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Children's Valuation of Significance

By

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Abstract

To live a meaningful life, we need to pursue work and activities with significance (i.e., the sense that something matters beyond the trivial or momentary). Is the sensitivity toward the lack of significance rooted in childhood? To shed light on this question, we investigated whether 4-9-year-old children (total N = 220) and adults (total N = 226) value the significance of productive activities. In Study 1, we presented participants with two games in which they could put together heart puzzles, one without significance (their work would be taken apart) and one with "minimal significance" (their work would be kept). Children were randomly assigned to play these games in two different contexts (i.e., repetitively versus only for one round). We found that children across ages and adults were more likely to evaluate the game with minimal significance as being better and mattering more than the game with no significance, across both contexts. Study 2 revealed similar patterns in children's and adults' motivation to play the games. The results provide initial evidence that children are sensitive to the lack of significance in productive activities, suggesting the importance of perceived significance in children's motivation and achievements.

Keywords: significance, meaning, motivation, achievement, social cognition

Introduction

Human beings have a profound need for having meaning in life. Repetitively doing work with no significance — The "Sisyphus" condition — is considered a tragedy and miserable punishment in life (Camus, 1955). To live a meaningful life, we need to pursue work and activities with significance (i.e., the sense that something matters beyond the trivial or momentary) (Ariely et al., 2008; Martela & Steger, 2016). The sense of significance or "mattering" is theorized as one of three essential components of "meaning in life" (Martela & Steger, 2016), which has been found to be an even stronger predictor of meaning in life than the other two predictors (i.e., purpose and coherence) (Costin & Vignoles, 2020). Despite that having a sense of significance is essential for living a meaningful life, little is known about the developmental origins of the valuation of significance. To shed light on this question, our work investigates children's sensitivity toward the significance of productive activities in their evaluations and decisions.

Having a sense of significance and mattering has positive implications for motivation. It has been theorized that having a sense of significance and mattering could motivate people's actions and even shape a person's choices in life (Frankl, 1959/1985; Ryan & Deci, 2017). Adolescents who have a sense of meaning and pursue purposeful actions with broader significance have better academic achievement and adjustment outcomes (Damon et al., 2003; Kiang, & Fuligni, 2010; Mason, 2017). Most relevant to our focus, Ariely and colleagues (2008) studied whether "meaning" influences people's motivation for doing simple tasks. They found that adults were motivated to create more lego models if their work could be kept or recognized by others, compared to when their work got disassembled. These findings suggest that people care about meaning when completing simple tasks and work harder when they perceive the

potential significance of their activities. It remains to be examined if the valuation of significance is rooted in childhood, the focus of our work.

There is little direct research on children's valuation of the significance of activities. But research on "meaning-making" has revealed that seeing the significance of turning points in life was positively correlated with positive adjustment among Grade 12 students (Tavernier & Willoughby, 2011). Moreover, even young children could make meaning from negative experiences by normalizing and generalizing them, suggesting that children may have the basic ability to derive meaning and significance from events (Orvell et al., 2019). Building on these findings, our work examines whether perceived significance would guide children's evaluations and decisions for activities.

On one hand, it is possible that children may not be able to recognize meaning and significance until relatively late in life. The feeling of meaning could be viewed as a privilege in life that is only needed and achieved by a small percentage of people who are satisfied with other basic needs. Indeed, Maslow viewed the need for and pursuit of meaning as a characteristic shared by people who have achieved self-transcendence, the ultimate life stage that comes after self-actualization (Maslow, 1965). Previous studies have suggested that the understanding and search for meaning might emerge in adolescents (Kiang & Fuligni, 2010; Steger et al, 2006). These conceptualizations and findings predict that meaning would only be valued by only a small percentage of people and certainly not be present in childhood.

