 female) and ten 6 year olds ($M = 78.29$ months, $SD = 4.27$ months, 5 female) with photographs of the 30 pairs of pictures produced by their corresponding age groups. For each picture pair, children were asked to pick which picture was better looking. A binomial test revealed that 6 year olds did not systematically favor pictures with the adult's labor ($M = 14.0$ selections out of 30) versus the child's labor ($M = 16$ selections), $p = .273$. Similarly, 4 year olds showed no preference for the picture with the adult's labor/child's idea ($M = 14.7$ selections out of 30) over the picture with the child's labor/adult's idea ($M = 15.3$ selections), $p = .773$. These analyses eliminate the concern that children chose pictures based on obvious disparities in picture quality.

2.3. Discussion

Overall, these findings suggest that children prefer their own ideas, as evidenced by selecting the picture containing their idea even when pitted against a picture containing their physical labor. Subsequent analyses ruled out the possibility that children chose a picture based upon time investment, the picture that they performed more physical labor on, or the picture that looked objectively better. Instead, it appears that children chose a picture simply because it contained an abstract idea they quickly generated, even though they contributed no physical work and neither picture looked objectively better.

One possible explanation remains. Rather than being driven by children valuing their own ideas, children's responses could instead reflect an "idiosyncratic preference fit" (Franke & Piller, 2004; Schreier, 2006). That is, the picture containing a child's idea also contains his or her own aesthetic preferences. Thus, one interpretation of these results is that rather than valuing ideas over labor, liking vs. disliking certain visual elements instead drove the

¹ Not all participants' sessions were videotaped because not all parents gave permission. However, there were no differences between participants who were videotaped and those who were not.

observed effect. For instance, a child may like pictures with circles in the corner, and in coming up with an idea for her picture, told the confederate to place circles in the corner. Then the child may have selected the picture with circles in the corner not because she came up with the idea, but because she likes pictures with circles in the corner, and this was the only picture with such a feature.

3. Study 2

In Study 2, we sought to rule out this alternative explanation that children chose pictures containing their idea not because it contained their idea, but because it also contained their idiosyncratic preferences. We used a method nearly identical to Study 1, but a delay was added after which the experimenter misled children about which picture contained their idea. Children then had a chance to select a picture to take home. Children were told the picture with their idea was instead the picture containing their labor. By switching the pictures, we separated ideas from both labor and idiosyncratic preferences, asking children to choose between a picture they thought had their idea (which now did not contain their idiosyncratic preferences) versus a picture they thought had their labor (and contained their idiosyncratic preferences). Such a switch seemed plausible because recent research has suggested even adults can be tricked using sleight of hand (Johansson, Hall, Sikstrom, & Olsson, 2005).

If children's choices were driven by aesthetic preferences, they should now choose the picture containing their labor, as this picture also contains their design idea. However, if children value ideas over labor, then they should choose the picture they believe contains their idea simply because they value their own ideas.

3.1. Method

3.1.1. Participants

We tested thirty-four 4 year olds ($M = 52.18$ months, $SD = 5.60$ months; 16 female) and fifty-one 6 year olds ($M = 77.40$ months, $SD = 3.8$ months; 26 female). More children participated in this study than in Study 1 because 4 four year olds and 21 six year olds were not successfully misled by the experimenter, and spontaneously objected when told which picture contained their idea and which contained their labor. We collected data until we had 30 children in each age group who were misled (i.e. did not state otherwise) by the switch. Data are reported separately for children who fell for the switch and children who did not (who functionally serve as participants in a replication of Study 1). Participants were recruited from a child development lab or through local preschools and elementary schools.

3.1.2. Procedure

The procedure was identical to Study 1, except that after the two pictures were completed, the experimenter removed both pictures, and told children to look at a Where's Waldo book with the adult confederate. After a

2-minute delay, the experimenter returned and presented participants with the completed pictures.

The experimenter pointed to the picture from the Idea condition, and said "Remember this picture? In this picture, <confederate's name> came up with the idea for the picture, and you glued down all the shapes." The experimenter then pointed to the picture from the Labor condition and said "Remember this picture? In this picture, you came up with the idea for the picture, and <confederate's name> glued down all the shapes". Children were asked to choose to take one home as a reward. Pictures were presented in a counterbalanced order across participants.

