Information-Consumption Substitutes
Outline of Analysis

1 Brief Introduction

This study tests the idea that current consumption is a substitute for information about aversive future events. That is, the more we enjoy the present the less willing we are to learn about negative future experiences. We also hypothesize that receiving information about aversive future events decreases the demand for immediate pleasurable consumption. We propose to run two separate experiments focused on these two different by related questions, using ice cream as the immediate consumption and the chance of mildly painful electric shocks as the aversive future event.

2 Study Design

2.1 Interventions

2.1.1 Experiment 1

Experiment1 investigates the effect of current consumption on the demand for information about a potentially negative outcome. The information is a signal that is correlated with the outcome. The current consumption is ice-cream or no ice cream. Subjects are randomly assigned into one of two groups: the treatment group (receiving ice-cream) and the control group (no ice cream). Subjects are asked to choose whether to receive information about the possible shocks.

Timeline of experiment 1

Randomization	
Control: No Food	**Treatment: Ice Cream**
Shock calibration.	
Instructions	
Ice cream ranking	
Nothing	They get ice cream sundae. Can't eat it yet.
Room choice: • Room A: No information • Room B: Envelope. Once the waiting period starts, they will be asked to reveal the card in the envelope. It will then be posted on the monitor for the duration of the waiting period. The card has clue that is 90% accurate, indicating whether the person will be shocked or not.	
Room assignment is random but more likely to get the room that was chosen. 60% chance to get chosen room, 40% chance to get other room.	
BDM shock block	
Reveal card in the envelope if the person is in Room B.	
Waiting period. (Eat ice cream in treatment condition.)	
Exit Survey	
50% chance of electric shocks Receive shock block or not.	

2.1.2 Experiment 2

Experiment2 investigates the effect of aversive salient information on consumption. Subjects are randomly assigned to the control group with no information or the treatment group with information. The procedures of these two groups are identical, except that the information group gets a clue about the possibility of future shocks. We then wish to observe how this salient information affects the demand for full information, ice cream, distractors, and a shock block.

Timeline of experiment 2

<table>
<tr><td colspan="2">Randomization</td></tr>
<tr><td>Control: No Information</td><td>Treatment: Information</td></tr>
<tr><td colspan="2">Shock calibration.</td></tr>
<tr><td colspan="2">Instructions</td></tr>
<tr><td>Nothing</td><td>Envelope. Once the waiting period starts, they will be asked to reveal the card in the envelope. It will then be posted on the monitor for the duration of the waiting period. The card has clue that is 90% accurate, indicating whether the person will be shocked or not.</td></tr>
<tr><td colspan="2">BDM for
• Full Info
• Ice cream
• Access to game apps on a tablet
• Shock block
(Only receive one item during the waiting period.)</td></tr>
<tr><td>No info</td><td>Reveal the card in the envelope.</td></tr>
<tr><td colspan="2">Waiting period. (Receive the item depending on choice and chance.)</td></tr>
<tr><td colspan="2">Exit Survey</td></tr>
<tr><td colspan="2">50% chance of electric shocks
Receive shock blocks or not.</td></tr>
</table>

2.2 Power Analysis

2.2.1 Experiment 1

In a preliminary power analysis, we propose to use a two-sample proportion test, which focuses on the difference between the treatment group and the control group in proportions of subjects choosing the room with information. When determining the minimum detectable effect that yields a statistically significant result for target sample size of 60 for each independent group, we set the significance level and power by default at 0.05 (two-sided) and 0.80 respectively. Considering a preference for sooner information, we specify the proportion in control group choosing room with information 0.85 consistent with that found in Falk and Zimmerman (2016). We hypothesize that current consumption increases information avoidance. The Stata command "power twoproportions" in a Chi-squared test generates a smallest detectable difference of -0.2225, corresponding to a proportion of treatment group of 0.6275. The effect size we have in mind is expected to be larger than this, perhaps closer to 30 percentage points. In truth, there is little evidence to ground our subjective beliefs. We won't know until we try.

2.2.2 Experiment 2

In a basic power analysis, we aim to investigate the differences of WTPs between the treatment group (with reminder) and the control group (no reminder). Again, when conducting a t-test of the means of WTPs in the control and the treatment, we are interested in determining the smallest statistically significant effect and the corresponding treatment group mean, when we prespecify the power level and sample size. Additionally, we have to arbitrarily specify the control group mean. For instance, if we set the WTP for full information in the control group as \$0.40 with a standard deviations in the control and treatment groups as 0.3 and 0.4, we will find the corresponding WTP in the treatment to be \$0.58, with the minimum detectable effect size of \$0.18, given a default significance level at 0.05 and power level at 0.80. We expect effects substantially larger than this.

2.3 Allocation to Treatments

Whether the subject will be assigned to treatment group will be decided by a randomizer generated by Qualtrics prior to the commencement of each session.