On the other hand, it has been shown that even young children value physical labor and ideas in their work. Children as young as ages four or five value their creations more than the identical ones created by others (i.e., "the IKEA effect", Marsh et al., 2017), and with age 4-12-year-old children increasingly expect people to prefer handmade objects over factory made items

(DeJesus et al., 2022), which suggests that children recognize the contribution of labor in objects' value. By age six, children also value their ideas over their labor in artistic creations (Li et al., 2013). These results suggest that children's valuation of creations depends on the physical labor and ideas contained in the work. Building on these findings, our work examines whether children's valuation of productive activities also depend on the potential *significance* of activities (holding constant invested labor and ideas), such that if even activities with "minimal significance" (e.g., their work would be kept) would be preferred by children compared to activities with no significance (e.g., their work would be taken apart).

Our current work examines whether children from age 4 to 9 are sensitive to the significance of productive activities in their evaluations and decision-making. Across two studies, each child was randomly assigned to two contexts (*repetitive* and *one-round*) and were presented with two games in each context: *game without significance* (their work would be taken apart) and *game with "minimal significance"* (their work would be kept). Children were asked to evaluate the two games (Study 1) and which game they would like to play (Study 2). We hypothesize that: 1) If children do not care about the significance or meaning of their actions, they will show no preference for a *game with minimal significance* versus a *game without significanc*e, both when the games are played in the *one-round* and *repetitive contexts*; 2) if children do care about the significance of their actions, they may prefer the *game with minimal significance* more than the *game without significance.* However, there could be different possibilities regarding the effect of context: a) Children might show a stronger preference for the minimal significance in the *repetitive context* than in the *one-round context,* since repetitiveness might make the lack of significance more salient than in one-round activities; b) Alternatively, children might show similar preferences in the two contexts, if playing the activities for even one

round is sufficient for children to notice its lack of significance; c)It is less likely (but still possible) that children might show a stronger preference for the minimal significance game in the *one-round context* than in the *repetitive contex*t. The reason is that repetitiveness might shift their attention and preferences from the significance of their actions and outcomes to the process of completing sequences of actions itself.

Study 1

Methods

Participants. We predetermined the sample size to be at least 40 per context (80 in total). Data collection was stopped when this goal was met. The final sample included 81 4-9-year-old participants (*M* age = 7.59 years, *SD* = 1.65 years, *range* = 4.02 to 9.94, female = 41, male = 40). Of these participants, 31 were White, 10 were Black or African American, 16 were American Indian or Alaska Native, 18 were Asian or Pacific Islander, 0 Latino or Hispanic, 6 were mixed, and 0 Other. Child participants in this study and the subsequent studies were from diverse socioeconomic backgrounds and recruited from the database of a mid-western university.

As a comparison, we also recruited a sample of 82 adult participants on Amazon Mechanical Turk (*M* age = 40.78 years, *SD* = 11.07 years, *range* = 23 to 72, female = 26, male = 34, Other = 0, and 22 chose to not report their gender). Of these participants, 43 were White, 4 were Black or African American, 7 were American Indian or Alaska Native, 4 were Asian or Pacific Islander, 4 Latino or Hispanic, 2 were mixed, 0 Other, and 22 chose to not report their race. All studies reported in this paper were approved by the Institutional Review Board of the University of Chicago, project title “The Value of Meaning”, Human Nature & Potentials IRB

19-1347. Written parental consent or adult participant consent was obtained in advance of all testing; children also provided verbal assent prior to beginning the procedures.

Design and Procedure. Each child was tested individually in a quiet space at home over Zoom (during the COVID-19 pandemic). Before the testing session began, we asked parents to check that their technical devices were functional, minimize background noise, and remove other distractions. Parents were allowed to remain in the same room as the child but were instructed not to talk to the child or comment on the study during testing. The testing session lasted an average of 10 minutes for each participant. All testing materials were presented through Qualtrics.

