

# Thought: Personalized Optimal Facebook Posting Strategy

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ThoughtBurner

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Two weeks ago, I used my friends' Facebook posts to figure out an optimal Facebook posting strategy. Using the results I was able to give credit to some common theories about optimal Facebook strategies and dispel others – at least as they apply to my own specific friend group.

These suspected effects of post characteristics, however, were based on what happens *on average*. It doesn't say whether the effects are true for any single individual. While what works on average is good for giving advice *in general*, it's not helpful if what works on average doesn't work for you specifically. And in the spirit of ThoughtBurner's mission – to solve the Daily Optimization problems – I wanted to see if the average effects would prove to be the same for me personally.

So, I went back and recorded data on every post I put on Facebook since the introduction of the 'like' button [in February 2009](#)<sup>i</sup>. Using this dataset, I performed an analysis similar to the one I did on the data from my friend group. The results are different, which suggests that optimal Facebook posting advice based on what works on average might not work perfectly for everyone (and that it doesn't quite work for me). In order to devise your *true* optimal Facebook posting strategy, you have to analyze data from your own posts and see what works on an individual level.

## **Data**

After spending far too long looking at my (often cringe-worthy) old Facebook posts, I can confidently say that I know with precision my past posting habits. I stopped looking at posts that occurred in June of 2015, which is when I originally had the idea for this post (I was worried that I would modify my posting behavior after thinking more about optimal Facebook posting). Using Tableau Public, I was able to create some cool interactive visualizations [here](#)<sup>ii</sup>, and [here](#)<sup>iii</sup>, that will reveal my natural Facebook posting habits to you and the world. I will start with describing some of the general trends I found in my own data.

The frequency of my posts has generally increased over time, the biggest change starting around 2012. Figure 1 shows the total number of posts each month. Total posts peak in the summer of 2013 (33 posts in July 2013), which was when I was posting pictures every day (more about this later...). Recently, however, there has been a slight decrease in the frequency of my posting.

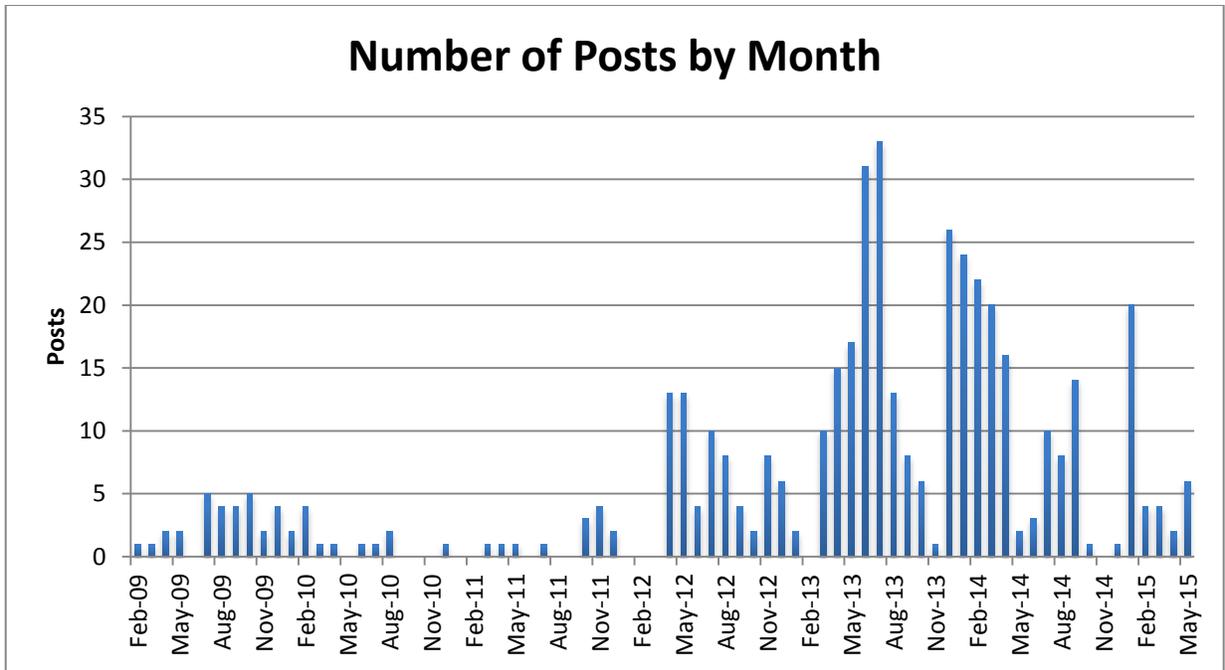


Figure 1: Total posts over time, by month

Figure 2 shows how many new friends I made on Facebook each month. You can pretty easily see the wave of new friends that came as I met new people as summer ended and school started (the peaks around August each year).

