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Young children's future-oriented reasoning for self and other: Effects of conflict and perspective



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ABSTRACT

Young children reason more adaptively about the future (e.g., predicting preferences and delaying gratification) when they are asked to think about another person's perspective versus their own perspective. An explanation for this "other-over-self" advantage is that in contexts where current (e.g., small reward *now*) and future (e.g., larger reward *later*) desires conflict, adopting the perspective of another person provides psychological distance and hence more adaptive decision making by reducing conflict. We tested this hypothesis in 158 preschoolers using a battery of representative future-oriented reasoning tasks (Preferences, Delay of Gratification, Picture Book, and "Spoon") in which we varied the perspective children adopted (self or other) and the level of conflict between current and future desires (high or low). We predicted that perspective and conflict would interact such that children would benefit most from taking the perspective of "other" when conflict was high. Although results did not support this hypothesis, we found significant effects of conflict; children reasoned more optimally on our low-conflict task condition than on our high-conflict task condition, and these differences did not appear to be related to inhibitory control. The effect of conflict was most marked in younger preschoolers, resulting in Age × Conflict interactions on two of our four tasks. An other-over-self advantage (i.e., perspective effect) was detected on the Preferences task only.

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These results add to the growing body of literature on children's future thinking by showing the important role of conflict (and its interaction with age) in the accuracy with which children reason about the future.

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Introduction

Young children are often described as being overly focused on the present with little regard for the future. For example, when 3-year-olds are asked to predict items they will need or prefer in the future, or to choose between an immediate smaller reward and a larger delayed reward (i.e., delay of gratification), they often respond as a function of their current state. Yet, intriguingly, when asked some of these questions about *another child*, children provide significantly more future-oriented responses. This "other-over-self advantage" (Lee & Atance, 2016; Renault, Kopp, Davidson, Taler, & Atance, 2016) has been reported both in the realm of delay of gratification (Mahy et al., 2020; Prencipe & Zelazo, 2005) and in children's ability to understand that current and future preferences may differ (e.g., Bélanger, Atance, Varghese, Nguyen, & Vendetti, 2014). This advantage has been explained by the argument that adopting another person's perspective leads to more optimal reasoning and decision making in contexts where one's current and future states conflict (e.g., what is desirable *now* differs from what is desirable *in the future*).

We tackled this claim in the current study by examining the effects of perspective, conflict, and their potential interaction on young children's reasoning about the future. We asked the following:

1. Is the reported other-over-self advantage in the Preferences task (e.g., Bélanger et al., 2014) and the Delay of Gratification (DoG) task replicable, and does this advantage generalize to other commonly used future thinking tasks?
2. Do contexts in which there is "conflict" between current and future desires or preferences lead children to reason less optimally about the future, compared with contexts in which conflict is low?
3. Are high-conflict contexts those in which we are most likely to observe an other-over-self advantage? (i.e., an interaction between perspective and conflict).

The answers to these questions will shed light on how different contexts affect the accuracy and adaptiveness with which children reason about the future. This is important given that children and adults alike struggle with accurate future-oriented decision making or forecasting, often with negative consequences. These consequences, such as overspending on groceries when shopping on an empty stomach (e.g., Nisbett & Kanouse, 1969), can result from mispredicting one's future physiological states (see also Atance & Meltzoff, 2006; Kramer, Goldfarb, Tashjian, & Lagattuta, 2017; Loewenstein, 1996; Mazachowsky, Koktavy, & Mahy, 2019) but can also result from mispredicting emotional and psychological states. For example, people tend to overpredict the duration and intensity of their future emotions (i.e., errors in affective forecasting; e.g., Wilson & Gilbert, 2005) and fail to consider the extent to which their future preferences and personality characteristics will change (i.e., end of history illusion; Quoidbach, Gilbert, & Wilson, 2013), leading to substantial regret about decisions that were unduly influenced by current states rather than future states.

We begin by providing a brief overview of how future thinking has been studied in young children, which sets the stage for examining how perspective (i.e., reasoning about self vs. other) and conflict affect young children's future thinking—the focus of the current article.

Future thinking in young children

Mentally projecting the self into one's personal past and future, or "mental time travel," is a highly adaptive aspect of human thought that has received widespread attention in research with adults, children, and nonhuman animals (e.g., Atance, 2015; Schacter, Benoit, & Szwedzinski, 2017; Suddendorf & Corballis, 2007; Wilkins & Clayton, 2019). Children's capacity to talk about future events, plan for future needs (e.g., select an item for future use), and anticipate physiological states (e.g., thirst, hunger, cold) and psychological states (e.g., preferences) improve from 3 to 5 years of age (e.g., Atance & Meltzoff, 2005; Bélanger et al., 2014; Suddendorf, Nielsen, & von Gehlen, 2011).

For example, Atance and Meltzoff (2005) developed a task to measure 3-, 4-, and 5-year-olds' capacity to anticipate physiological states in particular. Children were presented with photographs of various locations designed to elicit thought about future states such as hunger, thirst, cold, and hurt. Children were asked to imagine themselves going to the given location and could then select one item to bring with them. For example, when asked to imagine walking near a waterfall, children were presented with a raincoat, money, and a blanket. The raincoat was considered the correct choice because otherwise one might get wet. Although 4- and 5-year-olds performed significantly better than 3-year-olds, all three age groups were significantly above chance in selecting the item that would address a future physiological state. Children's capacity to predict future psychological states (e.g., preferences, knowledge) also improves during the preschool years (e.g., Atance & Caza, 2018; Bélanger et al., 2014; Goulding, Atance, & Friedman, 2019; Lee & Atance, 2016; Martin-Ordas, 2017). For example, Bélanger et al. (2014) showed that when asked to select items that they would prefer when they were all grown up, only 5-year-olds accurately predicted that they would prefer the "adult-preferable" item (e.g., coffee) to the "child-preferable" item (e.g., Kool-Aid).

Another common method to test children's future-oriented thinking includes variants of the "Spoon" task (Suddendorf & Busby, 2005; Tulving, 2005). Children are introduced to a novel problem (e.g., locked box with stickers but no functional key) in one location and, after a delay in another location, are told that they will be returning to the first location. Before returning, children are presented with a set of items, including one (e.g., key) that can address the problem. Many studies have shown that children's performance on such tasks improves from 3 to 5 years of age (e.g., Moffett, Moll, & FitzGibbon, 2018; Suddendorf & Busby, 2005; Suddendorf et al., 2011).

The other-over-self advantage

The research just described shows that children's capacity to think about their personal futures (i.e., episodic future thinking) improves significantly during the preschool years. Because a key feature of such episodic thought is a mental projection of the *self* into the future, most tasks have focused on children's responses to questions such as "What will you like best when you're all grown up?" and "Which one of these [items] do you need for tomorrow?" Yet, in addition to asking children to consider or make predictions about their own futures, several studies have asked children comparable questions about *another person's future* (e.g., a same-age peer, an adult).

For example, in the context of delay of gratification, which can also be considered a marker of future-oriented reasoning or self-control (Mischel, Shoda, & Rodriguez, 1989), researchers have compared children's choices between receiving one item now and receiving multiple items in the future for "self" or "other" (i.e., "Choice Delay" task). Using a between-participants design in which children were assigned to either a self or other condition, Prencipe and Zelazo (2005) found that 3-year-olds (but not 4-year-olds) were significantly more likely to choose the delayed option for the other (in this case, an adult experimenter) than they were for themselves, resulting in an age by condition/perspective interaction (see also Mahy et al., 2020). These findings suggest that the other-over-self advantage may be present at certain ages but not at others. They also suggest that younger preschoolers (i.e., 3-year-olds) are capable of making the more "rational" future-oriented choice for another person but have difficulty in resisting the "impulsive" present-oriented choice for themselves.

