

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

COLLEGE OF INFORMATION SCIENCES AND TECHNOLOGY

MOBILE HEALTH USABILITY WITH SNAPCHAT'S SOCIAL MEDIA PLATFORM

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SPRING 2018

A thesis submitted in partial fulfillment of the requirements for a baccalaureate degree in
Information Sciences and Technology with honors in Information Sciences and Technology

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ABSTRACT

Snapchat has been a rising social media platform across the world since its creation in 2011. The Snapchat platform is different from many forms of social media because it combines temporary pictures, video, and text all in one media platform. With the combination of data types that can be sent through Snapchat, it provides cognitive affordances that are most similar to face-to-face communication of any social media platform. Face-to-face communication has been deemed the most positive and motivating form of communication, and with Snapchat being the closest to that, it would only make sense for it to be used for motivational purposes. Mobile Health (mHealth) technology companies have been struggling with retaining users of their products, and there is potential for a technical integration with Snapchat to increase motivation and improve user retention rates. The research presented in this paper highlights the importance of using Snapchat as a motivational social media platform and aims to discuss the potential implications of this idea. Findings and results are presented, but since the paper is widely exploratory in nature, the conclusions determine that much more research needs to be done before an extensive technical integration can be made.

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ACKNOWLEDGEMENTS

There are many people to whom I owe gratitude for the efforts made in the completion of this thesis. First, I could not have done any of this work without the help and patience of my Thesis Supervisor, Dr. Alison Murphy. She has been extremely helpful through the entire process and has kept me on track when things seemed scattered.

Secondly, I owe great thanks to my parents, Jon and Lori, who have stressed the importance of this project and have done everything they can to ensure that I stayed focused not only on the thesis, but also throughout my four years as a Schreyer Scholar.

Finally, I am thankful for my friends who have gone out of their way to distribute my survey to others in order for me to collect data. Without their help, I would not have been able to receive as many participants as I did.

Chapter 1

Introduction

“Mobile health apps must minimize user friction. Operation must be intuitive and natural, even passive. This requires a strong understanding of the user’s context and motivation” (Mehra, 2014). This note from a 2014 TechCrunch article is extremely applicable to today’s challenges in 2018 with mobile healthcare (mHealth) technology. The challenges facing the mHealth industry are numerous and wide in scope, however, the focus of this paper will aim to highlight the importance of usability and technical integration with social media peer groups as a form of motivation and influence.

A variety of social media tools are used by millions of people around the world as a means of forming communities of practice with specified goals in mind. Fitness goals and peer groups are among the most common communities formed on social media sites like Facebook and Twitter, but there is a major problem that arises from these platforms serving this purpose. Generally speaking, the most effective form of communication is real-time, face-to-face communication, and platforms like Facebook and Twitter don’t effectively mirror the cognitive affordances that face-to-face communication provides. A 2017 study [4] summarizes this idea further,

“We will argue that the appeal of visually-dominated social media is rooted in their mirroring of perceptual reality, a design that has not been as effectively mobilized on traditional social media platforms. We will focus our attention on what we call the “Snapchat model” of multimodal affordances, which mirrors perceptual reality not only through visual representations, but by capturing social information contained within action and movement” (Jeong, 2017).

In 2011, a new social media platform was introduced to the world by a Stanford undergraduate student named Evan Spiegel. Snapchat, a person-to-person picture messaging service jumped onto the social media scene with much controversy, but has since proved to a major player in the social media market. With the ephemeral nature of the Snapchat model, users are submerged in a communication environment that more closely resembles face-to-face communication than any other social media platform, and this reality provides major significance in regards to the forming and successes of motivational peer groups. People respond more positively to face-to-face communication – which leads to the question: why has the technology that most closely resembles face-to-face communication not been used to facilitate peer groups with an inherent desire for motivation and support?

The mHealth industry undoubtedly has its share of challenges, with a major one being a high degree of difficulty in usability and a low attrition rate associated with the products. An excerpt from the 2014 TechCrunch article (Mehra, 2014) highlights the key to overcome this mHealth obstacle that the industry is facing:

“This brings us to the key to virtually any mobile health technology breakthrough: user acceptance. Developers and healthcare companies must make users a seamless part of the process, and this is where high-quality, easy-to-use mobile apps become essential. Mobile health apps must minimize user friction. Operation must be intuitive and natural, even passive. This requires a strong understanding of the user’s context and motivation.”

Chapter 2

A Review of Existing Literature

“Snapchat is more personal”: An exploratory study on Snapchat behaviors and young adult interpersonal relationships

Since founder Evan Spiegel started Snapchat in 2011, the social media platform has skyrocketed in popularity amongst all social media users. While Facebook remains the most popular social media site, Snapchat is rapidly growing in adoption, especially among young adult users, which the study defines as ages 18-29. Of any age demographic, young adults use smartphones at the highest rate (90%), and 41% of young adults report regularly using Snapchat (Vaterlaus, Barnett, Roche, Young, 2016). Snapchat started as a controversial smartphone application, with implications of being utilized for sexting due to the temporary nature of the received “snaps.”

As Snapchat has existed and grown over the 7 years of its life, it has morphed into an escape from the general one-to-many platform that most social media sites such as Twitter, Instagram, and Facebook follow. Snapchat has an ephemeral and private nature, which makes it new and unique in the scope of modern social media. This study was conducted to determine how Snapchat will impact relationships amongst young adults, and a focus group of 34 young adults ages 18-23 was used to conduct the study. The focus question of the study done in 2016 by Vaterlaus et al. was

“How do young adults perceive Snapchat use influences their interpersonal relationships (parent-child, sibling, social, and romantic relationships)?”

The findings of the study weren’t overly conclusive about any one influence of Snapchat in interpersonal relationships, but instead gave suggestions at a variety of trends and rules that

young adults noted in the research study. The study provides a base for making the role of Snapchat in young adult lives clearer in that young adults reported using Snapchat in their close relationships and that the platform “facilitates more congruent communication” (Vaterlaus et al., 2016). Congruent communication suggests that Snapchat allows more meaning to be attached to the message because it includes a picture for contextual background, and is a temporary message in which both users must actively engage. Young adults also recognized that Snapchat introduces concepts like jealousy and competition in relationships because of the existence of best friend lists which track who you Snapchat most frequently. In summary, the research aimed to grasp the perceived results of Snapchat on interpersonal relationships amongst young adults, and while it wasn’t entirely conclusive, the study still led to findings that can be explored further.

Sharing the small moments: ephemeral social interaction on Snapchat

This research study was particularly interesting because it contained two separate studies in one. The first study was the most relevant to the usability aspect of Snapchat, while the second study led to suggestions and potential relationships between the psychology of Snapchat and positive emotions and rewards. Both of the studies complement the research of the current study in that they pertain directly to the psychology of Snapchat and the impact of the ephemeral nature of the platform.

The studies were conducted on 154 undergraduate students at a university. The questions were designed in alignment with previous research on the topic to probe participants about all interactions on two dimensions of perceived communication quality: enjoyment and supportiveness. The research questions of the study were posed as follows:

“RQ1: How do Snapchat interactions compare to other interaction formats in terms of their perceived (1a) enjoyableness and (1b) supportiveness?

RQ2: How do Snapchat interactions compare to other interaction formats in terms of their relationship to emotional (2a) valence and (2b) arousal?

Given that relationship strength has been linked to the mobile photo sharing affordances of Snapchat as well as the outcomes of interest noted above, we further ask:

RQ3: Do Snapchat interactions occur with closer or weaker relationships than other forms of communication?”

The average age of study participants was 20.4 years old, and 67% of participants identified as female. The study asked a series of questions administered through surveys sent to participants over a 14-day test period, and the questions were aimed at gauging interactions and the emotions

that resulted from those interactions. According to the results of the survey, “participants viewed Snapchat interactions as significantly more pleasant than texting, email, and Facebook – but significantly less pleasant than face-to-face interactions.” The results of the study also concluded that “Snapchat interactions produced a more positive mood than texting, email, and Facebook interactions.” To summarize, the results found by the first study show that “Snapchat interactions are more enjoyable and associated with a more positive mood.” The study continues to refer back to the ephemerality of the Snapchat platform, and cites two psychological studies from 2010 and 1989, noting that:

“substantial research in psychology suggests that present focus – concentrating on what one is doing as opposed to the contemplating the past or future – is associated with feelings of reward and positive mood. Furthermore, the limited time may amplify the affective response to a given message because of its perceived scarcity.”

A Pilot Study of a Peer-Group Lifestyle Intervention Enhanced With mHealth Technology and Social Media for Adults With Serious Mental Illness

This study was notable for purposes of literature review because it pertains directly to achieving fitness goals while also utilizing a social media and peer support groups. The study aims to examine the effectiveness of lifestyle interventions through peer-groups using social media and mobile health technology. The study was also relevant to the current study because it directly uses mHealth technology to track activity amongst participants. Each participant in the study was given a Fitbit device and a smartphone to track their progress and integrate their results on social media via Facebook. The difference in the current study is that it will use Snapchat as its social media platform, but still is integrating social media and mHealth technology.

Over the course of the study, 76% of the 25 participants used the Facebook peer-group, and 100% of participants used the Fitbit. In the study, 72% of participants achieved clinically significant (greater than or equal to 5%) weight loss. Perhaps the most important data point from the study is that weight loss was significantly associated with perceived support from the peer-group. This study is unique in that to the knowledge of the researchers,

“this is the first evaluation of the preliminary effectiveness of a lifestyle intervention that uses experiential and collaborative learning techniques and popular technologies to create and facilitate a peer support network to promote weight loss in obese adults with serious mental illness.”

The findings of the study are by no means conclusive that peer-support groups will equate to achieving all fitness goals. It is important to note that the study was conducted on participants with obesity who are also classified as mentally ill. That being said, this study cited

previous research, stating that participants may have been motivated to complete their weight loss goals because they felt connected to other participants through their peer-group. The prior study stated that weight loss among the general population could be linked to and influenced by team-based weight loss, where participants were influenced by other participants all striving to achieve their fitness goals.