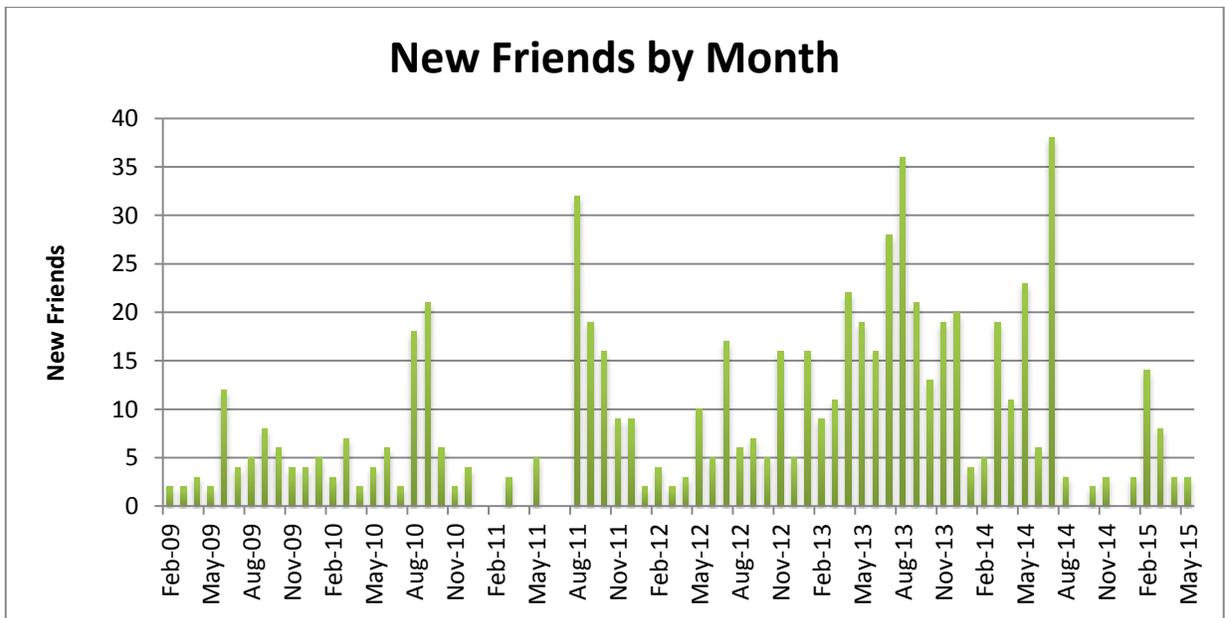


Figure 2: New friends over time, by month

I also wanted to get an idea of how connected my friend group was – Figure 3 is a mutual friend count histogram. The x-axis is how many mutual friends I have with someone, and the y-axis is the

frequency of that count. (So, “y” many of my friends share “x” mutual friends with me.) The most common number of mutual friends was 7, I share less than 37-ish mutual friends with a very large percentage of my friends, and almost all people fall below 80 mutual friends. And of course there are a few outliers – there was one person with whom I shared 238 mutual friends, and another person with whom I shared 247 mutual friends.