3 Main Hypotheses

Hypothesis 1: *Current consumption increases information avoidance.* **In experiment 1**, a lower proportion of subjects in the treatment group, compared to that in the control group, will choose Room B with information about whether they will get shocked.

Hypothesis 2: *The presence of a reminder of possible shocks is hypothesized to affect subjects' valuation towards imminent consumption.* Specifically, **in experiment 2**, the group with the envelope containing information will exhibit higher Willingness-to-pay (WTPs) for full information, distracters like game apps, and the shock block, while the WTP for food consumption is uncertain.

4 Data and Variables

Individual-level data will be collected from recruitment procedure and lab experiment sessions through Qualtrics survey. The population will be drawn from registered volunteers with the Center for Neuroeconomic Studies (CNS). We will select those volunteers who are currently students and who are at least 18 years of age.

4.1 Data Structure

4.1.1 Experiment 1

a. Qualtrics data collected from Recruitment

1) Gender
2) Age

b. Qualtrics data collected during experiment

1) Session hour
2) Self-reported level of hunger (scale 1-7)
3) Choice of preferred flavors of ice-cream (up to 3 among 5 flavors)
4) Choice of Room (With or without information)

5) Valuation for avoiding electric shocks
6) View towards room choices
7) Frequency of thinking about the shocks
8) Time preference (Discount factor and present bias)

4.1.2 Experiment 2

a. Qualtrics data collected from Recruitment

1) Gender
2) Age

b. Qualtrics data collected during experiment

1) Session hour
2) Valuation of Full Info
3) Valuation of Ice cream
4) Valuation of Access to game apps on a tablet
5) Valuation of Shock block
6) Frequency of thinking about the shocks (before and during waiting period)
7) Time preference (Discount factor and present bias)
   A time-staircase procedure is adapted to elicit time preferences for each participant.
8) Fear of electric shocks (scale 1-5)

4.2 Variables

4.1.1 Experiment 1

a. Outcomes

1) Main Outcome – Room Choice:
   We will look at and compare the percentage of subjects receiving information in both treatment group and control group.
2) Valuation for avoiding electric shocks:
   We will measure the valuation of subjects in both groups for a particular item "Shock Block" which guarantees the subject not to get shocked, using the Becker-DeGroot-Marschack (BDM) procedure. Each increment indicates $0.5 increase in the valuation towards avoiding electric shocks.

b. Regressors

1) Treatment (Receive ice-cream vs. Not receive ice-cream):
   A dummy variable with treatment group which receives ice-cream being 1.
2) Session hour
3) Level of hunger
4) Gender
5) Age

4.1.2 Experiment 2

a. Main Outcomes

1) WTP for item "Get Information":
   We will measure the valuation of subjects in both groups for "Get Information", using the Becker-DeGroot-Marschack (BDM) procedure. Each increment indicates $0.1 increase in the valuation towards getting the accurate information as to whether the subject will be shocked.
2) WTP for item "Shock Block":

Each increment indicates $0.5 increase in the valuation towards avoiding electric shocks.

3) WTP for item "Game Apps":
   Each increment indicates $0.1 increase in the valuation towards distractors during waiting period.
4) WTP for item "Ice-Cream" (for each flavor):
   Each increment indicates $0.25 increase in the valuation towards a specific flavor of ice-cream to be received during waiting period.

b. Main Regressor

1) Consumption Assignment:
   Control group gets no ice cream, treatment group gets ice cream.
2) Information/room Assignment:
   Control gets no information, treatment gets information.

c. Control Variables

1) Eat when nervous?
2) Fear of shocks

5 Methodology

5.1 Descriptive summary statistics

5.2 Main Regressions

Here we list the regressions that we will run to test for our main hypotheses once the data are available.

Hypothesis 1

In Experiment 1, we are interested in detecting the effect of current consumption (ice-cream) on subjects' preference for future information. In the main regression analysis, we aim to see whether we can reject the null-hypothesis that both groups are equally likely to choose the room with information.

The main test will be a propotions test between the two conditions.

We will also test the effect of the ice cream and room assignment on the WTP for the shock block. We hypothesize that the shock block will have a higher WTP in the the room with information.

We can estimate a counterfactual WTPs for the shock block as if everyone got their preferred information/rooms and then use that to compare the effect of ice cream on WTP.

5.3.2 Hypothesis 2

In Experiment 2, we aim to detect the effect of the presence of salient information about possible shocks on subjects' valuation towards imminent consumption for each item.
We conduct a t-test for the WTP of each item by condition. For ice cream, we plan to average all flavors together to get an average ice cream WTP. This should reduce measurement error.

5.3 Heterogeneous treatment effects

We will also carry out subgroup analyses and test for heterogenous effects:

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 T_i \times \text{interaction variable} + u_i$$

Where the interaction variable is "Eat when nervous?", fear of shocks

5.4 Potential Adjustments for non-compliance

Subjects are free to leave the experiment at any point during each session. Any subject that has not finished the experiment will be excluded from our analysis.