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Impact of Time Pressure on Healthfulness of Dietary Decisions: Evidence from a Lab Experiment

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Introduction

- Time pressure has driven shifts in eating habits towards more fast food and convenience food consumption, increasing rates of obesity and lifestyle-related chronic diseases such as diabetes and cancer.ⁱ
- Consumers' time constraints significantly influence Americans' dietary choices, with a notable correlation: **Time constraints and time pressure are strongly linked to poorer diet quality.**ⁱⁱ
- Scanner data, which include details on food choices and factors affecting opportunity cost of time, can explain parts of the correlation. Yet **time pressure may cause stress beyond mere time constraintsⁱⁱⁱ that is not captured in scanner data analysis but can be controlled in laboratory experiments**, which provide an opportunity for testing behavioral mechanisms.

Objective and Research Questions

- Objective:** Investigate behavioral impacts of time pressure on healthfulness of food choices.
- Research Questions:**
 - Q1. Does time pressure during decision-making lead to less healthy food choices?**
 - Q2. Do consumers choose less healthy food when they anticipate time pressure during consumption?**

Policy Implications

- The government is actively formulating diverse policies aimed at addressing health challenges caused by time pressure in modern society.
- By recognizing and accounting for the varying impact of time pressure on different types of food choices, policymakers can devise more targeted and effective strategies to improve public health outcomes.

Experimental Design Overview

- Participants were informed that they would receive **one food item and one beverage** to consume during the experiment.
- Ten **healthy vs unhealthy snack option pairs** were provided and participants selected one product for each of the ten pairs.
- Participants received the food item and the beverage of their choice in two predetermined snack pairs.

Period	June to November 2023
Place	Laboratory for Economics, Management and Auctions (LEMA) at Penn State University
Participants	N=399 (134 sessions) from Centre County, PA
Rewards	Maximum Rewards: \$40.00 + \$2.00 Parking Fee <ul style="list-style-type: none"> Participation Fee: \$20.00 Incentive: Maximum \$20.00

Treatments and Products

- Treatment 1: Time pressure on selection** of one product in each pair (ten pairs in total)
Control: No time limit Treated: Within 3 seconds for each pair
- Treatment 2: Time pressure on consumption** of one food item and one beverage of choice
Control: 20 minutes Treated1: 20 minutes while being asked to perform arithmetic and typing tasks
Treated2: 3 minutes

Table 1. Products — Healthy vs Unhealthy Snack Option Pairs

	Healthy Option	Unhealthy Option
Food Item	Baked Potato Chips	Regular Potato Chips
	94% Fat-Free Butter Flavor Popcorn	Extra Butter Flavor Popcorn
	Whole Grain Wheat Crackers	Crackers
	Oats & Chocolate Bar	Chocolate Candy Bar
	Banana (1 NLEA serving)	Banana Muffin
	No Sugar Added Diced Peach Cup	Diced Peach Cup
Beverage	Fat-Free Peach Yogurt	Peach Yogurt
	Purified Water	Sweetened Iced Tea
	Zero Sugar Lemonade Flavor Drink	Lemonade Pop Soda
	Zero Sugar Sport Drink	Regular Sport Drink

Estimation Model

- Random Effect Logistic Model

$$Y_{ij} = \alpha_0 + \alpha_1 Pressure_Select_i + \alpha_2 Pressure_Consume_i + \alpha_3 Pressure_Select_i Pressure_Consume_i + \alpha_4 Order_j + X_i + \epsilon_{ij}$$

Y_{ij} : Indicator variable whether individual i made healthy choice in snack option pair j
 $Pressure_Select_i$: Dummy variable for *time pressure on selection* treatment (1=treated)
 $Pressure_Consume_i$: Vector of dummy variables for *time pressure on consumption* treatments (1=treated)
 $Order_j$: Order in which snack option pair j was shown
 X_i : Random effect of individual i
 ϵ_{ij} : Idiosyncratic error term

Data

- Figure 1 shows a histogram of the number of healthy choices each individual made. 21 participants selected healthy options for all pairs and 63 participants selected healthy options for half of the pairs. 2 participants selected unhealthy options for all pairs.
- Figure 2 shows the time spent on each selection and Figure 3 shows the average achievement rates of the tasks for the treated group who received *time pressure on consumption* treatment with tasks. The treated spent less time on the selection compared to the control and most of the treated diligently performed the given tasks.