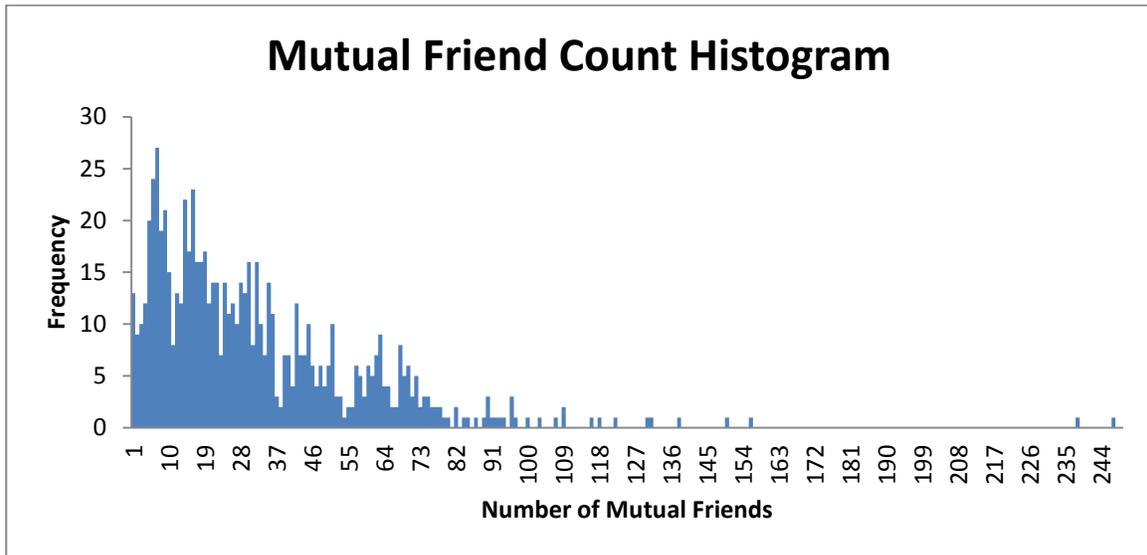


Figure 3: Histogram of mutual friend count

Last, I looked at the average number of likes I received on my posts over time. Figure 4 shows the number of average likes by year, along with a linear trend line. The linear approximation suggests that every year my average likes increased by about 2 – which I took as good news, and possibly as a sign that I was getting better at posting stuff over time.

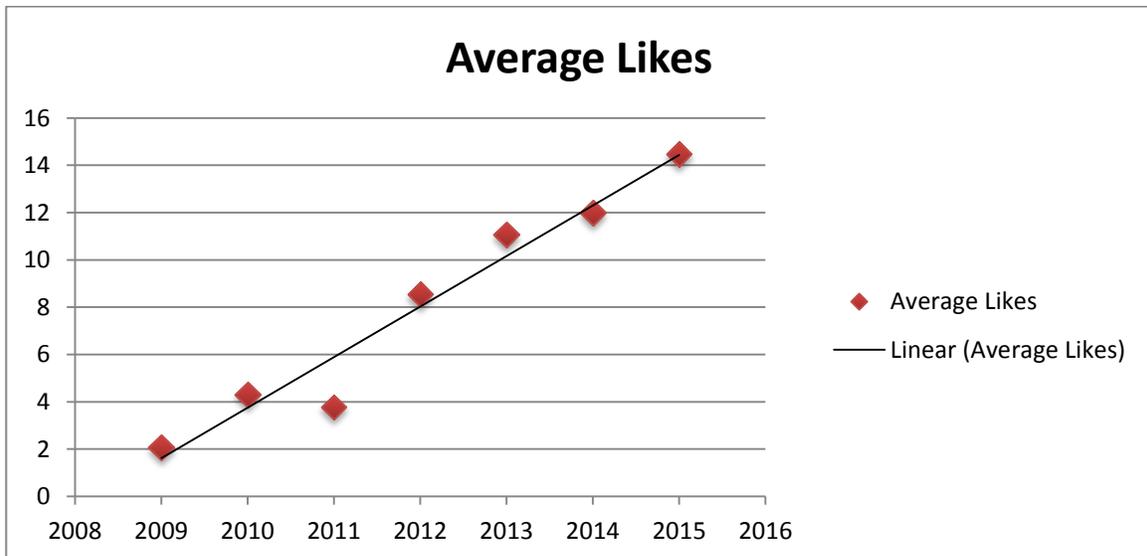


Figure 4: Average likes over time, all Facebook posts

## Analysis

Visually, it seems like my Facebook posting habits changed around 2012. Specifically, I remember trying to “post at least one picture a day” using Instagram (acquired by Facebook in early 2012<sup>iv</sup>). I was more successful in accomplishing this goal in the summer time (when school was less intense), and this shows up in the data – starting around 2012, there is a dramatic increase in the percentage of posts that include a picture.

