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A Strategic Mindset Enhances Children's Generation of Effective Strategies and Delay of Gratification Across Tasks

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Overcoming challenges to achieve success involves being able to spontaneously come up with effective strategies to address different task demands. Research has linked individual differences in such strategy generation and use to optimal development over time and greater success across many areas of life. Yet, there is surprisingly little experimental evidence that tests how we might help young children to spontaneously generate and apply effective strategies across different challenging tasks. We test this in an area important to development: delaying gratification. To do this, we developed a "strategic mindset" storybook that encouraged children, when waiting felt hard, to ask themselves strategy-eliciting questions, such as: "What can I try to be better at this?" In two experiments (N = 237), 5- to 6-year-old children who read the strategic mindset storybook with an experimenter (vs. a control storybook) waited significantly longer to receive desirable treats (Experiments 1 and 2) and to watch an appealing YouTube video (Experiment 2). Moreover, they were able to wait longer because they spontaneously generated and applied a greater number of effective waiting strategies. Going beyond classic research that taught children specific strategies to delay gratification, our results suggest that our new "metacognitive" approach can empower children's self-regulation.

Public Significance Statement

Children who learned a "strategic mindset" spontaneously generated and applied more effective self-control strategies—and hence, waited longer on two, different delay-of-gratification tasks (compared to a control group). This is one of the first experimental tests of an internally driven, metacognitive, potentially generalizable way of teaching young children to regulate themselves. This research paves the way for research on real-world, longer term outcomes that may be influenced by such agentic, self-driven strategizing.

Keywords: strategic mindset, delay of gratification, self-control, strategies, self-regulation

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Shareable data, preregistration, experimental procedure and storybooks (Experiment 2), code, and output are available on the Open Science Framework at https://tinyurl.com/osf-smdogchildren. This research was approved by the National University of Singapore Institutional Review Board.

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Effective and flexible strategy use is crucial for overcoming challenges throughout life. When faced with difficulty, those who can adapt to the task demands and spontaneously come up with effective strategies show long-term benefits from childhood, through adolescence and adulthood (Eigsti et al., 2006; Michaelson & Munakata, 2020; W. Mischel et al., 1988, 1989; Peake, 2017; Shoda et al., 1990). Such strategic proficiency contributes to optimal development and success across many domains of life, including academic learning, emotion regulation, and self-control (e.g., Aldao et al., 2010; Cheng et al., 2014; Duckworth et al., 2013, 2016; D'Zurilla & Sheedy, 1991; John & Gross, 2004; W. Mischel et al., 1988, 1989; Peake, 2017; Pintrich et al., 1991; Zimmerman & Schunk, 2001). Yet, most of the research does not speak directly to causal factors that could enhance such strategic proficiency. As a start, our current experiments begin to address the important question within the domain of self-control: How might we help young children generate and apply effective strategies spontaneously, and to do so across different tasks? We test this question in an area crucial to development: delaying gratification. Preschool delay-of-gratification behavior, even as assessed in laboratory tasks, is a strong predictor of cognitive functioning, social competency, and physical health in adolescence and adulthood (e.g., Duckworth et al., 2013; Michaelson & Munakata, 2020; W. Mischel et al., 1988, 1989; Peake, 2017; Shoda et al., 1990). Given how much research has shown the importance of delaying gratification, surprisingly little experimental research has investigated how to help children learn to *spontaneously* generate effective strategies that they can apply on their own to different delay-of-gratification challenges.

The most well-studied approach has been to train children to implement specific strategies that work in the moment within a particular situation. For example, in classic delay-of-gratification experiments, children were taught to delay gratification in a given situation by imagining marshmallows, not as food, but as puffy white clouds, or imagining pretzels as long, brown logs (W. Mischel & Baker, 1975; W. Mischel & Moore, 1973). Yet, learning specific techniques that apply to one specific task may not easily apply to another task especially when the temptations or conditions change. Moreover, it is unwieldy, and perhaps impossible, to teach people a specific, effective strategy for every challenge they may encounter.

Notably, in the original delay-of-gratification studies, preschool children who were more successful at delaying gratification in the lab—and who attained long-term success across many domains later in life—were those who *spontaneously* came up with effective strategies to help themselves wait (Shoda et al., 1990). In comparison, when children were instructed in specific strategies to implement, their waiting time did not show this same longitudinal predictive relationship. What seemed to predict life outcomes, then, was the degree to which children spontaneously adapted to a tempting situation by generating strategies on their own, and then using these strategies to navigate the task more effectively (Peake, 2017). However, as noted above, little experimental work has sought to help children initiate such ways of regulating themselves.

A Strategic Mindset for Delaying Gratification

We undertook to encourage a "metacognitive" stance in children—by teaching them a *strategic mindset*. A strategic mindset is defined as an orientation, or tendency, toward frequently prompting oneself with strategy-eliciting questions—such as "What can I try to be better at this?," "How else can I do this?," or "Is there an even better way of doing this?"—especially in the midst of challenges or unproductivity (P. Chen et al., 2020; P. Chen & Teo, 2024). Among adults (which the published literature has been limited to thus far), those who have more of a strategic mindset tend to spontaneously generate and apply more strategies that are effective for navigating challenging tasks. These strategies that they spontaneously apply include sophisticated metacognitive strategies, such as planning and self-monitoring, which involve taking a perspective on oneself and the task (P. Chen et al., 2020; P. Chen & Teo, 2024; Ng et al., 2023). Indeed, the more of these effective strategies adults apply to their goal pursuit, the greater the progress they report making toward personally important professional, educational, health, and fitness goals (P. Chen et al., 2020; Michaelis et al., 2021).

In an experiment that tested causality, adults who were randomly assigned to read an article about a strategic mindset (the strategic mindset condition) produced more strategies on a problem-solving task than those in a control condition. Those in the strategic mindset condition also reported greater metacognition (such as planning, self-monitoring, and self-reflection) during the problem-solving task, which then predicted faster performance on the task (P. Chen et al., 2020, Experiment 3). Because prior research on a strategic mindset has focused on goal striving and problem-solving among adults, it remains an open empirical question whether this mindset can be learned and applied by young children to support their self-regulation.

Extending this strategic mindset to young children who are faced with the task of delaying gratification, we predicted that children who are taught (vs. not taught) a strategic mindset will apply more effective strategies for delaying gratification and, as a consequence, will be more successful at waiting. To teach young children a strategic mindset, we adapted the strategic mindset prompts from past research and turned them into a mantra that preschool children could learn to ask themselves: "What can I try? What can I try? What can I try to be better at this?" In the context of delaying gratification, when waiting feels difficult, children who learn to ask themselves these kinds of strategic mindset questions will prompt themselves to search for task-appropriate, potentially effective strategies to navigate the task at hand. Such metacognition might enable children to come up with more effective strategies for delaying gratification, and as a result, they should be more successful at delaying gratification on multiple tasks.

