

Pokémon Go Players' Perceptions on Twitter

Yoonsin Oh, Ph.D.

Gracia R. Clark

Allison C. Brunett

University of Wisconsin-Eau Claire

Eau Claire, WI, USA

Abstract

The purpose of this study was to analyze the perceptions of Pokémon Go players who tweeted about the game on their health while playing. Pokémon Go is an augmented reality exergame that requires players to travel to accomplish game goals. News outlets reported that Pokémon Go players shared on Twitter how this game had motivated them to be physically active. However, no study has been conducted to examine the actual amount of tweets expressing the players' perceptions of the game on their health. In this study, researchers collected publicly available tweets by using an advanced search of hashtags (e.g., #PokemonGo & #walking) to get a consistent pool. Tweets were collected from one week of each month from July 2016 through January 2017. Based on grounded theory, qualitative analysis methods were used for categorization. Researchers numbered and coded the tweets to determine how players who tweeted might perceive the game as it relates to health topics. The results indicate that the most common tweets were about how Pokémon Go motivated players to increase their physical activity levels. This study serves as a base research for future in person interviews to investigate the players' interests and motivations to be physically active.

Keywords: Pokémon Go, Twitter, Health, Physical, Mental, Social.

Introduction

Pokémon has been popular among youth since the 1990s (Tobin, 2004). When the first games were released in the United States in 1999, the Pokémon franchise produced \$5 billion in revenue (Buckingham and Sefton-Green, 2004). Pokémon Go is a recently released (July 6th, 2016) mobile game using characters from the Pokémon franchise that has an estimated 7.5 million U.S. downloads and \$1.6 million in daily revenue as of July 11th, 2016 (Etherington, 2016) with players spending more time playing it than using Facebook and Twitter in that time period (Perez, 2016). Although Pokémon Go is a new game, the fan-based Pokémon phenomenon is not. Buckingham and Sefton-Green (2004) describe Pokémon as a “cultural practice” because “pokémon is something you do, not just something you read or watch or ‘consume’” (p. 12). Typical Pokémon cultural practices include taking on the role of a trainer, someone who catches mysterious creatures called Pokémon, a combination of the words pocket and monster. Once Pokémon are caught, trainers develop them by battling them against other Pokémon. The Pokémon games have appeared across multiple Nintendo game systems including the Game Boy, Nintendo DS, and Wii and in a trading card game. Pokémon Go is the first Pokémon game to appear on a mobile phone.

Pokémon Go is an augmented reality exergame with multiple goals including collecting as many kinds of Pokémon as possible, visiting “Pokéstops” (real-world locations granting players in-

game items), and controlling “Pokémon gyms” (other real-world locations providing opportunities for indirect player interaction) for the player's chosen faction. In order to accomplish these goals, players need to go outside and move in the real world. This setup has great potential to promote physical activity. However, the game has been shown to cause danger for drivers and pedestrians (Ayers, 2016). To reduce distraction, Pokémon Go Plus (a watch players can use to play the game without watching the app) was released in September 2016.

Health game researchers have been investigating how to motivate people to be more physically active via video games due to their popularity. Previous research on playing video games has been done in controlled settings to examine the physiological responses of energy expenditures (Duncan & Dick, 2012; Lanningham-Foster et al., 2009; Lanningham-Foster et al., 2006; Lin, 2015; Marks, Rispen, & Calara, 2015; Nathan, Huynh, Rubenson, & Rosenberg, 2015; Scheer, Siebrant, Brown, Shaw, & Shaw, 2014; Siegel, Haddock, Dubois, & Wilkin, 2009) and enjoyment levels (Coulter & Woods, 2011; Duncan & Dick, 2012; Gao, Zhang, & Podlog, 2014).