Because of these changing posting habits over time, and also because I remember the Facebook interface changing over time, I decided to analyze only posts that happened in 2012 onward. Posts in 2012-onward comprise about 86% of all of my posts ever, so I am not losing much information by excluding earlier posts. They are also the most recent and probably the most relevant to optimizing my present Facebook posting. See Table 1 below for details. The analysis that follows consists of 385 of my posts from January 1, 2012 through June 12, 2015.

	Summary Stats - Comparison						
	N	Total Likes	Total Comments	Average Likes	Average Comments	Percent with Picture	Percent with Link
<b>All Years</b>	450	4453	809	9.896 (9.409)	1.798 (2.557)	0.669	0.071
<b>2012-2015</b>	385 85.6%	4123 92.6%	650 80.3%	10.709 (9.225)	1.688 (2.428)	0.745	0.081

**Table 1: Differences between all posts and restricted sample**

First, I wanted to see if I had gotten better at posting things on Facebook. More specifically, I wanted to see if I was getting significantly more likes as the years went by, which might suggest that I was learning how to create better Facebook posts as I grew older. A simple regression of likes on year showed that the average number of likes on my Facebook posts increased by close to 1.7 likes per year, and the results were indeed significant. (Figure 5)

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. regress Likes Year, r
```

Linear regression		Number of obs =	385	
		F( 1, 383) =	10.34	
		Prob > F =	0.0014	
		R-squared =	0.0264	
		Root MSE =	9.1139	

Likes	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Year	1.725147	.5363876	3.22	0.001	.670514	2.77978
_cons	8.432793	.8158071	10.34	0.000	6.828772	10.03681

Figure 5: Simple linear regression of likes on year

Seemed like good news for me! But it wasn't. Adding a control for total number of friends revealed that I was not actually getting better at posting – the increase in average number of likes I received each year was better explained by the fact that I was adding more and more friends on Facebook. According to this new regression, for every 42 or so new friends I made, I would get on average 1 more like on my posts. (Figure 6)

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. regress Likes Year TotalFriends, r
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Linear regression		Number of obs =	385	
		F( 2, 382) =	10.21	
		Prob > F =	0.0000	
		R-squared =	0.0435	
		Root MSE =	9.0454	

Likes	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Year	-1.660313	1.4879	-1.12	0.265	-4.585812	1.265185
TotalFriends	.0239634	.0092483	2.59	0.010	.0057794	.0421474
_cons	-.9448979	3.538305	-0.27	0.790	-7.901891	6.012095

Figure 6: Regression of likes on year and total friends

Next, I added in all of the controls I used in my previous analysis. This includes links, pictures, days of the week, and my total number of friends (accounting for new friends made each month). With my own data, I also include a new variable: time since my last post (in days). In my previous analysis, I found that people who posted more than once in the two week observation period got, on average, about 0.5 fewer likes per extra post. I was limited in my ability to estimate the optimal time to wait between posts, however, because the observation period was so short. My own data has many more observations of and variation of the numbers of days since my last post, allowing for me to make more

