Backwards Design Assignment
Causal Inference

Team 1

March 19, 2021

1 Topic: Promotional on Facebook

What is your project about? What problem are you seeking to solve, or in which domain do you think you can contribute meaningfully?

Through the project, we would attempt to understand what promotional advertisement strategy between the two - photos and videos - work better for promoting a Musical Band's (our own team member's!) Facebook Page. We intend to run a split testing on the advertisements and gauge the effectiveness of the two strategies to understand which is better. This project would be helpful in learning about effectively advertising on Facebook - for Musical Bands in particular, and most professional organisations in general, including Businesses.

As a start up musical band, we are trying to understand the best way to promote our Band's Facebook page, through ads. Right now, the band uses images as ads and is considering to replace it with ads that have video. Thus, we want to understand the impact of ads that have videos vs ads that consists of still images.

The team requires financial support to start the project (including the trial run). We kindly request your help is in this regard as soon as possible.

2 Project Question

What specific question are you seeking to answer with this project? For this project, this must be a ***causal*** *question.*

The Question we seek to answer is: Are advertisements containing video content more effective i.e. Does a video-advertisement increase the number of the Band's Facebook page clicks when compared to an advertisement with a still picture?

3 Ideal Experiment

If you were a god, what experiment would you run to answer your question? Define both your treatment variable, and your outcome of interest.

The outcome of interest here is the number of page hits or views coming via the advertisements. The treatment here is the using video in the advertisement. An ideal experiment would have been one where we could randomly (perfectly divide such that the two groups - have neither baseline differences nor differential treatments.) allocate the normal version of advertisement (still picture-based) and the video version of the advertisement to the viewers.

This would help us calculate the causal effect of the latter over the former.

4 Pick a Study Context

Where can you get data that (a) measures your outcome variable, and (b) includes variation in your treatment variable?

Facebook Ads Insights - Facebook measures the number of clicks (on the Learn More Button) of ads as well as the number of people who viewed the ad. -It also enables us to delivery multiple types of ads at the same time.

5 Project Design

Given the context you want to study (and data you can find), what design do you think would be feasible?

We plan to do a split testing - We plan to create two Facebook advertisement posts-one containing a still photo and the other containing a video. We would use the "Ads Manager" feature which would create a "Learn More" button associated with each of those adds. When the user clicks on the "Learn More" button, they will be redirected to the Band's Facebook Page. The number of clicks we get via the button would be the outcome of interest and the metric that we would base our final metric of cost per click we would use. For running this experiment we plan to do a base run to understand our baseline conversion rates (the number of page hits we get via the normal advertisement) and see the randomization present. Based on these, we would calculate the sample size, duration of study and the power of the experiment. We would then do a final run and get the metrics. These would be finally regressed with cost per click as per dependent variable and independent variables (to be understood better during the trial run).

We plan to run 2 types of ads at the same time. The ads will have the exact same text descriptions but will consist of different types of multimedia- one ad will have a photo while the other ad will have a video.

Below, are the sample templates for the ads:

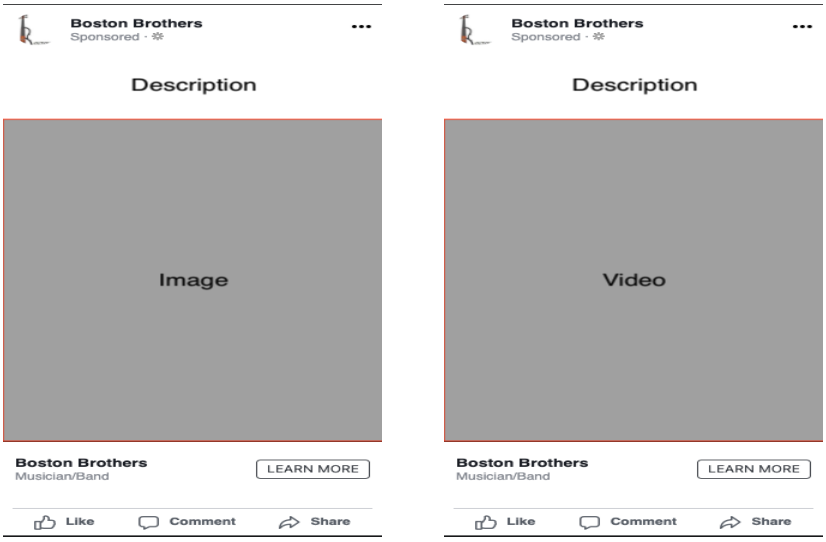

Figure 1: Advertisements

6 Model Results

Result when hypothesis is true
The clicks on the Learn More Button via (originating from) the Video advertisement would be more compared to the picture advertisement.