Snap back to reality: Examining the cognitive mechanisms underlying Snapchat

This study is specifically unique because of its pertinence to usability and user experience with the Snapchat platform. The study argues that the platform affords the user the ability to visually represent the present time in more than one place. Snapchat combines both text, audio, and visual affordances to perceive a message, which allows the receiver to perceive the Snapchat as a real-time interaction, which has implications for enjoyment and appeal amongst users. The hypothesis of the study basically states that the heightened social presence associated with Snapchat is a positive user experience and is a major source of appeal to users.

The study uses components of the highly regarded, but highly criticized Theory of Mind, to decipher whether more personal, “realistic” communication is linked to user intensity, mental states, goals, and intentions. There is a major gap in literature in regards to studying Snapchat since it is a relatively new social media platform. However, this study aims to link the popularity of Snapchat to its similarities with natural interpersonal communication via face-to-face interaction. The study composed a Theory of Mind measurement scale which was formulated based on current knowledge of Theory of Mind using prior research. There are five evolutionary precursors associated with Theory of Mind: imitation, introspection, directedness, parsing, and shared attention. The imitation precursor is particularly of interest for the current study being conducted, because if Snapchat is more appealing to users, and users see others behavior using mHealth technology, then users may be more inclined to imitate other users who are utilizing mHealth products and social media integrations.

The study was conducted on 656 participants who completed a survey asking a variety of questions geared at understanding the impact of social presence and Theory of Mind within the Snapchat platform. The participants were comprised of 69.8% female students, and all

participants were under the age of 30. The findings of the study were fairly conclusive in that the researchers make the argument that:

“Snapchat users identify and find appeal in various cognitive precursors and mechanisms that underlie Theory of Mind within the Snapchat interface and user experience.”

This study is particularly important because many social media platforms have not utilized the cognitive affordances that humans possess through evolution. These platforms have stuck to largely text based presentation of content, and the findings of the study indicate that “Snapchat’s appeal seems to be rooted in its mirroring of perceptual reality (visual, movement-based, fleeting moments). Other, namely older, social media platforms have not used this design as effectively for various reasons.”

Chapter 3

Research Methodology

Data Collection

This exploratory research study was conducted with an online survey via Google Forms. This survey was previously reviewed by my thesis supervisor, and an informed consent statement was issued at the beginning of the survey. Any further action in regards to participation in the survey implied consent to have participant data viewed and analyzed as part of the research study.

The survey, all of which is attached in [Appendix A](#) was designed to develop an understanding of the usage of Snapchat and mobile healthcare (mHealth) wearables like Fitbit amongst participants. The survey questions were created after conducting a comprehensive review of survey questions used in previous mHealth and social media research studies. This ensures that the questions in this study are informed by existing research and aligned with the types of questions asked in the mHealth research community. The survey was comprised of three main sections all aiming to gather information about different aspects of Snapchat, social media, and mobile health (mHealth) technology. The first section of the survey gauges general demographic information and social media usage, the second part consists of questions relating to Snapchat, and the final section pertains to Fitbit usage as an example of mHealth technology.

Question Category	Number of Questions	Example Question
Social Media	10	Rank these social media platforms in order of which you use the most. 1 being most used and 5 being the least used.
Snapchat	14	How many times do you look at Snapchat per day?

Question Category	Number of Questions	Example Question
Fitbit	8	If you were to share your Fitbit data through Snapchat, how would you share it?

Table 1: Survey Question Information

Participant Information

The survey was administered via Google Forms to participants mainly comprised of students at Penn State University. The survey was distributed on social media with a link to the survey. It was also given to Penn State professors, who distributed it to approximately 150 students. The survey required approximately 15-20 minutes to complete the 32 questions, but some participants took less or more time depending on their individual attentiveness to open-ended questions. There was no limit in place in regards to the amount of survey participants with the idea in mind that the more participants will yield more accurate results in relation to user preferences and usage of social media platforms, Snapchat, and mHealth technology.

Analysis of Collected Data

Since the survey was administered using Google Forms, the exporting of data into Google Sheets made the most sense in terms of analysis. While Google Sheets doesn't offer all of the functionality of Microsoft Excel, for this research project its functionality and usability was sufficient. The survey data was analyzed using descriptive statistics to understand trends and patterns in the responses related to users' social media habits, health data sharing, and use of Fitbit. The results to each question were looked at on an individual basis from each respondent. The results were also broken into two categories of male and female responses to determine trends and disparities amongst each group of respondents. After analyzing data on an individual question-by-question basis, respondents with notable answers to survey questions were contacted for further unstructured interviews in order to understand their thinking and feelings behind why

they answered questions the way they did. The unstructured interviews sought to identify trends and factors in motivation for healthcare from perceived social media influence.

Chapter 4

Results

This chapter describes the results of the study broken down based not only on respective sections of the survey, but also on demographic information (such as gender) that may impact the response.

Demographics

The survey was completed by 153 (n=153) individuals ranging from 18 to 36 but 94.7% of individuals that completed the survey were between ages 18-22. The average age of all survey respondents was 20.22 years with a standard deviation of 1.98 years (SD = 1.98). Fifty-two males completed the survey and 101 females completed the survey (Figure 4-1). Survey participants were majority Caucasian, with the next largest majority being Asian (Figure 4-2).

What is your gender?

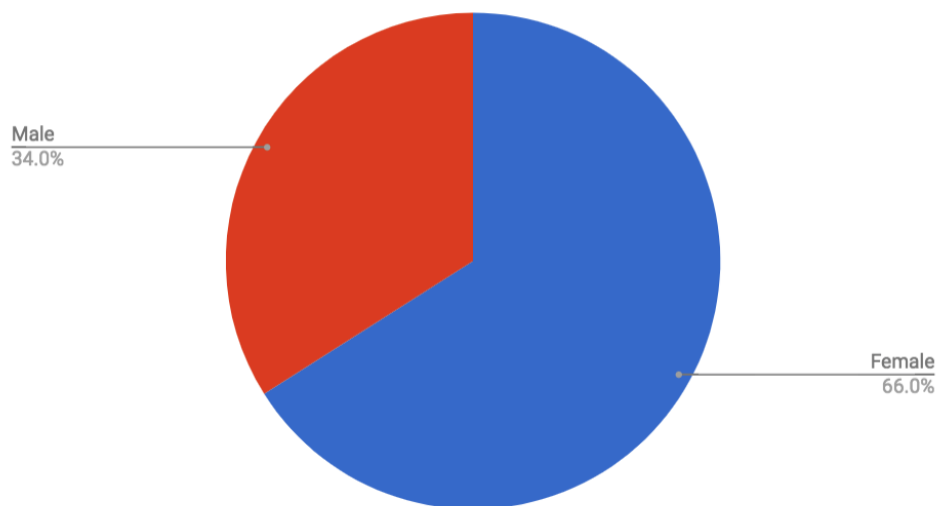


Figure 4-1: Gender Breakdown

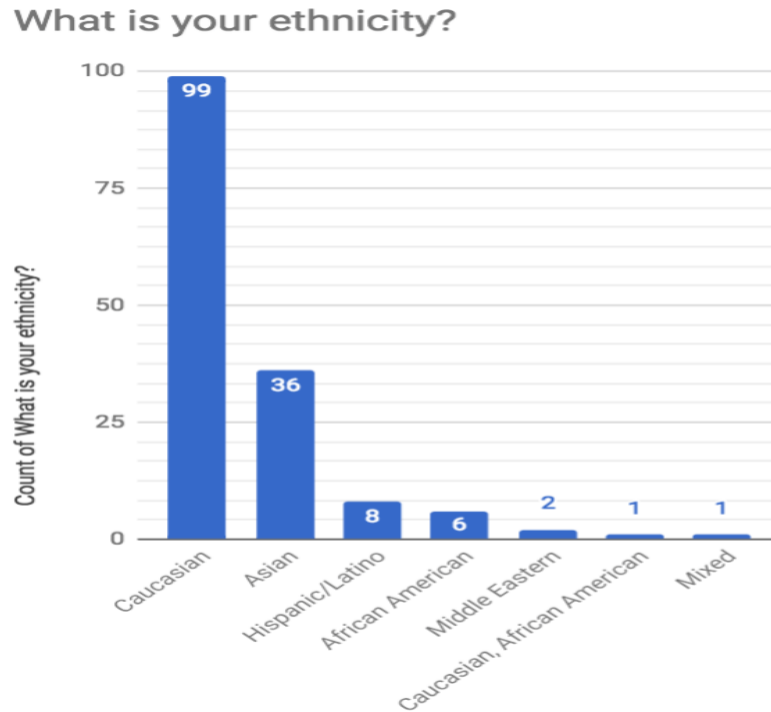


Figure 4-2: Ethnicity Breakdown

Social Media

The greatest number of participants in the survey stated that they used Snapchat the most of any social media platform – followed by Instagram (Fig 4-3). Participants stated at an equal number that they used Instagram and Snapchat the second most of any social media platform.

Rank these social media platforms in order of which you use the most. 1 being most used and 5 being the least used.

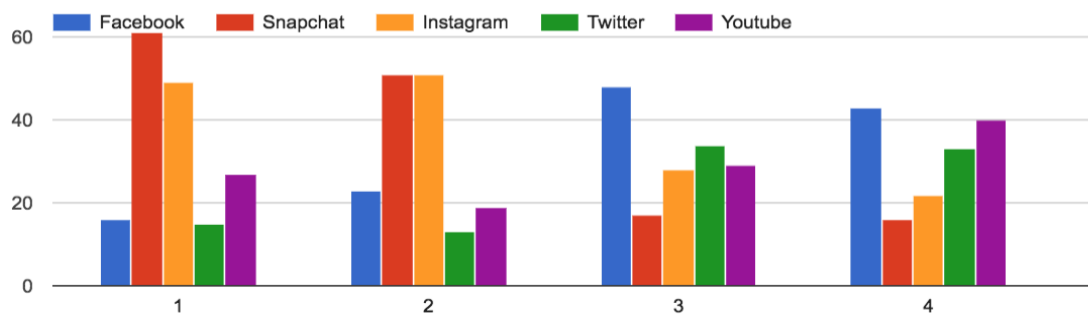


Figure 4-3: Social Media Usage Ranks

After gauging participants usage of social media platforms, the social media questions were then tailored towards health-related topics of content viewing and sharing. The first question of this nature was related to people sharing content via social media platforms (Figure 4-4). The large plurality of participants, 73 of them, stated that they have never shared anything related to health via social media. Facebook was the platform in which the most number of respondents (48), say that they shared health content – followed by Snapchat (29), then Instagram (28).