Each child was presented with two games (i.e., an "orange" game and a "green" game). In both games, children were shown pieces of heart puzzles (either in orange or in green) and were told that they would put the pieces together to create hearts. In one game, children were shown a shredder machine and were told that the heart created would be taken apart in the machine's box (i.e., *game with no significance*). In contrast, in the other game, children were shown the same shredder machine and were told that the heart created would be put in the machine's box (i.e., *game with minimal significance*). Therefore, creating the heart in the minimal significance game has a weak meaning compared to creating the heart in the game without significance, because children's work would be preserved in the minimal significance game. Children were randomly assigned to see the green game as the *game with no significance* and the orange game as the *game with minimal significance,* or vice versa. Children were also randomly assigned to see the games in two different contexts: *Repetitive* and *One-Round*. In the *Repetitive* context, the participants were shown three rounds of each game as examples and were told that they would play each game repeatedly ("*You can repeat this and create as many hearts*

as you want, and we will put all of them in this box"). In the *One-Round* context, participants were shown one round of the game and were told to play each game just once.\

Immediately after children were introduced to both games, the experimenter asked two check questions to make sure the child participants fully understood the game context ("*For both games, do you create a heart just once, or do you create hearts again and again?*") and the difference between the two games ("*Can you tell me, which game we will take apart the hearts you create?*"). The majority of children (63%) passed these check questions on their first attempt. Feedback was provided to the children who gave incorrect answers. Then children responded to two test questions: a) *Which game do you think is better?* b) *Creating the heart/hearts in which game matters more?*

repetitive context

Figure 1. *Demonstrated the two conditions base on the produces and the image that the participant will be viewing. The countercolor version was created and present during the experiments to avoid and color effect towards the result.*

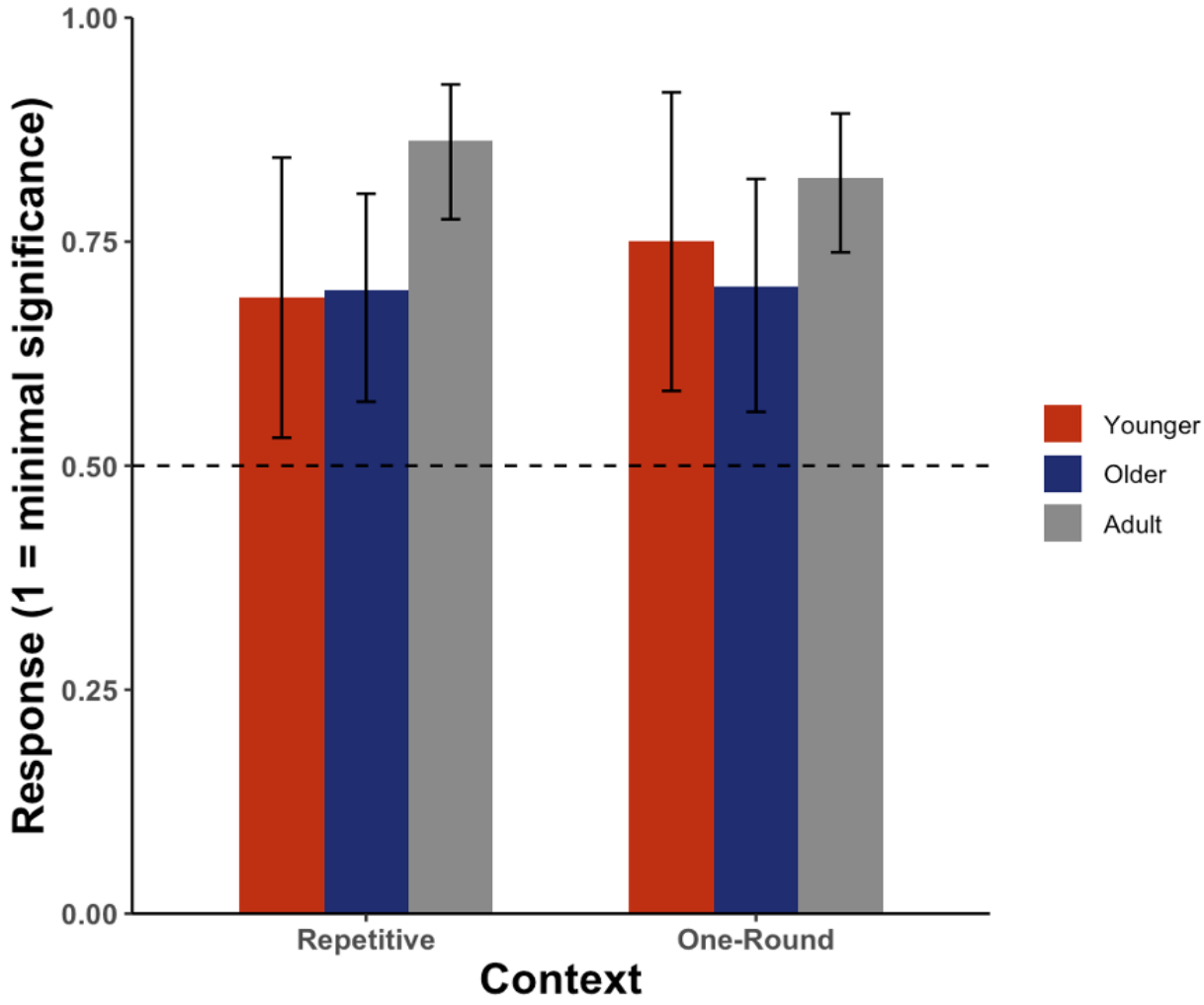
We presented adult participants with the same games and questions as a Qualtrics survey. Participants were told at the beginning of the survey that it was designed for children intentionally and they should answer the questions as to how *they* would answer them, not the way they think how *children* would answer them. To ensure data quality, each participant was asked to go through the same two check questions and the survey was terminated if the participant did not pass any of them.

