

Food and Finance: The Relationship Between Nutritional and Financial Knowledge in Intertemporal Preferences

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Extended Abstract

This study analyzes the relationship between financial discount rates (or patience for monetary payouts) and food-related self-control with high school students attending a Native American school in South Dakota. Previous studies have suggested that demographic characteristics and socioeconomic factors have strong impacts on individuals' food choice and dietary behaviors (Kim, Struempfer, & Parmer 2011; Molaison, Connell, Stuff, Yadrick, & Bogle 2005; Tucker, Spiro, & Weiss 1995; Wenrich, Brown, Miller-Day, Kelly, & Lengerich 2010). Compared to the general population of the United States, minorities—and Native Americans in particular—have lower incomes and higher rates of overweight/obesity and concomitant health problems on average. While some authors have assumed that time preferences differ by domain (e.g., Richards & Hamilton 2012), we posit that common cognitive mechanisms or other individual-specific factors may underpin consumer behavior in both finance and nutrition. Theory suggests that financial literacy should support individuals in their financial management; Agnew and Szykman (2005) tested people's financial knowledge and found that those who were more knowledgeable were more likely to actively make portfolio choices (opting out of a default) and were less likely to report feeling overwhelmed than were low knowledge participants in a hypothetical choice scenario. More knowledgeable people should also be aware of possible consequences of different intertemporal consumption options, including higher rates of foregoing current consumption to save for future needs. In many ways, the mechanisms that regulate an individual's nutritional choices and the awareness of possible health consequences function in a similar manner. People's food choices involve a trade-off between immediate convenience and pleasure for delayed benefits, such as better health in the future. Discovering fundamental yet malleable characteristics of individuals that relate to a greater understanding of these tradeoffs could yield novel approaches to encourage choices that promote better intertemporal decision-making.

Our research strategy combines measures of real intertemporal financial choice with food choices in a panel data structure and an education intervention. We collected measures of financial literacy from each student participating in the research, enabling us to correlate knowledge of the trade-offs and issues comprising financial management with students' willingness to trade immediate for future benefits in both financial and food settings. We also administered a survey on nutrition knowledge to elucidate how much students know about the relationship between food choice and health. Finally, we introduced an intervention to increase understanding about the intertemporal implications of financial and food choices. Measures of financial and food choices were collected before and after the intervention to examine the effect of education on promoting decisions being made over an increased time horizon.

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Hypotheses

1. There is a positive correlation between financial and nutritional behavior about time-preferences. A larger preference for immediate financial benefits is positively correlated with an increased preference for immediate food-related pleasure/convenience, represented by less healthy food choices.
2. Financial literacy and time preference are correlated.
3. Increased financial literacy will lead to greater consideration of future states, which will be reflected in lower discount rates, and healthier food choices

Methodology

We conducted four experimental studies between November-December, 2013 (once per week). We invited 12 to 20 students (aged between 16 and 18 years) from Flandreau Indian School to the South Dakota State University Food Lab to participate in an "Iron Chef"-style cooking competition and dinner gathering. Two financial literacy education sessions were given in the second and third weeks.

Students were divided into 4 to 5 subgroups (students were allowed to self-select into groups) and guided by two lab assistants to participate in the cooking competition. After the cooking competition, students were invited to the diner to eat dinner together. The dinner menu offered three options ranging from a very unhealthy, but also very delicious option (e.g., deep fried chicken with butter and gravy) to a very healthy option (e.g., grilled chicken without butter and gravy). Students were allowed to choose one of the three options, along with drinks and desserts. Meanwhile, lab assistants unobtrusively noted students' food choices to avoid influencing current consumption or future choices.

The researchers administered a survey on financial knowledge to elucidate how much students knew about the relationship between food choice and health.

At the end of each laboratory experiment, participants received a cash reward ranging from \$10 to \$15. Participants were asked to answer five questions regarding their choice of receiving \$10 immediately or a higher amount of reward (ranging from \$11 to \$15) one week later. The researchers then used a random number generator to select one of the five questions and rewarded student based on the options they chose from the question. This experimental design enabled us to estimate students' time preference.

Results and Discussion

Peer Influence

Our data indicated that peer influence is an important factor in students' food choice. Students who belonged to the same subgroups showed very similar food choice and time preference, along with their choice of dessert and drink. Other variables such as gender, age, and tribe origins were not obviously important in food decisions.

Financial Literacy

We calculated the numbers of correct answers from five financial literacy questions ($M = 1.9$, $N = 20$) and studied the correlation between students' financial literacy and their choice of food. In week 1, data indicate a negative correlation between financial literacy and unhealthy food choice (-0.107). Interestingly, the correlation between initial financial literacy and unhealthy food choice became -0.293 in week 3, indicating an improvement of food choice via either cooking experience or the exposure to additional financial education.

Time Preference

Students who gave more correct answers for the questions related to financial literacy showed a small decrease in the discount rate from week 1 to week 2. We also found a slight increase in the discount rate for the same participants from week 2 to week 3, possibly resulting from the financial literacy education sessions, or simply a stronger bond (trust) between researchers and the study participants.

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