Through which social media platforms have you ever shared anything health related?

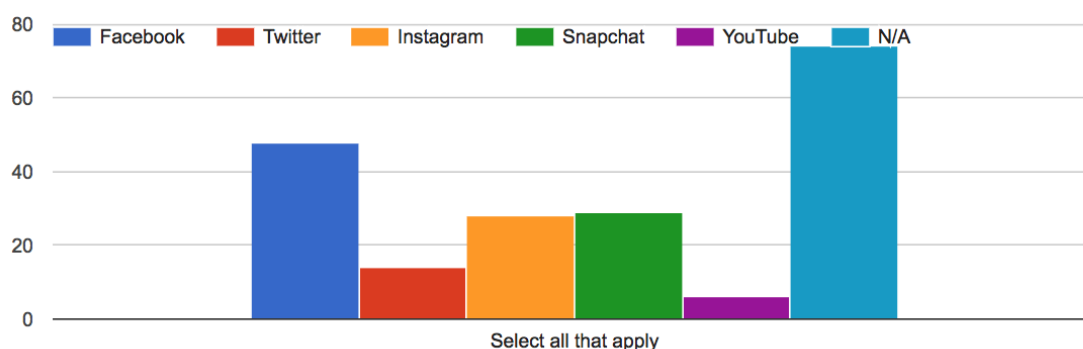


Figure 4-4: Health Content Sharing

The second question pertaining to health content and social media was related to participants viewing health related content via social media (Figure 4-5). The largest number of participants (119) stated that they viewed health content on Instagram, with the next largest being Facebook (115), followed by YouTube (90), then Snapchat (79), and finally Twitter (64).

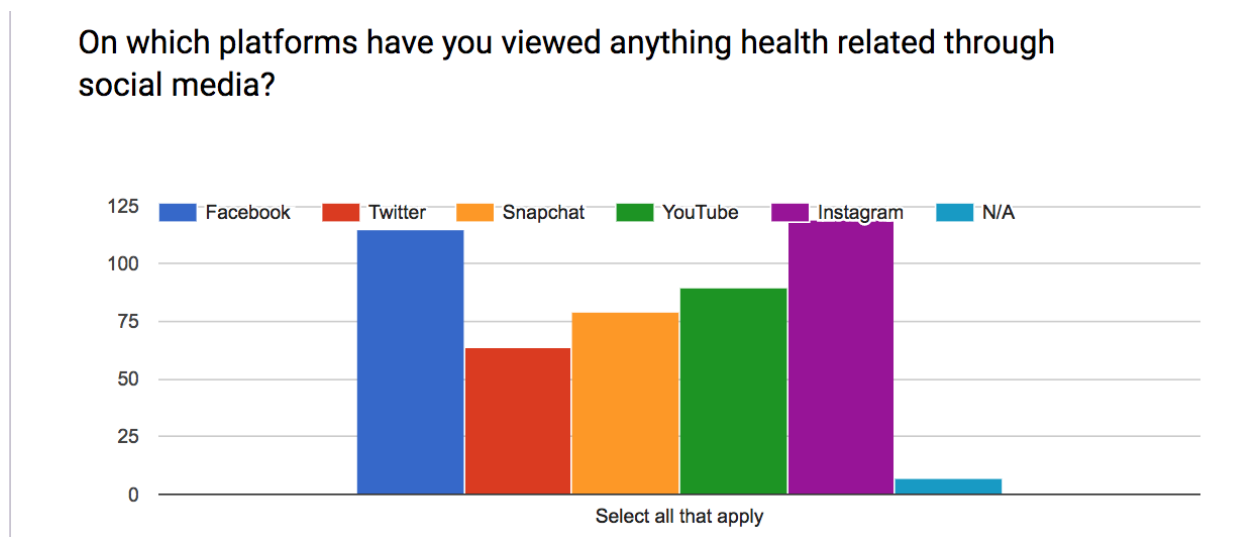


Figure 4-5: Health Content Viewing

The third question in the realm of health content and social media was tailored to determine which social media platforms influence content viewers to make changes to health-related topics in their lifestyle (Figure 4-6). Instagram received the largest number of participants who claimed that it was influential in their health habits with 81. The second largest media platform that was deemed to influence health habits was Facebook (55), followed by YouTube (53), then Snapchat (25), and finally Twitter (15). Also, 27 respondents said that no platform was influential to them, which was more than both Snapchat and Twitter.

Which social media platforms have ever influenced you to change a health habit/activity/plan/etc.?

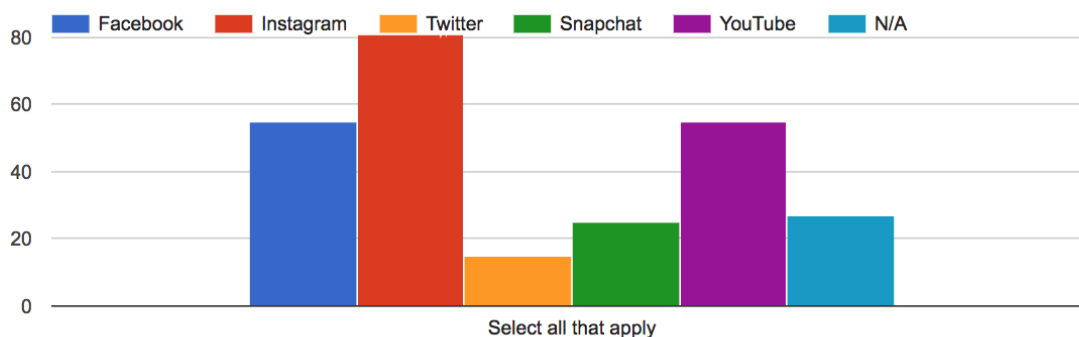
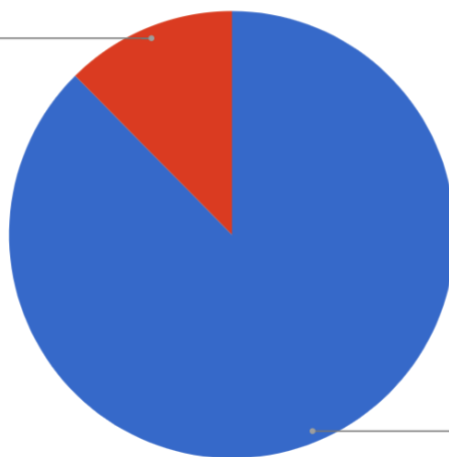


Figure 4-6: Social Media Influence

Being that this study leads to Snapchat as its social media platform of concentration, respondents were transitioned into the next section of the survey by asking if they were users of Snapchat (Figure 4-7). The overwhelming majority of participants (134) said “Yes” to using Snapchat, while only 19 participants said “No.”

Do you use Snapchat?

No
12.4%



Yes
87.6%

Figure 4-7: Snapchat Users

Snapchat

In order to gauge how often users of Snapchat were actually using the application, the next question in the survey was designed to determine the amount of times per day users believe they check (open) their Snapchat app on their mobile device (Figure 4-8). The plurality of respondents (29) stated that they check their Snapchat 30+ times per day, while the smallest number of respondents (11) stated that they checked their Snapchat 0-5 times per day.

How many times do you look at Snapchat per day?

134 responses

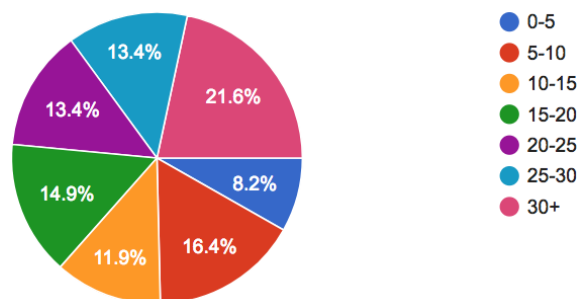


Figure 4-8: Snapchat Usage Frequency

Since the idea of this study is that Snapchat would be used to share health-related content for motivational purposes, it was important to see who users were communicating with via Snapchat. The following question in the study aimed to find out if users were using Snapchat to communicate with those closest to them (Figure 4-9). The plurality of users (61) stated that they Strongly Agree with the idea that they use Snapchat to communicate with their closest friends/loved ones, while 47 users said that they Agree. Only 6 participants Disagreed and only 3 Strongly Disagreed.

I use Snapchat to communicate with my closest friends/loved ones

134 responses

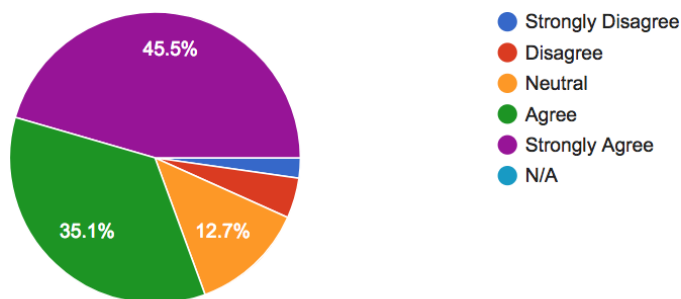


Figure 4-9: Snapchat Recipients

With the idea in mind that Snapchat users interact with the Snapchat platform as a close substitute for face-to-face communication, it would be important to see faces/facial expressions in “snaps” in order to most closely resemble that face-to-face style of communication.