If children spontaneously objected that the experimenter was wrong, the experimenter apologized and corrected herself before asking children to choose a picture to take home. These children were coded as part of the non-misled group.

3.2. Results

Of the children who were misled (i.e., those that likely fell for the experimenter's trick as indicated by not objecting), a chi-square analysis revealed an effect of age, $\chi^2(1, N = 60) = 13.13, p < .001$, indicating that the preference for pictures differed between 4 year old and 6 year old children (See Fig. 3). Six year olds preferred the picture they thought contained their idea (77%, $n = 23$), over the picture they thought contained their labor (23%, $n = 7$), Sign Test, $p = .005$. In contrast, 4 year olds showed the opposite effect, preferring pictures they thought contained their labor ($n = 21, 70\%$) over pictures they thought contained their idea (30%, $n = 9$), Sign Test, $p = .043$. This result suggests that 6, but not 4-year-old children value ideas over labor. Further, though 4 year olds appeared to value ideas in Study 1, these results suggest their responses in Study 1 may have been driven instead by a preference for idiosyncratic visual features.

Four 4 year olds and 21 six year olds were not misled by the picture switch and spontaneously objected to the experimenter's false feedback.² Of these children who correctly identified which picture contained their idea, 4 and 6-year-old children did not differ in their preferences, ($\chi^2(1, N = 25) = .414, p = .520$) and are collapsed in this analysis. Children preferred the picture that contained their idea, (92%, $n = 23$) rather than the picture that contained their labor ($n = 2$), Sign Test, $p < .001$. As with Study 1, these children did value their ideas over labor, but cannot disentangle picture choice due to idea generation versus idi-

² One concern might be that just as many 4 year olds as 6 year olds noticed the experimenter's mistake, but the 4 year olds were too shy to object. If we instead assume, that a similar percentage of 4 and 6 year olds (41%) were savvy to the picture switch, then 14 of 34 four year olds were aware of the switch (this includes the 4 already identified as objecting). Assuming these children all chose the picture from the actual Idea condition, we would still find that 55%, or 11 of 20 four year olds who *did* fall for the experimenter's mistake preferred pictures from the actual Labor condition, compared to 18% of 6 year olds. Thus, even if just as many 4 year olds were aware of the mistake but were too shy to protest, we would still find that the majority of 4 year olds did not value ideas over labor, and in fact trend in the opposite direction of the 6 year olds who do.

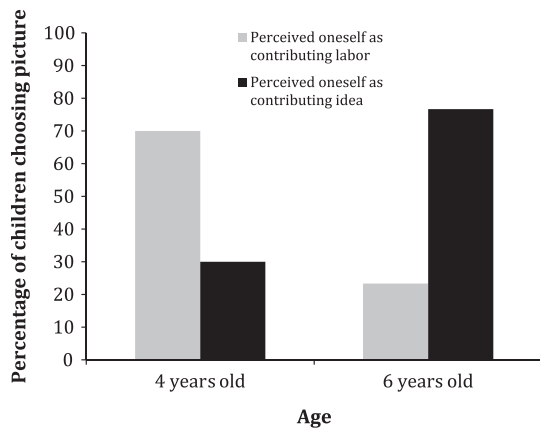


Fig. 3. Choice of picture by age. Percentage of children in Study 2 who were successfully misled by the experimenter, who chose pictures where they believed themselves to have implemented the picture, or originated the idea, by age.

osyncratic preferences. However, the results replicate findings from Study 1, further supporting our initial findings.

3.3. Discussion

Results from Study 2 show that 6 year olds chose pictures based on whether they thought they originated the idea, whereas 4-year-old children did not. In Study 2, 6 year olds consistently preferred pictures in which they merely believed they came up with the idea. These findings suggest that 6 year olds did not value ideas in Study 1 based merely on idiosyncratic preference fit. Instead, our findings strikingly suggest that 6 year olds choose a picture based only on whether they thought the underlying idea was theirs. These findings support the notion that ideas are viewed as more valuable than labor by 6 year olds but perhaps not by 4 year olds.