In contrast, children who do not have this strategic mindset available may not be as strategically oriented when waiting feels difficult. We expect that they will be less likely to prompt themselves to seek new, potentially more effective strategies to help themselves wait. They may be just as goal-directed, but overly focused on the temptation, which can actually make waiting more difficult (Haimovitz et al., 2020; H. N. Mischel & Mischel, 1983; W. Mischel et al., 1989).

Therefore, we expect that children who are taught (vs. not taught) a strategic mindset will generate and apply more effective strategies for delaying gratification, and as a consequence, actually be more successful at waiting on different delay-of-gratification tasks.

Unique yet Complementary Contributions

A strategic mindset differs from, and complements, other ways of promoting delay of gratification. These include teaching children to execute specific cognitive strategies (W. Mischel & Baker, 1975; W. Mischel & Moore, 1980), developing self-regulatory skills through practice on curricular activities (Rybanska et al., 2018), labeling children with an identity as a "patient" person (Toner et al., 1980), influencing children's belief in the potential for exertion to be energizing (Haimovitz et al., 2020), and providing an environment that is reliable and trustworthy (and therefore one in which delay of gratification can be counted on to actually produce the promised larger reward), among other changes to children's social environments (Kidd et al., 2013; Ma et al., 2020; Michaelson & Munakata, 2016). Here, we focus on cultivating a habit of self-prompting strategy-eliciting questions. Our theory is that, in asking and answering such questions as "What can I try?" or "What can I try to be better at this?," children will spontaneously come up with or seek out strategies that are appropriate and effective for navigating the challenge of waiting.

Unlike strategy training, we do not prescribe a specific strategy to enact in the moment. Unlike skill development, we do not train children in how to execute any particular self-regulatory strategy. Unlike identity-based approaches, we do not tell children to take on a persona. We do not address beliefs about the energizing (vs. depleting) effects of exertion or try to change the social environment. Instead, our manipulation focuses on motivating in children a mental habit of asking strategy-eliciting questions.

Although, like Haimovitz et al. (2020), we also call our approach a "mindset," in contrast to Haimovitz et al.'s (2020) self-exhortation to endure ("I can keep on keeping on"), we focus on self-prompting to be strategic by considering even better approaches ("What can I try to be better at this?"). In Haimovitz et al.'s (2020) studies, they used their "keep-on-keeping-on" mantra to convey to children through storybooks the belief that willpower is unlimited (as opposed to a limited resource that depletes with exertion). They found that children who had learned a "keep-on-keeping-on" mantra were better able to delay gratification in the classic delay-of-gratification paradigm. However, our work critically differs from theirs in that, in their approach, it is possible that one might think to keep on going with the same strategy (which may be ineffective), and not to necessarily focus on finding potentially even better, task-appropriate strategies. Additionally, Haimovitz et al. (2020) only tested children on one delay task immediately after their manipulation; by comparison, we also tested whether children were able to show benefits across different delay tasks after learning a strategic mindset. This is a crucial step toward establishing a strategic mindset as a potentially general, rather than task-specific, orientation toward navigating various tasks and challenges.

Hence, our strategic mindset approach differs from, and can potentially complement, other ways of empowering children to more effectively delay gratification—and importantly, to do so on their own across different delay tasks.

In these ways, our research offers the following important scientific contributions: One, research and theory suggest that preschool-aged children are building models of their world (Bodrova & Leong, 2003, 2024)—of the tasks they have to undertake, the outcomes they desire, and strategies to use to attain their desired outcomes. As part of this, they are developing metacognition about possible strategies that may be appropriate for a task (H. N. Mischel & Mischel, 1983), trying out strategies and changing or refining their strategies over time (Haimovitz et al., 2020), and evaluating the effectiveness of their various strategies (H. N. Mischel & Mischel, 1983). Teaching children a strategic mindset as they are developing such metacognition about strategies is timely and important. As prior research has shown, preschool children who are able to apply effective strategies to delay gratification longer tend to exhibit greater cognitive and social competence, more adaptive responses to stress, and higher academic achievement later in adolescence (Peake, 2017; Shoda et al., 1990).

Two, how might we help preschool children develop these skills? Importantly, our experiments suggest a way to promote children's spontaneous use of effective delay-of-gratification strategies. We show that adults can convey a strategic mindset by reading storybooks to preschool children—and in doing so, can increase children's success at delaying gratification across different kinds of tasks (at least in the short term). Our findings have implications for how parents, teachers, and caregivers may begin to socialize self-regulation among preschool children in a relatively low-cost, scalable manner.

Three, our work contributes to the nature–nurture debate about self-control. Our experiments show that, beyond any inborn, temperament-based, or trait variability in self-control, young children can be taught a simple mental habit of self-prompting strategic mindset questions. As we have seen, learning this strategic mindset can empower children to delay gratification more effectively and successfully. Moreover, young children seem to be able to generalize this strategic mindset across different delay tasks.

Research Goals and Overview

Here, we test three primary questions. First, can young children be taught a strategic mindset? Second, are they then able to use this mindset to generate and apply effective strategies to different delay-of-gratification tasks? Third, does this increase their success at delay-of-gratification tasks?

To address these questions empirically, we conducted two experiments with children of 5–6 years of age. These ages fall within the age range studied in the classic delay-of-gratification paradigm with American preschool children (W. Mischel et al., 1972, 1989), lending support for our choice of paradigm for children of this age group. Importantly, this is when children are beginning to become aware of the effectiveness of different kinds of self-control strategies and to enact more effective strategies (H. N. Mischel & Mischel, 1983)—that is, this is a developmentally appropriate age for this research. Relevant research by H. N. Mischel and Mischel (1983) asked children between the ages of 3 and 7 years old what strategies they would choose to enact on the classic delay-of-gratification task, and why. A large percentage of 4-year-old children volunteered ineffective strategies and were unable to articulate sound reasons behind these choices. However, around age 5 years and onward, a majority of children began to suggest effective delay strategies (in significantly higher proportions than 4-year-old children). As we wanted to test the effects of our strategic mindset manipulation on preschool children's application of effective delay strategies, we chose to work with 5- and 6-year-old children, who are beginning this process.

Our first, preregistered experiment sought to establish the effect of manipulating a strategic mindset on the classic, single delay-of-gratification task (e.g., W. Mischel & Baker, 1975; W. Mischel &

Ebbesen, 1970; W. Mischel et al., 1972). Our second experiment replicated the first experiment and additionally tested whether children were able to apply the strategic mindset they had learned to effectively navigate two different delay tasks. Across both studies, we hypothesized that children who were taught a strategic mindset (vs. those who were not) would spontaneously use more effective strategies for delaying gratification and, hence, successfully wait longer on the delay tasks.