precise estimates. Granted, the estimates might not be generalizable to others since it uses data exclusively from my own posts, but since I'm being selfish and only figuring out an optimal strategy for myself this is fine.

First, none of the day of the week effects were significant. This is the same result I found in my friend group analysis. Figure 7 shows average likes for each day of the week. It looks a bit like Wednesdays might be better, but the effects aren't significant after controlling for other post characteristics.

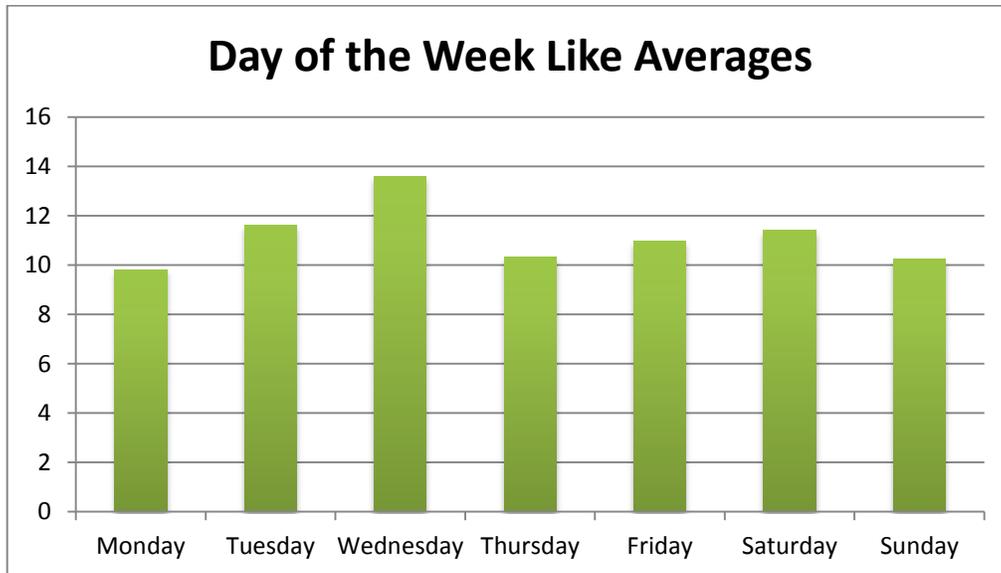
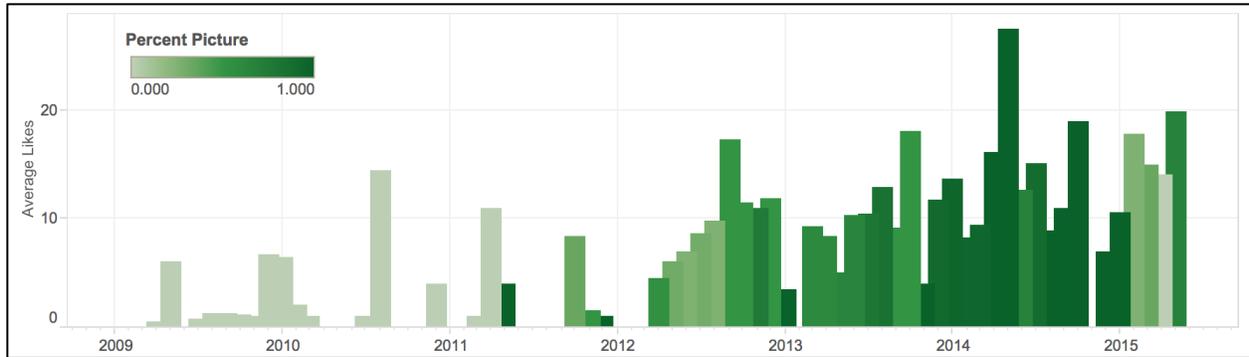


Figure 7: Average likes by day of the week

The results of my analysis also revealed that posts of mine with links in them had significantly less likes (about 9.5 fewer likes on average). This effect is in the same direction of the link effect I found in the friend group analysis, though it is not as strong. This could either be because my link posts were more likeable than the average link post of my friends, or because my non-link posts were of worse quality. I will assume the former for self-esteem boosting purposes.

In contrast to what I found in the friend group analysis, pictures had a very strong negative effect on likes; my picture posts had almost 7 fewer likes on average than non-picture posts, and the effect was highly significant. While maybe surprising, I actually expected this effect. For a while, I was on a "one-a-day" posting habit when it came to Instagram pictures. This habit started around 2012, and can be seen in the data; the darker the lines are in Figure 8, the higher the percentage of posts with pictures.



**Figure 8: Average likes over time (month), fraction of posts with pictures.**  
 Darker green indicates a higher percentage of the posts that month included pictures.

My theory is this: when I was ‘forced’ to post a picture everyday, the average quality of my picture posts decreased. (The increasing trend of average likes over time is more of an effect of my total number of friends, as mentioned before.) The quality of my picture posts decreased because I now had to post a picture every day, even if there was nothing that I normally would have deemed ‘post-worthy.’ Meanwhile, my non-picture posts remained high(er) quality. If this were true, and it seems plausible, we would see exactly what the data shows – a higher percentage of picture posts but a negative effect of pictures on average number of likes.

At first, I found that the ‘time since my last post’ variable did not have a significant effect on likes. This would suggest that there is not an optimal number of days to wait between Facebook posts. While I was collecting data, however, I noticed that there were a few extended periods of time where I did not post at all – sometimes for months. If it were the case that the effect of waiting an additional day ‘maxed out’ after a certain amount of time, then these long periods of no-posting could be messing up the results (they are outliers, in a sense). For example, if you have already waited a month since your last post, waiting an additional day might not have much of an effect. On the other hand, if you posted earlier that day then maybe waiting a day before your next post will stop you from ‘being annoying’ to other people (possibly resulting in slightly more likes).

