

Research Report

Preschoolers' Current Desires Warp Their Choices for the Future

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ABSTRACT—We introduce a new paradigm to assess how children's choices for the future are influenced by their current desires. Forty-eight 3-, 4-, and 5-year-olds were assigned to one of four conditions. In two of these conditions (intervention), we manipulated children's current state of thirst by allowing them to eat pretzels. In the remaining two conditions (baseline), we did not give them pretzels. The children were then asked to choose between water and pretzels. In one intervention and one baseline condition, they chose what they would like "now," whereas in the other intervention and baseline conditions, they chose what they would like "tomorrow." Results revealed that, despite children's overwhelming desire for pretzels in the baseline conditions, children in both intervention conditions chose water. The data support the notion that children's current state influences not only their choices for the present, but also their choices for the future. We discuss this finding in terms of both cognitive-developmental and adult social-cognitive theory.

Making adaptive choices for the future often requires "suspending" thought about one's current state to imagine how one will feel at a subsequent point in time. This is particularly true when predicting a future desire state. Predicting what one will desire in the future may be influenced by—or in fact even conflict with—what one desires now. A striking example of such a situation is grocery shopping on an empty stomach. Research by Nisbett and Kanouse (1969) and by Gilbert, Gill, and Wilson (2002) confirms that the hungry individual does indeed buy more food than the sated one. The hungry grocery shopper may

fail to take into account that his or her intense current state will abate and not be felt over the course of the ensuing week when the food will be consumed (Read & van Leeuwen, 1998; Wilson & Gilbert, 2003).

A number of studies have supported the idea that adults are not always accurate when making predictions about their future states—whether future desires, emotions, or behaviors (e.g., Gilbert et al., 2002; Loewenstein, 1996; Loewenstein & Schkade, 1999; Nisbett & Kanouse, 1969; Read & van Leeuwen, 1998; Van Boven & Loewenstein, 2003; Wilson & Gilbert, 2003). The many terms that have been coined to capture this phenomenon include "empathy gaps" (Loewenstein & Schkade, 1999; Read & van Leeuwen, 1998), "presentism" (Gilbert et al., 2002), and "projection bias" (Loewenstein & Angner, 2003). What these constructs have in common is the idea that people rely too much on their current state when making predictions about the future. When the future state that they must predict differs from what they are currently feeling, they fall prey to mispredictions—as highlighted in the case of the hungry grocery shopper. Although one might think that decisions about grocery shopping are trivial, Loewenstein and Angner (2003) argued that the underlying processes that lead to misprediction at the grocery store are similar to those that cause people to mispredict about major life events, such as marriage, job changes, and divorce.

Despite the interest in adults' predictions about the future, there has been little empirical work exploring such predictions in children. Exceptions include experiments by Moore and his colleagues (Moore, Barresi, & Thompson, 1998; Thompson, Barresi, & Moore, 1997) and by Suddendorf and Busby (2005). Moore et al. (1998) modified the classic delay-of-gratification paradigm (e.g., Mischel, Shoda, & Rodriguez, 1989) to determine whether young children would forgo choosing one sticker immediately in favor of receiving two stickers later. Suddendorf and Busby (2005) tested whether young children could select an

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item in the present (in this case, a particular toy) that reflected anticipation of a future need (e.g., the need to play or avoid boredom). In both cases, older preschoolers (i.e., 4- and 5-year-olds) tended to make decisions that reflected an awareness of their future self.

In the current research, we opted for a different approach to assessing children's decisions for the future—one that more closely resembles work done in adult cognitive and social psychology. One of our main goals was to develop a new methodology that could be used with very young children, but also could be modified for use with adults. We modeled our experimental paradigm on the grocery-shopping example, but targeted thirst rather than hunger. In pilot work, we established that when presented with a choice between pretzels and water, the majority of 3- to 5-year-olds choose (i.e., desire) pretzels. Not surprisingly, however, this baseline desire can be manipulated: After eating pretzels, most preschoolers evidence thirst and thus desire water rather than pretzels. This enabled us to systematically investigate how children's current state (i.e., thirst) influences their decisions about the future.

METHOD

Participants

Participants were 48 children: sixteen 3-year-olds ($M = 41.3$ months, range = 39–43 months), sixteen 4-year-olds ($M = 53.1$ months, range = 51–57 months), and sixteen 5-year-olds ($M = 64.5$ months, range = 63–69 months). Equal numbers of girls and boys were tested. Seven additional children were not included because they ate less than 12 pretzels ($n = 5$), wanted water immediately upon arrival ($n = 1$), or were fussy ($n = 1$). Participants were predominantly White and middle-class, with English as their first language.

Materials, Design, and Procedure

Each child was randomly assigned to one of four experimental conditions and tested individually.