This explanation is also consistent with Bélanger et al. (2014; see also Lee & Atance, 2016), who found that 3- to 5-year-olds were more apt to correctly predict that another child's preferences would change in the future (e.g., Billy will prefer coffee to Kool-Aid when he's all grown up) than they were at

making this same prediction for themselves. Similarly, [Mazachowsky et al. \(2019\)](#) recently showed that 3- to 7-year-olds tended to be more accurate in predicting that a thirsty experimenter would prefer pretzels tomorrow than they were at making this same prediction for themselves. Finally, using a paradigm similar to the Spoon task in which children selected two items that they would need “tomorrow” to play a game of “blow football,” [Russell, Alexis, and Clayton \(2010, Experiment 2; see also Experiment 3\)](#) found that 4-year-olds (but not 3- or 5-year-olds) were more often correct when asked what another child should select. This may have been because the distracter items were quite desirable (and thus had immediate value), leading to an other-over-self advantage (but see [Payne, Taylor, Hayne, & Scarf, 2014](#), who did not detect this advantage).

Together, these studies suggest that children may sometimes possess the requisite knowledge about the future (as evidenced by superior performance when asked about “other”) but have difficulty in applying this knowledge to their own future selves.

Psychological distance

Why might this be? Several researchers have argued that thinking about another person’s future provides “psychological distance” from one’s own current perspective, thereby leading to more accurate decision making (e.g., [Lee & Atance, 2016](#); [Mahy et al., 2020](#); [Mazachowsky et al., 2019](#)). [Liberman and Trope \(2014\)](#) defined psychological distance as “the extent of divergence from direct experience of me, here and now, along the dimensions of time, space, social perspective, or hypotheticality” (p. 365). A number of experiments have shown the benefits of psychological distance more broadly on self-control tasks in adults (e.g., [Fujita & Carnevale, 2012](#)) and children (e.g., [Mischel & Baker, 1975](#); [Prencipe & Zelazo, 2005](#); [White & Carlson, 2016](#)), including the DoG task we described earlier. With respect to the “social” dimension (i.e., self vs. other) of psychological distance in particular, adopting the perspective of other benefits children’s reasoning about future preferences (e.g., [Bélanger et al., 2014](#); [Lee & Atance, 2016](#)) and future physiological states ([Mazachowsky et al., 2019](#)). Yet, there is no systematic research about whether (social) psychological distance interacts with “conflict” to affect children’s future-oriented reasoning. As we alluded to earlier, thinking about the future often entails conflict between one’s current state (e.g., preferring Kool-Aid) and one’s future state (e.g., preferring coffee), leading to suboptimal predictions (e.g., [Loewenstein, 1996](#)). However, as the research so far suggests, this conflict may be reduced by “distancing” from one’s current perspective by reasoning about another person’s perspective, leading to more accurate predictions. An important corollary of this argument is that when there is little conflict between one’s current and future states, an other-over-self advantage should be attenuated such that responses for self and other are more similar. We refer to this potential interaction between perspective (i.e., reasoning about self vs. other) and conflict (i.e., high conflict between current and future states vs. low conflict between current and future states) as the “perspective by conflict” hypothesis; that is, in “predictive” contexts (e.g., future preferences, delaying gratification), the more current and future states conflict, the more beneficial it may be to adopt the perspective of another person.

The current study

The goal of the current study was to test the hypothesis that present–future conflict drives the other-over-self advantage (i.e., perspective by conflict hypothesis). Although the body of work discussed so far supports this hypothesis, we cannot rule out that task factors above and beyond conflict led to differences in children’s responding for self and other. For example, the various tasks to measure future thinking in young children are structured differently and often do not correlate (e.g., [Atance & Jackson, 2009](#); [Chernyak, Leech, & Rowe, 2017](#); [Hanson, Atance, & Paluck, 2014](#)). For this reason, comparing self–other differences across tasks that vary in naturally occurring levels of conflict should be done cautiously. A more optimal approach is to manipulate level of conflict *within* a given task to determine its effect on children’s responding.

Accordingly, in the current study, we systematically tested our perspective by conflict hypothesis by (a) administering a battery of future thinking tasks to a large group of 3- to 5-year-olds in which we manipulated present–future conflict *within each task* to create both high- and low-conflict versions

and (b) varying whether children were asked about self or other. We used the following four tasks, all of which capture age-related improvement from 3 to 5 years of age: (a) Preferences ([Bélanger et al., 2014](#)), (b) DoG ([Prencipe & Zelazo, 2005](#)), (c) Picture Book ([Atance & Meltzoff, 2005](#)), and (d) Spoon ([Suddendorf et al., 2011](#)). We included this representative set of tasks because there is debate in the field about the tasks that best measure future thinking. For example, [Hudson, Mayhew, and Prabhakar \(2011\)](#) argued that tasks such as Spoon, Picture Book, and DoG contain extraneous demands above and beyond future thinking and also might not capture critical aspects of this ability. Moreover, as noted earlier, future thinking tasks (including those in our study) often do not correlate significantly once age and language are controlled, suggesting that they are tapping somewhat different aspects of future thought. These limitations can be at least partly overcome by including a variety of tasks, which also serves to broaden the scope and generalizability of our findings.

Whereas we conceive of the first two tasks (i.e., DoG and Preferences) as inherently “high conflict,” we conceive of the last two (i.e., Picture Book and Spoon) as “low conflict.” This is because in the latter children are not typically presented with an attractive or “salient” immediately available option that conflicts with a future one. We created low-conflict versions of the Preferences and DoG tasks and created high-conflict versions of the Picture Book and Spoon tasks. In the low-conflict version of the Preferences task, rather than explicitly pitting children’s current desire (e.g., Kool-Aid) against a future one (e.g., coffee), children were simply asked, for example, “Will you/Billy like coffee when you’re all grown up?” We reduced present–future conflict in the DoG task by asking children to choose between receiving/having Billy receive a small reward and receiving/having Billy receive a large reward, but with *both* rewards being obtainable in the future (e.g., “Do you/Billy want one sticker later or four stickers tomorrow?”). Our approach was based on [Ziegler and Tunney’s \(2012\)](#) argument that decision makers are less impulsive when both rewards are located in the future. Although such a context still presumably requires thinking about the future and the temporal distances involved, the absence of an immediate reward reduces present–future conflict. We created a high-conflict version of the Picture Book task by embedding the correct item on a given trial within two other highly desirable distracter items. Similarly, in the high-conflict version of the Spoon task, the correct item was embedded within distracter items, but (importantly) two of these items were immediately desirable or obtainable, creating conflict between taking one of them now and selecting the item with future utility.

Half of the children received all four tasks in their *high-conflict* versions, whereas half received them in their *low-conflict* versions. Within each of these versions, children responded for either *self* or *other*, resulting in a 2 (high conflict or low conflict) \times 2 (self or other) between-participants design.

We predicted that task performance would increase with age, that performance in the low-conflict condition would be superior to performance in the high-conflict condition, and that performance for other would be superior to performance for self. We also predicted a significant interaction between perspective and conflict such that other scores would be significantly higher than self scores in the high-conflict condition but less so in the low-conflict condition. This is because high-conflict tasks involve present–future conflict, which is precisely the context in which children should benefit from adopting the perspective of another child. This pattern of results thus would support the hypothesis that reasoning about another’s perspective is most beneficial when there is present–future conflict. We did not predict task-based differences as a function of our manipulations of conflict and perspective but rather expected a relatively uniform effect across each of the four tasks.