Transparency and Openness

We report how we determined our sample size, all data exclusions (if any), all manipulations, and measures relevant to this article (including all preregistered measures in Experiment 1). The preregistration for Experiment 1 can be found at https://tinyurl.com/osf-smdogchildren (P. Chen & Chua, 2024). Experiment 2 was not preregistered. The data set, code and output, experimental procedure, and Experiment 2 storybooks are available at https://tinyurl.com/osf-smdogchildren. Institutional Review Board agreement prohibits sharing of all the raw, identifiable videos; therefore, we share the behavioral codes of the children's relevant behaviors, as well as the strategy variables derived from these. The behavioral strategies codebook is in Supplemental Appendix A. Data were analyzed using R (Version 2023.06.2+561).

Experiment 1

Experiment 1 was a first proof-of-concept test, where we tested the effects of a strategic mindset on the classic delay-of-gratification task—popularly known as the "marshmallow test."

Method

Participants

We recruited 146 children in Singapore for this preregistered study. After excluding six participants based on the preregistered criteria (two were upset and discontinued the experiment; four encountered an equipment malfunction during the experiment), our final analyzed sample comprised 140 5- to 6-year-old children (51.4% males, 48.6% females; age range = 61–83 months; M_{age} = 71.6 months or 6.0 years, SD_{age} = 6.3 months or 0.5 years). This final sample size was consistent with our preregistered target sample size of 140 children (based on 80% power to detect an estimated 0.42 effect size observed in a pilot study).

We conducted the study in English since children in Singapore learn English as a first language and all of our participants were fluent in English. The ethnic backgrounds of our final sample included 87.1% Chinese, 2.1% Malay, 4.3% Indian, and 6.4% other races including multiethnic children, as reported by their parents. The median monthly household income ranged from SGD$10,000 to $15,000 (approximately USD$7,400–$11,100). Recruitment mostly took place in neighborhoods surrounding a public university campus, which may include families of slightly higher median household income than the general Singapore population, which had a median monthly household income of SGD$9,520 (Department of Statistics Singapore, 2021). Parents' written informed consent and children's verbal assent were obtained before the start of the study.

Procedure

Strategic Mindset (vs. Control) Storybook Manipulation. Children were randomly assigned to either the strategic mindset condition or a control condition, both delivered through a storybook read by the experimenter. Prior research shows that storybooks can be effective methods to engage and teach children (e.g., Haimovitz et al., 2020; Kesek et al., 2011). In both storybooks, the protagonist, who was given the participating child's name, waited successfully in all three scenarios. We deliberately chose a first-person point of view to facilitate the child's perspective-taking and internalization of the strategic mindset (or control) message (Brunyé et al., 2009), and we used multiple scenarios because offering multiple concrete examples can support children's generalization of broad principles (Z. Chen et al., 1995). We adapted stories previously used in Haimovitz et al. (2020) written for children of these ages: Our storybook scenarios involved waiting to open a present from their grandmother, waiting to get their favorite ice cream flavor, and waiting for their turn on the playground slide.

Our critical theory-based revision to create the strategic mindset storybook was that, at each opportunity to wait, the storybook described the child as being able to wait by learning and repeating the following strategic mindset mantra:

> What can I try? What can I try?
>
> What can I try to be better at this?

The storybook then read:

> You think of ways you can try to help you wait.
>
> You think of one way, then another way, and then an even better way!

Importantly, the strategic mindset storybook did not reference any specific waiting strategies. It simply described the child thinking of better ways to help themselves wait.

The control storybook also described the child as waiting successfully in the same three scenarios. It, too, featured a mantra, controlling for the possibility that giving children any mantra to recite while waiting might help them wait. However, its content was unrelated to spontaneous self-strategizing. At each waiting period, the child thought of how much fun they had on Sundays (see Haimovitz et al., 2020):

> I love Sunday. I love Sunday.
>
> I love Sunday. It is always special!

They were then read the following:

> You think of how special Sundays are!
>
> You think of how much fun you had last Sunday and how much fun you are having this Sunday!

We avoided representing the control mantra as a specific waiting strategy and any content that could undermine children's preexisting inclination to think or behave strategically.

The experimenter encouraged each child to listen to the mantra the first time, to chant the mantra along with the experimenter the second time, and then to chant it on their own the third time. To help children remember and begin to take ownership of the mantra, each child received a sticker to stick on their hands, with the words "What

can I try" (strategic mindset condition) or "I love Sunday" (control condition).

Delay of Gratification "One-Treat-Now-Versus-Two-Treats-Later" Task. Next, the experimenter introduced each child to the delay-of-gratification task as a new game that they would play. This paradigm is a well-validated behavioral measure of preschool children's ability to delay gratification (W. Mischel et al., 1972, 1989). It gives children a choice between a smaller treat immediately or a larger, delayed reward if they wait.

In the delay-of-gratification task, all children were first given a bell. The experimenter then told them that she had to leave the room to do some work, but as soon as they pressed the bell, she would return. The experimenter had the children practice this by leaving the room and then returning immediately when the child pressed the bell. Next, the experimenter took out a tray with two treats on one side and one on the other. As treats, we used Yupi Hamburger gummies, a popular treat among children of this age in Singapore, and which pretests showed most children found desirable. The experimenter explained to each child that they would get two treats if they waited for her to return to the room on her own; alternatively, they could press the bell at any time to recall her to the room, but in that case, they would get only one treat. To ascertain that each child understood the instructions, the experimenter asked each child to answer what they would get if they waited for her to return, what they could do to bring her back, and what they would get if they instead rang the bell to call her back. After the child answered these questions correctly, the experimenter left the room. The child remained in the room. In the room, each child started the delay task seated at a table on which the experimenter had placed the tray with the (uncovered) treats. The room was bare, other than the table, the chair on which they were sitting, the chair on which the experimenter had been sitting, the bell, the tray with treats, and a video camera.

The experimenter did not tell the child how long she would take to return, so the total duration of their wait was unknown to the child. In actuality, the experimenter returned to the room after 20 min, or as soon as the child pressed the bell or ate a treat. In a prior pilot study, we pretested this 20-min time interval to ensure that it provided sufficient variation in waiting times among Singaporean children of this age group. If any child opened the lab room door (to look for the experimenter or to leave the room), the experimenter stopped the time and returned to the room.

Upon the experimenter's return to the room, the child was given either one or two treats and then time to eat their treat(s). Finally, each child was debriefed. Parents of participating children were invited to complete a questionnaire asking about their family background, including their demographics and household income, as they waited for their child to do the experiment.

Dependent Measures

Waiting Time. Consistent with prior research (e.g., W. Mischel et al., 1972), we operationalized total waiting time on the delay-of-gratification task as the time the child waited before calling the experimenter back by ringing the bell or eating a treat, or the full duration of 20 min if they successfully waited for the experimenter to return on her own.