Intervention Conditions

In the two intervention conditions, children were seated at a table and told that it was “story time.” They were given 36 pretzel sticks (3/4 oz) and encouraged to eat as many as they wanted while the experimenter read to them. If a child did not eat at least 12 (1/4 oz) of the pretzels during a 12-min time period, his or her data were not included. Once the 12 min elapsed, the pretzels (if any remained) were removed, and the Peabody Picture Vocabulary Test-III (PPVT-III; Dunn & Dunn, 1997) was administered for 10 min. If the PPVT-III was not completed during this time, it was completed at the end of the experimental session. The children were then asked two forced-choice comprehension questions about “tomorrow.” Regardless of whether or not they responded correctly, they were given a correct explanation of “tomorrow.”

At this point in the procedure, the two intervention conditions diverged. In the *intervention-tomorrow* condition, a bag of marbles was placed on the table, and the children were told, “Let's pretend that you're going to come back here tomorrow, and we're going to play a game with these marbles. We're not going to play with the marbles *right now*; we're going to play with them *tomorrow*.” The critical *test question* was as follows: “What would you like to have for the marble game tomorrow: some pretzels to eat, or some water to drink?” Whether “pretzels” or “water” came first in this question was counterbalanced within each of the four experimental conditions. The children then indicated their desire either verbally or by pointing. Regardless of their choice, they were offered water so that we could determine whether our state manipulation had succeeded in making them thirsty.

In the *intervention-now* condition, children underwent the identical procedure as in the *intervention-tomorrow* condition except that the test question asked them to make a choice for “now.”

Baseline Conditions

The baseline conditions were identical to the intervention conditions except that the children were not given pretzels to make them thirsty. In the *baseline-tomorrow* condition, children were asked the same test question as in the *intervention-tomorrow* condition, and in the *baseline-now* condition, children were asked the same test question as in the *intervention-now* condition. These baseline conditions allowed us to assess children's spontaneous choices between water and pretzels for “now” and for “tomorrow.”

Scoring

In the intervention conditions, we obtained the following measures: (a) the number of pretzels eaten (range: 0–36), (b) the number of correct responses to the tomorrow comprehension questions (range: 0–2), (c) whether the child chose water or pretzels in response to the test question, and (d) how much water the child drank (range: 0–125 ml). The same measures, except for the first, were obtained in the baseline conditions.

Children's responses to the tomorrow comprehension questions and their choice of water or pretzels were scored independently by two coders. There were no disagreements.

RESULTS

Collapsing across the two baseline conditions revealed that children had a strong baseline preference for pretzels over water, binomial test, $p_{rep} = .98$ (see Table 1). Another demonstration of the desire for pretzels is that children in the *intervention-tomorrow* and *intervention-now* conditions freely ate a mean of 23.50 ($SD = 4.95$) and 23.17 ($SD = 8.45$) pretzels, respectively.

The principal question was whether the experimental intervention influenced children's choices. The results revealed a strong effect. As shown in Table 1, 83% (20/24) of the children in

TABLE 1
Number of Children Choosing Pretzels Versus Water and Subsequent Water Intake, by Condition

Condition	Choice (<i>n</i>)		Mean water intake (ml)
	Pretzels	Water	
Baseline-now	10	2	14.88 (20.82)
Baseline-tomorrow	10	2	21.43 (36.33)
Intervention-now	3	9	35.71 (37.25)
Intervention-tomorrow	1	11	34.23 (26.55)

Note. Standard deviations are in parentheses.

the baseline conditions desired pretzels, whereas only 17% (4/24) of the children in the intervention conditions did so, corrected $\chi^2(1, N = 48) = 18.75, p_{\text{rep}} = .99, \phi = .63$. Moreover, the crucial comparison between the baseline-tomorrow and intervention-tomorrow conditions also reached significance: Fully 11 of the 12 children in the latter condition said they would want water the next day, as compared with 2 of the 12 in the former condition, corrected $\chi^2(1, N = 24) = 10.74, p_{\text{rep}} = .99, \phi = .67$.

After the children provided their response to the test question, they were given a functional probe, namely, the opportunity to drink water. As expected, children in the intervention conditions drank more water ($M = 35.0$ ml, $SD = 31.6$ ml) than did children in the baseline conditions ($M = 18.15$ ml, $SD = 29.15$ ml), $t(46) = -1.92, p_{\text{rep}} = .88, \eta_p^2 = .074$ (see Table 1).