Participants were asked if they believe it is important to see facial expressions in Snapchats (Figure 4-10). The vast plurality (59) said that they Agree, that it is important to see facial expressions. 19 respondents said that they Strongly Agree, which indicates that a majority of respondents said they either Agree or Strongly Agree. Only 5 respondents said they Strongly Disagree and 25 said they Disagree.

Through Snapchat, it is important to see my friends' face/facial expressions

134 responses

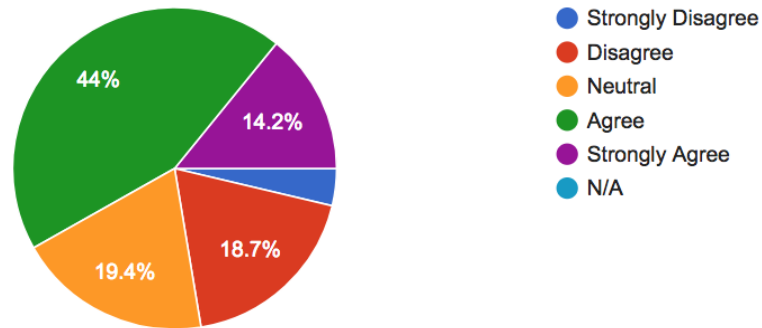


Figure 4-10: Facial Expressions

With the idea that Snapchat is comparable to face-to-face communication, and previous literature concluded that face-to-face communication is the most motivating form of communication, the study needed to determine if Snapchats have served as forms of motivation for respondents (Figure 4-11). The majority of participants, 71 of them, stated that Snapchats have indeed motivated them to do something. 38 participants said No, and 22 responded with Maybe.

Do Snapchats ever motivate you to do something?

134 responses

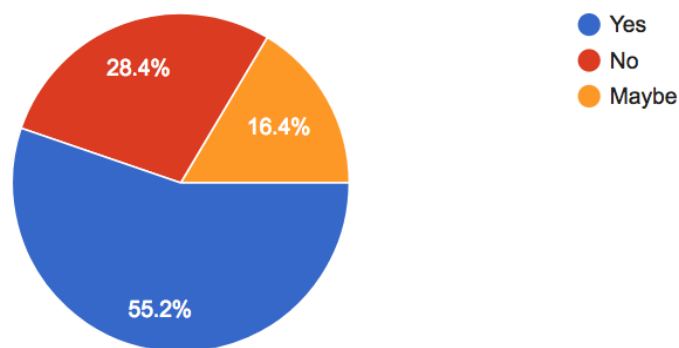


Figure 4-11: Snapchat Motivation

If Snapchat is a platform that is conducive for motivation, since the study is focusing on health-related goals, then the next question aimed to gauge if participants are viewing health-related content through Snapchat. A large majority, 90 participants, said Yes, they have viewed health-related content through Snapchat. Twenty-nine participants said No, and 15 participants said Maybe.

Have you ever viewed anything health related through Snapchat?

134 responses

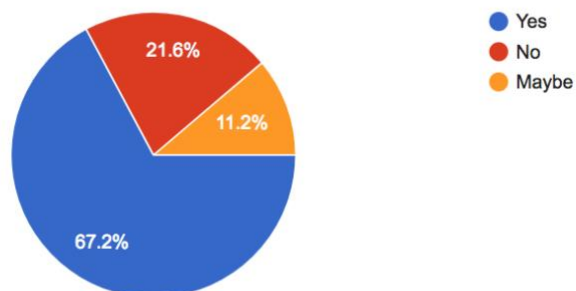


Figure 4-12: Health-Related Viewing

In order for people to be viewing content via Snapchat, there needs to be a party that is creating/sharing content to be viewed. The next question in the study aimed to determine how many participants were health content creators/sharers (Figure 4-13). Ninety-one participants, a large majority, said No, they have never shared anything health-related via Snapchat. Thirty-seven participants said Yes, and 6 participants said Maybe.

Have you ever shared anything health related through Snapchat?

134 responses

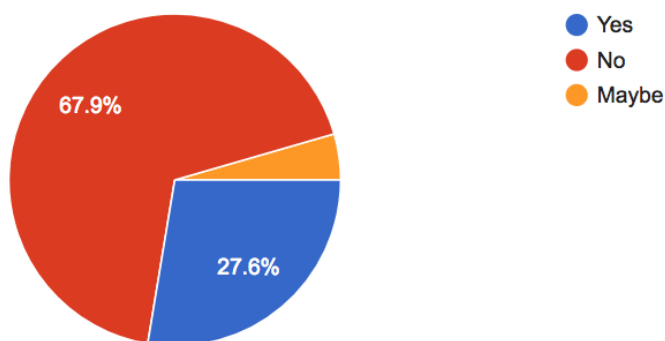


Figure 4-13: Health-related Sharing

Fitbit

After extensive questioning about Snapchat and its relation to health, the survey moves into Fitbit, which is a very popular source from where health-related content could be created. Participants were asked if they use Fitbit and the vast majority, 124 participants said No, 27 participants said Yes, and 2 said Maybe.

Of the 27 participants that answered Yes and the 2 participants that answered Maybe to using Fitbit, they were questioned more about their usage of Fitbit and whether they share the data that they generate. Participants were first asked how they currently share their Fitbit data (Figure 4-14). 15 participants said that they don't share their data in any manner, 13 participants

said they share their data via “word of mouth” with friends and family, and 1 participant said they share their data via Other. The one participant who answered “Other” was further questioned about how he/she shared his/her Fitbit data, to which he/she replied “I use the Fitbit app that shows everyone who I am friends with on the app what my data is.”

How do you share your Fitbit data? [Select all that apply]

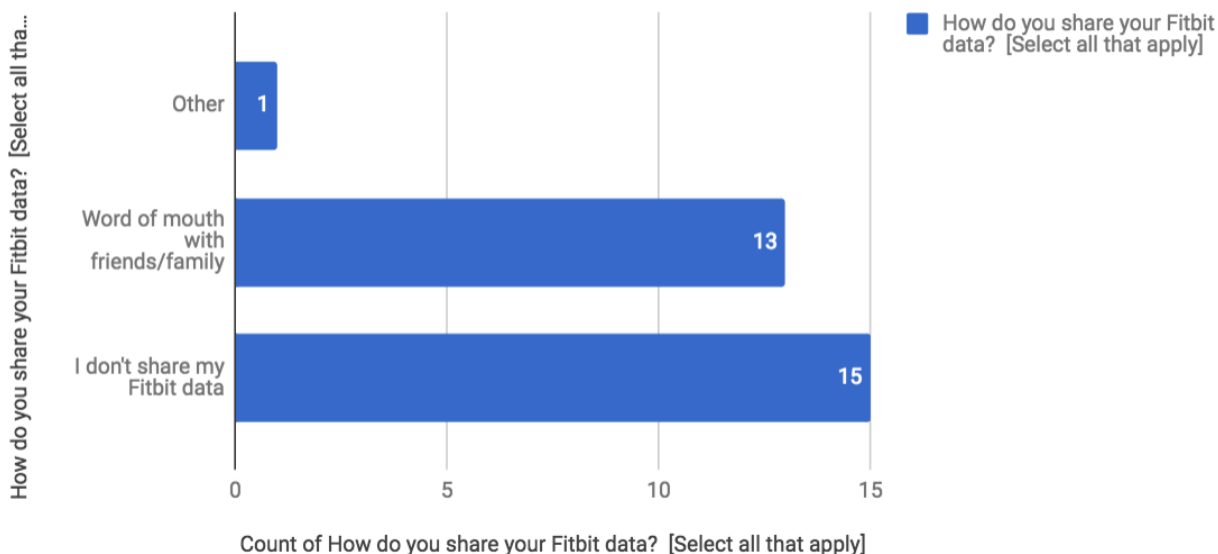


Figure 4-14: Fitbit data sharing

Participants were further questioned about why they share their data in an open-ended format. Of the participants that said they shared their data and chose to answer the open-ended question, the responses were very similar in the fact that they were mostly comprised of statements about accountability, accomplishment, and motivation.

Response Number	Response
1	I share it to compare activity with friends, making me more motivated to work out/increase activity
2	I share my Fitbit data because I like to compare my workouts with others
3	Accountability to stay on track with goals
4	My mom and I have Fitbits so we normally talk about our habits. It helps me stay competitive to out-do her goals.

Response Number	Response
5	keeps you more accountable
6	I share it with friends who also use a Fitbit and we compare our steps to see who has taken more on a day-to-day basis.
7	Compete with friends.
8	Sometimes I mention it to friends and family when it exceeds normal stats for a day
9	I share my data so my parents can see how I sleep.
10	So people can see my progress and it makes me feel accomplished
11	my friends and I compete, it provides me with a sense of motivation

Table 2: Fitbit Data Sharing Rationale

Once participants were questioned further about their tendencies to share Fitbit data, the survey proceeded to ask about the potential to share data via Snapchat. Snapchat provides three options for content sharing to those who are connected via Snapchat: Individual snapchats, Group snapchats, and Snapchat stories. The question was designed to allow respondents to select all methods that they would consider sharing their data through. Nine respondents said that they would share with individual snapchats, 8 participants said that they would share their data via group snapchats, and 6 respondents said they would share their data via Snapchat stories. Fourteen respondents who use Fitbit currently said they would not share their Fitbit data via Snapchat.