Strategy Use Variables. As noted earlier, we were interested in the extent to which children spontaneously used effective strategies to help themselves wait. With their parents' consent, children's behavior during the delay-of-gratification task was video recorded and then coded by two hypothesis-blind, independent coders. For example, coders looked for whether each child sang songs, clapped their hands, played with their feet, talked to themselves, walked to a part of the room farther away from the temptations, played with various items in the lab (e.g., the bell, light switch), and more (see Supplemental Appendix A for a list of behaviors that were coded). These coders were blind to the purpose and hypotheses of the study and only watched the waiting time part of the video to code.

Each coder coded 84 videos: 28 videos that the other coder also coded (which represents 20% of the total of 140 videos, for the purpose of assessing interrater reliability) and an additional 56 videos that only they coded. The average intraclass correlation coefficient (ICC) and its 95% confidence interval were calculated using the ICC() function in the irr package using R statistical software v. 2023.06.2+561, based on a mean-rating ($k = 2$), absolute agreement and a two-way random-effects model. Because we were interested in how many specific behavioral strategies each child had applied during their wait, we calculated the ICC estimate based on the number of each behavior within each strategy category that the child observably used. The ICC across coders was high: 0.97 [0.956, 0.972].

After coding, children's observable behaviors were classified in a theory-driven manner into "effective" and "ineffective" waiting strategies, as defined by the prior literature (Haimovitz et al., 2020; W. Mischel et al., 1989). More effective strategies were behaviors that took children's focus away from the enticing features of the treats and from the bell. These included dancing, singing, telling oneself stories, playing with one's hands and feet, or wandering around the room farther away from the treats. Less effective strategies, which we label as "ineffective" for the sake of concision, were behaviors that maintained or increased children's attention to the enticing features of the treats or to the bell. They included touching or sniffing the treat and touching the bell. Supplemental Appendix A tables detail how the strategies were classified and their observed frequencies.

We then computed our key strategy use dependent variables. Our main measure of strategy use was each child's *total number of effective strategy uses* during the time they waited. In addition, as preregistered, we also computed three other dependent variables of strategy use, including the number of *different* effective strategies they used, the total number of (effective + ineffective) strategy uses during their waiting time, and the total number of different (effective + ineffective) strategies they used. We define these variables below.

Total Number of Effective Strategy Uses. For our main measure of strategy use, we computed the total number of times the children used effective waiting strategies. A given effective strategy could count more than once if it was separated by another strategy use. Only effective (and not ineffective) strategies were included in this variable. If a child sang, then sniffed the gummies, and then sang again, this behavior would be coded as two effective strategy uses, because the two instances of singing were separated by another (in this case, ineffective) strategy. Note that children could use multiple, effective strategies at the same time (e.g., singing and clapping hands), which would each count as one effective strategy (in this case, two effective strategy uses).

Number of Different Kinds of Effective Strategies Used. Given that the same effective strategy could be repeated, we also computed the number of *different* kinds of effective strategies children used. In the same example, the child would be coded as having used one kind

of effective strategy (i.e., singing). This was highly correlated with the total number of effective strategy uses, $r = .92$, $p < .001$.

Total Number of Strategy Uses. To figure out what helps them in the situation, we expected that children with a strategic mindset might explore different kinds of strategies—perhaps both effective and ineffective. To capture the breadth of strategy generation and use, we summed the total number of times each child observably tried any kind of strategy, whether effective or ineffective. Again, the same strategy could be counted more than once as long as it was separated by another strategy. Thus, if a child sang, then sniffed the gummies, and then sang again, this sequence would count as three strategy uses in total. Children could use multiple strategies at the same time (e.g., singing, making faces, and touching the bell), which would each count as one strategy (in this case, three strategy uses).

Number of Different Kinds of Strategies Used. Given that any strategy could be repeated, we also calculated how many *different* kinds of (effective + ineffective) strategies children generated and applied during their waiting time. In the earlier example, the child would be considered to have used two unique strategies (i.e., singing and sniffing the gummies). This was highly correlated with the total number of strategy uses, $r = .92$, $p < .001$.

We originally preregistered an additional dependent variable: the proportion of waiting time spent on effective strategies. However, we later realized that this measure is problematic in three ways: One, it can be inflated by children who simply had very short waiting times. For example, if a child waited for only 30 s and was covering their eyes for the entire time, they would have a proportion of 1, even though they only waited briefly. Two, calculating the total duration of using all (effective + ineffective) strategies by summing up the duration of each strategy use can exceed the total waiting time, because children may use more than one strategy at the same time (e.g., singing and clapping their hands). Three, testing it as a mediator is also problematic because its denominator (total time spent waiting) is our predicted outcome. Given these reasons, even though the results supported our predictions, we decided to exclude this variable from our main text analyses and describe its results in Supplemental Appendix B instead.

Results

All the analyses reported in this study were preregistered. As the data were mostly nonnormally distributed, Mann–Whitney *U* tests were used to test the effect of condition on all the dependent measures, with rank-biserial correlations to describe the effect sizes (Kerby, 2014). Table 1 presents the means, standard deviations, and Mann–Whitney *U* test results of our between-condition comparisons for each dependent variable. Supplemental Table S1 shows the correlations among all dependent variables, both waiting time and each strategy use variable. For ease of interpretation and comparability to other studies, we additionally present in Supplemental Table S2 the Cohen's *d* effect sizes we observed, though the data were not normally distributed.

Waiting Time

As Table 1 shows, children in the strategic mindset condition waited for an average of 11 min 54 s—substantially longer than children in the control condition, who waited for just an average of 6 min 47 s. Waiting times were not significantly predicted by interactions between condition and either age or gender, *p*s > .580. A survival analysis, comparing the proportion of children in each condition who waited the full 20 min for the experimenter to return, further revealed the effect of the manipulation: 38.6% of children in the strategic mindset condition waited for the full 20 min, more than double the 14.3% of children in the control condition who did so, $\chi^2(1) = 14.6$, $p < .001$.

Strategy Use

Importantly, there were significant differences in children's strategy use across all four of our operationalizations of strategy use (see Table 1). Crucially, as hypothesized, children in the strategic mindset condition used more effective strategies while waiting ($M = 35.9$), compared to children in the control condition ($M = 20.4$). This difference in strategy use was also evident across our three additional strategy use measures: the number of different kinds of effective strategies used, the total number of strategy uses of any kind, and the number of different strategies of any kind used.

