Conor Brownell

Writing Portfolio

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My writing portfolio comprises three pieces of written work completed throughout my undergraduate education. I chose these works because they best illustrate my abilities and affinities. They showcase my proficiency at cogently analyzing complex issues in computing, ethics, cognitive science, and user research. I have included a long research paper, an excerpt from a group research paper, and a personal essay about technology and the internet.

Each written work is listed below, along with its format and the course for which it was completed.

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Algorithms, Manipulation, and Autonomy: A Story of Facebook

Introduction

This story begins with emotional contagion, a scary-sounding psychological phenomenon that everyone experiences whenever you are around other humans. Hatfield, Cacioppo, and Rapson define emotional contagion as "the tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another person's and, consequently, to converge emotionally" (1993). Researchers like Fowler and Christakis extended this definition to study the spread of emotion over a large social network over time; they concluded via 20-year longitudinal analysis that happiness spreads amongst friends, spouses, and family members (2008).

Since 2008, the reality of large social networks has dramatically, irrevocably changed. By 2009, Facebook was by far the world's dominant social media platform, far outpacing the previous pacesetter MySpace (Arrington, 2009). In the process, Facebook broke ground on a new era of connectivity and redefined social networks and relationships forever. The early years of Facebook's dominance were characterized by rapid change driven by a thirst for more users, but in 2014, Mark Zuckerberg changed the company's motto from the (in)famous "move fast and break things" (Kelly, 2014). Unfortunately, in my opinion, their founding ethos—paired with a fundamental abdication of responsibility—resulted in a great many broken things, numerous of them important. This paper will examine Facebook's addictive algorithms and scrutinize what ethical responsibilities to its users Facebook may have as a company of its power and influence. These topics will be analyzed through the lens of a notorious research study.

The same year that Facebook changed its motto, it published a paper titled "Experimental evidence of massive-scale emotional contagion through social networks" (Kramer, Guillory, & Hancock, 2014). At the time of publication, Adam Kramer was a data scientist at Facebook while Jamie Guillory and Jeffrey Hancock were faculty at Cornell, a grouping that will be important. The study manipulated "the extent to which people were exposed to emotional expressions in their News Feed" and tested if this was correlated with "change in their own posting behavior" (Kramer, Guillory, & Hancock, 2014). Although the effect size of the study was miniscule—on the order of

tenths of a percent change in posting amount—the study had N = 689,003, so the effect was statistically significant. Although one can argue that such a small effect size is unimportant, the authors themselves counter by saying the effect would "[correspond] to hundreds of thousands of emotion expressions in status updates per day" (Kramer, Guillory, & Hancock, 2014).

This study raises many questions and resides in a zone of ethical murkiness. Furthermore, it became a hot button issue in the public eye. This is the study that launched a thousand think pieces and journal articles. In the course of this paper, I will sift through many of the perspectives on this issue and attempt to uncover a unified theory of Facebook's ethical obligations with regard to algorithms and user manipulation. It is not a dilemma of *whether* Facebook should use an algorithm, but of *how*.

Setting the Stage

Why did both the public and the research community react so strongly to this Facebook study? From a user perspective, people were not asked to participate in research and were unaware that they were doing so (Flick, 2016). Although users did sign a terms of service agreement, they were functionally not aware that they could be involved in Facebook experiments (Flick, 2016). In essence, there was no informed consent. This was a subject that inflamed users and academics alike.

In addition, Facebook did not utilize outside ethical oversight even as they were attempting to manipulate users' emotions (Flick, 2016). This perceived lack of necessary oversight drew the ire of many academics who argued that such a study should be subject to an IRB-like review process (Boyd, 2014). Interestingly, the Cornell IRB was actually consulted, because two of the researchers were workers there. The IRB ruled that the study needed no review because it was not direct human research and the data was collected prior to the involvement of the Cornell researchers (Flick, 2016). This paper is not an analysis of IRB practices, but this ruling surely indicates prioritization of protecting the university as opposed to ruling solely on the basis of ethics. Those advocating for IRB-like reviews of corporate research need accept that board review processes are no panacea. Nonetheless, the point that this study should have undergone further review is a valid one.