If you were to share your Fitbit data through Snapchat, how would you share it? [Select all that apply]

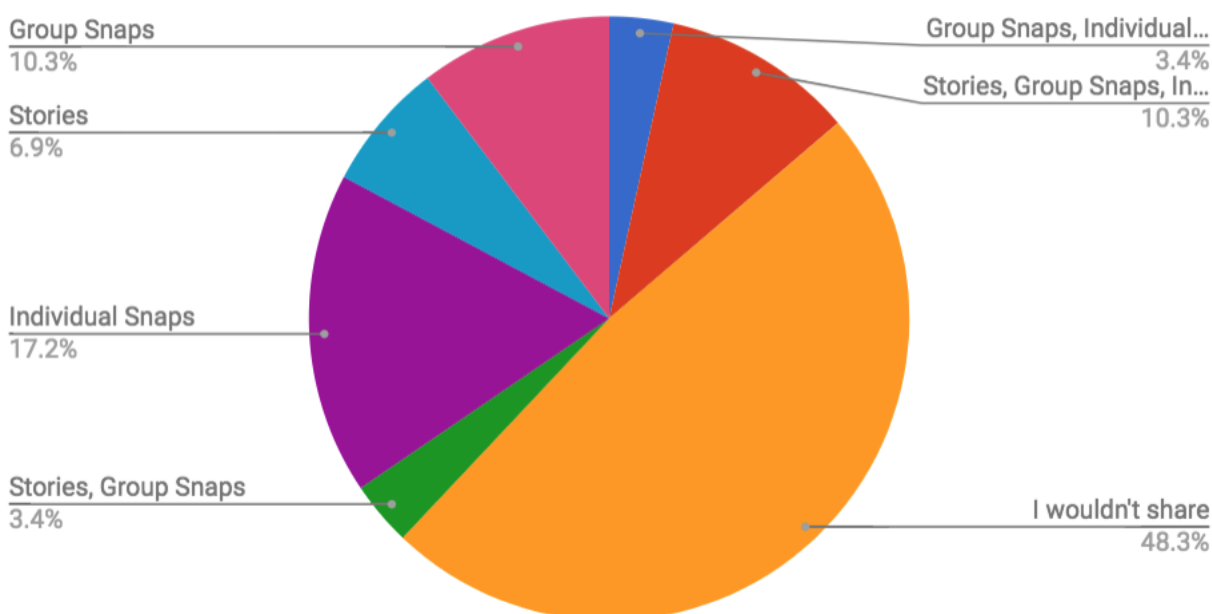


Figure 4-15: Fitbit sharing via Snapchat

Differences between Male and Female Responses

Once data was received from survey participants, it was important to see what the results of the study were on a gender-by-gender basis to determine if there were any differences in response based on gender.

Male Responses

In response to the question of whether or not they use Snapchat, 12 males (23.1%) said No to using Snapchat, while 40 males said Yes, they did use Snapchat (Figure 4-16).

Do you use Snapchat?

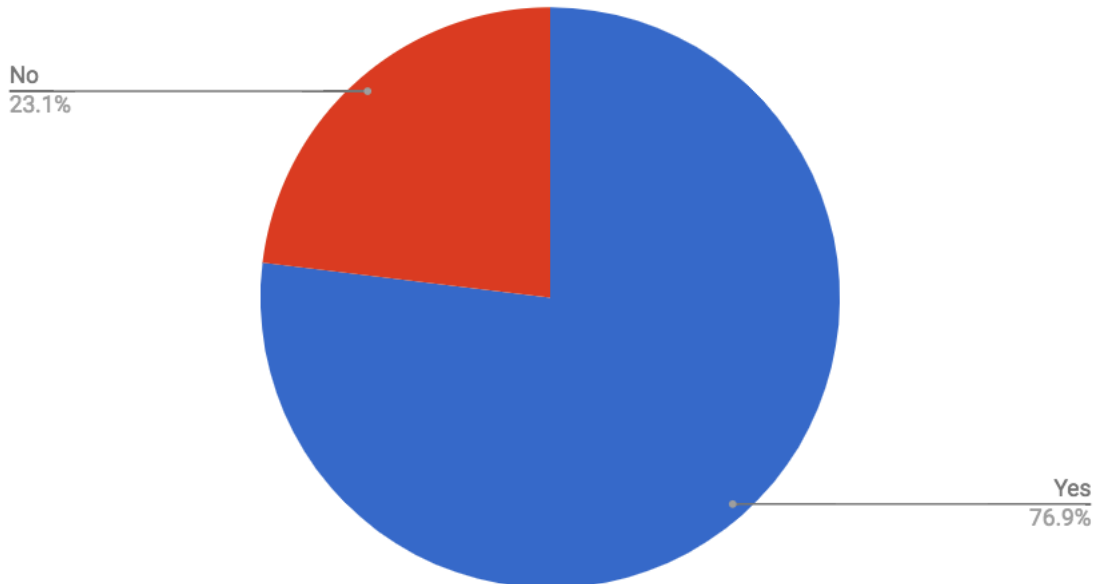


Figure 4-16: Male Snapchat Use

In response to how many times a day they check Snapchat, the plurality of males, which was ten of them, said that they check their Snapchat 5-10 times per day. The next highest was 10-15 times per day and 30+ times a day with six respondents for each reporting those answers. five respondents said 0-5 times per day, and five respondents said 20-25 times per day. Finally, four participants said 25-30 times per day, and four participants said 20-25 times per day (Figure 4-17).

How many times do you look at Snapchat per day?

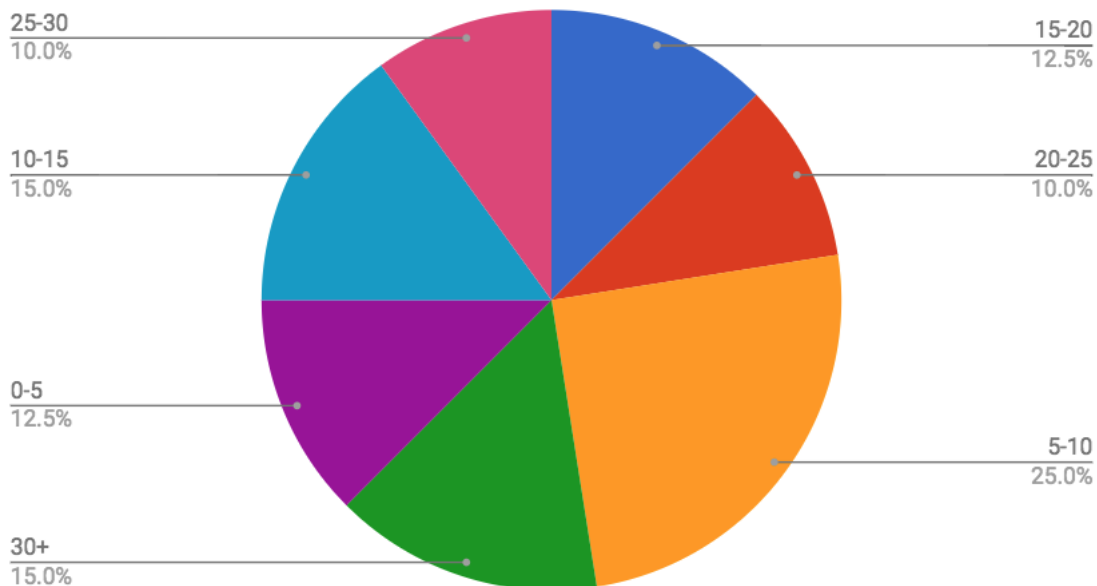


Figure 4-17: Male Snapchat Use Frequency

For the question of where they have viewed health-related content on social media (Figure 4-18), 37 males indicated that they had seen health-related content on Facebook. Thirty-three males said they have viewed content on YouTube, 35 said Instagram, 18 reported seeing content on Twitter, and finally, 20 participants said Snapchat. Only two respondents said that they hadn't seen health-related content on social media. It is noteworthy that the numbers should add up to more than 52 males because participants could select multiple options for where they have viewed content.

On which platforms have you viewed anything health related through social media? [Select all that apply]

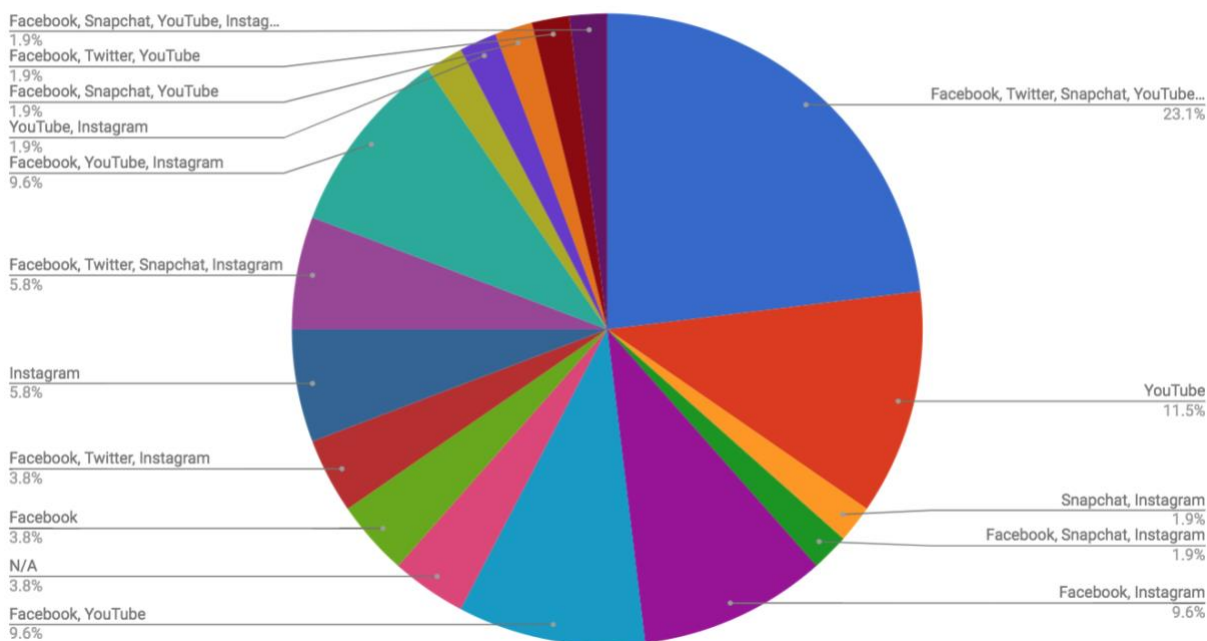


Figure 4-18: Male Health Content Viewing

A breakdown of how males shared health-related content showed that the majority of males do not share health content on social media. Of those that do, 13 said they shared their data via Facebook, 6 said they used Instagram, 8 said they utilize Snapchat, and 4 said they have shared health data on Twitter (Figure 4-19).