Finally, all children were given two inhibitory control tasks: Sun/Moon ([Gerstadt, Hong, & Diamond, 1994](#)) and the Dimensional Change Card Sort (DCCS) ([Zelazo, 2006](#)). These were included to address the possibility that, irrespective of the perspective that children were asked to adopt (i.e., self vs. other), high-conflict task versions would be more strongly associated with children’s inhibitory control than their low-conflict counterparts. This is because stronger inhibitory capacities may help children to set aside a current desire or need that conflicts with a future one. If so, this could partly explain why thinking about a current state that conflicts with a future one is particularly difficult for preschoolers.

Method

Participants

We had initially planned on running a within-participants design in which 120 participants would respond to two blocks of future thinking tasks: one adopting the perspective of "self" and one adopting the perspective of "other" (i.e., same-age peer), with order counterbalanced across participants. This sample size was based on an a priori power analysis using G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009), assuming a medium effect size of .25, power of .80, alpha of .05, and correlation of .20 between repeated measures. However, once we completed data collection, preliminary analyses indicated order effects such that for some tasks participants answered differently depending on whether they received self or other questions first.¹ Thus, we decided to test additional participants so that we could run between-participants analyses using only the perspective (self or other) that children answered first. To determine the number of additional participants needed to detect a significant interaction between perspective and conflict, we ran another power analysis for a between-participants design using G*Power 3.1 (Faul et al., 2009). Assuming a medium effect size of .25, power of .80, and alpha of .05, our participant total was set at 158, which is the final sample size we ultimately obtained.

Children were recruited from a large university city using a participant database, posters, and advertising at children's fairs. Participants were 52 3-year-olds (26 boys; $M_{age} = 42.87$ months, range = 37–47), 53 4-year-olds (27 boys; $M_{age} = 53.68$ months, range = 48–59), and 53 5-year-olds (27 boys; $M_{age} = 65.30$ months, range = 60–71). An additional 7 children were tested but were excluded due to failure to complete the entire experiment ($n = 5$) or experimenter error ($n = 2$). All children were fluent in English, with 89.2% of the sample having English as their first language. Most children came from high-income families (74.7% earning more than \$80,000 annually) and were White (64.6%; 17% were mixed ethnicity, 11.4% had parents who identified them as "other," and 7% of parents provided no information). Children received a small toy for completing the study, and families received free parking. Our procedures were approved by the health sciences and science research ethics board at the University of Ottawa.

Procedure

Children were tested individually by one experimenter in a session lasting approximately 45 min. Testing took place in two adjacent laboratory rooms on the university campus. Sessions were video-recorded, and parents were invited to watch the testing session live on a computer monitor from an adjoining room. After obtaining parental consent and child assent, children completed four future thinking tasks in a fixed order: Preferences, DoG, Picture Book, and Spoon. Children responded to these tasks from the perspective of either self or other and in either the high-conflict or low-conflict condition. This 2 (Perspective: self or other) \times 2 (Conflict: high or low) between-participants design thus resulted in four different protocol versions: high-conflict self, high-conflict other, low-conflict self, and low-conflict other. Children were randomly assigned to these protocol versions such that there was an equal number of children in each age group in each version. Children also completed two theory of mind tasks (not reported here) followed by two inhibitory control tasks in a fixed order. These

¹ After we had reached our sample of 120 participants, we conducted a mixed 3 (Age Group: 3 vs. 4 vs. 5 years) \times 2 (Conflict: high vs. low) \times 2 (Order: self first or other first) \times 2 (Perspective: self vs. other) ANOVA on performance for each of the four future thinking tasks with perspective as the within-participants variable. For the Picture Book task, we detected a Perspective \times Order interaction, $F(1, 104) = 8.85$, $p < .01$, $\eta_p^2 = .08$, as well as a Perspective \times Age \times Condition \times Order interaction, $F(2, 104) = 7.75$, $p < .001$, $\eta_p^2 = .13$. For the Preferences task, we detected a Perspective \times Condition \times Order interaction, $F(1, 104) = 6.06$, $p < .05$, $\eta_p^2 = .06$. For the Spoon task, we detected a Perspective \times Age \times Condition \times Order interaction, $F(2, 104) = 7.75$, $p < .05$, $\eta_p^2 = .07$ (there were no effects of order on the DoG task). These significant interactions between order and our variables of interest (particularly our hypothesized Perspective \times Conflict interaction) suggest that task scores differed significantly between children who completed the self perspective first compared with those who completed the other perspective first. Because it was critical that children's responses for self and other were not influenced by the previous perspective they received, the cleanest approach was to implement a design that was fully between participants.

four tasks were administered during the delay period of the Spoon task (which was the last future thinking task administered).

Future thinking tasks

Preferences task

This task (adapted from [Bélanger et al., 2014](#)) assesses children's understanding that current and future preferences will differ. A photograph of a gender-matched adult was placed on the table and introduced to the children (e.g., "Here is a picture of Jane/John. Jane/John is a grown-up woman/man. She/He is as big as a mommy/daddy."). In the self condition, children were shown a Polaroid image of themselves, and the experimenter, while pointing to both images, explained that the children themselves would later become a grown-up just like Jane/John. In the other condition, children were shown a photograph of a gender-matched child ("Sally" or "Billy") and were told that this child would later become a grown-up just like Jane/John. All photographs were then placed out of sight.

In the high-conflict condition, children were shown two identical items that an adult would prefer and two identical items that a child would prefer, including reading materials (novels vs. picture books), leisure activities (magazines vs. sticker books), drinks (cups of coffee vs. juice boxes), games (crossword puzzles vs. Play-Doh), DVDs (cooking show videos vs. *Curious George* videos), and personal accessories (wallets vs. schoolbags). Pairs of items, rather than single items, were used so that children did not perceive the task to involve limited resources. After the simultaneous presentation of each pair of adult and child items, children were asked, "Which one of these will you/Sally/Billy like best when you're/she's/he's all grown up?" A score of 1 was awarded each time a child selected an adult item (range = 0–6).

The low-conflict condition was designed to minimize present–future conflict, and thus children were presented with each pair of adult items and instructed to indicate with a "yes" or "no" whether they/Sally/Billy would like them in the future (e.g., "Will you/Sally/Billy like magazines when you're/she's/he's all grown up? Yes or no?"). Children completed six trials and were awarded 1 point for each "yes" (range = 0–6). To control for a yes/no response bias, children in the low-conflict condition only were given four questions that required them to answer "yes" twice (i.e., "Is grass green?"; "Do cats have tails?") and "no" twice (e.g., "Do fish have feet?"; "Are bananas blue?"). Accordingly, responses to the Preferences task were excluded from the final analysis if a child did not answer at least three of these four questions correctly (6 children were excluded for answering only two of the four questions correctly).

At the very end of the testing session, all children received the previously described six trials but this time phrased to assess their/Sally's/Billy's current preferences (e.g., "Which of these do you/Sally/Billy like best right now?"). Self future and other future choices or trials were excluded from the final analysis if the child item was not selected on the corresponding self now and other now trials. For both self and other perspectives, the final score was calculated by dividing the number of correctly answered future trials by the number of corresponding present trials for which the child item had been selected. Data from 13 children were excluded from the Preferences analysis for the following reasons: fewer than three of the four yes/no response bias questions correct ($n = 6$), did not complete the now trials ($n = 3$), or had no correct responses on the now trials ($n = 4$).