The first way I tested this idea was to limit my sample to posts that were posted within 1 month (4 weeks) of the last post. This means that the first posts I posted after the long period of no-posting (and their very high ‘days-since-last-post’ value) were excluded from analysis. The results showed that there was a significant and positive relationship between the number of likes one of my posts receives and the number of days since my last post.

Then, I decided to add in days-since-last-post squared and days-since-last-post cubed terms to my regression to allow for a non-linear effect of being patient. This allowed me to model the idea that the effect might change depending on how long you’ve already waited. I’ve plotted the resulting like effect estimation in Figure 9 below.

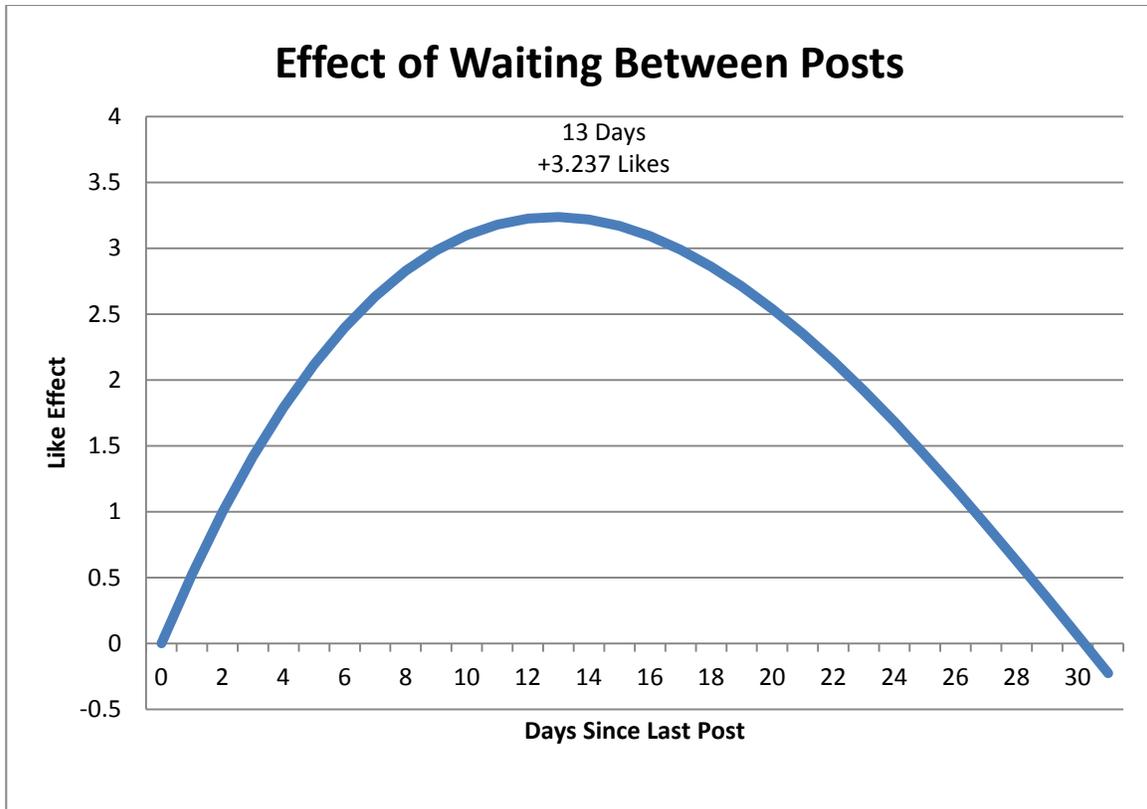


Figure 9: Estimates of effect of days since last post on expected likes, with quadratic and cubic terms

The maximum effect of waiting on likes occurs at 13 days, estimated at about +3.24 likes. After 13 days, the model predicts that the effect decreases, and eventually even drops below zero. While I don't think the model is very accurate for 'time since last post' values that are very high, I think it could serve as a good guess of the effect for posts that are within a month of each other.

While many of the results I found using my personal data were the same as the analysis in my [earlier post](#)<sup>v</sup>, there are enough differences that I wanted to look at how the optimal Facebook posting strategy derived from each analysis would differ. In the next section, I create my own personalized optimal Facebook posting strategy and compare it to the strategy I came up based on my friend group data.

### **Personalized Optimal Facebook Posting Strategy**

I started by "re-optimizing" my Facebook posting strategy based on the new results. The simple advice I can give (to myself) would be to not include links *or pictures* in my posts and to wait almost two weeks (13 days) between each post. Comparing this 'best' strategy to the 'worst' strategy, and assuming that the time-of-day effects are the same for me as they were for my group of friends, my expected average would be *19.02 likes higher*.

To give you a better idea of how the optimal strategies differ, and how they would affect expected likes on Facebook posts, Figure 10 shows the differences in expected likes based on different

strategy and data combinations. The columns indicate which dataset is being optimized, whereas the rows indicate which strategy is being used. The cells display the expected difference between the like-maximizing strategy and a strategy-constrained like-minimizing strategy – that is, they show the difference between the maximum like effect possible and the minimum like effect possible with the column-determined data while following the row-determined strategy. For example, the friend group optimizing strategy suggests that pictures have no effect on likes – but including a picture while optimizing my personal data would reduce the expected average number of likes by about 7. The cells where the data and strategy are mismatched (white cells) show ‘how wrong’ things can go by following the wrong advice (which gives you an idea of the range of the total effect on likes).

	Friend Group Data	Personal Data