Through which social media platforms have you ever shared anything health related? [Select all that apply]

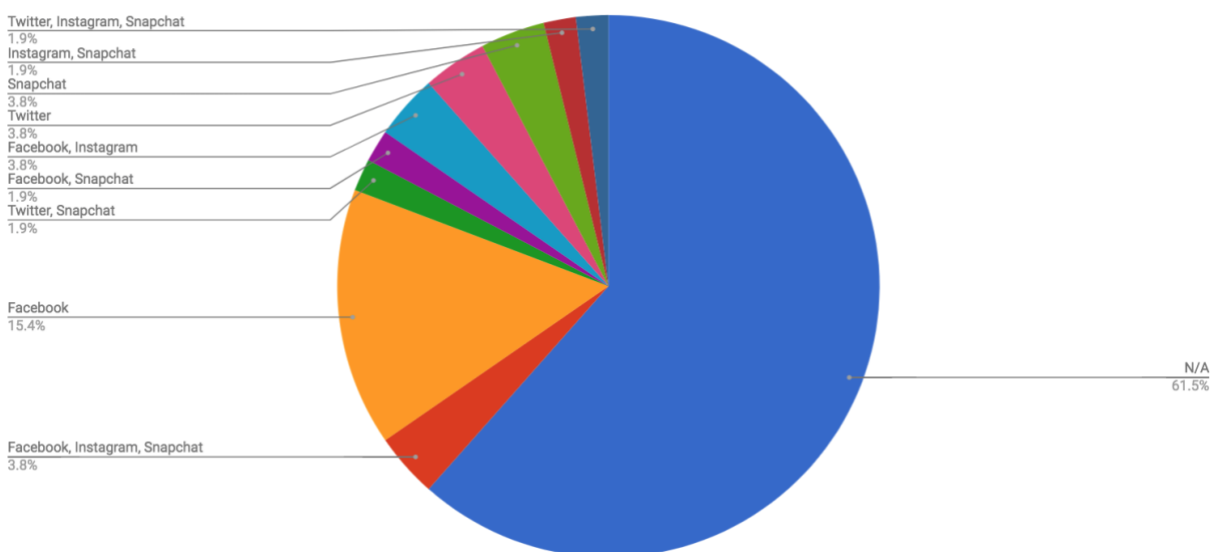


Figure 4-19: Male Health Content Sharing

Female Responses

In response to the question of whether or not they use Snapchat, the vast majority, 94 females (93.1%) said Yes to using Snapchat. 7 out of 101 (6.9%) females said No, they did not use Snapchat (Figure 4-20).

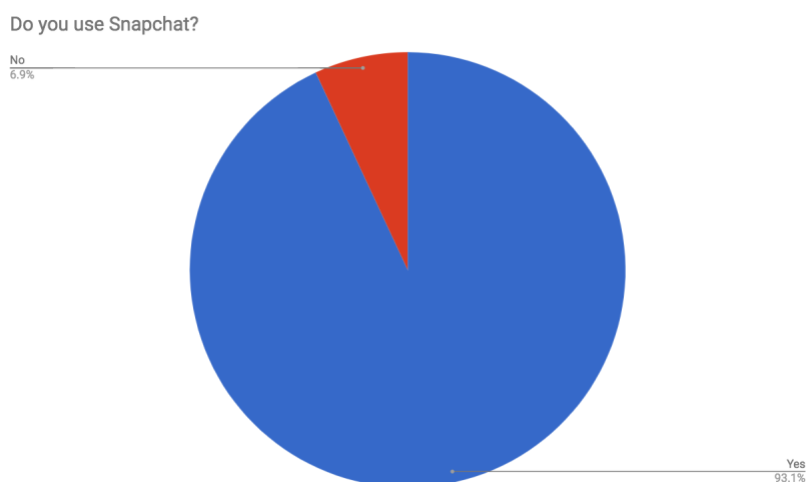


Figure 4-20: Female Snapchat Use

The plurality of female respondents, which was 23, said that they checked their Snapchat over 30 times per day. 15 females said 15-20 times per day, 14 females said 25-30 times per day, 14 females said 20-25 times per day, 12 responded with 5-10 times per day, 10 said 10-15 times per day, and finally, 6 said 0-5 times per day (Figure 4-21).

How many times do you look at Snapchat per day?

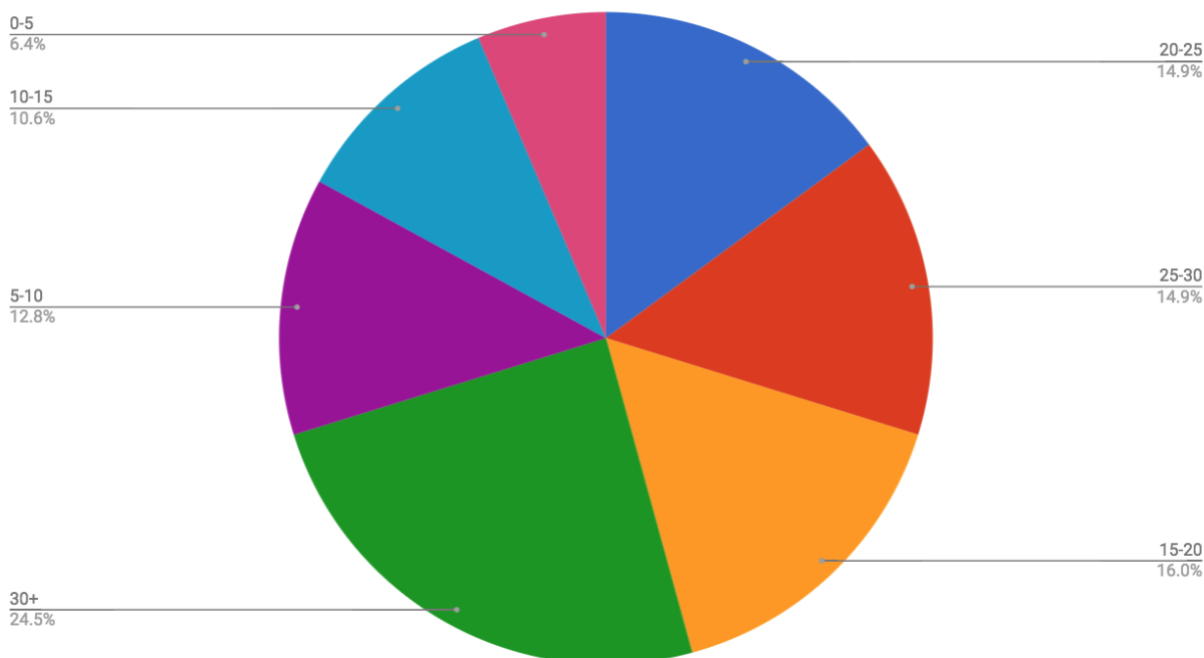


Figure 4-21: Female Snapchat Use Frequency

Of the 101 female respondents to the survey, only 5 of them said that they had not viewed any health-related content on social media. 46 said they reported viewing health content on Twitter, 59 said they reported viewing content on Snapchat, 84 said they have seen health content on Instagram, 57 said they have viewed health content on YouTube, and lastly, 77 females said they have viewed health content on Facebook (Figure 4-22).

On which platforms have you viewed anything health related through social media? [Select all that apply]

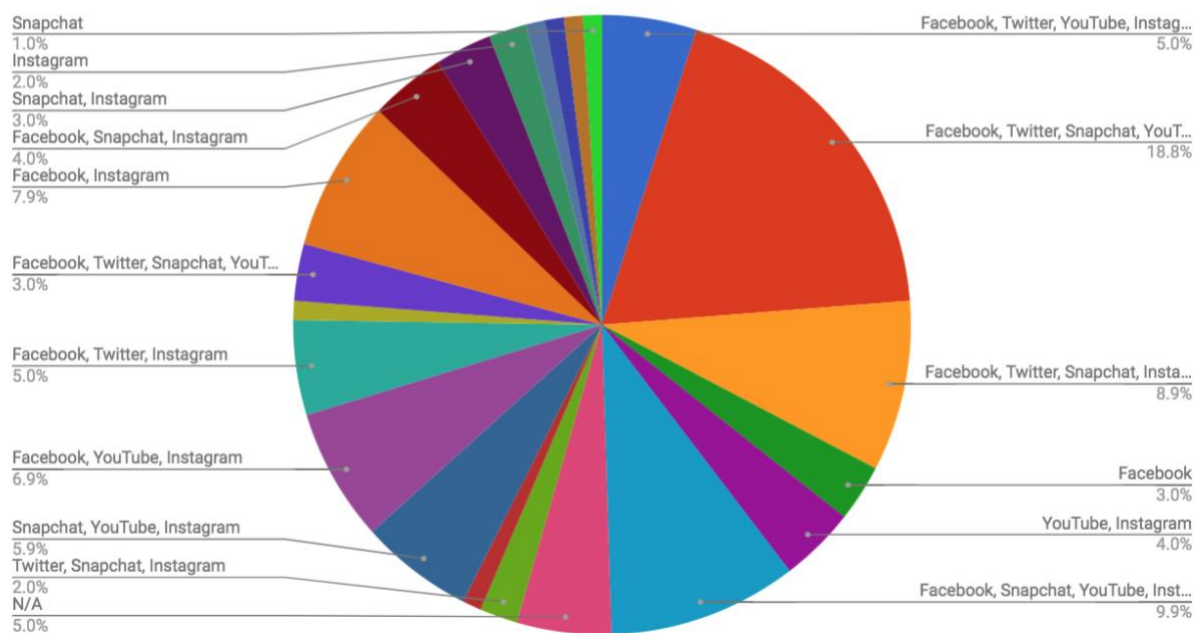


Figure 4-22: Female Health Content Viewing

Of the 101 female participants that took the survey, 41 of them reported not sharing any health-related content via social media. 35 females reported sharing health content via Facebook, 22 reported sharing health content via Instagram, 21 reported using Snapchat, 6 reported using YouTube, and finally, 10 females reported using Twitter to share health-related content (Figure 4-23).