Results

We first analyzed adults' responses to the test questions, by conducting a generalized mixed-effects model using measure (better and matter), context (repetitive vs. one-round), and their interactions to predict their responses, with a random intercept for each participant. According to the "drop1" function in R, we found there is no significant two-way interaction, (B = -1.705, SE = 1.93, t = -0.66, p = 0.4). We also compared adult responses to each question to chance level (.5) using binomial tests. We found that adults evaluated the game with minimal significance more positively, both for the repetitive context (M = 0.86, SD = 0.35, $p < 0.001$) and for the one-round context (M = 0.82, SD = 0.39, $p < 0.001$).

To analyze children's responses to the test questions, we conducted a generalized mixed-effects model using measure (better and matter), context (repetitive vs. one-round), child age, and their interactions to predict children's responses, with a random intercept for each participant. According to the "drop1" function in R, we found there is no significant three-way interaction (B = -0.446, SE = 0.43, z = -1.04, p = 0.3). We also conducted a binomial test and found that children across ages were more likely to evaluate the game with minimal significance as being better and mattering more than the game with no significance across contexts (M = 0.70, SD = 0.46, $p < 0.001$)(Figure 2). We concluded that children prefer productive activities that contain minimal significance and are sensitive to the lack of significance of such activities.

Figure 2. *Children's and Adult's Evaluation by Context in Study 1*



Study 2

Hypothesis.

After analyzing the result of Study 1 and found out children do sensitive to the (lack of) significance. We know that children from age 4 to 9 prefer the *game with minimal significance* and evaluating the *game with minimal significance* matters more. We hypothesized that children would decide to play the *game with minimal significance* more than *game without significance* in both contexts.

