Pre-Analysis-Plan: Control for Investigating Motivations for Information Avoidance - The Role of Certainty, Rewards and Overconfidence *

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1 Motivation

A lot of the literature on active information avoidance has identified a clear objective for people to avoid information: Self-Image protection. In these studies, this happens through willful ignorance about a specific attribute of themselves. This research has identified several factors that influence this importance and identified intelligence and attractiveness as reliable categories. This has also been shown in an experiment by (Eil and Rao, 2011), where people that get a bad but imprecise signal about either their IQ or attractiveness have a positive willingness to pay to avoid more precise information about that. Potentially, this behavior can be hurtful in other instances because a more precise knowledge of these facts could lead to better outcomes in markets (finding a more suitable career path, acting more informed in the dating market etc.). In our first experiment we used a general intelligence test to investigate this behavior. (Ay and Meißner) Our main questions were to what extent people avoid potentially hurtful information and are they willing to pay for it. Our results show two main results:

1- Individuals are willing to pay not to learn their relative rank in a general intelligence test 2-Almost half of the sample (N=400) didn't chose to learn their rank when there is a clear monetary gain of learning.

In the present experiment we use a similar framework with neutral information in terms of ego utility to show the change in avoidance when there is only clear instrumentality of information to

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reach higher monetary gain. This study focuses on two main questions: *1*-*What is the impact of ego relevant information on avoidance keeping the value of information constant? 2- Does avoidance respond to value of information when the instrumental of information is clearly higher?*

2 Experimental Outline

This pre-analysis plan will be uploaded before data collection.

First year NHH students, a sample of people that derive high utility from assuming they are smart and put a lot of value on that attribute, will take part in the classroom experiment in October 2019.

First, participants take an IQ test and they are informed that that test was taken from a longer test. After taking the test they are asked to guess a random number drawn by the computer in the session and if their guess is correct they are going to win 80 NOK. After making their guess they are assigned to two treatments randomly: costly information and costly avoidance. In both treatments a Becker-DeGroot-Marschak(BDM) (Becker et al., 1964) auction takes place to implement the participants' decision. The aim of having a BDM auction is to elicit their real preferences and willingness to pay for that. A bonus payment of 50NOK will be introduced and they are asked to submit how much they would be willing to pay for their decision (getting/avoiding information) to be implemented. The submitted price is compared to a randomly chosen game price in the next stage and if the submitted price is higher participant pays the game price and the decision is implemented. If the auction is lost, participant's decision is not implemented and bonus payment will be added to final payoff. If the participant gets the information (with or without choosing it) there is a chance to revise the guess. At the end of the game they will receive a payment from their guess (0 *or* 80) and the rest of the bonus payment after BDM results.

We are using a 2x2 design built on the variations for the instrumentality of information and WTA, WTP treatments. In both WTA and WTP conditions subjects are assigned one of the 2 information structures: in case of getting information they can see set of 2 numbers or 4 numbers including the actual number. In the condition that they can see 2 numbers, information has a higher instrumental value compare to 4 numbers (see table 1).

3 Measurement and Hypotheses

The experiment will be used to answer the two main research questions mentioned above. The main hypotheses of the experiment are listed below.

The variables of the experiment will be measured in a lab experiment. The experiment will give us an opportunity to measure the extent of information avoidance when the information is neutral with a clear monetary value. We will observe whether a significant amount of participants chooses to avoid the information and enable us to compare results with the avoidance when the information is ego relevant. Also, it will give us chance to analyze how avoidance and acquisition responds to strictly increasing value of information without any non-monetary effect.

Moreover, the test will validate if financial incentives are a driver of information acquisition. Other covariates (beliefs, past experiences etc.)will be checked in the post-experimental survey.

Before running the experiment we ran an experiment with ego relevant information in which subjects decides whether to learn their rank in an intelligence test when there is a monetary gain from learning. Results are reported in Figure 2 and 1 and the hypotheses are built upon them.

Hypothesis 1:¹ *Avoidance is a strong indicator of the sensitivity to certain types of information. When information is not ego related information avoidance is much lower.*

By adding a control treatment we aim to show that avoidance is a strong indicator of concerns for the ego related information. Keeping everything same, when the information is about a random number which is not related to score or rank, avoidance is expected to decrease substantially. This adds support to the hypothesis that people avoid sensitive and potentially hurtful information. Following this argument, we expect WTA to be higher and WTP to be lower in treatment conditions compare to the clearly useful (helps to increase monetary gain), neutral and unhurtful (not ego related) information in control conditions.

Hypothesis 2: When information is instrumental and neutral, information preferences have a more rational pattern than the treatment conditions and share of evaders and WTA is lower when the value of information is higher.

In the control treatment, we use neutral information which is not related to score or performance and has a clear monetary value. When the information doesn't have any ego utility, we expect avoidance to respond value of information. When the monetary gain of getting information is higher share of evaders and mean WTA is expected to be lower.

4 Experimental Procedure

The control treatment will be conducted at NHH in October 2019. The experiment will test for the behavior of participants with regards to information that will provide them with a monetary gain in the experiment. This information is neutral in terms of ego utility and has a clear monetary value.