Delay of gratification (or delay choice) task

In this task (adapted from [Prencipe & Zelazo, 2005](#)), children received a series of trials in which they could select an immediate reward now or wait to receive a larger reward later. In the self condition children decided for themselves, whereas in the other condition children decided for a gender-matched same-age peer (i.e., Sally or Billy). In the high-conflict condition, children decided between receiving one goldfish or sticker "now" and receiving 2/4/6 goldfish or stickers "for tomorrow." If children selected the immediate option, then they could consume the goldfish cracker or put the sticker in a notepad (self version) or watch as the experimenter pretended to feed Sally/Billy a goldfish cracker

or put the sticker in Sally/Billy's notepad (other version). If children selected the delayed option, they placed the rewards in a basket and were told that their/Sally's/Billy's parent or guardian would give it to them tomorrow.

In the low-conflict condition, children decided between receiving one goldfish or sticker "later, at the end of our games" and receiving 2/4/6 goldfish or stickers "for tomorrow." As in the high-conflict condition, children decided either for themselves (self condition) or for Sally/Billy (other condition). The low-conflict condition did not provide children with the opportunity to receive goldfish or stickers right away so as to reduce present–future conflict. If children selected the "later" option, the reward was placed in a "later" basket, whereas if children selected the "tomorrow" option, the reward was placed in a "tomorrow" basket. To clarify this distinction, the experimenter said, "If you/Sally/Billy want something for later, at the end of our games I will give it to you/Sally/Billy then. If you/Sally/Billy want something for tomorrow, I will give it to your/Sally's/Billy's parent or guardian to give to you/Sally/Billy tomorrow." Although previous versions of this task set the delayed period to "later" (e.g., "after the experiment/games"), we decided on "tomorrow" so that this aspect would be consistent across both our high-conflict condition (now vs. tomorrow) and low-conflict condition (later vs. tomorrow). Children received six trials in randomized order: three involving goldfish crackers (1 vs. 2, 1 vs. 4, and 1 vs. 6) and three involving stickers (1 vs. 2, 1 vs. 4, and 1 vs. 6). In both conditions, a score of 1 was awarded each time children chose to receive their reward tomorrow (range = 0–6). Data from 4 children were excluded from the DoG analysis because they had three or more missing trials.

Picture Book task

This task (adapted from [Atance & Meltzoff, 2005](#)) assesses children's ability to select an appropriate item to bring on a hypothetical trip. Children were shown pictures of the following locations: (a) a long road, (b) a steep mountain, (c) a waterfall, and (d) a rocky stream. The experimenter then asked children to imagine themselves (self condition) or Sally/Billy (other condition) visiting each place the following day (e.g., "I want you to imagine that you/Sally/Billy are going here tomorrow. Let's pretend that you/Sally/Billy are going to walk under this waterfall."). Children were then presented with a photograph of three item choices and were asked which one they/Sally/Billy would bring on the imaginary trip. The correct item corresponded with a future need inherent to that situation, whereas the other two items served as distractors. In the high-conflict condition, children were presented with highly desirable distracter items that did not address a future physiological state (see [Table 1](#)). The low-conflict condition included distracter items that were less desirable for children in the present, thereby minimizing present–future conflict. Children received the four trials in a fixed order. Children were awarded 1 point each time they selected the correct item (range = 0–4). One child was excluded from the Picture Book analysis due to missing data for the rocky stream choice response.

Spoon task

This task (adapted from [Atance & Sommerville, 2014](#); [Suddendorf et al., 2011](#)) measures children's ability to select an item needed to solve a future problem. Children were brought to a room adjacent to the primary testing room. This room had a picture of a rainbow displayed on the door. Prior to the testing session, a transparent cylindrical box containing eight Smarties and eight marshmallows was placed on a table in the room. The experimenter introduced the new room by saying, "Okay, this is

Table 1
Scenarios and item choices in the Picture Book task.

Scenario	High conflict			Low conflict		
	Correct item	Distracter 1	Distracter 2	Correct item	Distracter 1	Distracter 2
Dirt road	Water	Present	Ball	Water	Card	Shampoo
Mountain	Lunch	Blocks	Crayons	Lunch	Comb	Bowl
Waterfall	Raincoat	Stickers	Balloon	Raincoat	Blanket	Spoon
Rocky stream	Band-Aids	Teddy bear	Game	Band-Aids	Pillow	Toothpaste

the Rainbow Room." Once the children were brought inside, the box was revealed: "Oh look, there's a box in here with Smarties and marshmallows in it!" The experimenter motioned to a lock affixed to the box's hinge and exclaimed with disappointment, "But too bad, it's locked!" Children then returned to the primary testing room where they completed four tasks to create a delay between the presentation of the problem and their opportunity to solve it.

After completing these tasks, the experimenter placed a key and an additional three distracter items on the table. Children in the self condition were told that they would be returning to the Rainbow Room and were asked, "Which one of these things should you bring back with you to the Rainbow Room?" Children in the other condition were asked, "Sally/Billy is going to come here tomorrow to play exactly the same games you and I played together. Which one of these things should she/he bring with her/him to the Rainbow Room?" Note that when asking about "other" we asked about "tomorrow" because we worried that otherwise children might intentionally select the incorrect item for fear that they themselves would not have an opportunity to obtain the reward. The correct response for both the high-conflict and low-conflict conditions was a key. However, in the high-conflict condition, the distracter items consisted of one Smartie, one marshmallow, and a ruler. Using a Smartie and a marshmallow as distracter items was meant to induce conflict between the immediately desirable option of securing one Smartie or marshmallow and the option of waiting to obtain more Smarties or marshmallows later by selecting the key. In contrast, the low-conflict condition included less desirable distracter items (i.e., scissors, eraser, and ruler) to minimize present-future conflict. Children were awarded 1 point for selecting the key, whereas all other selections received a score of 0 (range = 0–1). Regardless of choice, all children were handed the key and allowed to access the candy. Two children did not provide data for this task because their parents did not want them to have candy.

Inhibitory control tasks

Sun/moon stroop task

During the training phase of this task (adapted from [Gerstadt et al., 1994](#)), children learned the correspondence between saying "sun" when they saw a moon card and saying "moon" when they saw a sun card. Children were given one to three training trials, depending on their performance. Regardless of performance on the training trials, all children proceeded immediately to 21 test trials. In each trial, a score of 0 was assigned to an incorrect response, a score of 1 was assigned to an incorrect response that was immediately self-corrected (e.g., "Sun, no moon"), and a score of 2 was assigned to a correct response (possible range = 0–42). Although self-corrections are typically assigned a score of 0, we adopted a scoring system that [Mahy, Mazachowsky, and Pagobo \(2018\)](#) used for a similar Stroop-like inhibition task, with the goal of obtaining increased variability in task performance. A trained undergraduate research assistant who was blind to the goals of the study conducted reliability coding on 38% of the data. Agreement between the two sets of ratings was good, with an intraclass correlation coefficient of .89, $F(59, 59) = 9.32, p < .001$. Disagreements were resolved through discussion.

Dimensional change card sort task

In this task (adapted from [Zelazo, 2006](#)), children were asked to sort cards into two clear plastic bins facing them, first by shape and then by color. One bin had an image of a blue star affixed to its front, whereas the other bin had an image of a red truck. In the "pre-switch" phase of the task, children completed up to eight trials in which they were instructed to sort cards by shape (i.e., truck or star). Children were given corrective feedback and a repetition of the rules between each trial (e.g., "Yes, that's right. Remember, if it's a star, then it goes here. If it's a truck, then it goes there."). Children proceeded to the post-switch phase as soon as they answered five pre-switch trials correctly or, in failing to do so, answered eight pre-switch trials. Following the pre-switch phase, children were told, "Now we are going to switch," and were instructed to sort the cards by color. For these "post-switch" trials, cards were labeled by both dimensions (i.e., shape and color) and the post-switch instructions were repeated between every trial. Corrective feedback was not given during the post-switch phase. Correct responses (including self-corrections) were awarded a score of 1 for the post-switch trials (possible range = 0–5). Again, a trained undergraduate research assistant conducted reliability coding on 38%

Table 2

Intercorrelations between future thinking tasks controlling for age and condition.