Effective Strategy Use Predicts Waiting Time

As expected, the total number of effective strategies children used significantly and positively predicted their overall waiting time, $b = 15.8$ [14.4, 17.2], $t(138) = 22.8$, $p < .001$. The total number of (effective + ineffective) strategies that children used also significantly and positively predicted their overall waiting time, $b = 13.6$ [12.3, 14.9], $t(138) = 21.3$, $p < .001$. To examine whether *effective* strategies

Table 1
Experiment 1 Between-Condition Comparison of Waiting Time and Strategy Use

Dependent variable of interest	Control condition		Strategic mindset condition		*p*	Effect size (rank-biserial)
	M	*SD*	*M*	*SD*		
Waiting time (in seconds)	407.2	438.9	714.4	482.3	<.001	0.35
Total number of effective strategy uses	20.4	24.1	35.9	28.2	<.001	0.34
Number of different effective strategies used	5.8	5.2	8.9	5.5	<.001	0.33
Total number of strategy uses	25.6	27.7	42.3	32.5	.001	0.32
Number of different strategies used	7.8	5.9	11.4	6.7	.002	0.30

Note. Given the nonnormal distributions of the data, Mann–Whitney *U* tests were used to test the differences between conditions, and rank-biserial correlation coefficients were calculated to estimate effect size (Kerby, 2014).

in particular mattered, instead of simply any kind of behavioral strategy, we regressed children's waiting time on the total number of effective strategies that they had observably used as well as the total number of ineffective strategies that they had observably used. Notably, only the total number of effective strategies used significantly and positively predicted waiting time, $b = 15.9$ [14.1, 17.6], $t(137) = 18.1$, $p < .001$; the total number of ineffective strategies used was not significantly related to waiting time, $b = -0.74$ [−9.6, 8.1], $t(137) = -0.16$, $p = .877$. This result underscores the importance of applying effective waiting strategies, and not simply more of any kind of behavioral strategy.

Testing the Psychological Process

Using the lavaan statistical package in R, we tested our hypothesized psychological process using a simple mediation model with 1,000 bootstrapped resamples. As predicted, the effect of condition was significantly mediated by the total number of effective strategies children used, indirect effect = 239.3 [108.0, 377.8] (Figure 1). The direct effect was no longer statistically significant at the .05 level after accounting for the indirect effect of the mediator.

We observed the same mediation results using children's total number of strategy uses, which was highly correlated with their total number of effective strategy uses ($r = .99$, $p < .001$; see Supplemental Appendix C for these mediation results). However, as noted above, it is the *effective* (and not ineffective) strategy uses that predicts waiting time.

Discussion

Children randomly assigned to be read a strategic mindset storybook were more successful at delaying gratification for a larger, later reward, compared to children were read a control storybook. Statistical tests of mediation were consistent with the hypothesis that this was because the strategic mindset storybook led children to use more of the strategies that prior research has identified as effective for waiting. Crucially, it is *effective* strategy use that predicted waiting time, and not simply using more of any (especially ineffective) strategies.

Of course, tests of mediation are not necessarily definitive tests of the causal process—but as described, these tests were consistent with our hypothesized psychological process. We did not directly manipulate the mediator (i.e., children's use of effective delay strategies) in our experiments, which can provide more direct causal evidence of the process (Spencer et al., 2005), because such studies have already been conducted. It is clear from many prior experiments that manipulating children's use of effective strategies increases delay time on delay-of-gratification tasks (e.g., W. Mischel & Ebbesen, 1970; H. N. Mischel & Mischel, 1983; W. Mischel et al., 1972; W. Mischel & Underwood, 1974; Patterson & Mischel, 1975). Thus in our view, our data, in conjunction with this prior literature, provide strong evidence that the effects of our strategic mindset storybook on children's delay time worked by prompting more effective delay strategies.

A limitation of this first experiment was that, although both storybooks described successful waiting, the word "wait" or "waiting" appeared more often in the strategic mindset storybook (21 times) than in the control storybook (four times). This was because it was included as part of the mantra prompt only in the strategic storybook (e.g., "When *waiting* is hard, what do you say?," "You think of ways you can try to help you wait." vs., e.g., "What do you say?," "You think of how special Sundays are."). It could be that exposure to these words simply primed children to value waiting or to want to wait longer. To address this, we better balanced the number of times that wait(ing) was mentioned across conditions in Experiment 2, as described in the Experiment 2 Procedure.

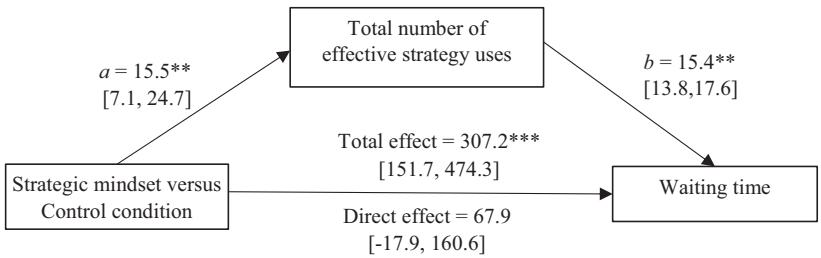
Experiment 2

Having established that we can teach preschool children a strategic mindset, we next asked: Would children who learn a strategic mindset be able to apply it in a generalizable manner to navigate different tasks that call for effective self-control strategies? To answer this question, in Experiment 2, we gave each child two different delay-of-gratification challenges: One required them to wait for consummatory treats passively placed in front of them, as in Experiment 1; the second required them to resist peeking at a YouTube video that actively called for their attention. This experimental design allowed us to (a) test the replicability of Experiment 1, while better balancing exposure to the concept of waiting across conditions, and to (b) investigate the extent to which children were able to apply a strategic mindset to navigate both delay tasks effectively.

Following the consummatory delay-of-gratification "treats" task used in Experiment 1, children in Experiment 2 completed a

Figure 1

The Relationship Between Condition and Waiting Time Is Mediated by the Total Number of Effective Strategies That Children Used (Experiment 1)



Note. Unstandardized coefficients with 95% confidence intervals are reported.
** $p < .01$. *** $p < .001$.

"resist-peeking" delay-of-gratification task. In this task, children had to resist the urge to peek at an iPad that was playing the sounds of a YouTube video—a common and difficult-to-resist temptation relevant to preschool children today. The soundtrack of the video was pretested to make sure that the soundtrack would be of interest to preschoolers and that it would tempt them to look at the video. Because the temptation actively and continuously called for their attention throughout the wait, this second, resist-peeking task was attentionally different from, and potentially more challenging than, the first treats task.

In the experimental condition, would children apply the strategic mindset that they had learned to both kinds of temptations? If children were indeed able to do this on their own, it would be important initial evidence that a strategic mindset can help young children spontaneously use effective strategies across different challenging tasks.

