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- Is there an
exemplary example
you can build
from

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Essay 2: Project Proposal

Does viewing pictures of food make people feel hungrier?

Background/Introduction

Food plays an integral part of our everyday lives. Often we see images of food displayed in advertisements on the outsides of food establishments and restaurants often in enticing ways. This brings up the question does looking at pictures of food make us feel hungrier after viewing them. The question is fairly simple and straightforward. From daily life experiences it would seem that the answer should be that viewing pictures of food does seem to have some kind of effect judging by the numerous advertisements there are about food. So the argument that looking at various pictures of food would in fact make people hungry seems very plausible. In examining the research that has been done regarding the topic there appears to be conflicting results^{1,2,3}. Some studies that suggest looking at food pictures makes you feel full as well as looking at food pictures make you feel hungrier. Looking at food photos and feeling full seems counterintuitive based on daily life experiences. It would be interesting to conduct a simple experimental study to examine whether there is a causal effect between looking at pictures of food and hunger. The findings of the experiment will give some insight into the efficacy of food advertisements that are so common within our everyday lives.

Recruitment

The survey will be conducted online and study participants will be recruited through social networks. Participants will be a basic background about the survey and need to indicate consent by filling out a consent form. If participants are interested they will need to provide an email address, so that a one-time survey link can be sent to them and ensure that participants do not take the survey multiple times and skew results.

Outcome measure

Prior to viewing the pictures, the participant would be asked to indicate how hungry they are on a Likert scale of 1-10, with 1 being not hungry and 10 being very hungry. The treatment in the experiment will be presenting various images of food and the control would be various images of non-food images such as scenery, and animals. A variety of food pictures will be included in the treatment group covering all major food groups and cover typical breakfast, lunch and dinner foods. The control pictures will consist of everyday objects that are not food related. After viewing the pictures, the participant will be asked again how hungry

→ Can you modify this measurement?

they feel. The second measure of hunger will be subtracted from the first measure of hunger to calculate the change in the hunger levels that they feel after viewing the pictures. This change in hunger levels will be the primary outcome measure of interest and will be the focus of the study. Covariates of interest to collect consist of age, race/ethnicity, gender, local time, geographic area, and food allergies. There may be other factors that interfere with the measurement of hunger so it is necessary to collect information about these additional covariates and block randomize on those factors that are highly related to being hungry. In administering the survey, participants should be instructed to not talk to each other while taking the survey or after they are finished taking the survey to ensure that there is no cross contamination while the survey is being conducted.

Randomization Method

Time since food was last consumed will have a strong effect on the results of the study, so it is important to measure potential confounders and implement a block randomization on these factors. Logically the time of day and when food was consumed will naturally have an effect on levels of hunger even without being exposed to pictures of food. The randomization will be blocked on the time since the last meal to avoid confounding effects from people eating food at different times affecting the level of hunger they feel. The local time of day should also be accounted for by some kind of time stamp on the online survey to validate the time since last meal measure.

The block randomization design and simple randomization design should theoretically prevent clustering of characteristics in test subjects. There could be various demographic factors that influence the amount of hunger a person feels such as like age, gender, and race/ethnicity. It is unknown how much of an effect other characteristics like geography and demographics will have on hunger levels so a pilot study is necessary to test if random assignment to the control and treatment within the blocks of time since last meal is effective at accounting for all these differences. The demographic and geographic information collected will serve as double check to see if the simple randomization within the block groups was randomized adequately. People may also have unintended negative reactions to pictures of food that they are allergic to so a pilot study including those with food allergies will also be important to determine if this is a vital covariate to block randomize on. If the potential covariates are found to be of concern block randomization will have to be done on the fly after asking some screening questions about these potential confounding covariates to ensure that there are an equal number in both treatment and control.

Pilot Study/Validation

The pilot will consist of a small group of people recruited through social network and the results of the pilot will be used to check if the food presented is culturally appropriate and

Can you switch this to in person?

relevant to the test subjects. The randomization design proposed for the final experiment is not suited for small sample sizes of the pilot so the pilot study may have to be adjusted to make sure participants take the survey at approximately the same time of day relative to local time after recruitment in order to ensure that the treatment and controls are comparable with the limited sample size. To test if this blocking on time after a meal is necessary, the time after a meal will be restricted to two different time points after a meal. The pilot study would also include additional qualitative focus group type questions to examine whether the pictures seem appetizing or enticing and see if those have a different effect than static and less vibrant pictures of food as well as their opinions on what type of pictures capture the feeling of the best meal they've experienced. These findings will be used to finalize the types of pictures to be included in the finalized standardized treatment design.

After conducting a pilot test, a theoretical treatment effect will be derived to calculate power and determine how many study participants to recruit. If there is not sufficient power the study design will be limited in scope to specific time after a meal or restricted to a specific group of people. Power calculations would have to be done in order to determine what an adequate sample size would be to detect a treatment effect after controlling for confounding covariates.

Statistical Analysis

The mean hunger levels for treatment and control will be compared by using a one sided t-test. The sharp null hypothesis would be that the mean change in hunger of the treatment and control are equal: $H_0 : \mu_0 = \mu_1$. The alternative hypothesis would be that the mean change of hunger of the treatment group is greater than the control: $H_1 : \mu_0 < \mu_1$. The t-test will use a significance of $\alpha = 0.05$ to calculate a 95% confidence interval and determine whether the treatment effect is statistically significant and not due to chance.

Concerns

The greatest risk to the validity of the study would be violation of the non-interference assumption. The survey is online so participants will need to follow the directions to not talk about the survey before and after they take it. The other potential concern is that the randomizing design will not be able to account for some confounding covariate and that there will be some kind of clustering based on some unaccounted factor such as taking the survey after doing an intensive workout. Theoretically there should be no clustering in the design since the randomization will be done to every individual. This highlights the importance of a pilot study to stress test the study design and see if there are any potential issues to address from both the quantitative and qualitative feedback from the pilot study participants.

From an ethical standpoint, there does not appear to any obvious concern from conducting the study. No actual food will be consumed in the study so those with food allergies will not be harmed. Since subjects are merely viewing pictures there is no significant harm physically or mentally on participants. The online survey would also be relatively simple to implement logistically and would not require a large source of funding since the treatment consists of images that can be embedded directly into the online survey platform.

Discussion/Conclusion

The results of the study will be potentially useful to determine whether the commercials for the food industry are relevant. If the experiment reveals that looking at pictures of food does in fact cause people to be hungrier it would validate spending a large amount of money on various food advertisements that we often see in daily life. If the images lead to people feeling more full, efficacy of the various food advertisements may be called into question. On the other hand, this would suggest that looking at pictures of food would be a useful method for portion control and dieting.

References

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Writing: 3
RQ: clarity 4
RQ: scope 3
RD: clarity 3

- Measurement on this
behavior will be hard.
- Can you switch to
an actual "weight
loss measure"
- Can you conduct
this in-person?