The final—and perhaps most fundamental—issue taken with this study was that many users were *wholly unaware* that Facebook manipulated their feed *at all* (Flick, 2016). This is a crucial point and sets the stage for the rest of this paper. In many ways, this was a conflict of expectations and reality.

The other side of this issue would maintain that this study is merely business as usual. "At Facebook, virtually every change to the app, no matter how small or obviously beneficial, is thoroughly tested on different segments of the audience before it's rolled out to everyone" (Manjoo, 2017). A/B testing is the bedrock of Facebook's (and other platforms') efforts to increase engagement (Boyd, 2014). So how is the emotional contagion study different from a best practice? This is essentially a discussion of business practices vs research.

Zooming Out

If we take a step back, much of the outrage can be traced to the context of the time into which this study arrived. In 2014, trust in Facebook and other social media sites was eroding; at that time the public trusted Facebook less than the IRS or NSA (Boyd, 2014). This study was published as the public was waking up to the "big data" era of online life. Users were primed to perceive Facebook in a negative, controlling light.

Now let us set aside for a moment the ethics of this study. Was any harm actually done? As discussed, the effect size of this study was incredibly small. However, one can argue—as the authors themselves did—that a small effect size multiplied by 689,003 people is meaningful. In my opinion, such a small effect size is of little consequence, especially since the study was performed for only a single week. Acknowledging this allows us to more deeply examine the bigger picture issues raised by this study, rather than getting bogged down in the immediate impact of a week-long experiment.

Algorithms: Can't Live with 'Em, Can't Live without 'Em

Social algorithms are not distinctive of Facebook, they are increasingly ubiquitous. David Lazer uses Google as a paradigmatic example of this rise; it was founded as "a simple deterministic ranking system" but has evolved to produce "[personalized] results on the basis of information about past searches and other contextual information, like location" (2015). Social algorithms are impossible to understand via their code alone: "the interplay of social algorithms and behaviors

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yields patterns that are fundamentally emergent" (Lazer, 2015). On the other hand, people have an expectation that social media feeds are not manipulated. To users, social media and their telephone company are of a piece; they do not expect either to control how much contact they have with their social groups (Boyd, 2014). These challenges make the implementation of social algorithms a fraught situation. In a sense, users want to be catered to, without knowing that an algorithm is doing the catering.

Facebook is not alone in struggling with its implementation of social algorithms. For example, in 2016 Twitter replaced their reverse-chronological sorting with a new default algorithmic sorting method. After public pressure mounted, they gave users the option of picking their sorting method and even went the extra step of allowing users to block recommended tweets (Statt, 2018). Twitter seemingly realized that providing a straightforward chronological feed could be a market advantage as the public grew increasingly suspicious of algorithms and big data.

More problematic is YouTube's "Up Next" algorithm. The feature—which theoretically has the goal of keeping users engaged—can rapidly send users down a rabbit hole of "conspiracy videos, videos produced by hate groups, and pirated videos published by accounts that YouTube itself sometimes bans" following a search about a mainstream news topic (O'Donovan, Warzel, McDonald, Clifton, & Woolf, 2019).

Like Twitter, YouTube, and countless other platforms, Facebook algorithmically decides what to show people 24/7. These other examples serve to illustrate the challenges presented by social algorithms, but not all hope is lost. Users appreciate that the algorithm prioritizes things they like (Bucher, 2017). In my opinion, if Facebook were to switch to a chronological feed, users would be startled at how much refuse they had to sift through to find the things they care about. In this sense, algorithms are certainly a useful tool that, as discussed, many people are unaware of.

However, sometimes the algorithm taketh away. Facebook can be a tremendous platform for fledgling artists to promote themselves, but doing so requires gaming the algorithm, with inconsistent success (Bucher, 2017). Users must fine tune posts to get maximum promotion by gaming the system. Sometimes the opposite problem occurs, and users are unable to control what they see. One user was repeatedly asked if she wanted to "poke" her ex-boyfriend, even

though she had hidden all of his posts (Bucher, 2017). Users were also sometimes creeped out by targeted ads or posts clearly shown in reaction to their recent activity (Bucher, 2017). Algorithms run the risk of being too good at their job; users want to feel that they are in control of their social network not that their social media platform is determining what friends they interact with.