Methods

Participants. We predetermined the sample size to be 60 per context (120 in total). Data collection was stopped after we recruited 139 participants from the University of Chicago's Center for Early Childhood Research's data pool. Of the 139 4-9-year-old participants we recruited (*M* age = 7.25 years, *SD* = 1.55 years, *range* = 4.13 to 9.92, female = 58, male = 62), 51 were in the younger group, 4- to 6-year-olds (*M* age = 5.77 years, *SD* = 0.81 years, *range* = 4.13 to 6.99), and 67 were in the older group, 7- to 9-year-olds (*M* age = 8.38 years, *SD* = 0.87 years, *range* = 7.01 to 9.92). Of these participants, 57 were White, 11 were Black or African American, 18 were American Indian or Alaska Native, 36 were Asian or Pacific Islander, 0 Latino or Hispanic, 15 were mixed, and 0 Other. Child participants in this study and the subsequent studies were from diverse socioeconomic backgrounds and recruited from the database of a mid-western university.

As a comparison, we also recruited a sample of 144 adult participants on Amazon Mechanical Turk (*M* age = 39.90 years, *SD* = 12.48 years, *range* = 21 to 70, female = 32, male = 36, Other =1, and 75 chose to not report their gender). Of these participants, 42 were White, 8 were Black or African American, 0 were American Indian or Alaska Native, 14 were Asian or Pacific Islander, 4 Latino or Hispanic, 1 were mixed, 0 Other, and 75 chose to not report their race. All studies reported in this paper were approved by the Institutional Review Board of the University of Chicago, project title “The Value of Meaning”, Human Nature & Potentials IRB 19-1347. Written parental consent or adult participant consent was obtained in advance of all testing; children also provided verbal assent prior to beginning the procedures.

Design and Procedure. Identical to Study 1, each child was tested individually in a quiet space at home over Zoom. Before the testing session began, we asked parents to check that their

technical devices were functional, minimize background noise, and remove other distractions. Parents were allowed to remain in the same room as the child but were instructed not to talk to the child or comment on the study during testing. The testing session lasted an average of 10 minutes for each participant. All testing materials were presented through Qualtrics.

Each child was presented with two games (i.e., an "orange" game and a "green" game). In both games, children were shown pieces of heart puzzles (either in orange or green) and were told that they would put the pieces together to create hearts. In one game, children were shown a box and were told that the heart they created would be taken apart in the box (i.e., *game with no significance*). In contrast, in the other game, children were shown the same box and were told that the heart created would be put in the box (i.e., *game with minimal significance*). Therefore, creating the heart in the minimal significance game has a weak meaning compared to creating the heart in the game without significance, because children's work would be preserved in the minimal significance game. Children were randomly assigned to see the green game as the *game with no significance* and the orange game as the *game with minimal significance,* or vice versa. Children were also randomly assigned to see the games in two different contexts: *Repetitive* and *One-Round*. In the *Repetitive* context, the participants were shown three rounds of each game as examples and were told that they would play each game repeatedly ("*You can repeat this and create as many hearts as you want, and we will put all of them in this box*"). In the *One-Round* context, participants were shown one round of the game and were told to play each game just once.

Immediately after children were introduced to both games, the experimenter asked two check questions to make sure the child participants fully understood the game context ("*For both games, do you create a heart just once, or do you create hearts again and again?*") and the

difference between the two games ("*Can you tell me, which game we will take apart the hearts you create?*"). The majority of children (57%) passed these check questions on their first attempt. Feedback was provided to the children who gave incorrect answers. Then children responded to one test question: a) *Which game do you want to play?*

We presented adult participants with the same games and questions as a Qualtrics survey. Participants were told at the beginning of the survey that it was designed for children intentionally and they should answer the questions as to how *they* would answer them, not the way they think how *children* would answer them. To ensure data quality, each participant was asked to go through the same two check questions and the survey was terminated if the participant did not pass any of them.