Looking across Studies 1 and 2, the results of 4 year olds suggest that their preference might be driven by their idiosyncratic preferences. In both studies, 4 year olds selected pictures that they had actually designed which presumably included these idiosyncratic elements. Importantly, they retained this preference even when they were lead to believe these pictures were not the results of their idea. These results suggest that 4 year olds were simply looking at the two pictures and deciding which one they liked more. Not surprisingly, most often this was the picture that they had designed which incorporated their specific idiosyncratic preferences.

While the results from Studies 1 and 2 nicely converge in suggesting that 6 year olds, but not 4 year olds, value ideas more than labor, critical questions remain. First, do 6 year olds merely appreciate the value of their own ideas more than labor, or do they value ideas more globally? Second, if 4 year olds rely on idiosyncratic preferences, what if the possibility of these preferences is removed—will they then prefer ideas or labor? Or were 4 year olds simply overly confused by the switch, leading us to over-interpret their results from Study 2? We address these questions in Study 3 using a much simpler third-party design.

4. Study 3

In Studies 1 and 2 we found that children value ideas over labor by 6 years old. However, one leaner interpretation is that they simply value their own ideas, rather than ideas more generally. To ask whether the leaner or more general interpretation is correct, a similar study was run, but in a third-party context. We presented children with a vignette about two girls creating one picture, one who contributes the idea and another who contributes labor, and asked children to judge which girl should get the picture. If children value ideas more generally, and not just their own ideas, they should favor the person who contributes the idea more than the person who only contributes labor.

This design also allowed us one final chance to investigate whether 4 year olds value ideas over labor. As described above, our best interpretation of the 4 year olds' results in Studies 1 and 2 is that they showed a preference for their own idiosyncratic design features. In Study 3, there is no choice between two pictures and in fact one picture is represented by a blank sheet of paper. Using this design, we can eliminate the possibility that 4 year olds' selections in Study 3 are based on idiosyncratic preferences and now ask whether, when these are removed, 4 year olds favor ideas or labor.

Study 3 is also useful for studying the relative preference for ideas vs. labor in 4 year olds because the method of Study 2 may have been particularly challenging for these younger children; we may have inadvertently overestimated their abilities and therefore underestimated their valuations of ideas. In this third-party design, children had no personal connection with the idea and no objections or tricks were necessary, thereby providing a new test of whether 4 year olds value ideas. In addition, to respond to one last potential criticism—that 4 year olds simply did not pay attention to who came up with ideas and who performed labor—Study 3 included a manipulation check.

4.1. Method

4.1.1. Participants

Twenty 4 year olds ($M = 52.75$ months, $SD = 3.29$ months; 12 female) and twenty 6 year olds ($M = 77.36$ months, $SD = 3.65$ months; 10 female) participated in this study. Participants were recruited in a child development lab or at a local museum.

4.1.2. Procedure

An experimenter told children the following vignette using paper dolls: "Sally and Anna are making a picture. Sally thinks of an idea for the picture, and she tells Anna how to make it. Then, Anna makes the picture. Sally and Anna fight over who gets to take the picture home." A small piece of blank paper was placed between the dolls and was used to denote the picture. Children were asked, "Who should get the picture?", and, as a manipulation check, to identify which character came up with the idea.

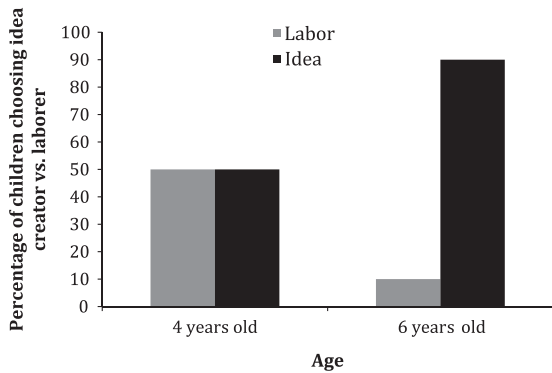


Fig. 4. Judgments of which person should get the picture. Percentage of children in Study 3 who judged the idea creator versus the laborer as more deserving of the picture.