The crux of the algorithm question is that algorithms are updated and tweaked *constantly*. None of the aforementioned companies ask for your permission when they change how they recommend the next video or the next great follow. Twitter is an interesting case because they allow users to opt out, but that option does not undermine the effectiveness of their live event centric platform. Facebook, as mentioned, relies on filtering due to a high volume of content.

These algorithms are black boxes, so even if platforms did disclose every update the intended effects would be difficult to parse. Furthermore, the *intended* effects are potentially very different from the *actual* effects.   The interplay of algorithm and human behavior is nigh impossible to predict.

To summarize, platforms do not disclose every update to their algorithms. Even if they did, the algorithms are complex and arcane, and modifications would be equally inscrutable. And even if their modifications were totally transparent, the algorithm's functional output is dynamic and unpredictable. Change, and therefore manipulation, is inherent to social algorithms.

Autonomy

The power dynamic at Facebook is increasingly asymmetrical as its user base continues to grow worldwide. If somebody found out a friend was manipulating them, they would likely end the friendship. But what can you do if the platform by which you communicate with your friends is doing the manipulating? Saying "find a new platform" is easier said than done when the largest tech companies are practically monopolies.

Technology made available partially makes our decisions for us, and this should be considered when undertaking ethically fraught experiments (Gertz, 2016). Facebook would claim that by agreeing to their terms of service users have agreed to participate in experiments such as the emotional contagion study. But part of Facebook's ethical calculus should include their asymmetrical power relationship with their users.   Not only did Facebook not get informed

consent—everyone, including Facebook, knows that nobody reads the ToS and are therefore not informed—but also users cannot autonomously decide to quit the platform. Their users are not fully independent in their decision to stay on Facebook. Their decision is partially made for them by Facebook's universality.

Conclusions

This is a fascinatingly complex issue. On one hand, Facebook's study violated the basic principle of informed consent and was not subject to exterior ethical review. On the other, it exemplified standard A/B testing that is a foundation of technological development. Industry members would likely argue "if there is no 'natural' News Feed, or search result or trending topic, what difference does it make if you experience A or B?" (Crawford, 2014).

In immediate terms, there was not a meaningful difference; the study essentially used a massive sample size to make marginal results significant. However, there is a problem with the big picture power dynamic of the user-platform relationship. Facebook is inescapable, and it controls the situation with its opaque algorithm. This muddies the ethical waters and takes us beyond a simple violation of informed consent. In my opinion, algorithmic manipulation was a tricky, insidious problem that Facebook inadvertently brought into the public consciousness with this study.

From the user perspective, this was a violation of expectations. In the aftermath of the study, Facebook apologized for the way the study was communicated, but not the study itself (Flick, 2016). This signals that they may have learned the wrong lesson. I fear that Facebook thinks that "the practice of algorithmic manipulation is acceptable but being transparent about the process is not" (Boyd, 2016). Did the reaction to this study teach Facebook that they should reduce transparency?

In the course of researching for this paper, I concluded that there is certainly much to be reformed. Although I am not persuaded that Facebook should simply have an IRB-like system, the mix of omnipresent algorithms with an inescapable, socially monopolistic platform is a situation that necessitates change. Facebook cannot go on quietly manipulating its captive users. The status quo would be preferred to decreased transparency, but there are several outcomes that would be even better.

Future Ideas

Many people writing about this issue got hung up on the question of business operations vs research, but I do not find this to be a meaningful distinction. Tech companies such as Facebook have insignificant separation between research and product (Boyd, 2014). Quibbling over who precisely is manipulating your feed is losing the forest for the trees. With this in mind, all of the ideas presented here deal with Facebook as a whole.

One obvious modification that Facebook could make is to allow users to opt-in to A/B testing of different kinds (Crawford, 2014). It would be incredibly easy for Facebook to notify users of their new options. If users are not fully in control of their choice to be on Facebook, we should give them autonomy within the Facebook ecosystem. Users could choose between an algorithmically sorted feed (presumably the recommended choice) and a chronological one. They could choose to be a beta tester for different subsets of features. They could agree to try tweaks to the sorting algorithm. It is very possible to conduct sound research with a smaller sample than the near 700,000 that Facebook manipulated in the emotional contagion study, so reductions in participants is not a meaningful concern. Users could even be compensated for participating with early releases. In toto, the company should be responsible for *informing* the user what they are agreeing to, and the user should be responsible for *consenting* (Flick, 2016).