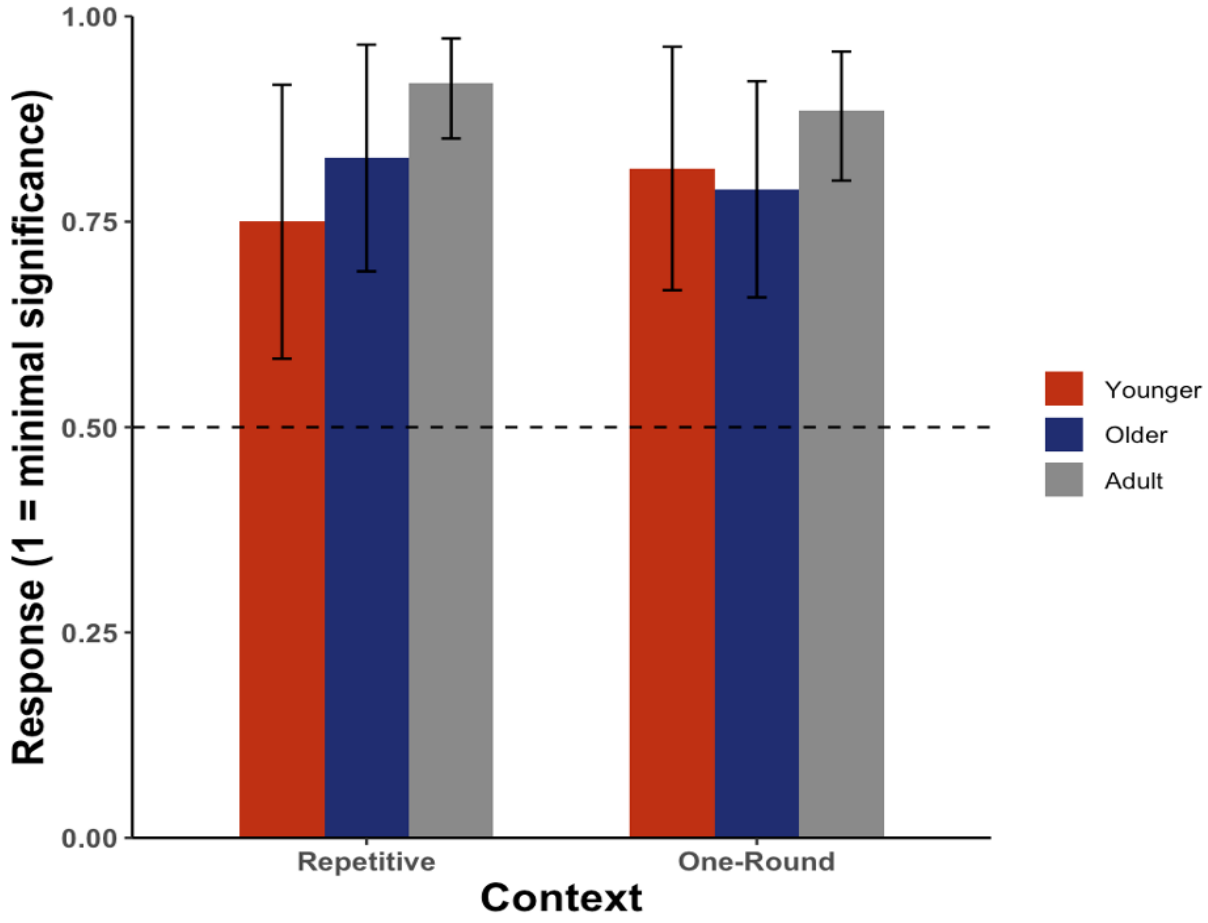
Results

We first analyzed adults' responses to the test questions, by conducting a generalized mixed-effects model using measure (want), context (repetitive vs. one-round), and their interactions to predict their responses, with a random intercept for each participant. We compared adult responses to each question to chance level (.5) using binomial tests. We found that adults evaluated the game with minimal significance more positively, both for the repetitive context ($M = 0.89$, $p < 0.001$) and for the one-round context ($M = 0.92$, $p < 0.001$).