Method

Participants

We recruited 97 5- and 6-year-old children (53.6% males, 46.4% females; M_{age} = 72.6 months or 6.0 years, SD_{age} = 4.5 months or 0.4 years) in Singapore. Their racial backgrounds were 84.5% Chinese, 3.09% Malay, 5.15% Indian, and 7.22% from other races/ethnic groups, as reported by their parents. The median monthly household income range of our sample was SGD$10,000 to $15,000 (approximately USD$7,400–$11,100), as in Experiment 1. Parents' written informed consent and children's verbal assent were obtained before the start of the experiment.

Procedure

Experiment 2 had three parts: (a) reading the strategic mindset (vs. control) storybook, (b) the same treats task used in Experiment 1 followed by a short break, and then (c) the new resist-peeking task.

Strategic Mindset (vs. Control) Storybook Manipulation. The strategic mindset and control storybooks were the same as Experiment 1, except that we increased the number of times that wait(ing) was mentioned in the control storyline to better balance this across conditions. To do this, we added the word "wait(ing)" to the control storyline (e.g., "As you *wait* in the kitchen … ," "while you *wait* for your mum, there are many things to see, and you are having so much fun"). We deliberately chose not to add references to wait(ing) in the control mantra prompts, because that may suggest singing or thinking about Sundays as a specific strategy for waiting, which we wanted to avoid in a nonstrategic control.

Task 1: Treats Task. We used the same delay-of-gratification task as in Experiment 1. Children chose between one treat now or two treats later if they waited for the experimenter to return after 20 min.

Task 2: Resist-Peeking Task. After a short break (during which each child had the opportunity to drink water or use the bathroom), the experimenter brought them back into the lab room with a new setup for the second, resist-peeking task. This delay-of-gratification paradigm built upon the well-established "forbidden toy" paradigm (Aronson & Carlsmith, 1963; Ebbesen et al., 1975), in which children were shown a desirable toy and were asked to resist playing with it until the experimenter returned. However, in the current task, children were "forbidden" to even look at the video that was tempting them. Our pretests and conversations with parents suggested that children in our target population were especially excited to watch YouTube videos on iPads. We found and pretested age-appropriate YouTube videos for this study, making sure that the video was unfamiliar and enticing to 5- and 6-year-old children in our target population.

First, the experimenter told each child that there was a big surprise that she wanted to prepare for them on the iPad. To do this, she needed the child to sit with their back to her and not peek while she was preparing the surprise. Thus, each child started the experiment seated on a chair with their back to the experimenter and table.

On the table, the experimenter placed the iPad within a box. The box had only one open side. The experimenter purposely positioned the only opening of the box at the edge of the table that was perpendicular to the child. This meant that, to peek inside the box at the iPad, the child would have to turn to face the table and then peer around the box into the opening, or to walk around the table to where the opening of the box faced.

The experimenter started playing the designated video for a few minutes on the iPad as she placed the iPad inside the box, arousing the child's awareness of and curiosity toward the tempting video sounds. Next, the experimenter paused the video momentarily, as she informed the child that she needed to get something from outside the room to finish preparing the surprise: "Let's play another game. Try not to turn around and peek at the surprise while you wait in the room until I come back, OK? Let's see how long you can stay in your seat without peeking at the surprise."

Children were told that the longer they waited without peeking at the surprise and without pressing the bell, the better the surprise would be for them. However, if they did not want to wait any longer, they could press a bell placed on the table to call the experimenter back.

As described earlier, to peek at the surprise before the experimenter returned, the child would have to intentionally turn around from their seated position and then peer around the opening of the box to see the iPad screen, or to get up and walk over to the opening of the box—behaviors that we could observe and code.

The experimenter asked the child if they agreed to stay in the room until she returned (without stating how long this would be). Upon receiving the child's agreement, the experimenter resumed the video, playing it at a lower volume—loud enough that the child could hear sounds of the characters talking and music playing, but also low enough such that they could not make out exactly what the characters were saying or what was happening in the video. Then, she left the room. Pretesting showed that children were attracted to the sounds and eager to find out what was happening in the video. Thus, the situation created temptation and suspense for the child, presenting a self-control challenge as they waited.

In actuality, the experimenter returned to the room after 10 min, or when the child peeked or rang the bell. This maximum time of 10 min was chosen through pilot testing, which indicated that the distribution of overall waiting times was, on average, lower than that in the treats task. Because the temptation was continuously calling for children's attention, this resist-peeking task was potentially more challenging than the first, treats task. Children's waiting time was clocked as soon as they pressed the bell, peeked into the box, or opened the door to look for the experimenter.

Strategy Use Variables. Two independent coders blind to the study hypotheses, and who were not the experimenter, coded videos of the children on both delay-of-gratification tasks—specifically,

identifying the behaviors that each child observably used. As in Experiment 1, these behaviors were classified into effective and ineffective strategies (see Supplemental Appendix A for our list of strategies and their classifications). Each coder coded 59 videos. Out of the 97 total videos, 21 (22%) were randomly selected to be coded by both coders to assess interrater reliability. We calculated the ICC across coders as described in Experiment 1. The ICC was high in both Task 1 (ICC = 0.95 [0.936, 0.959]) and Task 2 (ICC = 0.93 [0.900, 0.947]).

Results

Waiting times in the two tasks were significantly and positively related, $r = .30$, $p = .003$. The modest size of this correlation, however, is consistent with our theorizing that the two tasks also differed in important ways. Supplemental Table S3 presents the correlations among all dependent variables in this study.

Differences in Waiting Time and Strategy Use Between Conditions

As in Experiment 1, because the data were mostly nonnormally distributed, Mann–Whitney *U* tests and rank-biserial correlation coefficients were used to test the effects of condition and their effect sizes on all dependent measures, respectively. For ease of interpretation and for comparability to other studies, we present in Supplemental Table S4 (for the treats task) and Supplemental Table S5 (for the resist-peeking task) within the Supplemental Materials the Cohen's *d* effect sizes we observed, though the data were not normally distributed.

We observed significant between-condition differences in waiting time and strategy use on both the treats task and the resist-peeking task (see Tables 2 and 3)—replicating the results of Experiment 1 and providing empirical support for the use of a strategic mindset across tasks.

On the treats task, children in the strategic mindset condition waited for an average of 12 min 5 s—substantially longer than children in the control condition, who waited for an average of 6 min 47 s. Children's waiting times were not significantly predicted by interactions between condition and either age or gender, ps > .590. A survival analysis, comparing the proportions of children in each condition who waited for the full 20 min, revealed that 38.8% of children in the strategic mindset condition waited the full time, more than double the 14.6% of children who did so in the control condition, $\chi^2(1) = 10.7$, $p = .001$. The mean waiting times and proportion of children who waited the full time in each condition are comparable to those observed in Experiment 1.

Consistent with our theory and again replicating Experiment 1, children in the strategic mindset condition used more effective strategies while waiting ($M = 52.5$), compared to children in the control condition ($M = 30.7$). We again observed this difference across all three additional strategy use variables: the number of different effective strategies children used, their total number of (effective + ineffective) strategy uses, and the number of different strategies children used (see Table 2).