Through which social media platforms have you ever shared anything health related? [Select all that apply]

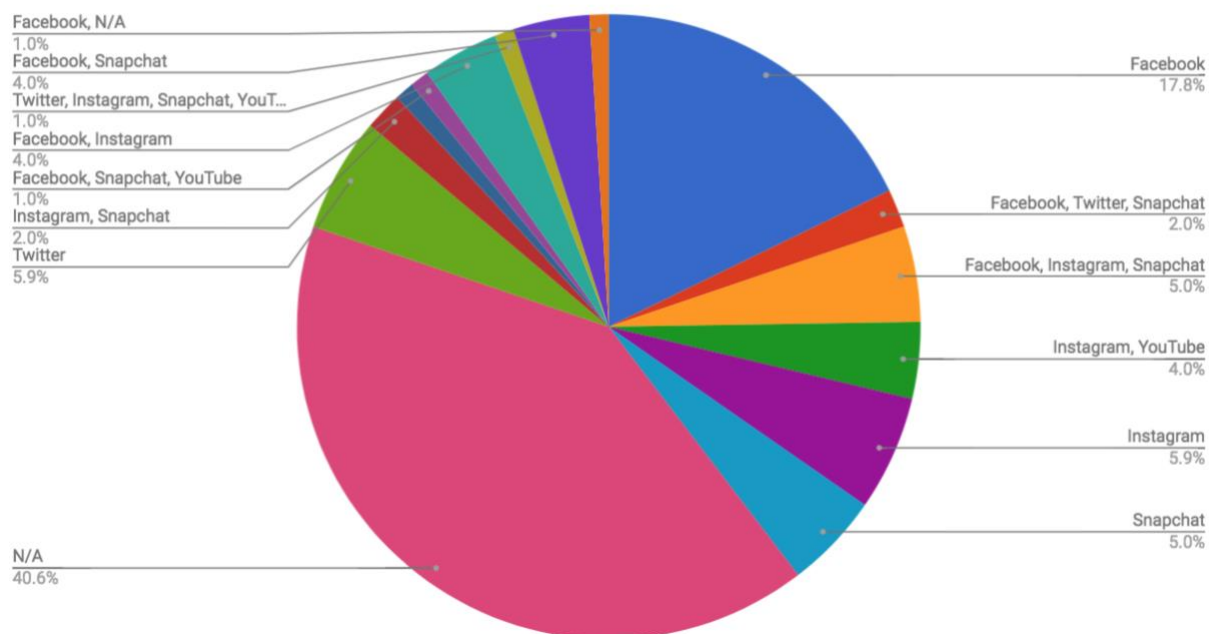


Figure 4-23: Female Health Content Sharing

Chapter 5

Discussion

In this chapter I will discuss the exploratory study that was conducted and its implications for its surrounding topics. "Since this study was exploratory in nature, the results of the study do not aim to confirm a specific hypothesis. Instead, the results aim to address a gap in existing mHealth research by highlighting the opportunity to use Snapchat as an effective platform for extrinsic motivation in mHealth initiatives."

Social Media

Based on the results of the survey that was given to the 153 participants, a much better understanding of social media habits was gained for the age group of 18-23 years old. The results of the study were shown with a clear distinction that Snapchat was the most used social media platform amongst this age demographic, with Instagram coming in second (Figure 4-3). This may come as a surprise to many, who have previously believed that Facebook was the dominant social media platform. It is important to note that while Facebook may be the dominant platform amongst a wider age range, those that will be influencing content and creating content in the future will be the younger age demographic. The younger age demographic more widely uses Instagram and Snapchat, and those platforms should be utilized more as the younger age group creates and views more media content.

With the topic of content creation and content sharing, it is important to note a vast disparity in those that create content versus those that view content. There is a significant difference in the number of users that are content creators and content viewers, and as of now this difference is largely without explanation. In Figure 4-4 and Figure 4-5, it is easy to see that the majority of survey participants didn't share any content on social media, but when asked

about viewing content, less than 20 respondents had said they didn't view any content. This is an important disparity, and requires further research into why this great disparity exists.

Snapchat

Being that Snapchat, according to the data collected by the survey, is the most widely used social media platform for this age demographic, it is worth discussing what the appeal of Snapchat is to its user base. According to previous literature [3], Snapchat is associated with a more positive mood than email, text, Facebook, or any form of communication rather than face-to-face. This is based on the cognitive affordances that are made available through the nature of the platform. Snapchats are temporary and can contain visual, textual, and audio content that equates Snapchat as the most similar platform to face-to-face communication. This is an important fact because the previous literature associates Snapchat with a more positive mood than other forms of communication, which has users checking the app more and interacting with each other more often through snaps.

With Snapchat being associated with a more positive mood after communication, it would only make sense that users are seeking this positive mood frequently. The study showed that the plurality of users, 21.6% of them, are checking their Snapchat more than 30 times per day. This result proves that more research needs to be done to capture benefit from the frequency at which users are looking at Snapchat for that positive mood boost which comes with the platform. The frequency of use and more positive mood leads to a chance for Snapchat to facilitate more motivational benefit than other social media platforms.

Fitbit

After reviewing the results of the survey, the responses in relation to the Fitbit section were very interesting to analyze after learning about content sharing on other media platforms. In general, of those that used Fitbit, approximately 50% of respondents said that they would share their Fitbit data through Snapchat (Figure 4-15). The idea was that Snapchat provides a more positive mood, which inherently is more motivating, and mHealth technology relies on extrinsic motivation to be the most effective that it can be. Those that do share their Fitbit data mostly all referenced an increased sense of motivation from sharing (Table 2). Also, in summary, approximately 30% of users said that they would share their data via Individual Snapchats, which most closely resembles face-to-face communication and was the plurality when given the option to choose between Individual Snaps, Group Snaps, and Snapchat Stories. Those that do share get a benefit from sharing, so it was very interesting to see that approximately 50% of Fitbit users wouldn't share their data through the platform that is the most associated with positive mood and motivation.

Male vs. Female

One of the major takeaways from this research was the blatant difference between males and females in terms of their social media usage and their propensity to share/create content. Firstly, the difference in male and female usage of snapchat is significant to note because 77% of males in the survey used Snapchat (Figure 4-16), while 93.6% of females used Snapchat (Figure 4-20). The plurality of females checked their Snapchat 30+ times per day (Figure 4-21), while the plurality of males checked their Snapchat 5-10 times per day (Figure 4-17). The simple

difference in usage requires more research, but has also been found in previous literature [2] where findings have showed that females use social media more often than males.

Another disparity between males and females exists in the rates at which they share content on social media. Being that previous literature and the current study have shown that females use social media at a rate higher than males, it should come as no surprise that females share health-related content at a rate higher than males. Approximately 40% of females said that they have never shared health-related content on social media (Figure 4-23), while 61.5% of males said that they have never shared anything health related (Figure 4-19). Again, previous literature would say that this should be no surprise, but more research is needed in the field to determine why exactly these disparities occur.

Implications of the Research

This research study highlighted the following findings:

- Snapchat is the most preferred method of social media communication by young adults aged 18-22
- Snapchat is seen as the social media communication tool that most closely resembles face-to-face communication
- mHealth content generators find motivation in sharing their data with others
- mHealth content generators would share their data via Snapchat if the platforms were integrated

The implications of the research presented in this paper highlight a critical opportunity for the mHealth community to integrate with the social media platform Snapchat. This opportunity has not yet been explored in the mHealth or social media research communities. In regards to mHealth, the integration of Snapchat with mHealth platforms could provide a much-needed addition of social media motivation to mHealth devices that are struggling to retain users. Integrating these two platforms would provide a more seamless and positive user experience for

those with mHealth devices, and the positive mood and motivational aspects of Snapchat have potential to increase user retention rates.

Also, health-related content sharing is much simpler through Snapchat because of the ephemeral nature of the content. Snapchatters may be reluctant to share data if they know it will be permanently visible for all of their followers to see. The ability to share data temporarily but still provide that positive social interaction serves as a means for temporary motivation which can serve a non-temporary purpose.

Finally, the findings of this study can have a important impact in other fields and areas of focus where motivational elements amongst peer-groups and individuals are needed. For example, a peer group within drug rehabilitation counseling could benefit from a Snapchat focused platform of social media because of the positive mood, motivation, and sense of accountability that data sharing can provide. Sports teams, large organizations, counseling services, or really any entity requiring motivational support systems can benefit directly from the ideas that this study explores. Much more research is required to analyze what factors would specifically improve these fields, but the ideas presented in this research are exploratory and further research could shed more light on the potential benefits of this research.

Limitations

As with any research, especially research of such exploratory nature, there is always a high degree of limitations which can impact the results of a study. One of the major limitations of this study is that the influence of social media on an individual can be misperceived by that individual. One may think that social media didn't have an impact on their behavior, but the reality is that it did influence their behavior. Essentially, the perception of reality and true reality

in regards to social media influence may alter the way respondents answer questions in relation to how they perceive their own social media usage.

Another big limitation that may have impacted this study was the size of the sample along with the age demographic. Firstly, there were more females than males which could certainly skew results of the study. Also, the age group was limited to college students which could alter the potential for Snapchats ability to be used positively in peer-groups with older members. Snapchats feasibility as a motivational platform needs more research to prove its effectiveness for more age brackets.