Task	1	2	3	4
1. Preferences	–			
2. Delay of Gratification	.02 (−.05)	–		
3. Picture Book	.47** (.30**)	.07 (.10)	–	
4. Spoon	.20* (.04)	−.09 (−.10)	.33** (.21*)	–

Note. Partial correlations controlling for age and condition are shown in parentheses.

* $p < .05$.** $p < .01$.

of the data. Agreement between the two sets of ratings was excellent, with an intraclass correlation coefficient of .99, $F(58, 58) = 384.73$, $p < .001$. Disagreements were resolved through discussion.

Results

We predicted that task performance would improve with age, that children would perform better in the low-conflict condition than in the high-conflict condition, and that children would perform better when predicting for other than when predicting for self. Importantly, our perspective by conflict hypothesis predicts that the benefit that children derive from reasoning about another child's perspective (i.e., other) will be more marked in the high-conflict condition than in the low-conflict condition, leading to a perspective by conflict interaction.

We first ran Pearson's correlations to determine whether any of our future thinking tasks were related. As can be seen in Table 2, several of the first-order correlations were significant, but because these were not particularly strong and did not fully maintain when controlling for age and condition, we first analyzed each task separately and then formed a composite by combining the tasks that were related.

Preferences task

A 3 (Age Group: 3 vs. 4 vs. 5 years) \times 2 (Conflict: high vs. low) \times 2 (Perspective: self vs. other) analysis of variance (ANOVA) on task scores revealed a main effect of age, $F(2, 133) = 5.50$, $p = .005$, $\eta_p^2 = .08$. Tukey post hoc tests revealed that 3-year-olds ($M = 0.46$, $SD = 0.39$) scored lower than 4-year-olds ($M = 0.62$, $SD = 0.36$), $p = .024$, $d = 0.42$, and 5-year-olds ($M = 0.67$, $SD = 0.35$), $p = .001$, $d = 0.57$; the scores of 4- and 5-year-olds did not differ significantly, $p = .627$, $d = 0.15$. There was a main effect of conflict, $F(1, 133) = 79.45$, $p < .001$, $\eta_p^2 = .37$, such that children scored higher in the low-conflict condition ($M = 0.80$, $SD = 0.21$) than in the high-conflict condition ($M = 0.37$, $SD = 0.38$). Finally, there was a main effect of perspective, $F(1, 133) = 4.81$, $p = .030$, $\eta_p^2 = .04$, such that children reasoned better about other ($M = 0.63$, $SD = 0.38$) than about self ($M = 0.54$, $SD = 0.37$). None of the interactions was significant (all $ps > .11$, all $\eta_p^2s < .03$), including our main interaction of interest, Conflict \times Perspective, $F(1, 133) = 2.52$, $p = .115$, $\eta_p^2 = .02$ (see Fig. 1).

Delay of gratification task

A 3 (Age Group: 3 vs. 4 vs. 5 years) \times 2 (Conflict: high vs. low) \times 2 (Perspective: self vs. other) ANOVA revealed a main effect of conflict, $F(1, 142) = 3.99$, $p = .048$, $\eta_p^2 = .03$, but no main effects of age ($p = .287$, $\eta_p^2 = .02$) or perspective ($p = .894$, $\eta_p^2 = .00$). However, the conflict main effect was qualified by a significant Age \times Conflict interaction, $F(2, 142) = 3.92$, $p = .022$, $\eta_p^2 = .05$. We followed up on this interaction by conducting two sets of one-way ANOVAs. The first isolated the effect of conflict within each age group (Bonferroni correction for three comparisons: $\alpha = .017$). The 3-year-olds chose more delayed options in the low-conflict condition ($M = 4.67$, $SD = 1.57$) than in the high-conflict condition ($M = 3.00$, $SD = 2.40$), $F(1, 50) = 8.93$, $p = .004$, $d = 0.82$, but choices did not differ between conflict conditions for 4- or 5-year-olds (both $ps > .18$, both $ds < 0.39$). We also conducted a second set of

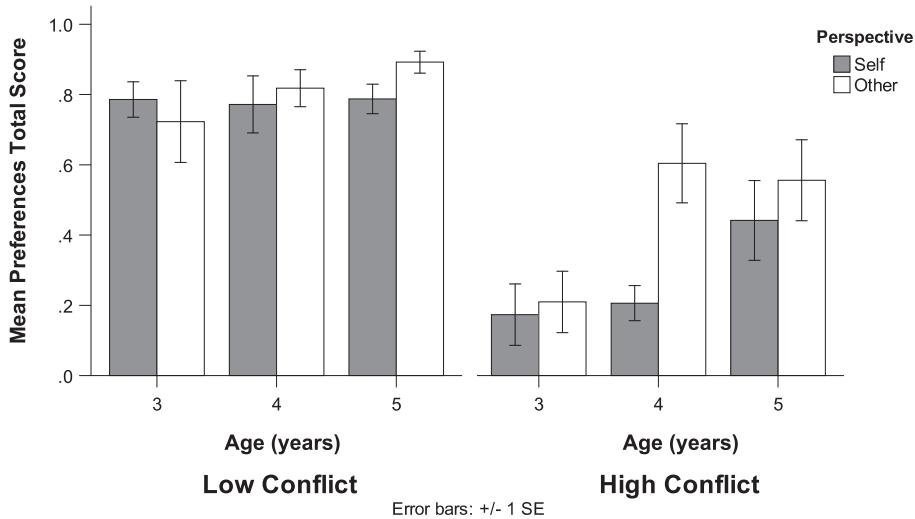


Fig. 1. Preferences scores by conflict, perspective, and age.

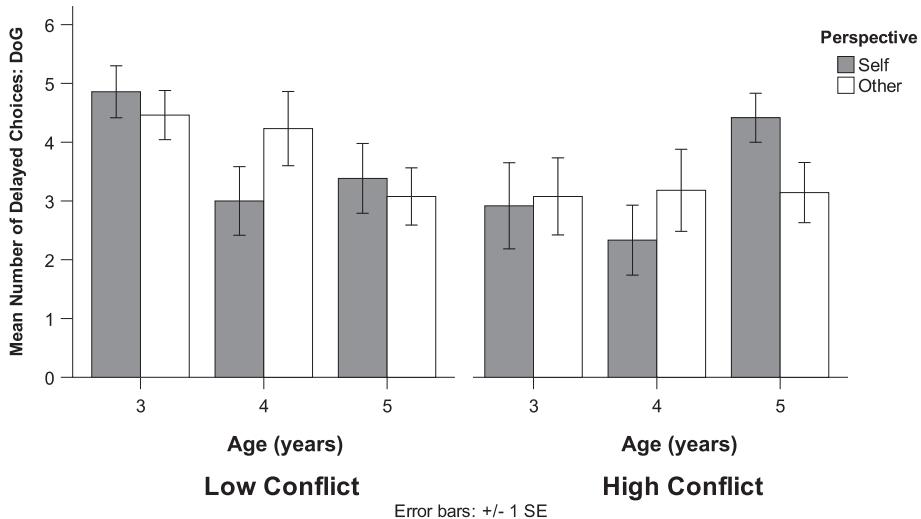


Fig. 2. Delay of Gratification (DoG) scores by conflict, perspective, and age.

one-way ANOVAs to isolate the effect of age within each conflict condition (Bonferroni correction for two comparisons: $\alpha = .025$). The age effect was significant in the low-conflict condition, $F(2, 77) = 3.94$, $p = .024$, $\eta_p^2 = .09$, but not in the high-conflict condition ($p = .243$, $\eta_p^2 = .04$). Tukey post hoc tests in the low-conflict condition revealed that 3-year-olds ($M = 4.67$, $SD = 1.57$) chose more delayed options than 5-year-olds ($M = 3.23$, $SD = 1.93$), $p = .024$, $d = 0.82$, but that choices did not differ between 3- and 4-year-olds ($p = .112$, $d = 0.55$) or between 4- and 5-year-olds ($p = .777$, $d = 0.17$) (see Fig. 2). None of the other interactions was significant (Age \times Perspective, $p = .077$, $\eta_p^2 = .04$; Conflict \times Perspective, $p = .688$, $\eta_p^2 = .001$).