To analyze children's responses to the test questions, we conducted a generalized mixed-effects model using measure (want), context (repetitive vs. one-round), child age, and their interactions to predict children's responses, with a random intercept for each participant. We conducted a generalized linear model and found there was no age affect ($B = 0.098$, $SE = 0.42$, $z = 0.24$, $p = 0.8$). We also conducted a binomial test and found that children across ages were

more likely to play the game with minimal significance than game without significance across contexts (M = 0.79, SD = 0.41, $p < 0.001$)(Figure 3). We concluded that children prefer to play productive activities that contain minimal significance and are sensitive to the lack of significance of such activities.

Figure 3. *Children's and Adult's Decision by Context in Study 2*



General Discussion

Across two studies, we investigated children's perceptions of the significance of productive activities. Our studies showed that children are sensitive to the significance or lack thereof as young as four or five years old. We found that children evaluate the game with minimal significance as being better and matters more than the game without significance (Study 1), and they would like to play the game with minimal significance compared to the game without significance (Study 2). The results provide initial evidence that even young children (similar to adults) are sensitive to the lack of significance in productive activities and even minimal significance means a lot to children.

Promoting students' achievement is one of the primary purposes of education (U.S. Department of Education, n.d.), and research suggests that having a sense of "meaning" can improve students' motivation and lead to higher achievement (e.g., O'Rourke et al., 2019). Youth with a higher sense of meaning in life have more positive self-esteem, self-identity, and self-motivation (Kiang & Fuligni, 2010). Therefore, having "meaning" in their lives and school tasks is essential for encouraging children's motivation. Our studies reveal that a sensitivity to the significance of activities (or lack thereof) is already present in early childhood, contributing to a better understanding of children's motivation mechanisms in doing productive work.

One of our original hypotheses was that children would prefer a game with minimal significance as being better and mattering more and want to play that game more in a Repetitive context compared to a One-round context since repetitiveness would make the lack of significance salient as the Sisyphus story (Camus, 1955). Interestingly, our results indicated no difference across contexts. Therefore, even doing activities for one-round is enough for children

to recognize the lack of significance, which suggests that children have robust sensitivity towards significance in productive activities.

Our results have implications for the role of significance in children's motivation. Our results implicated that even young children are sensitive to the significance of productive activities and use that to guide their choice of activities, suggesting that perceived significance may have motivational power from early in life. This finding is consistent with the view that meaning provides intrinsic motivation (Frankl, 1959/1985; Ryan & Deci, 2017) and could be an important psychological need (Baumeister & Wilson, 1996). There is little research on whether perceived significance could motivate children's actual behaviors to create work and influence students' academic performance, which are fruitful directions for future research.

Our ongoing studies focus on examining the potential boundary of the effect (e.g., if children also prefer watching something being kept vs. being taken part). Even though our studies displayed children's preference in keeping their creation since that object is significant to them, we do not know if simply observing something being kept or taken apart will also impact children's evaluation and decisions through their understanding of significance. We predicted that children would also prefer watching something to be kept because of the significance of the activities, which will help illuminate the emergence of the need for significance and have implications for promoting motivation in children. Even though our two studies showed promising results, children are sensitive to the significance or lack thereof in productive activities at a young age. One alternative explanation needs to be ruled out: children evaluating the game with minimal significance as being better and mattering more might because they did not want to see anything wasted in the box. Therefore, the following study should rule out this possibility by creating the stimulus to avoid giving children a sense of waste.

In conclusion, our studies investigated children's valuation of significance in productive activities. Study 1 showed that children would evaluate games with minimal significance as being better and mattering more across contexts, which indicated that even minimal significance means a lot to children. Study 2 revealed that children's decisions were influenced by their perception of significance, which provided initial evidence that the perception of meaning and significance has motivational implications for children. Our findings suggest that the sensitivity toward significance of productive activities is rooted in childhood — the perception that their work matters indeed matters a lot for children.

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