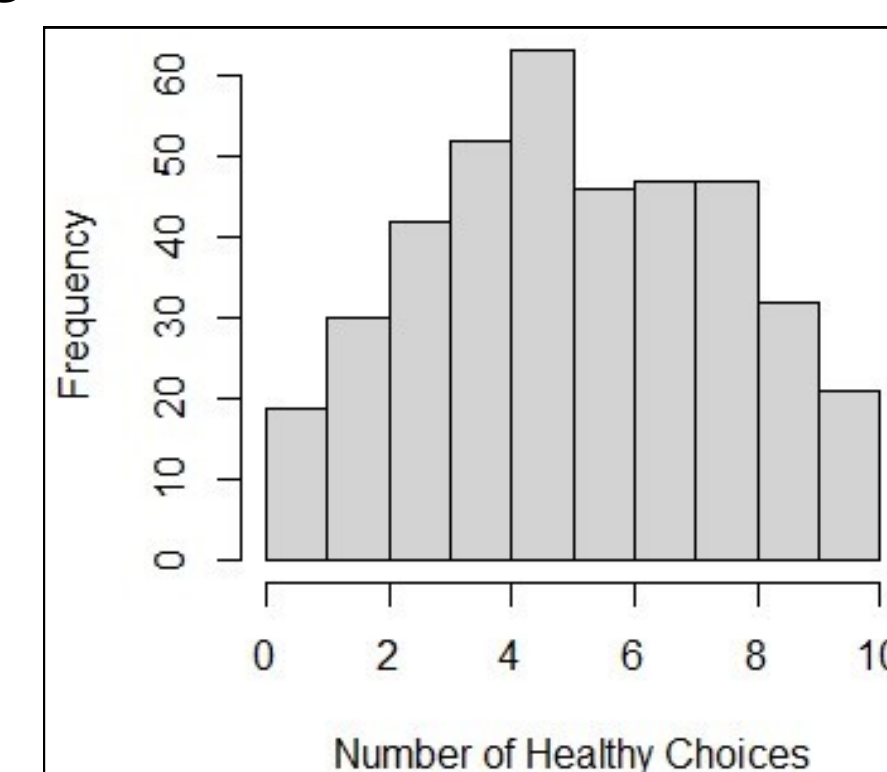


Figure 1

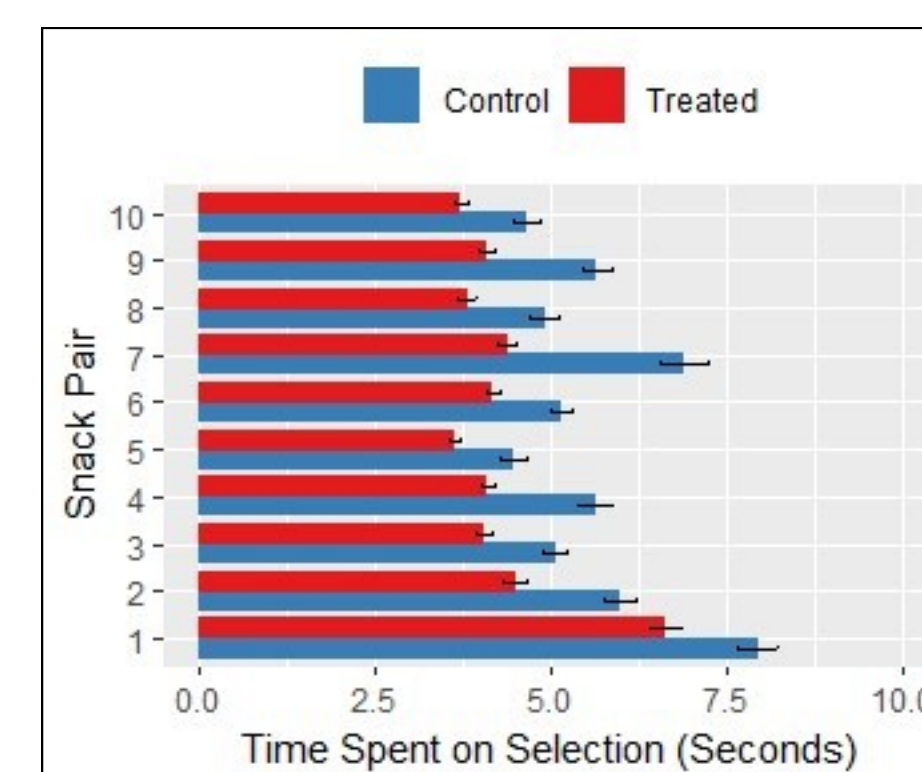


Figure 2

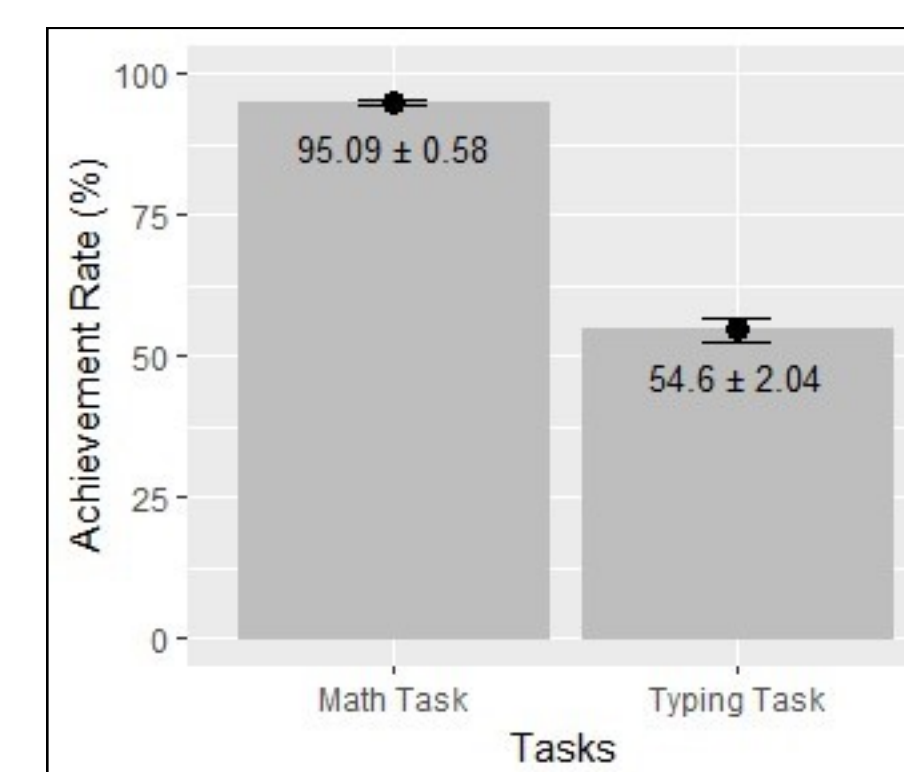


Figure 3

Results

- Most of our treatments are not statistically significant. For sweet products, when people have *time pressure on consumption with tasks*, the probability of choosing healthy options increases.

Table 2. Random Effect Logistic Model Regression Results

	Dependent Variable: Whether the healthy option was selected (binary)							
	All		Savory		Sweet		Beverage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pressure_Select	-0.171	-0.112	-0.228	-0.168	0.054	0.129	-0.431	-0.396
Pressure_Consume w/ Tasks	0.312	0.303	0.112	0.094	0.399*	0.403*	0.332	0.325
Pressure_Consume w/o Tasks	0.013	0.081	-0.049	-0.028	0.155	0.272	-0.123	-0.073
Pressure_Select*Pressure-Consume w/ Tasks	0.119	0.079	0.047	0.009	-0.129	-0.183	0.561	0.541
Pressure_Select*Pressure-Consume w/o Tasks	-0.181	-0.230	-0.220	-0.206	-0.180	-0.300	-0.106	-0.135
Order	-0.350***	-0.350***	-0.153**	-0.153**	-0.315***	-0.315***	-0.602***	-0.602***
Sweet (1=Sweet Snack Option Pairs)	1.869***	1.868***	-	-	-	-	-	-
Beverage (1=Beverage Snack Option Pairs)	2.982***	2.981***	-	-	-	-	-	-
Constant	0.539***	-0.453	0.284	-0.869**	2.028***	1.022**	5.893***	5.225***
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3,990	3,990	1,197	1,197	1,596	1,596	1,197	1,197

*p<0.1; **p<0.05; ***p<0.01

- Within each category (savory, sweet, and beverage), healthy options are less chosen as time goes by.
- However, people tend to choose healthier options for sweet products compared to savory products, and for beverages compared to sweet products.