The second, resist-peeking task yielded similar results. Children in the strategic mindset condition waited an average of 4 min 47 s—longer children in the control condition, who waited an average of 2 min 46 s (out of 10 min in total). There was no significant interaction between condition and either age or gender, ps > .410. A survival analysis, comparing the proportions of children in each condition who waited the full 10 min for the experimenter to return, revealed that 34.7% of children in the strategic mindset condition waited the full time, compared to only 18.8% of children who did so in the control condition, $\chi^2(1) = 6.40$, $p = .010$. Again, children in the strategic mindset condition used more effective waiting strategies ($M = 19.4$) than those in the control condition ($M = 11.6$). This difference replicated across all three other strategy use variables (Table 3).

Effective Strategy Use Predicts Waiting Time

As theorized, the total number of effective strategies that children used significantly and positively predicted their overall waiting time in each task: Task 1, $b = 10.8$ [9.7, 11.9], $t(95) = 19.8$, $p < .001$; Task 2, $b = 12.7$ [11.3, 14.0], $t(95) = 19.2$, $p < .001$. When we regressed children's waiting time on the total number of effective strategies that they had used as well as the total number of ineffective strategies that they had used, only the total number of effective strategies used significantly and positively predicted waiting time: Task 1, $b = 11.1$ [9.5, 12.8], $t(94) = 13.6$, $p < .001$; Task 2, $b = 12.9$ [11.5, 14.3], $t(94) = 18.2$, $p < .001$. Ineffective strategy use was not significantly related to waiting time on both tasks, ps > .400.

Replicating the Psychological Process

Using the lavaan statistical package in R and applying 1,000 bootstrap resamples in our mediation analyses, we tested and found support for the theorized psychological process across both

Table 2
Between-Condition Comparison of Waiting Time and Strategy Use on the First Treats Task (Experiment 2)

Dependent variable of interest	Control condition		Strategic mindset condition		p	Effect size (rank-biserial)
	M	*SD*	*M*	*SD*		
Waiting time (in seconds)	407.1	431.0	725.2	480.5	.002	0.37
Total number of effective strategy uses	30.7	35.7	52.5	41.5	.007	0.32
Number of different effective strategies used	7.6	6.0	11.0	7.0	.016	0.28
Total number of strategy uses	36.4	41.5	61.2	47.5	.007	0.32
Number of different strategies used	9.6	7.1	13.7	8.3	.016	0.28

Note. Given the nonnormal distributions of the data, Mann–Whitney *U* tests were used to test the differences between conditions, and rank-biserial correlation coefficients (Kerby, 2014) were calculated to estimate effect size.

Table 3
Between-Condition Comparison of Waiting Time and Strategy Use on the Second Resist-Peeking Task (Experiment 2)

Dependent variable of interest	Control condition		Strategic mindset condition		p	Effect size (rank-biserial)
	M	*SD*	*M*	*SD*		
Waiting time (in seconds)	166.1	232.2	286.5	252.4	.004	0.33
Total number of effective strategy uses	11.6	16.5	19.4	17.8	.003	0.35
Number of different effective strategies used	4.5	5.0	6.2	4.4	.020	0.27
Total number of strategy uses	12.9	17.3	21.7	19.3	.002	0.36
Number of different strategies used	5.5	5.3	7.4	4.6	.015	0.29

Note. Given the nonnormal distributions of the data, Mann–Whitney *U* tests were used to test the differences between conditions, and rank-biserial correlation coefficients (Kerby, 2014) were calculated to estimate effect size.

delay-of-gratification tasks. For the first, treats task, the effect of condition on children's waiting time was mediated by the total number of effective strategies children used, indirect effect = 228.2 [54.7, 394.3] (Figure 2).

We observed the same psychological process on the second, resist-peeking task. The effect of condition on children's waiting time was significantly mediated by the total number of effective strategies that children used, indirect effect = 97.6 [13.5, 187.9] (Figure 3). In both mediation models, the direct effect was no longer statistically significant at the $p = .05$ level after accounting for the indirect effect of the mediator (although notably the 95% confidence interval of the direct effect on the first treats task did not overlap with 0 this time).

On each task, we also observed the same mediation results using children's total number of (effective + ineffective) strategy uses as the mediator variable (see Supplemental Appendix C for details).

Discussion

Replicating Experiment 1, children who were randomly assigned to learn a strategic mindset were more successful at delaying gratification—not only when asked to wait for consummatory treats but also when they had to resist a temptation that continuously called for their attention. Importantly, as hypothesized, these children who had learned a strategic mindset spontaneously applied more effective strategies to help themselves navigate each of those tasks, facilitating their longer waiting times. These findings underscore that children are able to learn a strategic mindset and to apply it across different delay-of-gratification challenges.

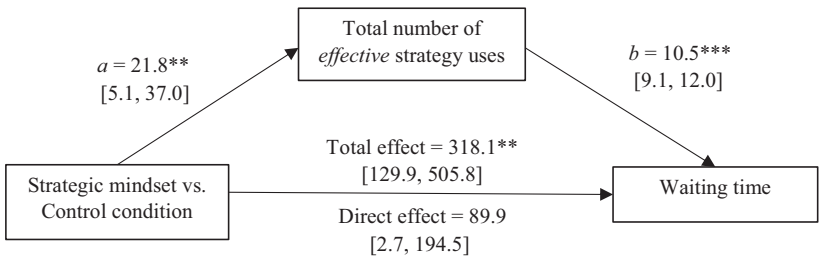
General Discussion

What if young children could learn something that helps them self-regulate more effectively across a wide range of challenging tasks? Our experimental findings show that this may be possible when it comes to the developmentally important process of delaying gratification—by cultivating a strategic mindset.

In two randomized, controlled experiments with 237 preschool children, we offered a strategic mindset to 5- to 6-year-old children—by inviting them to ask themselves the strategy-eliciting questions, "What can I try?" and "What can I try to be better at this?" whenever waiting felt hard. Children who were taught this strategic mindset spontaneously generated more varied and, importantly, more *effective* strategies for delaying gratification, which they then applied to navigate two different delay tasks. Consequently, these children were more successful at waiting for their desired, but delayed, reward, compared to their peers who had not learned a strategic mindset. These are the first experiments to show that even young children can learn a strategic mindset, with observable effects on their spontaneous behavior in delay-of-gratification contexts.

