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 but 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 Experiment

Experiment 1 investigates the effect of current consumption on the demand for information about a potentially negative outcome. The outcome is electric shocks or no electric shocks. The information is a coin flip result as to whether the subject will be shocked at the end of the experiment (coin flipped heads) or not (coin flipped tails). Subjects are presented with a slice of bread and an ice-cream platter sequentially. With each food item before them, subjects are asked to choose the timing to know the coin flip result.

Timeline of experiment 1

<table>
<tr><td colspan="3">Demo Shock</td></tr>
<tr><td colspan="3">Instructions</td></tr>
<tr><td rowspan="3">Information choice with bread</td><td>Presented with a slice of bread</td><td rowspan="6">The order of food items presented is randomly decided by the computer.</td></tr>
<tr><td>Information choice among:
Receive the information during the Eating Period;
Receive the information after the Eating Period;
Let the computer decide and receive $0.50.</td></tr>
<tr><td>Take away food item</td></tr>
<tr><td rowspan="3">Information choice with ice-cream</td><td>Presented with an ice-cream platter</td></tr>
<tr><td>Information choice among:
Receive the information during the Eating Period;
Receive the information after the Eating Period;
Let the computer decide and receive $0.50.</td></tr>
<tr><td>Take away food item</td></tr>
<tr><td colspan="3">Instructions for Multiple Price Lists</td></tr>
</table>

BDM for a pen
Food item (ice-cream or bread) selected by computer and presented to subjects
BDM Shock Block.
Eating Period (Information revealed during or at the end of this period).
Exit survey
50% chance of electric shocks Receive shock block or not.

2.2 Power Analysis

In a preliminary power analysis with our within-subject design, which focuses on the difference in percentage of subjects choosing to delay receiving information between the ice-cream condition and the bread condition, we need much smaller sample size to achieve the same power than a between-subject design. When determining the minimum detectable effect that yields a statistically significant result for target sample size of 65-80, we set the significance level and power by default at 0.01 (one-sided) and 0.80 respectively. We specify the proportion in bread condition choosing later information as 0.18, a number drawn from our pilot survey online. This number is also consistent with consistent with that found in Falk and Zimmerman (2016), finding that subjects generally prefer sooner information. We hypothesize that current consumption increases information avoidance, and thus increases preference for later information. The Stata command "power oneproportion" generates a smallest detectable difference of 0.1551-0.1726. The effect size we have in mind is expected to be larger than this, perhaps closer to 30 percentage points, based on our preliminary pilot survey, which found the effect to be 35 percentage points. In truth, there is little evidence to ground our subjective beliefs.

For the between-subject analysis, which studies whether ice-cream increases the value of the Shock Block, we need larger sample size to be powered enough to detect a valuation difference. We decide to increase the sample size from 80 to 120, which gives rise to minimum detectable effect at around $1.60.

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 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.

3.1 Data Structure

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) Self-reported scariness of electric shocks
4) Order of food item presented
5) Choice of timing to know the coin flip result in bread condition
6) Choice of timing to know the coin flip result in ice cream condition
7) Food item received
8) Valuation for avoiding electric shocks
9) Eat more or less when nervous
10) Frequency of thinking about the shocks during the instructions and while making decisions
11) Frequency of thinking about the shocks during the eating period
12) How appetizing the bread/ ice cream is
13) Time preference (Discount factor and present bias)

4 Main Hypotheses

1. *Current consumption increases information avoidance.* Ice-cream increases the probability of delay in receiving information about the coin flip compared to the bread condition.
    a. Paired proportions test on information delay by treatment
    b. Regression (OLS / ordered logit / logit) information delay on ice-cream condition controlling for variables: session hour, hunger, scariness of shocks, order, eat when nervous, frequency of shocks during the instructions, frequency of shocks and individual fixed effects.
2. *Current consumption increases the benefit of eliminating future threat.* Ice cream increases the valuation to avoid electric shocks.
    a. Unpaired t-test of means of the value of shock block by treatment (this is likely to be underpowered due to the high variance of the valuations).
    b. Regression on value of shock block controlling for variables session hour, hunger, scariness of shocks, order, eat when nervous, frequency of shocks during the instructions, frequency of shocks and individual fixed effects (preferred analysis esp with scariness of shock as a control; we expect ice cream to increase shock block value controlling for shock scariness as the presence of possible shock detracts from enjoying ice cream).

Additional Hypotheses

3. Hypothesis 1 will be reversed for those who eat more when nervous.
    a. In regression, interacting "eat when nervous" with ice cream condition should yield a negative coefficient and the sum of that coefficient with the coefficient on ice cream condition will also be negative.
4. Hypothesis 1 effect will be mitigated for those who do not find the shock scary.
    a. In regression, interacting shock scariness with ice cream condition should yield a positive coefficient.
5. Those who get the information during the Eating Period will think about the shocks more during the eating period.
    a. Positive correlation
6. Those who think about the shocks more during the instructions and choices will want information sooner.
    a. Positive correlation
7. Hypothesis 1 effect will be mitigated for those who don't find the ice cream appetizing.
    a. In regression, interacting "ice cream-appetizing" with ice cream condition should yield a positive coefficient.
    b. Alternative to (a) above, use difference between "ice cream-appetizing" and "bread-appetizing".
8. More present biased and lower discount factor people will delay information more.
    a. Regression (OLS / ordered logit / logit) information delay on time preference controlling for variables: ice cream condition, session hour, hunger, scariness of shocks, order, eat when nervous, frequency of shocks during the instructions, frequency of shocks.

5. Experiment 2

Another experiment, which investigates the effect of aversive salient information on consumption, has been run before the start of our main experiment, and the timeline is listed below. 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.

However, we found no difference in demand for various items between the information group and control group, which indicates that either our theory fails or that the manipulation is ineffective. Our manipulation check, the question about the frequency thinking about the shocks (How often were you thinking about the shocks before/ during the waiting period) suggest the latter, since were found no difference in the answers to this question between two groups of subjects. Given the manipulation failure, we cannot infer much from the data.

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>
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