4.2. Results

A chi-squared analysis showed an effect of age on judgments of who should get the picture, $\chi^2(1, N = 40) = 7.62$, $p = .006$ (See Fig. 4). Specifically, 6 year olds were more likely to favor the person who came up with the idea as the owner (90%, $n = 18$) over the person who actually made the picture ($n = 2$), Sign Test, $p < .001$. In contrast, 4 year olds did not favor either person as the owner ($n = 10$ favoring each), $p = 1.00$.

Critically, both 4 year olds (95%, $n = 19$, Sign Test, $p < .001$) and 6 year olds (85%, $n = 17$, Sign Test, $p = .003$) correctly identified which person came up with the idea, suggesting that previous results were not driven by inattentive 4 year olds, or by 4 year olds' failure to encode who came up with the idea.

4.3. Discussion

These results demonstrate that 6 year olds value ideas over labor even when making third-party judgments, favoring those who only contributed ideas as more deserving of a picture over those who only contributed labor. Our findings support the more general interpretation of the findings from Studies 1 and 2 – that 6 year olds not only value their own ideas over labor, but appear to value ideas more generally in a third-party case. These results also provide support for the developmental change observed in Study 2, as 4 year olds did not place special value on ideas above labor. Four year olds' chance preferences also could not be explained by confusion, since they, like 6 year olds, were able to accurately track other information from the scenarios about which person contributed ideas versus labor.

5. General discussion

In three studies we have demonstrated that by 6 years old, children value ideas. Importantly, they value their ideas more than something equally plausible—physical labor. Six year olds systematically chose pictures that contained their own ideas over pictures that contained their

labor, even when they were merely tricked into believing that they had come up with the idea for a picture that they had not. Further, 6 year olds demonstrated a general appreciation of ideas – they not only valued their own ideas (Studies 1 and 2), but also privileged idea creators over laborers in a property dispute (Study 3). In contrast, 4 year olds appear to have preferred pictures that contained their specific idiosyncratic preferences. Four year olds preferred pictures containing their ideas, but also their idiosyncratic preferences in Study 1 and pictures they believed contained their labor but also their idiosyncratic preferences in Study 2. Further supporting this possibility, in Study 3 where idiosyncratic preferences could not play a role in selection, 4 year olds showed no bias for either a third-party idea creator or laborer. Importantly, the latter effect was not driven by lack of attention to the different roles or simply forgetting who did what work, as these children could easily identify who had come up with the idea.

Ideas comprise a significant part of our mental lives. Broadly, our findings suggest that appreciating ideas and valuing creations containing our own or others' ideas have early emerging roots. The primacy of ideas seems especially striking when we consider that the ideas generated in these studies were not the result of hours or even minutes of deliberation. Rather, children judged a few seconds of mental activity as superior and more valuable than labor that took more than four times as long. While previous research has shown that personal connections (Belk, 1988) and emotional attachment can drive adults' positive perceptions of their own work (Ariely & Simonson, 2003; McGraw, Tetlock, & Kristel, 2003), our findings suggest that even children believe a mental contribution is more valued than a mere physical one. Importantly, our research demonstrates that this intuition extends beyond simple personal attachment to the work, since children sided with the idea creators in third-party case, even when they personally had no connection to the idea.

Ideas may be strongly valued early in childhood because just as adults are rewarded for having good ideas, even young children earn praise for creative drawings and build good reputations for telling funny jokes. That is, one reason ideas are valuable is because being acknowledged matters (Shaw et al., in press). People want to be acknowledged for the good ideas they come up with, and affiliate with others who have good ideas, and thus it seems likely that we are equipped to accurately track and attribute ideas to their originators. This would suggest that children not only value ideas, but they may be sensitive to information about who comes up with an idea and whether credit is appropriately assigned – an assertion that should be tested in future investigations.

