

# The Impact of Beliefs on Treatment Efficacy

## Analysis Plan

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### 1. Introduction

There exists ample evidence documenting the role of a “placebo” (often a sugar pill) in improving objective outcomes in medical trials, including a smaller literature identifying beliefs as the channel through which this effect operates (Malani [2006]; Kamenica et al. [2013]; Benedetti et al. [2005]). In what follows I describe a project aimed at experimentally testing whether a congruent effect exists in the social sciences. That is, do recipients of government interventions or research treatments experience better outcomes if they have more positive beliefs about the efficacy of the treatment they are receiving?

To address this question, I am partnering with a non-profit organization, Wholesome Wave, to run an experiment on the role of beliefs in determining treatment efficacy. Wholesome Wave provides fruit and vegetable gift cards to low-income individuals in the United States to encourage healthy eating. I plan to introduce an intervention in a new Wholesome Wave program in Corpus Christi, TX in which participants will be asked to set a goal for the amount they want to spend on fruits and vegetables. I will randomly assign individuals to receive either optimistic or no information about the efficacy of goal setting. My primary outcome of interest is the impact of this exogenous variation in beliefs on goal achievement, measured through card expenditures. Participant outcomes in response to the randomly-assigned information will provide evidence regarding the impact of beliefs on treatment outcomes.

This experiment launched January 24, 2020 and is scheduled to conclude mid-year. Thus far only enrollment, or baseline, data have been collected - no outcomes have been realized.

In what follows I will discuss the experimental design in further detail in Section 2, outline my hypotheses and outcomes of interest in Section 3, and conclude in Section 4.

## 2. Experimental Design

Wholesome Wave (WW), the partner non-profit organization, implements “Wholesome Rx” programs across the country in which low-income households receive gift cards that can be spent exclusively on fresh fruits and vegetables. The focus of the current experiment is the launch of a new Wholesome Rx program in Corpus Christi, TX. Participants are 700 low-income pregnant women or mothers of children aged six months to 5 years, who will be recruited through local healthcare clinics. Each participant will be enrolled for a period of six months.

The intervention, described in more detail below, involves asking all program participants to set a goal for the amount they want to spend on their gift card in the first month of the program, and then exogenously varying participant beliefs about the efficacy of goal setting. I am interested in whether more optimistic beliefs about goal setting predict goal achievement.

**Program components.** All participants will receive a Walmart gift card which will be reloaded with \$60 to spend on fruits and vegetables during each month of the program. I will receive purchase-level data to track expenditures and identify whether participants met their goal. Other program components include:

1. *Nutrition education classes:* Participants will be asked to attend at least two classes aimed at promoting healthy eating.
2. *Baseline and endline surveys:* Participants will receive both a baseline and an endline survey. These surveys will include standard demographic questions, as well as questions aimed at better understanding beliefs about the import of eating fruits and vegetables and potential mechanisms that might drive the “placebo effect,” such as motivation to spend the gift card amount.
3. *Food diary:* Participants will complete a food diary to better understand food consumption, complementing the objective purchase data obtained via the card.

**The intervention.** I will ask all participants to set a goal for fruit and vegetable consumption (see the Appendix for the full experimental instructions). Half of these participants will be randomly assigned to the treatment group and will receive information indicating that research has shown that goal-setting is effective in helping people stick to healthy habits like eating fruits and vegetables (Beshears et al. [2016]; Verplanken and Faes [1999]; Epton et al. [2017]). To further shape beliefs regarding the efficacy of goal setting, treatment participants will also answer a comprehension question about the information they just received. Control participants, meanwhile, will not receive information about the efficacy of goal setting (see Figures 1 and 2 below). All participants will also receive follow-up text reminders regarding the goal they set; reminders sent to treatment participants will reiterate that goal-setting has been shown to be effective. I am interested in whether those who receive optimistic information about goal setting get closer to achieving their goal over the subsequent month.

## Figure 1: Treatment Information

Congrats on setting your goal!

We asked you to set a goal because **research has shown that setting goals helps people develop and stick to healthy habits, like eating fruits and vegetables**. For instance, one study that looked at the results of 384 tests of goal-setting concluded that goals effectively promote behavior change. Although it may seem surprising that doing something as simple as setting a goal for how much you want to spend on your card can make such a big difference, goal setting has been shown to motivate people to eat more nutritious foods and to make other important lifestyle changes.

All of this is to say, we asked you to set your goal because we think it really will help you to use your card to buy a lot of fruits and vegetables!

## Figure 2: Control Information

Congrats on setting your goal!

We asked you to set a goal because we are interested in whether setting goals helps to improve consumption of fruits and vegetables in settings like this one.

### 3. Hypotheses and Outcomes

**Goal Achievement.** My primary hypothesis is that the participants who receive the optimistic information regarding the efficacy of goal setting will get closer to achieving their goal within the following month. The outcome of interest – namely, whether participants meet their goal – will be captured via purchase-level data from participants' Walmart cards. In particular, I will identify the treatment effect on the difference between card expenditures on fruits and vegetables and the goal amount.

**Secondary Outcomes.** Additional outcomes include the impact of the treatment on:

1. Self-reported motivation to consume more fruits and vegetables and meet one's goal (as measured by the endline survey)
2. The likelihood of spending any positive amount on the Walmart card during the first

month in the program (again measured by Walmart card data)

3. Self-reported fruit and vegetable consumption (as measured by a food diary around the one-month mark)

I am also interested in heterogeneous treatment effects depending on baseline beliefs about the importance to one's health of eating fruits and vegetables (as measured in the baseline survey).

#### **4. Conclusion**

I have outlined a plan to experimentally test the impact of beliefs about the efficacy of a treatment on actual treatment outcomes. I will run an experiment, in partnership with the non-profit organization Wholesome Wave, where I will exogenously vary beliefs regarding the efficacy of a goal-setting intervention. The outcome of interest is whether participants with more optimistic beliefs get closer to achieving their goal. I see this experiment as taking a first step to explore the existence of the placebo effect in the social sciences. It is my hope that this work will not only allow researchers to better understand the generalizability of observed treatment effects but also, if beliefs indeed play a role, provide a tool for policymakers looking for a cost-effective means of improving intervention outcomes.

## References

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## A. Experiment Screenshots

Figure 3: Goal Setting Instructions

In the last portion of this survey, we would like to ask you to **set a goal for the amount you would like to spend on your Walmart fruit and vegetables card in your first month**, up to \$60.

To encourage you to hit your goal, **we will give you a bonus gift card that can be spent on anything at Walmart (not just fruits and vegetables) if you meet your goal for spending on fruits and vegetables this month.** The gift card amounts will depend on the goal you set: If you set a goal between \$0 and \$20, you will not receive a bonus gift card, even if you meet your goal. If you set a goal between \$21 and \$40, you will receive a \$5 bonus gift card if you meet your goal. If you set a goal between \$41 and \$60, you will receive a \$10 bonus gift card if you meet your goal. The amounts you will receive based on the goal you set are also explained in the table below:

Goal Amount	Bonus Card Amount
\$0 - \$20	\$0
\$21 - \$40	\$5
\$41 - \$60	\$10

Wholesome Wave encourages you to spend as much as you would like on your Walmart fruit and vegetables card, so feel free to set your goal as high as you would like, up to the \$60 cap.

However, if you do not spend the full amount of your goal, you will not receive the bonus gift card, so it does make sense to set a goal that you think will be likely to reach.

(Note that the money you receive on your Walmart fruit and vegetables card will not be affected by whether or not you hit your goal; this will only affect whether you receive the bonus card.)

**Please enter your goal amount between \$0 and \$60:**

\$