Within the algorithm itself, Facebook could provide options. To borrow an idea from artificial intelligence, Facebook could allow for different degrees of exploration and exploitation. In my personal experience, I enjoy seeing posts from friends that I have not interacted with in a long time. It is enriching for me to be reminded of old friends and acquaintances. On the other hand, some people may want to remain "friends" with those people but do not want their updates to appear on their news feed. Allowing users to customize this would better address user needs and again would allow for increased autonomy within a restricted system.

These ideas—while useful and relatively easy to implement—do not address the larger questions raised here. Every platform that employs algorithms faces these same questions. Social media platforms and social algorithms are unregulated as of yet (although there is growing pressure to change that, including among some presidential candidates). Although I do not have an answer for what a big picture ethical solution would look like, I do know some requirements

that I think it should fulfill. I see three major stakeholder groups: platforms, users, and institutions (not the least of which is our democracy). Platforms can be further broken down into business considerations and researchers.

As Boyd raises, such a solution should be conversational, and everyone on all sides should understand the other points of view (e.g. so that users see the value of A/B testing frameworks) (2014). These solutions must also be flexible and applied differently to different platforms. Ethics is contextual.

When I began this paper, I was faced with a dilemma not of *whether* algorithms should be used, but of *how*. I have suggested a few ideas that would, in my opinion, address some of the concerns with Facebook's current implementation, and I have laid out some requirements that solutions in general should adhere to.

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Yelp: Building Community One Review at a Time

This is an excerpt from a group research paper that I completed with Brittany Tan and John Ho. I have only included portions that are my original work.

This project involved qualitative research in the form of participant observation (i.e. becoming a committed member of the Yelp community for an extended period) and in-depth user interviews. All three of our group members joined and participated on Yelp, performed 3 interviews, and divided work on the paper equally. I also edited the paper prior to submission.

Names are either anonymized or included with permission.

Purpose

When Yelp was created in 2004, its mission was "to help people find great local businesses like dentists, hair stylists and mechanics" ("About Us," n.d.). Nowadays, that's been shortened to simply "to connect people with great local businesses" ("About Us," n.d.). Yelp's mission statement is very accurate - it is for locals, and this is part and parcel to its appeal to members. Case in point: its CEO wanted to name the company "Yocal" because it rhymes with "local" (Kamp, 2014). Although Yocal lost the name war, locals have been critical to the company throughout its life. It aims to create communities, most often in large metropolitan areas in the US.

Detailed demographic information is shown below in Figure 1. Age is fairly evenly distributed, but Yelp's members skew towards college-educated and financially well-off.
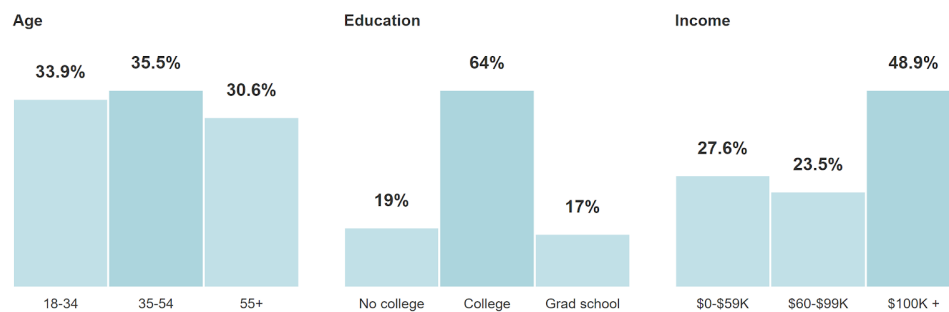

Figure 1. Yelp user demographics ("Factsheet," 2018)

Broadly, Yelp's potential members fall into three categories: visitors, reviewers, and businesses; Yelp tries to service the needs of all groups. Visitors want to quickly find a good place to eat or shop and maybe want to be able to save ideas for later. Reviewers enjoy writing and publishing reviews, and they may form relationships with other active users. Business owners want to interact with their reviewers and might want to buy ads on the Yelp site. Member roles will be broken down in more detail in the Range of Roles section.