Provocatively, the developmental difference observed in the current studies aligns with previous research suggesting a difference in children's evaluations of plagiarism between ages 4 and 6 (Olson & Shaw, 2011). What accounts for the difference in valuing ideas between 4 and 6 years old? We consider some possible explanations below. First, to believe that ideas are valuable presumably requires an understanding of the concept of ideas; thus, the observed age difference could be driven by 4 year olds

lacking an understanding of what ideas are, or meta-cognitively, how they are generated. A related possibility is that 4 year olds may fail to understand that creative ideas are valuable because they are generated in individuals' minds, are rare and unique, and indicate the designer's competence (Franke, Schreier, & Kaiser, 2010). If younger children have little understanding of the uniqueness of ideas, it is unsurprising that they neither care when an idea is used by someone else (Olson & Shaw, 2011) nor value them more than physical labor, as demonstrated in these experiments.

Yet another possibility is that what is missing for the youngest children is an understanding that ideas exist only in individuals' minds until they are expressed; perhaps instead children believe all ideas are known to all people. Such a belief may be spawned by the experience of being told a new idea and feeling as if one knew it all along, a bias children have been shown to make around this age in other domains (e.g., Taylor, Esbensen, & Bennett, 1994). Under this view, 4 year olds may simply not view contributing ideas as a special contribution to the joint effort (or at least not more important than labor), thus granting idea contributors no special status (and similarly having no problem with copying).

One final possibility is that the development of children's understanding of ideas requires applying rules of physical property ownership to ideas, but that 4 year olds cannot yet do this. Children may infer natural intellectual property rights, valuing ideas because ideas are meaningfully connected to their originators by means of ownership. Just as both adults (Kahneman, Knetsch, & Thaler, 1990) and children (Harbarugh, Krause, & Vesterlund, 2001) display endowment effects and overvalue owned objects, we may value our own ideas and favor those who contribute ideas because we treat ideas as being owned by their creators. Although object ownership understanding emerges by 2 years old (Fasig, 2000) and grows more robust around age 3–4 years (Blake & Harris, 2009; Friedman & Neary, 2008; Kim & Kalish, 2009), the notion that we can own ideas may be difficult for younger children to grasp because ideas are invisible and not intrinsically valuable. One recent paper has found that by the time children are 6 years old they apply ownership to ideas and use principles from physical ownership to determine who owns an idea (Shaw et al., 2012). These authors suggest that children may understand that ideas can be owned once they understand that ideas are valuable commodities that others may want. If this is the case, the age effect in the current studies may exist because 6, but not 4 year olds, understand that ideas are valuable and can thus be owned. Future studies are needed to examine if an understanding of idea ownership is connected to the value one places on one's own and others' ideas.

Although we have found that 6 year olds value ideas over labor, this is likely not an unequivocal preference. Results from Study 1 confirm that 6 year olds' preference for ideas was not merely about time investment – they valued ideas in spite of the labor phase being more than four times as time-consuming. However, children may rightly view labor as more important, for instance, when the labor is extremely intensive and requires tremendous skill, or

conversely if the idea is weak and process of coming up with the idea is trivial. For instance, if a layperson vaguely describes an idea for a painting they would like to have painted (e.g. a horse on a hill) and an expert painter executes an award-winning, museum-worthy mural, it would seem unreasonable to value the layperson's contribution more. Additionally, while we have tested ideas versus labor in one instance – creating pictures – it is possible that children weigh ideas and labor differently depending on the domain of the task. One possibility is that ideas may be viewed as more valuable in pursuits that stereotypically require creativity such as painting and storytelling, whereas ideas that serve utilitarian functions, such as solutions to a problem may not be judged in the same way. Future work might investigate the bounds of the effect described in this paper.

The current studies are among the first to provide evidence that the tendency to value ideas is present in childhood and may emerge between 4 and 6 years old. Many questions merit further investigation, including the nature of younger children's concept of ideas, and the mechanisms that underlie changes in idea understanding between ages 4 and 6. Future research could explore whether children overvalue their own ideas as adults do and test the limits of children's valuation of ideas, examining the circumstances under which information about the source of an idea would be ignored. It will also be important to directly test the extent to which older children's intuitions about ideas reflect those of adults as well as legal intuitions about intellectual property and whether people think ideas can be owned. What we do know from these findings is that by 6 years old, children's intuitions appear to align with those of scientists, valuing ideas over labor.

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