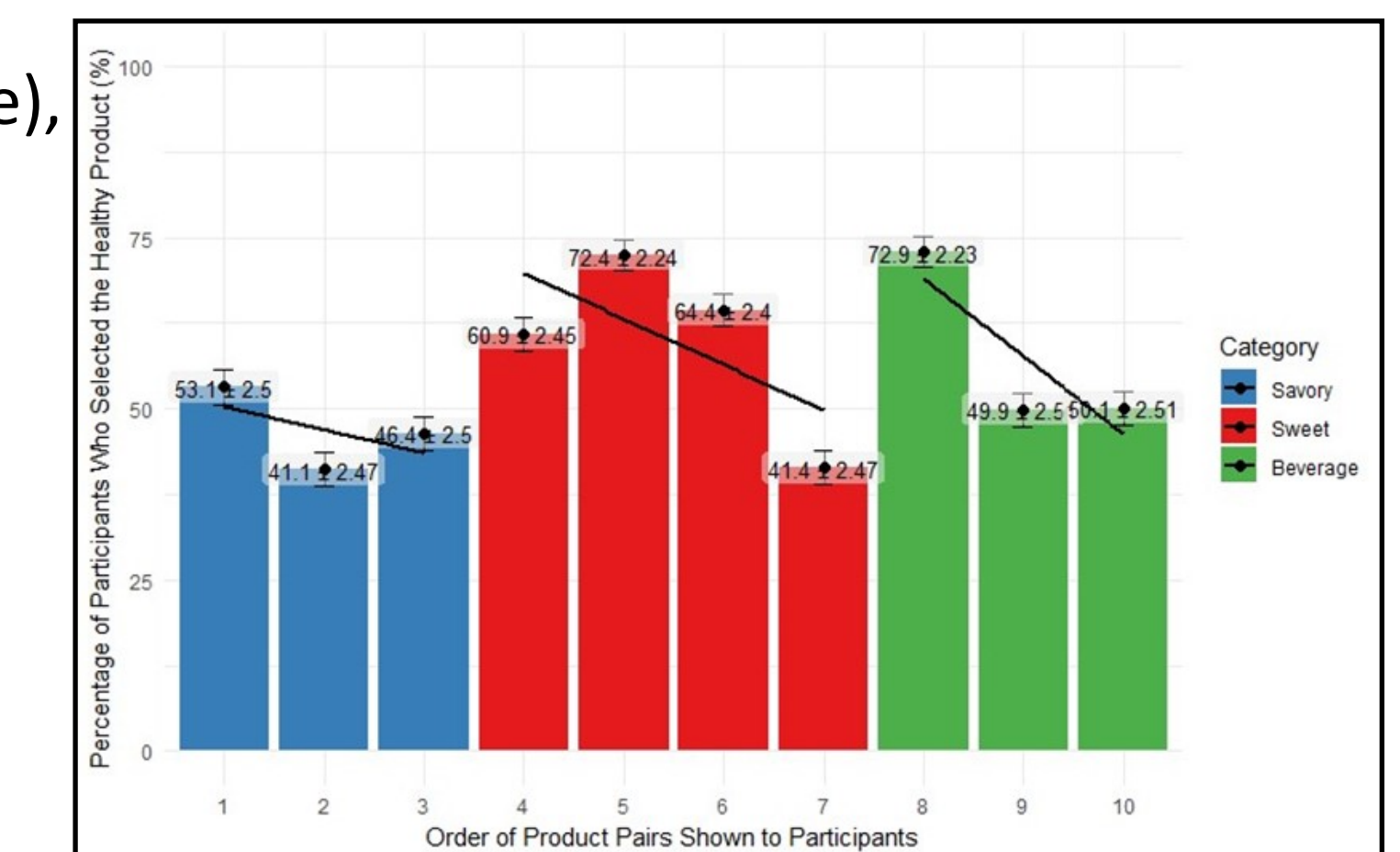


Figure 4

Conclusion

- Answers to the Research Questions:**
 - A1. Time pressure during decision-making does not always lead to less healthy food choices.**
 - A2. Consumers may choose healthier food when they anticipate time pressure during consumption due to multitasking, rather than simply a lack of time.**
- Consumer behavior varies across food categories, necessitating detailed analysis rather than aggregating all foods.
- As people make multiple decisions, they appear to become less conscious over time and tend to choose unhealthy options.

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