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Intertemporal Preferences or (In)Attention to Future Costs: Identifying Factors Influencing Variation in Health Behaviors

When you have the urge to buy a fancy coffee drink at your favorite coffee place, do you think about alternative future uses of the money that you would spend on the drink? If, in the end, you decide to forego buying the drink to save money, you have, by definition, considered what you are giving up now—the drink—in order to have the money later, but many people may not consider the future opportunities they forego when they make decisions now. Research suggests that this asymmetric attention to immediate versus future opportunity costs—the benefits that we give up when we make a choice, such as the drink we don't get so that we can save money, or the thing we could have purchased in the future if we do buy the drink—is common even in decision contexts frequently used in research to study how people discount future vs. immediate benefits.

A failure to consider the future opportunity costs of immediate decisions may lead to sub-optimal choices, and may partially explain high rates of obesity, low savings rates, and other behaviors that may threaten long-term health, such as smoking or not using sunscreen. While asymmetric attention to immediate vs. future opportunity costs has been identified in decisions that are likely unfamiliar to most people, it may be much more common in decisions that people make frequently. Decisions that people make frequently often become habitual. Habitual decision-making is a (frequently subconscious) way that people conserve limited time and

cognitive resources, in contrast to decisions that involve thinking through the implications of the different options the decision-maker faces.

Economists typically think about choices that result in outcomes that occur at different time points in the context of intertemporal preferences, which captures the preferred distribution of benefits or costs across time. There is a substantial amount of research showing that people who discount the future less have better long-term outcomes in a number of areas. They are less likely to be obese, more likely to get exercise, have more money saved for retirement, etc. Of course, for a choice to represent a preference, all the outcomes need to have been considered by the decision-maker, which the research that identified asymmetric consideration of opportunity costs suggests may not occur. Recent findings that simple reminder messages can positively impact the nutritional quality of food choice and frequency of physical activity—via gym attendance—may reflect the reminder over-riding tendencies to overlook future opportunity costs. Further, a couple of recent papers examining the active consideration of health implications of food choices showed that people who thought about the future opportunity costs—that is, health—of food choices selected significantly healthier foods.

Integrating the Relationship of Intertemporal Preferences and Consideration of Future Opportunity Costs

While there is evidence both that people who discount the future less and those who think about the future opportunity costs of current choices make healthier choices, these two areas of research have not previously been combined. To address this gap, a former master's student, Olivier Tuzizere, and I integrated intertemporal preferences with attention to future opportunity costs to examine the contribution of each to the healthiness of food choices in an article that was just published in the journal, *Frontiers in Behavioral Economics*.

We gathered data from 502 respondents to an online experiment and survey on food choice. The experiment consisted of a food choice task, which was followed by a survey comprising a question about consideration of health impacts of the food options available, questions about the use of nutrition information during food choice in the experiment, an intertemporal choice task, and standard demographic questions. The food choice task incorporated elements of real-world grocery shopping experiences, including large assortments of products and the opportunity for participants to limit their consideration of food products. That is, participants could choose to view all available products or to direct their attention to a subset of products when making their product choices; the set of products they considered was documented in the survey to understand more of the choice process that yielded an ultimate product choice. Participants made choices among three product categories: cereals, bread, and crackers. Each product category featured 33 unique options.

To examine the relationship of intertemporal preferences and active consideration of health/future opportunity costs with nutritional quality, we used the nutritional rating system, Guiding Stars (<https://guidingstars.com>), to record the nutritional quality of the foods. We also looked at data about the choice process, including the use of nutrition information during choice, the set of products that people considered, and the amount of time each person spent making a food choice. In each case, we examined the relationship of intertemporal preferences and active consideration of health with the variable capturing the

elements of the choice process. Variation in the use of nutrition information and in the sets of products considered during choice can lead to qualitatively different choice environments. The amount of time spent making a choice may differentiate between habitual decision-making, which likely correlates with inattention to future opportunity costs, and active consideration of health-related opportunity costs of different food options.