Yelp's logo is omnipresent; restaurants, events, and related websites proudly show it off. Yelp's visual design in general is slightly playful and encouraging, but not enough to undermine its functionality. The brand personality is mostly tied up in seeing the burst logo around your city.

The backstory of Yelp is not a crucial part of its identity. A few of the longer-tenured interviewees seemed aware of some of Yelp's history, but for the most part it was not a subject of discussion.

Participant Motivation

Motivation for using Yelp comes in many forms. It varies from purely extrinsic to mostly (or even entirely) intrinsic. Yelp balances these types of motivation effectively; different levels of commitment require different strategies for promoting usage.

For the least active roles, motivation is entirely extrinsic. Visitors use Yelp to find local businesses, but never contribute or make an account. Lurkers are committed enough to make an account, but may only do so to use features like Bookmarks or check-ins. Both of these roles want to use Yelp, but not directly contribute to it. Daniel Burapavong learned at his ACRONYM council that 95% of people that use Yelp do not write reviews. However, visitors or lurkers may become easily become amateur reviewers if they have a couple stand-out experiences that they want to share. As Gilbert found, amateurs contribute reviews when something really grabs them, and they do not much care if their review is unique (2010). Most Yelpers fall into one of these first three roles, and the lines between them are relatively blurry.

The final group of regular users is the pros. The pros contain a couple of subsets of users, between which motivations differ. The first subset is reviewers who frequently write reviews and interact on the site but are not Yelp Elite members. This could be for a myriad of reasons, including not knowing about the benefits of the Elite program, or simply not knowing it exists. These

reviewers perhaps display the most purely intrinsic motivation. They write reviews because they enjoy doing it, and they seek no further gratification.

The second group of pro reviewers is Elite users. Kraut and Resnick (2011, p. 26) claim that "rewards, whether in the form of status, privileges, or material benefits, will motivate contributions," and Yelp is certainly an example of this principle. As previously discussed, the Yelp Elite program offers perks to its members. Most prominently, there are regularly-occurring Elite-only events with free food and drink. These events are the primary motivator for most Elite users. Amanda Hui said "I literally only do it because of their elite program and the perks that come with it like free food events." Van Pham agreed, stating that he started writing reviews with the goal of becoming Elite because he "[knows] people who are Yelp Elites and then they go to like these Elite events and they seem pretty cool like I want free food. I like free food!"

A secondary extrinsic motivator for Elites is, in Amelia's words, "bragging rights!" Having the "Elite 2019" badge on your profile is a mark of commitment and status. Daniel Holliday said he likes "to fake flex on people. Like 'oh by the way, I'm Yelp Elite.'" Amelia joked that her special ten-year badge (colored black instead of the usual red) means she "can retire from Yelp!"

Finally, the most committed Yelp users find that they stick around for the community and the friends they have made along the way. Kraut and Resnick (2011, p. 18) argue that "combining contribution with social contact with other contributors will cause members to contribute more." Yelp effectively does this both through in-person events and online features like compliments and check-ins. Daniel Burapavong and Angela M., both ten-year black badge holders, were the biggest advocates of Yelp as a community. Angela M. said of Yelp Elite "for me, it is really a community, it's not just a status." Daniel Burapavong added that his "Yelp family" extended beyond Elite: "I made a lot of friends through the Yelp community and it's not just limited to the quote unquote Elite Squad." When asked if he had any final thoughts at the conclusion of his interview, Daniel said "I love the Yelp community and that's what keeps me coming back."

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My Best Online Experience

At some point in high school, I decided I should start a Twitter account. I did so with no intention of tweeting, and indeed I never really have. I joined because it seemed like the place where things happened, and I wanted to follow the action. The ensuing years have proven that to be true – Twitter is still the best place for in the heat of the moment action and reaction. But that tagline belies my experience on Twitter, which exposed me to an entirely new world and irrevocably shaped my interests and passions in the process.