Picture Book task

We conducted a 3 (Age Group: 3 vs. 4 vs. 5 years) \times 2 (Conflict: high vs. low) \times 2 (Perspective: self vs. other) ANOVA on performance on the Picture Book task and detected main effects of age, $F(2, 145) = 29.37, p < .001, \eta^2_p = .29$, and conflict, $F(1, 145) = 18.75, p < .001, \eta^2_p = .12$, but no main effect of perspective, $p = .386, \eta^2_p = .01$. The main effects of age and conflict were qualified by a significant Age \times Conflict interaction, $F(2, 145) = 6.57, p = .002, \eta^2_p = .08$. We first isolated the effect of conflict within each age group (Bonferroni correction for three comparisons: $\alpha = .017$). The 3-year-olds scored higher in the low-conflict condition ($M = 2.96, SD = 0.94$) than in the high-conflict condition ($M = 1.56, SD = 1.16$), $F(1, 50) = 23.18, p < .001, d = 1.33$, but scores did not differ between conflict conditions for 4- or 5-year-olds ($ps > .05, ds < 0.55$). We next isolated the effect of age within each conflict condition (Bonferroni correction for two comparisons: $\alpha = .025$). The age effect was significant in both the low-conflict condition, $F(2, 77) = 6.25, p = .003, \eta^2_p = .14$, and high-conflict condition, $F(2, 74) = 24.35, p < .001, \eta^2_p = .40$. Tukey post hoc tests in the low-conflict condition revealed that 3-year-olds ($M = 2.96, SD = 0.94$) scored lower than 5-year-olds ($M = 3.73, SD = 0.67$), $p = .002, d = 0.94$. Scores did not differ between 3- and 4-year-olds ($p = .106, d = 0.52$) or between 4- and 5-year-olds ($p = .305, d = 0.54$). However, in the high-conflict condition, 3-year-olds ($M = 1.56, SD = 1.16$) scored lower than 4-year-olds ($M = 2.85, SD = 1.26$), $p < .001, d = 1.07$, and 5-year-olds ($M = 3.69, SD = 0.84$), $p < .001, d = 2.11$, and 4-year-olds scored lower than 5-year-olds ($p = .019, d = 0.79$) (see Fig. 3). None of the other interactions was significant (all $ps > .51$, all $\eta^2_ps < .01$).

Spoon task

We conducted a logistic regression with task score (correct vs. incorrect) as the binary dependent variable and age, conflict, and perspective as the predictors. The omnibus test of model coefficients was significant, $\chi^2(11) = 24.53, p < .05$. The model explained 19.8% of the variance in item choice and correctly classified 69.9% of the cases. We detected a main effect of age ($Wald = 10.95, p = .004$), and a simple contrast revealed significantly more correct choices for 5-year-olds than for 3-year-olds ($Wald = 4.20, SE = 0.84, p = .04$, odds ratio = 5.56). There was also a main effect of conflict ($Wald = 4.93, SE = 0.38, p = .03$, odds ratio = 2.30) such that children performed better in the low-conflict condition ($M = 0.70, SD = 0.46$) than in the high-conflict condition ($M = 0.53, SD = 0.50$) (Fig. 4). The main effect of perspective was not significant ($Wald = 0.25, SE = 0.38, p = .615$, odds ratio = 1.21), nor were any of the interactions significant (all $ps > .09$, all odds ratios < 1.15).

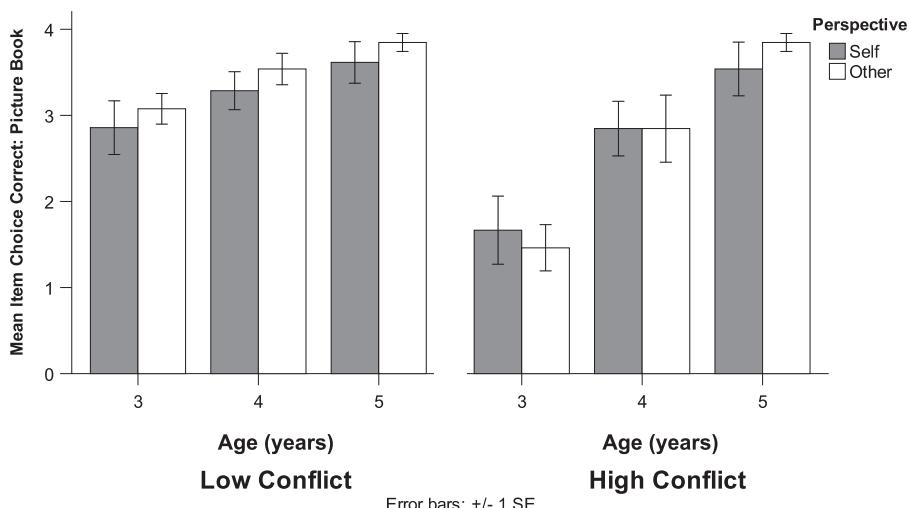


Fig. 3. Picture Book scores by conflict, perspective, and age.

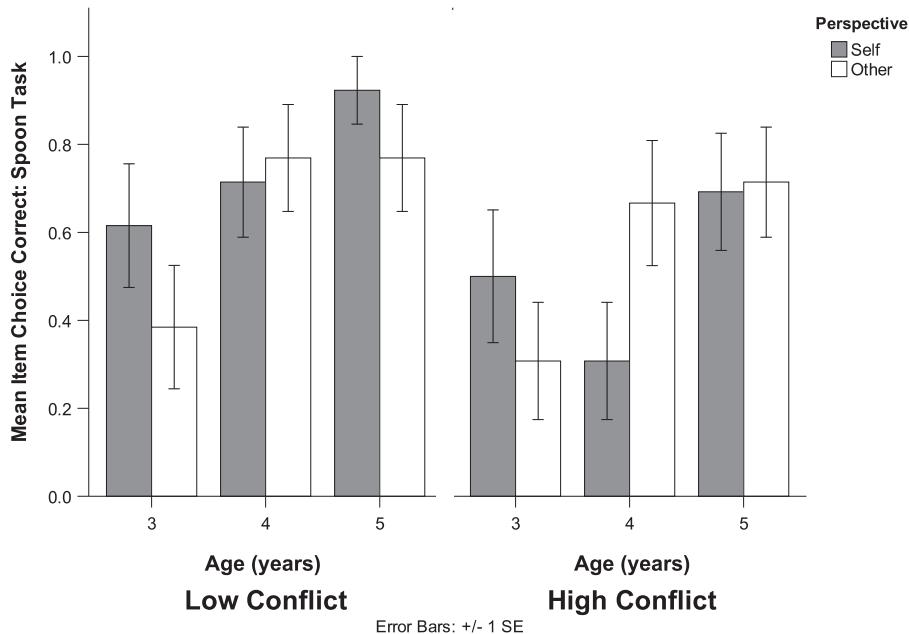


Fig. 4. Spoon scores by conflict, perspective, and age.