A strategic mindset puts the child in the driver's seat, in control of their own search for and use of effective strategies when they are faced with a challenge. We did not teach children any specific strategies for waiting, nor did we provide training to build their

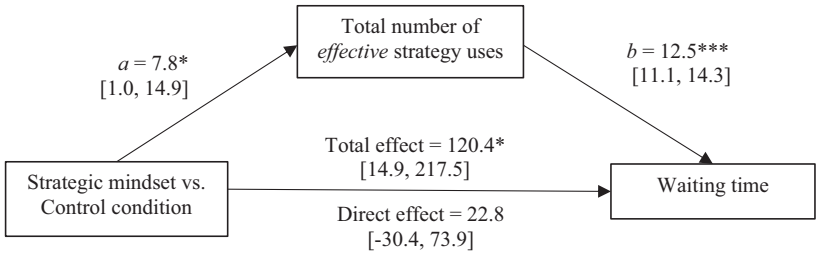
Figure 2
The Relationship Between Condition and Waiting Time Is Mediated by the Total Number of Effective Strategies That Children Used on the First Treats Task (Experiment 2)



Note. Unstandardized coefficients with 95% confidence intervals are reported.
** $p < .01$. *** $p < .001$.

Figure 3

The Relationship Between Condition and Waiting Time Is Mediated by the Total Number of Effective Strategies That Children Used on the Second Resist-Peeking Task (Experiment 2)



Note. Unstandardized coefficients with 95% confidence intervals are reported.
* $p < .05$. *** $p < .001$.

skills. In this way, our approach can complement self-regulatory skills training, which trains children in how to use various strategies, but often may not motivate them to access or develop such strategies when needed. Our "internally driven" approach also complements other efforts to change children's social environments, such as to increase their reliability and the trustworthiness of caregivers and teachers (Kidd et al., 2013; Michaelson & Munakata, 2016). Perhaps future research could consider increasing the strength of our manipulation by framing this strategic mindset both as a habit and as an identity (as prior work has done with identity labeling; Toner et al., 1980).

In particular, the comparison with Haimovitz et al.'s (2020) approach is instructive. Both focus on cultivating an internally driven orientation that children can use to navigate the challenge of delaying gratification. But as mentioned, whereas Haimovitz et al.'s (2020) approach might lead children to keep going with the same strategy (even ineffective ones), our approach encourages children to seek out better and better strategies. While future research can explore the implications of this difference empirically, it is possible that the strategic mindset approach is more effective at helping children navigate tasks that require different strategies or that involve changing one's strategies for success. When a previously effective strategy is no longer so, how quickly do children adjust? Our Experiment 2, which tested whether children, having learned a strategic mindset, were able to delay longer on two different delay tasks, is a step in this direction. Notably, Haimovitz's study, like many other delay-of-gratification experiments (e.g., Kidd et al., 2013; Ma et al., 2020; Michaelson & Munakata, 2016; W. Mischel & Baker, 1975; W. Mischel & Ebbesen, 1970), only observed whether children applied what they had learned in the manipulation on one delay task immediately following the manipulation. Yet, a crucial goal is to learn how to support children as they navigate a wide range of self-regulatory challenges over time.

To explain the long-term predictive power of childhood delay of gratification, psychologist Philip Peake (2017, p.35) underscored the "ability to be flexible and adaptive in responding to contextual demands, [and] to be cognitively competent in developing plans and strategies." Beyond inborn, trait self-control, our experiments demonstrate that a strategic mindset is an important and socializable factor in developing this strategic proficiency.

Limitations and Future Directions

Although we did not explicitly talk about the control mantra as a solution for waiting, it is not impossible that some children may have construed this mantra as a distraction strategy: Thinking of how fun and enjoyable Sundays are could potentially draw children's attention away from the temptation at hand. Nevertheless, this does not undermine our findings but may actually suggest that our results could be conservative estimates of the effect size.

In our experiments, we defined effective strategies as behaviors that took children's focus away from the enticing features of the treats or from the bell, and ineffective strategies as behaviors that maintained or increased children's attention to the enticing features of the treats or to the bell. We did not take a stance on whether such strategy use was conscious or not, in part because of limitations to children's ability to report on their internal states. Certainly, some of the coded strategies may have been initiated without much forethought. Our assumption is simply that, as children take a strategic mindset to the problem of delaying gratification, they try out behaviors and find those that are helpful for them in making delay easier.

Children who were taught the strategic mindset might be accessing strategies that they already knew before or developing new strategies of their own in the moment. Measuring this difference is nontrivial: People in general, and especially preschoolers, tend to easily rationalize their reactions after the fact as things that they had known beforehand (see hindsight bias research: Bernstein et al., 2011; Pohl et al., 2002; Roese & Vohs, 2012). Thus, young children may find it difficult to accurately report the difference between newly creating a strategy versus having known it all along. Nevertheless, these are questions that future research may consider investigating further.

Might the effects of our strategic mindset manipulation be different if we were to give children the opportunity to reflect on the storybooks before they had to perform the tasks? Quite possibly. It is possible that the strategic mindset storybook effects might be even stronger if children had the time to reflect on how to apply the mindset. Given the time constraints of each experimental lab session, we started the delay tasks immediately after the storybooks were read. Moreover, the children in our experiments did not know beforehand that they would be engaging in a waiting task after reading the storybook. We postulate that these observed effects

could possibly be larger if children had more time to anticipate and strategize before each task. However, this remains an open empirical question for future studies to test.

Another limitation of the present studies is that they are confined to the laboratory and to tasks that immediately follow the strategic mindset storybook. It is exciting to consider whether a strategic mindset might help children in their daily lives—and, perhaps, contribute, even in part, to the positive outcomes in adolescence and adulthood observed among children who delay longer on laboratory-based, delay-of-gratification tasks (as in Shoda et al., 1990). In the future, researchers can design and test field interventions that use expanded versions of the current delay-of-gratification experimental manipulation among preschoolers. Such research could then examine the efficacy of the interventions over time, compared to a control group, on important, real-world outcomes related to self-regulation, peer relations, achievement, or mental health.

Another high priority for future research is to examine whether a strategic mindset can also benefit self-regulation in contexts beyond delay of gratification. As our experiments and others (e.g., Duckworth et al., 2014, 2016; Rodriguez et al., 1989) suggest, some self-regulation situations that could seem to involve simply impulse control—whether waiting for desired treats or toys, avoiding distractions while doing homework, improving one's diet, or regulating emotions—may actually benefit from effective strategy use. Perhaps a more domain-general strategic mindset can help children broadly in self-regulating. Future research could examine this question by testing effects of a domain-general strategic mindset on diverse self-regulatory challenges (such as staying focused on a task and avoiding distraction, emotion regulation, and more).

Conclusion

A strategic mindset may be an empowering psychology that we can nurture in young children to improve delay of gratification—a fundamental part of self-regulation. In our research, children who learned a strategic mindset were able to apply it to effectively navigate different kinds of delay-of-gratification challenges. Our work paves the way for research on real-world, longer term outcomes that may be influenced by such agentic, self-driven strategizing.

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