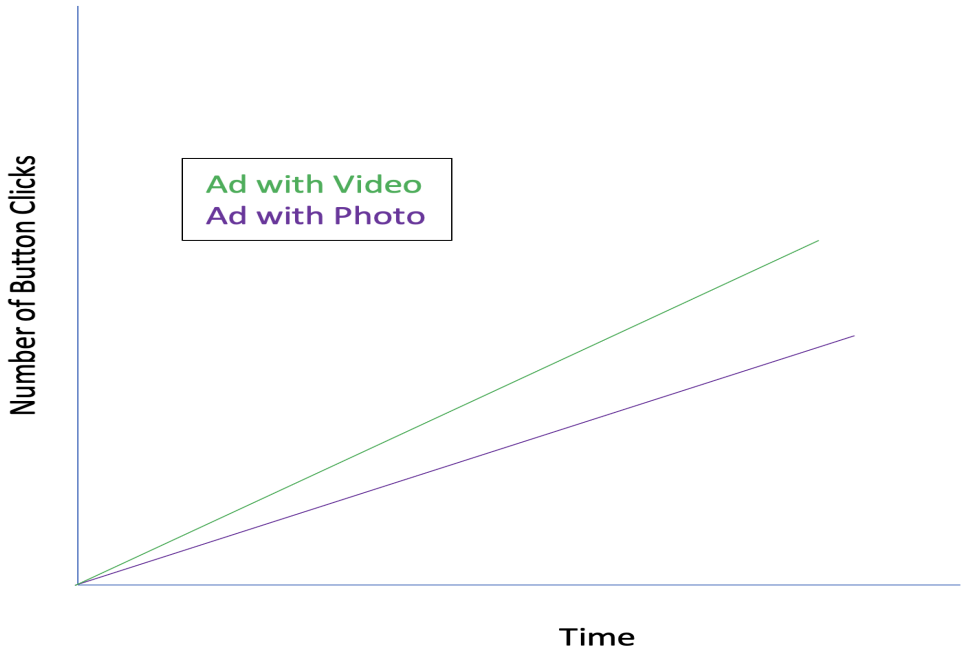

Figure 2: Results when hypothesis is true

Result the hypothesis is false
The clicks on the Learn More Button via (originating from) the Video advertisement would not

be more compared (equal) to the picture advertisement.i.e no difference

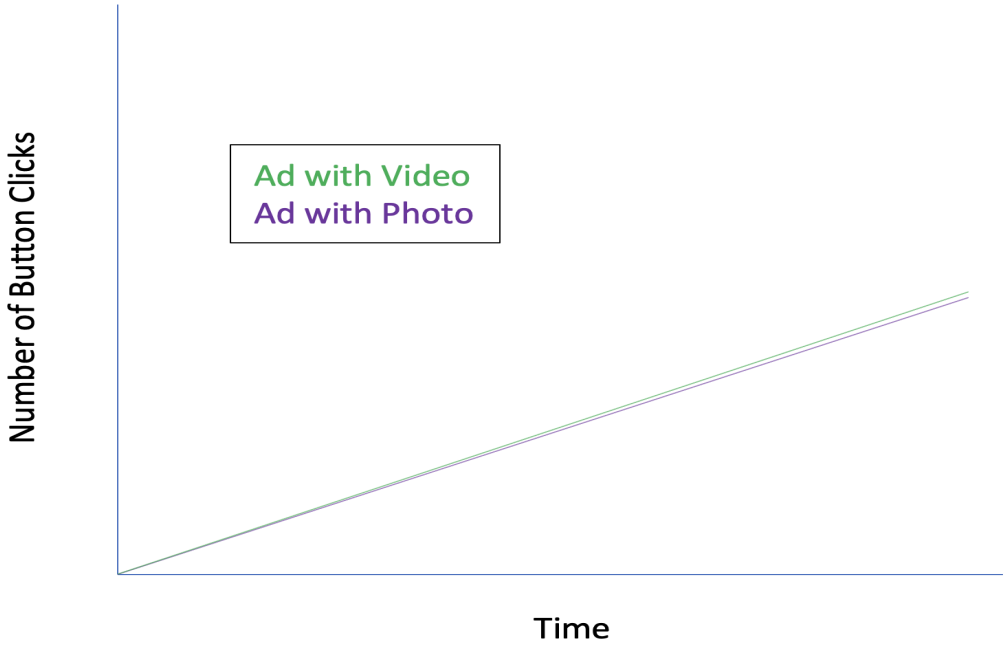

Figure 3: Results when hypothesis is false

7 Final Variables Required

Now that you've specified what an answer to your question looks like, what data do you need to generate that answer?

For each variable, define both the variable you need ***and*** *the population for which you need the variables to be defined.*

We need the number of clicks on Learn More buttons per day for both the image ad and video ad from March 20th to April 12nd (tentatively). Along with this, we need the number of people per day that saw advertisement 1 and advertisement 2 respectively.

The advertisement reach demographics such as the age and location of the viewers would also be required for a more thorough analysis.

Another metric that would be useful for this study would be the cost/clicks, given by Facebook.

8 Data Sources

Finally, given the variables you need for your analysis, what actual data sources do you think will have the data you need?

As mentioned above, Facebook can give us the number of people the ad reached, the clicks number of image ads and video ads from the start of the experiment to the end of the experiment, as well as the demographic reach of the advertisement.