Results

We find clear evidence of the importance of both intertemporal preferences and attention to opportunity costs during choice, though these two variables appear to capture different elements of choice processes. In terms of overall nutritional quality, both low discount rates and thinking about health impacts (that is, future health-related opportunity costs) are positively related to nutrition. Positive relationships between low discount rates and nutritional quality and active consideration of health and nutritional quality have both previously been found, but our findings show that they are both significant simultaneously, suggesting that they capture different factors that promote healthy choices. Interestingly, the parallel stops there.

For elements of the choice process related to consideration of products and use of nutrition information, only attention to health impacts mattered. In both cases, thinking about the health impacts of foods was related to health-promoting behaviors. People who considered the health impacts of the different foods they faced were significantly more likely to use nutrition information during choice than those who did not. Additionally, attention to health impacts was also significantly related to consideration of healthier sets of products during choice, which will necessarily lead to healthier choices. Differences in intertemporal preferences were not related significantly to either of these choices.

Finally, there is also evidence that attention to future health impacts of food choices may reflect differences in the decision-making process. People who reported paying attention to future health impacts spent significantly more time making a food choice than those who said they did not think about health, which may

reflect habitual (low time and cognitive investment) decisions versus more time and cognition-intensive processes that involve modeling the opportunity costs of choices.

Implications

The steady increase in obesity rates—and diet-related diseases—over the past 50 or more years has led to multiple policies that attempt to encourage healthier diets, including the nutrition facts panels that are required on all packaged food products sold and calorie labeling in many outlets selling prepared foods in the US. However, research has found that these policies have had little impact on food choices on average: the availability of nutrition information on food packages and calorie labeling in restaurants has not markedly changed the average nutritional quality of foods chosen.

Our findings suggest a reason that nutrition information has had limited success in improving nutritional quality of diets. In this study, people were significantly more likely to look at nutrition information, which promotes healthier choices, during the choice process if they considered the health-related opportunity costs of the food options they faced. Thus, it may not be enough to provide objective information; getting people to think about health while making choices may be necessary.

A positive implication of these findings is that there appears to be more opportunities to intervene in the decision process to promote healthier choices. Variation in attention to the health impacts of food choices provided the most consistent differentiation in health-related behaviors and choice outcomes. While intertemporal preferences are difficult to change, attention can be recruited to a particular choice aspect via simple methods, such as primes or prompts, which may lead to goal activation or attention to future opportunity costs (in addition to immediate opportunity costs). In real-world settings, reminder emails have been shown to increase gym attendance, with effects extending beyond the end of the email intervention. Research in brick-and-mortar supermarkets suggests that the use of primes or simple reminder/prompt messages can promote healthier food choices in real-world settings. Exposure to questions about overdraft fees on a survey about personal finances

led to a marked decrease in the probability that the individual suffered a subsequent overdraft event, with these effects being more pronounced and longer lasting the more questions about overdraft fees the respondent was exposed to.

Recent work using a computer interface to document choice process variables shows that the impact of these methods acts through multiple channels: shifting attention to healthier products, increasing the use of nutrition information (Arslain et al., 2021), and—perhaps most fundamentally—increasing consideration of differences in health-related opportunity costs of foods (Gustafson, 2022). Our results—using data on choice scenario-specific consideration—and those of Gustafson (2022) suggest a promising approach that permits intervening in food choices by eliciting instantaneous health consideration.

Our results suggest that attention to future opportunity costs is an important driver of the selection of healthier foods, which may present a chance to create targeted interventions. Our findings suggest two important factors underpinning decisions that promote long-term well-being. For one, individuals must value the future highly enough to forego immediate benefits, in order to obtain future benefits. Next, people must think about the future—including the future opportunity costs of current choice options—when making decisions.

Further Reading:

Arslain, Kristina, Christopher R. Gustafson, and Devin J. Rose. "The effect of health prompts on product consideration, attention to information, and choice in large, online product assortments: The case of fiber." *Food Quality and Preference* 94 (2021): 104329.

Gustafson, Christopher R. "Active consideration of future health can be prompted by simple health messages and improves nutritional quality of food choices." *Frontiers in Nutrition* 9 (2022): 926643.

Tuyizere, Olivier, and Christopher R. Gustafson. "The relationship of active consideration of health outcomes and intertemporal preferences to choice process variables and nutrition: Evidence from an experiment on food choice." *Frontiers in Behavioral Economics* 2 (2023): 1219281.

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