Composite future thinking score

Because first-order correlations between the Preferences, Picture Book, and Spoon tasks were significant (see Table 2), we created a composite score to determine whether similar effects (most notably, conflict) to those obtained for each task separately held when analyzed together. We obtained a composite score for each child by dividing the child's scores for each of the three tasks by the maximum score possible for each task (range = 0–1) and then creating a mean of the three tasks (range = 0–1). We then ran a 3 (Age Group: 3 vs. 4 vs. 5 years) × 2 (Conflict: high vs. low) × 2 (Perspective: self vs. other) ANOVA on these scores, which revealed main effects of age, $F(2, 130) = 17.85, p < .001, \eta_p^2 = .22$, and conflict, $F(1, 130) = 44.80, p < .001, \eta_p^2 = .26$ (see Fig. 5). With respect to age, Tukey post hoc tests revealed that 3-year-olds ($M = 0.50, SD = 0.29$) scored lower than 4-year-olds ($M = 0.67, SD = 0.26$), $p = .001, d = 0.63$, and 5-year-olds ($M = 0.80, SD = 0.23$), $p < .001, d = 1.14$, and 4-year-olds scored lower than 5-year-olds, $p = .020, d = 0.51$. As for conflict, children scored higher in the low-conflict condition ($M = 0.79, SD = 0.20$) than in the high-conflict condition ($M = 0.53, SD = 0.30$). There was no main effect of perspective, $F(1, 130) = 2.55, p = .113, \eta_p^2 = .02$, nor any significant interactions (all $p > .09$, all $\eta_p^2 < .04$). A summary of all the significant main effects and interactions for each of the four future thinking tasks and the composite future thinking score is displayed in Table 3.

Is inhibitory control related to future thinking?

The Sun/Moon Stroop task ($M = 20.75, SD = 14.17$), and the DCCS task ($M = 3.37, SD = 2.22$) were significantly correlated ($r = .44, p < .001$), and so we created an inhibitory control composite score by dividing raw scores for both measures by the maximum score possible for each (range = 0–1) and then created a mean of the two rescaled scores for each child. We then performed a series of Pearson's correlations to determine the extent to which this score was correlated to each of our future thinking tasks in both the high- and low-conflict conditions. As can be seen in Table 4, scores in the low-conflict condition of the Spoon task and scores in the high-conflict condition of the Picture Book task were significantly correlated with children's scores on the inhibitory control composite.

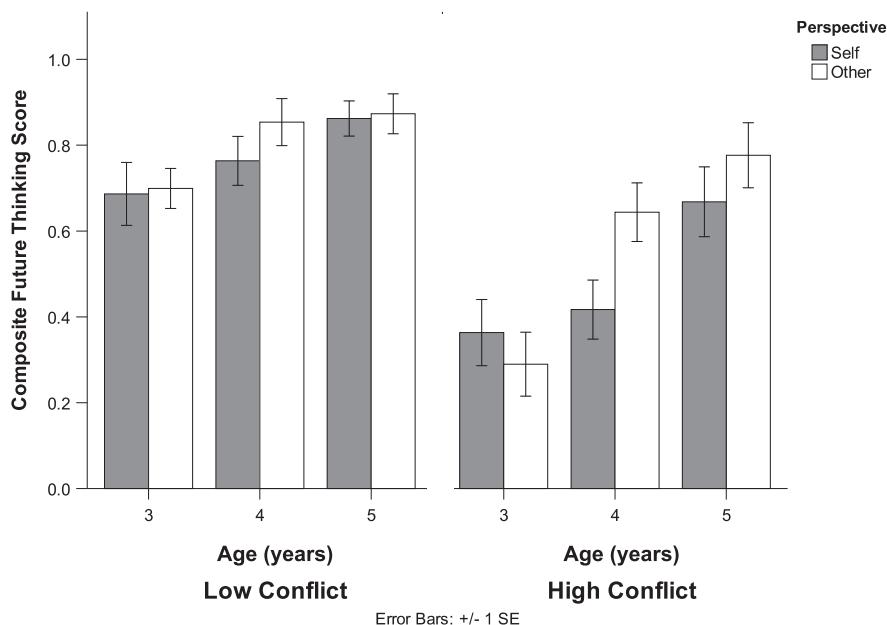


Fig. 5. Composite future thinking scores by conflict, perspective, and age.

Table 3
Future thinking tasks: Main effects and interactions.

Task	Age	Conflict	Perspective	Age × Conflict	Age × Perspective	Conflict × Perspective
Preferences	**	***	*			
Delay of Gratification		*		*		
Picture Book	***	***		**		
Spoon	**	*				
Composite	***	***				

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4
Correlations between inhibitory control and future thinking tasks (controlling for age).

Task	1	2	3	4	5
1. Inhibitory control	–	.07	.10	.25*	.05
2. Preferences	.03	–	.15	.33**	.04
3. Delay of Gratification	-.24	.03	–	.03	-.14
4. Picture Book	.13	.14	-.20	–	.21
5. Spoon	.39**	-.05	-.12	.20	–

Note. Correlations in the low-conflict condition are below the diagonal; correlations in the high-conflict condition are above the diagonal. None of the significance levels reported in the table change when self-corrections in the Sun/Moon task are assigned a score of 0 rather than 1.

* $p < .05$.

** $p < .01$.

Discussion

The goals of this study were to determine the effects of perspective, conflict, and their interaction (perspective by conflict hypothesis) on children's future-oriented reasoning. Our results showed that age and conflict significantly affected children's performance, perspective affected children's performance on the Preferences task only, and (contrary to our hypothesis) perspective and conflict did not interact. Moreover, individual differences in inhibitory control were not generally associated with children's performance on either the low- or high-conflict tasks.

Effects of age and conflict

Consistent with previous research on children's future-oriented reasoning, older children performed significantly better than younger children on all tasks except Delay Choice (i.e., DoG). This finding further underscores that tasks developed over the past 10–15 years to assess future thinking in young children capture important age-related variability. However, a novel contribution of our study was that children had more difficulty in reasoning about the future when there was present-future conflict than when there was not. This was true for all four tasks and was also true when we created a composite score that included the Preferences, Picture Book, and Spoon tasks. Moreover, for the DoG and Picture Book tasks, age and conflict interacted such that younger children had comparatively more difficulty than older children in the high-conflict condition than in the low-conflict condition.

These findings are significant in light of theories arguing that a key feature of episodic future thought is anticipating a future need that differs from (or conflicts with) a current one (e.g., Suddendorf & Corballis, 2007). In fact, the Bischof-Köhler hypothesis states that only humans (and not nonhuman animals) are capable of anticipating such future needs or drive states. Although previous empirical studies have hinted at the fact that children also have difficulty in anticipating conflicting future states (e.g., Atance & Meltzoff, 2006, Mahy, Grass, Wagner, & Kliegel, 2014), none have directly manipulated conflict within the same task. Our data show that when there was present-future conflict, children had more difficulty in setting aside their current desire (e.g., item with current utility, immediate smaller reward) to act in an adaptive future-oriented way (e.g., item with future utility, larger delayed reward). Our data also suggest that by 4 years of age, and especially by 5 years, the “pull” of the present is weaker such that children make the correct future-oriented choice regardless of whether immediately desirable options are available. Although 3-year-olds are beginning to contemplate the future, they have more difficulty in doing so when a current state conflicts with a future one and thus are influenced by the pull of the present.