As expected, language scores on the PPVT-III increased with age, $F(2, 44) = 19.67, p_{\text{rep}} = .99, \eta_p^2 = .47$, and there was no difference in language scores as a function of experimental condition, $F < 1$. Children's performance on the two tomorrow comprehension questions also improved with age, $F(2, 45) = 7.34, p_{\text{rep}} = .98, \eta_p^2 = .25$. Mean correct responses for the 3-, 4-, and 5-year-olds were, respectively, 1.13 ($SD = 0.81$), 1.69 ($SD = 0.48$), and 1.88 ($SD = 0.34$). Student-Newman-Keuls comparisons indicated that both the 4- and the 5-year-olds answered these questions significantly better than the 3-year-olds, and no other age differences were significant. Chi-square analyses also revealed that only the 4- and 5-year-olds answered these questions correctly significantly more often than would be expected by chance, $\chi^2(1, N = 16) = 9.03, p_{\text{rep}} = .97$, and $\chi^2(1, N = 16) = 21.13, p_{\text{rep}} = .99$, respectively (see Table 2).

We next reanalyzed choices among the 4- and 5-year-olds only and among those children who answered both of the tomorrow comprehension questions correctly, regardless of age. The choice patterns remained virtually identical to those reported for the entire sample (see Table 3).

DISCUSSION

The results demonstrate that preschoolers' current desire (as mediated by their current state of thirst) heavily influences their predicted future desire. This finding coincides with the results of

TABLE 2
Number of Children Producing Different Numbers of Correct Responses to the Tomorrow Comprehension Questions as a Function of Age

Age	Number of correct responses		
	0	1	2
3	4	6	6
4	0	5	11
5	0	2	14

a great deal of research documenting difficulties in theory-of-mind and executive function skills during the preschool years (e.g., Carlson & Moses, 2001; Wellman, Cross, & Watson, 2001). Results in both of these areas suggest that young children would have difficulty "extending" themselves in time to make decisions about future states of mind that differ from—and even conflict with—current ones. We did not, however, detect a marked improvement between 3 and 5 years of age in our task, although such an improvement is characteristic of children's performance on executive function and theory-of-mind tasks (and on the previously used decision tasks described in the introduction). Although one possible reason for this lack of an improvement with age is that our methodology was not sensitive enough to detect developmental changes, we suggest another interpretation.

We think that when the human mind, whether preschooler or adult, is in the "throes" of a current desire, it has difficulty processing that this desire may change in the future and return to a "baseline" level. The social psychologists Read and Loewenstein (1995) have labeled this failure the *time-contraction hypothesis*. According to this hypothesis, people in certain circumstances essentially treat the future as if it were the present,

TABLE 3
Number of Children Choosing Pretzels Versus Water Among 4- and 5-Year-Olds and Among Children Who Answered Both Tomorrow Comprehension Questions Correctly

Condition	Choice	
	Pretzels	Water
4- and 5-year-olds		
Baseline-now	6	2
Baseline-tomorrow	6	2
Intervention-now	3	5
Intervention-tomorrow	1	7
Children who passed both tomorrow comprehension questions		
Baseline-now	7	2
Baseline-tomorrow	5	2
Intervention-now	2	5
Intervention-tomorrow	1	7

failing to take into account the time that will pass between their current choice and the actual time of consumption (i.e., the interconsumption interval). In the present study, the children may have failed to realize that their current thirst would subside and that, the next day, they would again desire their baseline choice, the pretzels. By this argument, whether or not one has an understanding of the concept of “tomorrow” may not be the crucial factor. Adults have a solid understanding of this concept but do not always apply it when making choices about a future desire. Similarly, our results indicate that older preschoolers have a more solid concept of “tomorrow” than younger ones do (see also Busby & Suddendorf, 2005; Harner, 1975), yet even the older children in our study were not able to override their current desire for water to consider their future desire for pretzels.

It is possible that we have tapped a human decision-making process in which the developmental differences between adults and children are not as pronounced as one might expect. Nevertheless, our hunch is that because adults have (a) more experience with how their own internal states can change over time, (b) more sophisticated perspective-taking skills (including taking the perspective of a future self), and (c) a better understanding of the future, they will show errors of misprediction to a lesser extent than children do. A related possibility is that the predictions of children and adults are most similar when these involve visceral states, but that adults show a greater advantage over children in predicting future states and plans involving “colder” cognition. We are currently exploring this possibility.

Our findings feed into a larger network of recent research supporting the idea that there is more continuity in cognitive biases from childhood to adulthood than was previously suspected (e.g., Bernstein, Atance, Loftus, & Meltzoff, 2004; Birch, 2005; Diamond & Kirkham, 2005; Keysar, Lin, & Barr, 2003; Royzman, Cassidy, & Baron, 2003). For example, both children and adults have difficulty setting aside their current knowledge when reasoning about the knowledge of a naive other or a naive prior self (Bernstein et al., 2004). It seems that another such lifelong bias is also at work when people predict their future desires in the face of conflicting current desires (cf. Loewenstein & Angner, 2003)—in other words, when people must strive to adopt the perspective of a future self. The next challenge is to determine in which specific circumstances, and to what extent, adults and children may differ in their ability to adopt the perspective of the future self. Methodologies that, like ours, can be used with both children and adults will provide a useful tool with which to meet this challenge.

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