In the first stage of the experiment participants take part in an IQ-test. The test consists of 25 questions and participants get 8 minutes to fill out the test. Afterwards, they are informed that

¹The last 2 hypotheses are added in September 2019 for the control treatment which is planned to be conducted in October 2019.

they have to guess the random number drawn by the computer. Each session consists of 55-60 participants.

Participants are paid based on the accuracy of their guess. If their guess is within 5 percentage points of the actual share, they earn 80 Norwegian Kroner.

In the next step, participants are randomly selected into two different treatments. They are assigned to treatment within sessions. In treatment T1-WTP, participants are asked for their maximum willingness to pay to find out the information which is set of 4 numbers or 2 numbers and one of them is the actual random number in that session.² For that purpose, they are given 50kr as an additional bonus. Participants then take part in a BDM-auction in which they have to state their maximum willingness to pay for that information.

In treatment T2-WTA, participants are asked for their maximum willingness to pay to avoid the information. For that purpose, they are given 50kr as an additional bonus. Participants take part in a BDM-auction in which they have to state their maximum willingness to pay to not see the numbers in the condition they are assigned to.

If the participant finds out the actual random number, they can revise their previous guess and ensure that they earn the 80kr.

After they finished the revision, they are informed about their payment. To finish the experiment, they are asked to answer a post-experimental survey(see Appendix).

5 Statistical Analysis

Statistical methods to test for the validity of our hypotheses are introduced here. The collected data on the participants include their test performance, their guess over their random number and their willingness to pay regarding the treatments. Post-Experimental surveys will include questions regarding gender, effort and beliefs. This experiment is going to be conducted to investigate the effects of ego relevant information on avoidance therefore, results from the previous experiment will be used and included in the analysis. Treatment refers to the previous experiment whereas the present experiment is mentioned as control.

6 Budget and Timeline

The experiment will be conducted as a lab experiment at NHH on the 30th September- 4th of October 2018. We aim for a sample of N=400. Participants will make incentivized guesses over the

²The numbers are randomly selected between 1-15 to calibrate the chance of winning and losing on both tails of the distribution.

random number drawn by the computer. Total cost of the experiment is estimated as 40.000NOK. Details of the budget are listed in the table below.

Testing for Hypothesis 1

We define the difference between the mean WTP and WTA in control with low value(WTA_{cl} , WTP_{cl}) and treatment(WTA_t , WTP_t) conditions as:

$$\Delta_{WTA} = WTA_t - WTA_{cl} \tag{1}$$

and

$$\Delta_{WTP} = WTP_t - WTP_{cl} \tag{2}$$

Then we perform one-sided t-tests for WTA and WTP with the

 $H_0: \Delta_{WTA} = 0$ and $H_1: \Delta_{WTA} > 0$ and $H_0: \Delta_{WTP} = 0$ and $H_1: \Delta_{WTP} < 0$.

Testing for Hypothesis 2

In control treatment, we define the difference between share of participants who avoid the information (WTA > 0) in low (WTA_{cl}) and high (WTA_{ch}) value conditions as:

$$\Delta_{S_{WTA_c}} = S_{WTA_{cl}} - S_{WTA_{ch}} \tag{3}$$

then we conduct a one-sided t-test to show the difference with : H_0 : $\Delta_{S_{WTA_c}} = 0$ and H_1 : $\Delta_{S_{WTA_c}} < 0$.

We define the difference between mean WTA in control conditions as:

$$\Delta_{WTA_c} = WTA_{cl} - WTA_{ch} \tag{4}$$

and then we test if this difference is significant by using a one-sided t-test with: H_0 : $\Delta_{WTA_c} = 0$ and $H_1 : \Delta_{WTA_c} > 0^3$

³We expect the relation in WTP contol condition to be in line with this hypothesis.

Table 1: 2x2 Design			
Treatments	WTA	WTP	
Low Value Info.	\checkmark	\checkmark	
High Value Info.	\checkmark	\checkmark	

Note: This table sumaarizes the treatment variations. Participants are first assigned one of the 2 conditions WTA or WTP and then one of the other two conditions: Low or High Valu Information. In the Low Value Information, they see 4 numbers and are informed that one of them is the actual one. In High Value Information they see 2 numbers and one of them is the actual one.



Figure 1: WTA with Ego Relevant Information

BUDGET DETAILS		NOK
Average Payment to Subjects		100
Aimed Sample Size for Stakeholders in Control	400	
COST OF THE LAB EXPERIMENT	$N_{st} * (Avg.Pay.)$	40.000
TOTAL COST		<u>40.000</u>

Table 2: Total budget for the aimed sample size



Figure 2: WTP with Ego Relevant Information

References

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Appendices

A Post-Experiment Survey

- Gender
- Age
- How competitive do you consider yourself to be? Please choose a value on the scale below, where the value 0 means 'not competitive at all' and the value 10 means 'very competitive'.
- How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please choose a value on the scale below, where the value 0 means 'not at all willing to take risks' and the value 10 means 'very willing to take risks'.
- How do you think about your academic success compared to other students? Above average-Average-Below average
- How do you think your own intelligence compared to other students? Above average-Average-Below average
- How important is it for you to think yourself as an intelligent person? Not important at all(1)-Very Important(5)