This pattern of findings fits well with the notion of graded knowledge or representations (e.g., Munakata, 2001). Presumably, both the low- and high-conflict task conditions in the current study require that children have some concept or representation of the future to succeed. For example, in the low-conflict condition of the Picture Book task, each trial requires that children select the item with future utility (e.g., raincoat) as opposed to the items without future utility (i.e., blanket and spoon). This requirement also characterizes the high-conflict condition, but here children are faced with distracter items that also hold *current* utility or desirability (e.g., stickers, balloons). A key aspect of Munakata's (2001) graded knowledge account is that stronger (vs. weaker) representations may be required to resolve conflict. For adaptive or accurate future-oriented reasoning, a stronger representation might entail simultaneously representing one's current desire (e.g., stickers) and future desire (e.g., raincoat) and resolving the conflict between the two. Presumably, a more developed or stronger concept of the future allows children to recognize that although one item is currently desirable, because the task is about the *future*, the correct response is the item with future utility. In contrast, in the low-conflict condition of the task, where neither of the two distracter items is currently desirable, a weaker representation may suffice for children to select the item with future utility. Nevertheless, the fact that inhibitory control was significantly (although weakly) associated with children's performance on the high-conflict condition of the Picture Book task does not rule out that inhibition plays a role in certain tasks. Further exploring this issue continues to be an important direction for

future research in this area given the mixed findings about the role of inhibitory control and executive functioning more broadly in children's future-oriented thinking (e.g., [Hanson et al., 2014](#)).

The significant effect of conflict that we detected is important from a methodological standpoint. For example, the Picture Book task is often used by researchers to study future thinking in typically developing children (e.g., [Atance & Meltzoff, 2005](#); [Mahy et al., 2014](#)) and atypically developing children (e.g., autism spectrum disorder; [Marini et al., 2016](#)) of different ages. Our results show that in its low-conflict form, 3-, 4-, and 5-year-olds performed quite well, somewhat limiting the amount of task variability and raising concerns about ceiling effects. However, there was a drop in performance—most notably in 3-year-olds—when using the high-conflict version or condition that we developed for the current study. With this information in hand, researchers can implement a more or less difficult version of the Picture Book task as a function of their particular sample and/or research goals. This is also true of the Spoon task and clearly demonstrates that distracter items that hold immediate appeal significantly decrease children's performance.

Effect of perspective

On its own, perspective (i.e., whether children reasoned about their own future vs. another child's future) mattered less for task performance than age and conflict and had a much less uniform effect on task performance. In this respect, our data are in line with theories that argue for largely overlapping cognitive and neurophysiological processes underlying reasoning about one's own and others' perspectives (e.g., [Buckner & Carroll, 2007](#); [Hassabis & Maguire, 2007](#)). Our failure to detect a more generalized effect of perspective is also consistent with some recent work by [Bamford and Lagattuta \(2020\)](#) about the optimism bias in children from 5 to 10 years of age. In their study, children's judgments about the likelihood of positive events (e.g., having lots of fun at the playground) versus negative events (e.g., not having any fun at the playground) occurring to self or other did not differ. Like us, these authors predicted that asking about others would provide psychological distance (in this case, from the more positive or salient event, e.g., "having fun"), thereby leading to less optimism bias for others compared with self. As such, both our findings and those of [Bamford and Lagattuta \(2020\)](#) underscore the need to further explore the contexts (and ages) at which psychological distance may affect children's future-oriented reasoning. Indeed, our results are consistent with the idea that self–other differences obtain only for *certain kinds* of future-oriented decisions. Notably, children in our study performed better on the Preferences task when they reasoned about another child's perspective compared with their own—a finding that has now been replicated several times in both children (e.g., [Lee & Atance, 2016](#)) and adults (e.g., [Renoult et al., 2016](#)). In combination with our data, this suggests that children and adults alike tend to predict less change in their own preferences over time as compared with these same predictions for another person.

We did not replicate the perspective by age interaction detected in previous delay of gratification work ([Mahy et al., 2020](#); [Prencipe & Zelazo, 2005](#)), nor did we detect effects of perspective on either the Picture Book or Spoon task. With respect to the DoG task, this may be because we used different temporal distances into the future (i.e., "now or tomorrow" vs. "now or later"). In addition, our low-conflict condition might not have worked as intended; our data suggested that younger children ignored the temporal dimension of the test question (i.e., "later" vs. "tomorrow") and instead simply opted for the larger reward. With respect to the Picture Book and Spoon tasks, it may be that effects of perspective are most notable on tasks that pertain to people's future preferences, attitudes, traits, and the like because these are central to our sense of "self." Accordingly, it may be easier to envision someone else's preferences changing over time than recognizing that our own preferences will also change. Finally, we did not obtain support for our perspective by conflict hypothesis. On none of our four tasks did children perform better for other than for self in the high-conflict condition but not the low-conflict condition.

Limitations and future directions

Our clearest finding is that introducing conflict into future thinking tasks by making current alternatives or options desirable (and presumably more desirable than future ones) makes these tasks

significantly more difficult for children—especially younger children—than their “lower-conflict” counterparts. However, an important issue to address is whether the low-conflict versions of our tasks required children to think about the future at all. For example, one could argue that children passed the low-conflict version of the Picture Book task merely by associating the correct item with the scene in question. Although we cannot fully rule out this interpretation, it is important to note that we used the four trials (of a possible six trials) from Atance and Meltzoff’s (2005) original study that had the “weakest” associative links. Indeed, there is no obvious semantic association between the scene of a rocky stream and the correct item “Band-Aids” or between a mountain scene and the correct item “lunch.” Accordingly, as Atance and Meltzoff also argued about their original task version (Experiment 1), passing the low-conflict version of our task seems to require children to have some concept of the future.

One might also argue that our low-conflict version of the Preferences task could have been solved using semantic knowledge about what adults like rather than any kind of prediction of what oneself may like in the future. In fact, the same argument could be made about the high-conflict version of this task. Yet, Bélanger et al. (2014) showed that children do not appear to be simply drawing on semantic knowledge to solve this task—at least in its high-conflict version. When children in their study were asked about what adults prefer “right now,” they performed significantly better than when they were asked what they themselves would like best when they are all grown up. If children were succeeding by merely drawing on semantic knowledge, we would expect equal performance on both. This finding gives us confidence that when children in our study were asked about their future preferences in both the high- and low-conflict conditions, they were at least attempting to mentally project into the future. However, we cannot fully rule out the argument that our low-conflict task versions did not require children to consider the future to the same extent as their high-conflict counterparts. In future work, it will be critical to further refine this methodological approach to ensure that both versions require equal consideration of the future while varying only the extent to which current and future states conflict. Yet, as we noted earlier, the extent of this conflict may be central to genuine foresight (Suddendorf & Corballis, 2007) and thus difficult to fully isolate from it.

Although order effects precluded us from adopting a more powerful within-participants design, our between-participants analyses were sufficiently powered to detect at least a medium effect of a perspective by conflict interaction. Yet, we did not detect such an effect. It is possible that the way in which conflict is defined or created within a given task affects the extent to which children (and adults) reason more or less adaptively depending on whether they are considering themselves versus others. For example, when adults are presented with emotionally laden (i.e., “high-conflict”) scenarios, they tend to reason more wisely when they consider the scenario from another person’s perspective as compared with their own perspective (e.g., Grossman, 2017). To our knowledge, these higher-conflict scenarios have not been directly compared with lower-conflict versions but nonetheless suggest that reasoning about other leads to “wiser” reasoning. Moving forward with developmental work, this suggests that the type of reasoning task and the way in which conflict is induced may be critical in detecting interactive effects of perspective and conflict.

Conclusion

Our work clearly shows that when current and future states conflict, young children’s future-oriented reasoning is negatively affected. In contrast, asking children to reason about another child’s perspective leads to performance advantages only in certain kinds of future thinking tasks and does not appear to interact with present–future conflict (i.e., perspective by conflict hypothesis). Future work should continue to identify the contexts that help (and hinder) children’s future-oriented decision making because doing so is critical to fostering wise reasoning and healthy development.

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