My entrance into Twitter coincided with a couple other events in my technological life: I discovered podcasts (this was circa 2013, before the podcast boom) and I discovered the website Grantland. Really, those things are one and the same, because for years the only podcasts I listened to were Grantland podcasts. I was fiercely loyal. Grantland was a site dedicated to sports and pop culture and… life? Surely not, but that is what it seemed like to my teenage self. It was everything I had ever wanted about the things I loved (and the things I loved but just didn't know it yet). It was the perfect site for that time of my life. It made me smarter and more curious. Grantland was my first and only true internet love.

But, back to Twitter. I had just started reading Grantland, so what did I do when I joined Twitter? I followed as many of the Grantland writers and editors as I could. I started with a handful, but Twitter is good at giving you more of what you like (too good, as we will see), so a handful quickly became many times that.

Twitter was a new frontier. My feed was split into two distinct sections: news – the original reason I joined Twitter – and people I wanted to hang out with. Grantland writers certainly were the founding members of the latter category. Logging on and seeing what Brian Phillips or Wesley Morris or Bryan Curtis or Rembert Browne was doing right now was an incredible rush. I was already reading their every published word; now I could get the un-published stuff too!? I rapidly followed more and more people; once I exhausted the ranks of Grantland, I moved on to their friends and colleagues, or people who wrote things that the Grantlanders admired. I continued to follow enough news outlets to stay current, but Twitter primarily became a place for me to hang out. And for a while, it was a great hang.

Through Grantland, I became deeply interested in film, music, basketball, and writing itself. At the time, few of my friends were as invested in the year's best movies or the new album I was fixated on, let alone how those things were being written about. So, when I wanted to find a discussion about these obsessions, I turned to Twitter and the cohort of writers and personalities that I followed. During a live event, there was nowhere else I would rather have been. But my experience transcended the event-centricity of Twitter. I went to Twitter to have fun in the moment, but also to look for the next great essay or story. Twitter became my hang-out, my battle place of ideas, my land of discovery. I cannot overemphasize to what degree Twitter changed my viewpoint on the world and my own life. I am pursuing HCI because of Twitter, and I may yet pivot even further towards the arts. It exposed me to wonderfully written, world-shattering stories. The personalities I found on that site have not ceased to inspire me.

On the internet, good things must come to an end. Grantland did in 2015, a few months after I started college. When I read the news, my roommate thought something was seriously wrong, and it was. I struggled to explain to him how losing a website could be an intense emotional experience. My existence on Twitter stuck around for a few more years, but eventually I moved on. I still check it every few days, but without fail I am reminded why I left. Twitter, with its infinitely scrollable feed, is my addiction. When I open it, I reflexively scroll and scroll and scroll and become blind to the world. In 2016 and 2017, this was a multiple times a day occurrence. My land of discovery became unhealthy.

I do not know what my breaking point was, but I know I would have reached it with or without Grantland in my life. I still love the content and personalities that I follow on Twitter, and if I could experience them in smaller doses I would. Unfortunately, I know now that Twitter is not designed for that reality, and through its use I successfully rewired my brain to further undermine that possibility. Twitter wants you to unblinkingly read tweet after tweet. Why look up when the world is happening right on your screen?

After leaving, I thought about a second flaw in the ecosystem I had set up for myself. I was constantly absorbing information but not transmitting any. In my years on Twitter, save a handful of replies, I have never written a standalone tweet. Although I would argue this does not invalidate my experience or the sense of community I felt, I decided to seek out online

communities in which I can participate in engaging discussion, not merely absorb it (this remains a work in progress). Twitter served its purpose by efficiently exposing me to incredible amounts of information, but Twitter as constituted cannot be a part of my solution moving forward. With some tight-knit groups excepted, Twitter is mostly lots of people talking past each other. It is designed for people to perform, not converse.

My time on Twitter was a formative experience for me and remains my happiest period on the internet. Its semi-sour ending cannot ruin that for me. It changed my perspective in innumerable ways and opened my eyes to ways of thinking that I did not know were possible. Maybe someday I will get around to writing a tweet.