#EmpireStateBuilding Instagram Posts
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Which times of the day is it best to post on Instagram?

Why I asked: Having the ability to target times associated with high user exposure and large amounts of likes means more popular marketing.

To answer this question, I first had to decide what would determine a 'good' post vs. a 'bad'. At first I considered using the average 'Like Count' as a metric, but was wary because accounts with larger user reaches would get more likes and thus have higher weight than posts from users with less followers. I instead decided to normalize each post by creating a new field entitled 'Popularity', that was 'Like Count' divided by 'Reach'. This would give the percent of followers that actually liked the post. I assumed that certain times resulted in more post exposure and thus higher likes relative to their number of followers. For example, a post made at 3 AM would have a smaller 'Popularity' value than posts made when more people are awake and actively accessing social media, such as 12 or 5 PM.

One repercussion that comes from using this metric is supplying users with a small number of followers too much weight. There are two reasons this happens. One, the initial 50 or so followers a user gets tend to be people that are of close relation to the user. My 20 or so closest friends were the first people I followed after creating my Instagram account. These initial followers can be more loyal to said user, and thus they will like their content more often. Also, there exists a fair number of accounts with less than 20 followers that have posts with a Popularity value well above 100%. This meant that more people liked the post than follow the user. I considered these abnormalities, possibly products of bot accounts or accounts that used hashtags that were viral at the time, and while looking into these cases may provide insights, I wanted to target the "typical" user for this visual. So I filtered out posts from users with less than 150 followers. Doing so removed the majority of posts with over 100% Popularity and thus the posts that contribute to the outlier seen on the top most bar in the visual below. Filtering these records kept the sample size at a comfortable 11,446.


Average Popularity vs. User Reach Count
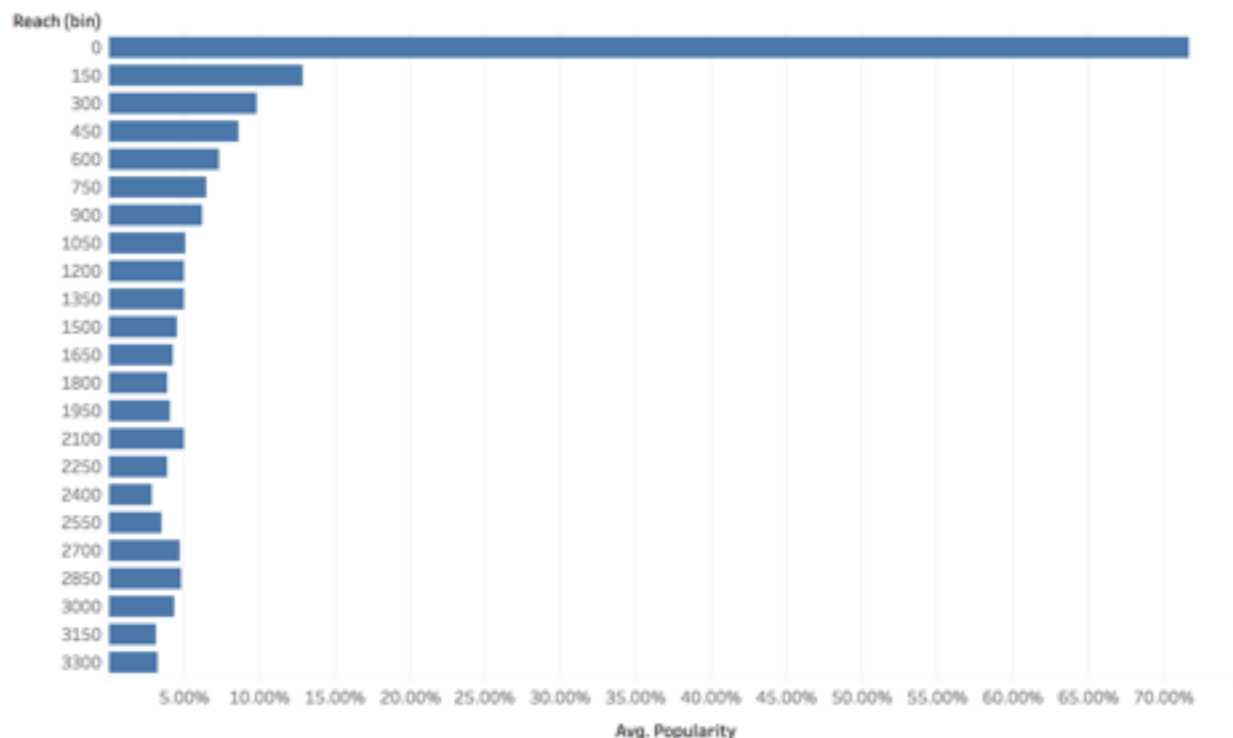
**The graph above does not include every Reach bin, and it is important to note that the Avg. Popularity remained relatively consistent for each Reach bin post 3300.