Friend Group Optimization Strategy	+23.61	+12.69
Personal Optimization Strategy	+23.06	+19.02

Figure 10: Like effects for strategy-data combinations

While an average person in my friend group would have been mostly fine with my personalized optimization strategy, I would have been missing out on a pretty big number of likes using the strategy based on group data. If you assume that the friend group is representative of your own posting, the difference between using the friend group strategy and the personalized strategy is only 0.55 likes on average – not very large. This small difference is a result of posting a little too often; you would post every 13 days, which is more than once every two weeks, and your expected likes would decrease by 0.55 likes by doing this. You’d be better off using the friend group strategy, but only by a little.

On the other hand, if I had personally followed the friend group strategy I could have ended up with an expected like bonus of only 12.69 more likes. Compare this to my personalized strategy, which had an optimal maximum of 19.02 more likes. The difference between the two strategies is 6.33 likes, meaning that I could fail to optimize pretty severely. The discrepancy comes from two factors; the fact that pictures were found to have no significant effects in the friend group strategy and the differences between the optimal wait time between posts.

### **Takeaway**

While many of the topics ThoughtBurner has written about in the past are generalizable to everyone, there are some Daily Optimization problems that can only be solved by fitting the solution to the particular individual. Facebook posting, I believe, is a good example of a Daily Optimization problem with person-dependent solutions.

I think I have made some good improvements to previous studies on how to optimally post to Facebook, but because of the nature of the problem I would caution against assuming that the results of the personalized analysis would hold true for you. As demonstrated above, analyzing my individual Facebook post data gives different results than analyzing my friend group data. You are probably the best judge of how closely your posting habits and group of friends match the ones in these analyses and whether you should follow the optimal strategies presented or not.

Luckily for me, I've already figured out my own optimal posting strategy. My expected number of likes while using the optimal strategy is 19.02; compare that to my overall average likes at 10.71, and you see that I could potentially be getting 8.31 more likes on average – an increase of nearly 78%. I don't normally try to maximize my average likes on Facebook, but now that I have a strategy don't be surprised if all my future posts start getting a high number of likes.

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<sup>i</sup> <http://techcrunch.com/2009/02/09/facebook-activates-like-button-friendfeed-tires-of-sincere-flattery/>

<sup>ii</sup> <https://public.tableau.com/profile/kevin.deluca#!/vizhome/PersonalFacebookFriendsOverTime/Friends>

<sup>iii</sup> <https://public.tableau.com/profile/kevin.deluca#!/vizhome/PersonalFacebookLikesOverTime/AverageLikes>

<sup>iv</sup> <http://www.wsj.com/articles/SB10001424052702303815404577333840377381670>

<sup>v</sup> <http://thoughtburner.org/2015/10/15/thought-optimizing-facebook-posts/>

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