Additionally, there is a big issue with data privacy in regards to mHealth research. Participants may be very reluctant to share their data depending on how it will be used. Some respondents would be opposed to sharing very detailed health data if it were to be used for insurance companies or mHealth companies to determine more about their health than the individual is willing to disclose. Data privacy and sharing is a major limitation going forward in the industry, especially after recent events like the Facebook data scandal.

Future Research

In regards to all of the future research that needs to be conducted, the most important lies within the technical integration of Snapchat with mHealth devices. The main struggle with mHealth technologies is that they are not very easy to use, and the process of data sharing is made difficult by having a variety of platforms needed to share content. If sharing and data generation were a seamless transition, potentially provided by integration with Snapchat, then usability would improve dramatically and user retention rates would be higher. There is also a need to discover what the most motivational elements of Snapchat are, and identifying how to best integrate them with not only the Snapchat platform, but also mHealth device platforms. It

may be worth investigating the gamification factor that Snapchat already uses, the Snapchat streak. The "streak" feature requires that Snapchat users communicate with each other every day in order to maintain their "streak." Users compete to see how long their streaks last and take pride in being able to maintain streaks for hundreds of days at a time. This could be a great motivating feature for mHealth technologies where two friends or family members could check-in with each other on a daily basis to encourage healthy habits, like hitting their Fitbit daily step goals. Their "streaks" could shift from a quick hello, to a motivating message of encouragement that improves their mHealth engagement. If mHealth companies and Snapchat would develop an integrated streak feature, potentially the same gamified result would make its way into the fitness aspect of social media for its users.

Also in regards to future research, it is important to understand users' concerns about data privacy and how social media companies can be held accountable to ethical data privacy policies that protect their users from the negative impact of privacy breaches or harmful use of their data. This is especially important when sharing health information. There has to be some moral or ethical limit to what data we are collecting about people and what the limit is to sharing that data. If insurance companies operate off of self-reported data currently, and in the future companies like Snapchat are selling them more incriminating but more accurate data, then there could be higher charges to people who don't even know that they're unhealthy. There has to be a limit to what data we capture and what data we share, or else we begin to cross ethical boundaries that have been in place for years.

Chapter 6

Conclusions

The goal of this research was to explore whether or not Snapchat, if integrated with mHealth technologies, could provide a higher degree of motivation to users to improve user retention rates. Retention rates in mHealth technologies are a big issue for mHealth companies, and the idea that Snapchat has a more positive mood associated with it, which could in turn be more motivational, is an idea that could have significant impact for health companies and citizens around the world. The study was exploratory in nature, so while it didn't arrive at any conclusions, it certainly provides data and analysis that leads to the idea that integrating Snapchat with mHealth technologies could be widely beneficial for a variety of parties.

Simply put, in the age group of college students, who will be the future of technology consumption, Snapchat is the most widely used social media platform according to the research. Snapchat also provides the form of communication amongst all social media that is most similar to face-to-face communication. Face-to-face communication is considered the most motivating and positive form of communication; therefore, Snapchat would be the most motivating and associated with the most positive mood of all social media platforms.

According to previous literature [4], the benefits of Snapchat's affordances are widely underutilized in today's society, and with this research in mind we have an opportunity to utilize these affordances. Why aren't we using the platform that is most similar to face-to-face communication for motivational purposes? According to the exploratory research in this study, there is a clear opportunity and need for more research into integrating Snapchat with mHealth technologies in order to provide a seamless user experience for optimal motivation to increase user experience and strengthen user retention rates of mHealth technologies.

Appendix A

Contained in this appendix is a series of screenshots of the initial survey administered to all participants of the study. Further interviews were conducted based on answers that participants gave to survey questions.

Snapchat, Social Media, and Mobile Health

The following survey is part of a research study for a Penn State undergraduate honors thesis. Your responses will be kept confidential. The collection of your email address is used to ask follow-up questions and to award extra credit points (if you're doing this for

Email address *

Valid email address

This form is collecting email addresses. [Change settings](#)

If completing for extra credit, please enter your full name and course number (ex. Joe Smith, IST 110)

Short answer text

What is your gender? *

- ☐ Female
- ☐ Male
- ☐ Prefer not to say
- ☐ Other...

What is your age? *

- ☐ 18
- ☐ 19
- ☐ 20
- ☐ 21
- ☐ 22
- ☐ Other...

What is your ethnicity?

*

- ☐ African American
- ☐ Asian
- ☐ Native American
- ☐ Caucasian
- ☐ Middle Eastern
- ☐ Pacific Islander
- ☐ Hispanic/Latino
- ☐ Other...

Which social media platforms do you use?

*

- ☐ Facebook
- ☐ Twitter
- ☐ Instagram
- ☐ Snapchat
- ☐ LinkedIn
- ☐ Pinterest
- ☐ Periscope
- ☐ Tumblr
- ☐ YouTube
- ☐ Other.....

On which platforms have you viewed anything health related through social media? *

	Facebook	Twitter	Snapchat	YouTube	Instagram	N/A
Select all that apply	☐	☐	☐	☐	☐	☐

Which social media platforms have ever influenced you to change a health habit/activity/plan/etc.? *

	Facebook	Instagram	Twitter	Snapchat	YouTube	N/A
Select all that apply	☐	☐	☐	☐	☐	☐

Do you use Snapchat? *

☐ Yes

☐ No

How many times do you look at Snapchat per day? *

1. 0-5
2. 5-10
3. 10-15
4. 15-20
5. 20-25
6. 25-30
7. 30+

⋮
Snapchat is part of my every day activity *

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree
- ☐ N/A

I use Snapchat to communicate with my closest friends/loved ones *

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree
- ☐ N/A

I feel out of touch when I haven't checked my Snapchat for awhile *

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree
- ☐ N/A

Through Snapchat, I am able to imagine and feel my friends' emotions *

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree
- ☐ N/A

...

Through Snapchat, I can imagine myself talking directly to my friends face to face *

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree
- ☐ N/A

Through Snapchat, it is important to see my friends' face/facial expressions *

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree
- ☐ N/A

Do Snapchats ever serve as a reminder to do something? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Do Snapchats ever motivate you to do something? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Have you ever felt more inclined to try something because of Snapchat? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Have you felt pressured to do something because seeing Snapchat stories or snaps? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Have you ever shared anything health related through Snapchat? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Have you ever viewed anything health related through Snapchat? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Has Snapchat ever influenced you to change a health habit/activity/plan/etc.? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Fitbit

Description (optional)

Do you use Fitbit?

*

- ☐ Yes
- ☐ No
- ☐ Maybe

On average, how many steps do you walk per day?

Short answer text

How do you share your Fitbit data?

*

	Facebook	Twitter	Snapchat	Instagram	YouTube	Word of mouth with friends/family	Other	I don't share my Fitbit data
Select all that apply	☐	☐	☐	☐	☐	☐	☐	☐

...

If you share your Fitbit data, why do you share it and what benefits does it provide?

Long answer text

If you don't share Fitbit data with anyone, why not?

Long answer text

Do you use the Fitbit leaderboard? *

☐ Yes

☐ No

Have you ever participated in a Fitbit challenge? *

☐ Yes

☐ No

...

If you were to share your Fitbit data through Snapchat, how would you share it? *

Stories

Group Snaps

Individual Snaps

I wouldn't share

Select all that
apply

☐☐☐☐

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Academic Vita

EDUCATION

The Pennsylvania State University, Schreyer Honors College
University Park, PA Bachelor of Science | Information Sciences and Technology
Class of May 2018

RELEVANT EXPERIENCE

PricewaterhouseCoopers LLC

New York City, NY *Technology Consulting Intern*

June 2017 – August 2017

- Coded various scripts in Microsoft Powershell and Amazon CLI to migrate client data to Amazon's Simple Storage Service (S3)
- Populated Agile project management software, Confluence, to organize the client's development needs and processes
- Alleviated daily issues and challenges within Agile management softwares Jira and Confluence

Ruvna Inc.

New York City, NY *Market Research/Development Intern*

September 2016 – December 2016

- Performed data-driven market research to gauge optimal customers for Ruvna's security software
- Created various Excel data tables and graphs to display optimal consumers and target clients for Ruvna
- Met with and present to CEO, CFO, CTO and other employees weekly to summarize findings and progressions in research

Penn State Asset Management Group

University Park, PA *Chief Information Officer*

May 2016 – Present

- Advised \$1 million AUM fund of various different asset classes on derivative and commodity specific investments
- Managed investments, trades, and portfolio activity of commodities and derivatives portfolios
- Provided oversight to portfolio managers for commodity and derivative educational plans for new and returning analysts

Penn State University

University Park, PA *Honors Work | Microeconomic Theory*

January 2015 – May 2015

- Engaged in research concerning the corporate merger between Time Warner Cable and Comcast Inc.
- Performed weekly analysis of events in the merger including FCC announcements and press releases from both parties
- Composed weekly summary of findings and research concerning the merger using microeconomic analysis
- Experience using microeconomic analysis techniques like Herfindahl-Hirschman Index

Chapel Hill Golf Club

Reading, PA

Website Design Aid

May 2015 – August 2016

- Assist in website maintenance and design for all golf course information
- Actively use WordPress site editor to perform changes and updates to website information
- Use HTML language commands to accomplish small tasks on the website that WordPress cannot easily perform

RELEVANT ACCOMPLISHMENTS

IST IdeaMakers Challenge

University Park, PA

Finalist

March 2015 – August 2016

- Competed with a team of freshman students to ideate, prototype, and present an idea to a panel of technology venture capitalists
- Finished in top 5 out of 30+ teams as a freshman competing against students of all ages
- Brainstormed and prototyped an idea for a sexual assault prevention app designed to be adopted on college campuses and towns

SKILLS AND INTERESTS

- Computer Skills: C++, Java, Python, Amazon AWS, Jira, Confluence, Microsoft Office, Mac OS X, BASIC, SQL
- Interests: Emerging technologies, current events, politics, golf, baseball, snowboarding, and the Penn State Dance Marathon