It was now time to create the chart that would help determine the answer to my question. It is a visual of the average Popularity per every hour of the day and can be seen below.

## Avg. Popularity vs. Hour of Day
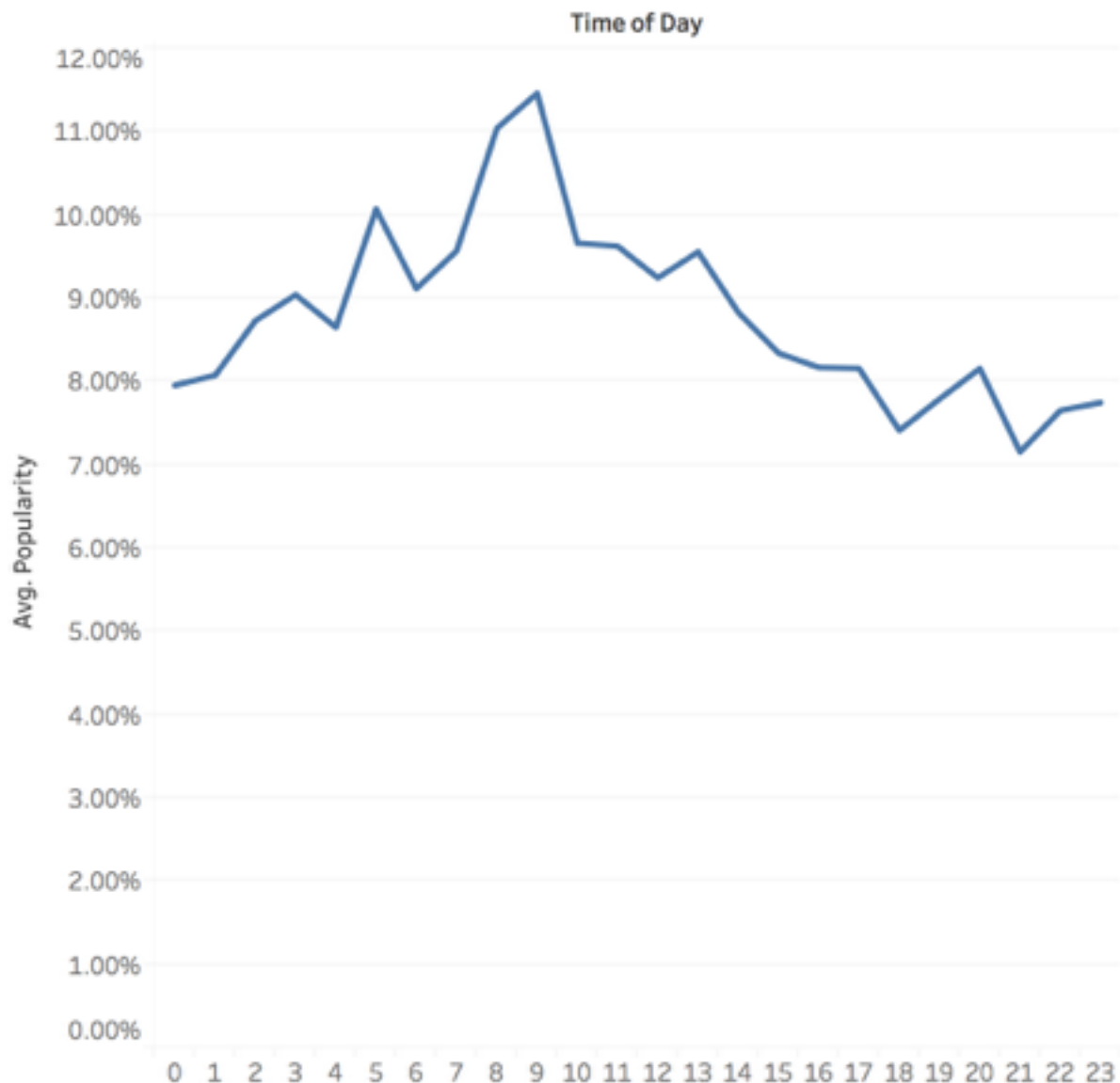
According to this chart, the posts correlated with the largest like to follower ratio are published between 8 and 10 AM. Avg. Popularity steadily increases from hour 0 (Midnight), to 9AM, and steadily decreases from 9AM to hour 23 (11 PM).

This gave solid initial direction, I wanted to dig deeper. What about this timeframe made posts more popular? One possibility I wanted to consider was the average Reach of users posting at any given time having influence on the Popularity. Perhaps my normalization process wasn't efficient enough, and users with either abnormally small or large followers tend to have higher Popularity values and thus inflate the data at the hours their posts are made.

I also considered the number of posts being made at any given hour having affect on Popularity. Maybe posts made during times of high or low Instagram traffic meant a larger percent of followers would like them. Below includes the graph above (Avg. Popularity per every hour), the the Number of Posts Made per every hour, and the Avg. Reach per every hour, in that order.

Comparisons
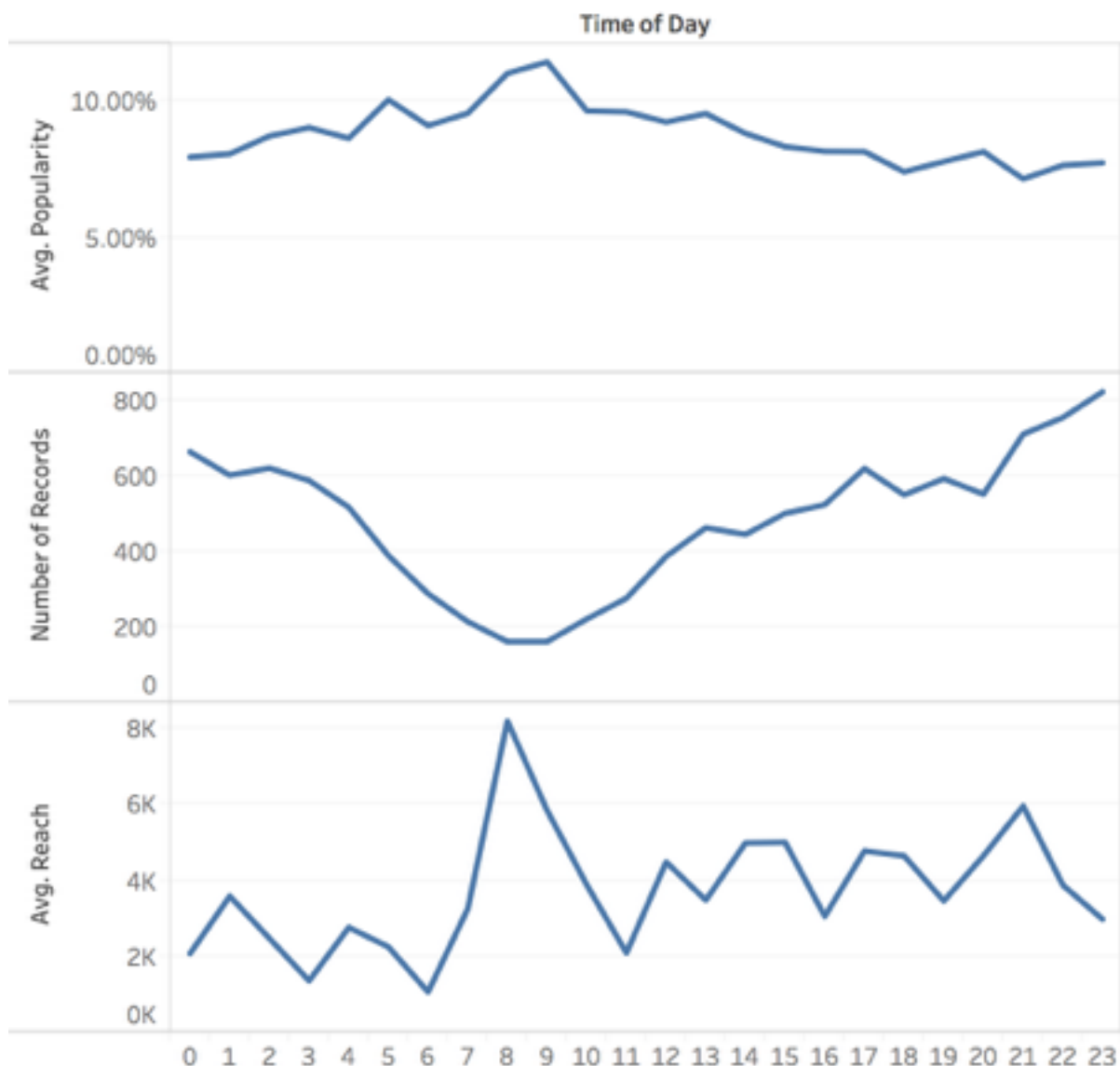
While the hours associated with posts of the largest Average Reach value are in fact 8 and 9 AM, the correlation between the Number of Posts Made and Average Popularity is obviously the strongest. They are negatively correlated with each other. Posts made during hours with little activity were associated with higher Average Popularity values, and vise versa.

Correlation does not equal causation, and further analysis needs to be done before any sound conclusions are drawn and action taken. But perhaps there is a cause here. Slow times, where fewer posts are made, may mean that those posts that are made get more follower exposure because they aren't watered down by many other posts being published in the same relative time period. Therefore, people seeing said posts have a higher chance of liking the posts because those posts sit at the top of their timeline for longer.

In order to affirm this postulation, I would collect more batches of Instagram data and create a model that statistically analyzes this association between Average Post Popularity of each hour and how many posts were made on said hour. The hour in which posts are most popular may change, and if the number of posts made on that hour change with it, we may want to consider when Instagram traffic is lowest as an influencer for when our Marketing posts are published.