Soon after the release of Pokémon Go, players started sharing how the game has motivated them to be physically active on Twitter, with news outlets covering the story (e.g., “I’ve probably burned 1,000 calories playing #PokemonGo today.”; Oliver, 2016). Some researchers have studied Pokémon Go and found that players had over a 25% increase in their physical activity in the first 30 days of playing (Althoff, White, & Horvitz, 2016). Howe, Suharlim, Howe, Kawachi, & Rimm (2016) found that players had an average increase of 955 steps per week for the first 5 weeks after playing the game. Although these recent studies have shown increases in physical activity levels for players, less research has been done around players’ perception of their change in health after playing the game. The purpose of this study was to investigate the current state of what and how people on Twitter mention and discuss Pokémon Go in terms of their perspectives on health.

Method

Data collection

Data was extracted from Twitter using methods following La Rosa’s (2013) recommendations. To make the data more purposeful, manageable, and consistent, the researchers used Twitter’s advanced search capabilities to isolate tweets including #PokemonGo and one or more of the following hashtags: #fitness #activity #active #exercise #walk #steps #walking #physicalactivity #workout #sweat #fit #sport #mentalhealth #anxiety #getfit #fitbit #health #depression #stress #pokemongo #pokemongowatch #pokemongoplus. The researchers collected tweets from one week for each month from July 2016 to January 2017 (July 6th-13th, August 6th-13th, September 6th-13th, October 6th-13th, November 6th-13th, December 12th-18th in 2016, and January 12th-18th in 2017). The initial week of data collection was chosen to coincide with the launch day of the Pokémon Go (July 6th, 2016) to capture people's perceptions of the game as soon as it came out. The following four months used the same dates to maintain a consistent pool. The date range shifted in December and January to collect data around an updated version of Pokémon Go; however, the updates were not released as planned. The researchers saved screenshots of the advanced search results and numbered each tweet. Records of all original and numbered tweets were saved.

Data analysis

We used qualitative analysis methods using categorization based on grounded theory (Glaser & Strauss, 1967). During the open coding phase, all the tweets were examined by the researchers.

Using the constant comparative approach during weekly meetings, the researchers created a set of emerging categories for the tweets. A central phenomenon category was selected, and the researchers reviewed the data again to find subcategories. After the researchers did not see any new categories from the data, they used those categories to code the Twitter data set. A spreadsheet was then used to organize the numbered tweets and code each tweet under categories. The researchers allowed a tweet to fall under multiple central categories if they fit. In each of the four central categories (physical health, mental health, social health, & technology), the tweets were coded as yes if the tweeter indicated that Pokémon Go had an impact on that topic of their lives or no otherwise. The researchers then further coded the tweets into the subcategories as yes or no.

Since the research purpose was to explore perception, tweets that were advertisements, links to articles, in a non-English language, or unavailable for viewing were all excluded from the data analysis. Three researchers did all of the coding, with at least two of them coding each tweet for triangulation. The researchers then compared and combined codings into a final spreadsheet. If there were discrepancies between the coders on a tweet during this process, the researchers went back to the tweet and agreed upon a code together. After finalizing the coding, the researchers analyzed the number and percentage of tweets in each category using spreadsheet.

Results & Discussion

The total number of tweets collected was 1,498. Of these, 555 tweets were excluded from the analysis because they did not contain any perceptions (e.g., advertisements), leaving a total of 943 tweets for data analysis. Tweets were categorized into emergent themes. The emergent central phenomenon themes found were physical health, social health, emotional health, and technology.

Table 1
Emergent Theme Tweet Frequencies

Total Tweets	943
Physical Health	361 (38%)
Positive	269 (75%)
Negative	70 (19%)
Neutral	22 (6%)
Social Health	75 (8%)
Positive	57 (76%)
Neutral	18 (24%)
Mental Health	25 (3%)
Positive	18 (72%)
Negative	5 (20%)
Neutral	2 (8%)
Technology	262 (28%)
Positive	163 (62%)
Negative	25 (9%)
Neutral	77 (29%)
Fitbit	144 (55%)

This table shows the frequencies of each emergent theme. The total number of tweet decreased over time as shown in Figure 1.

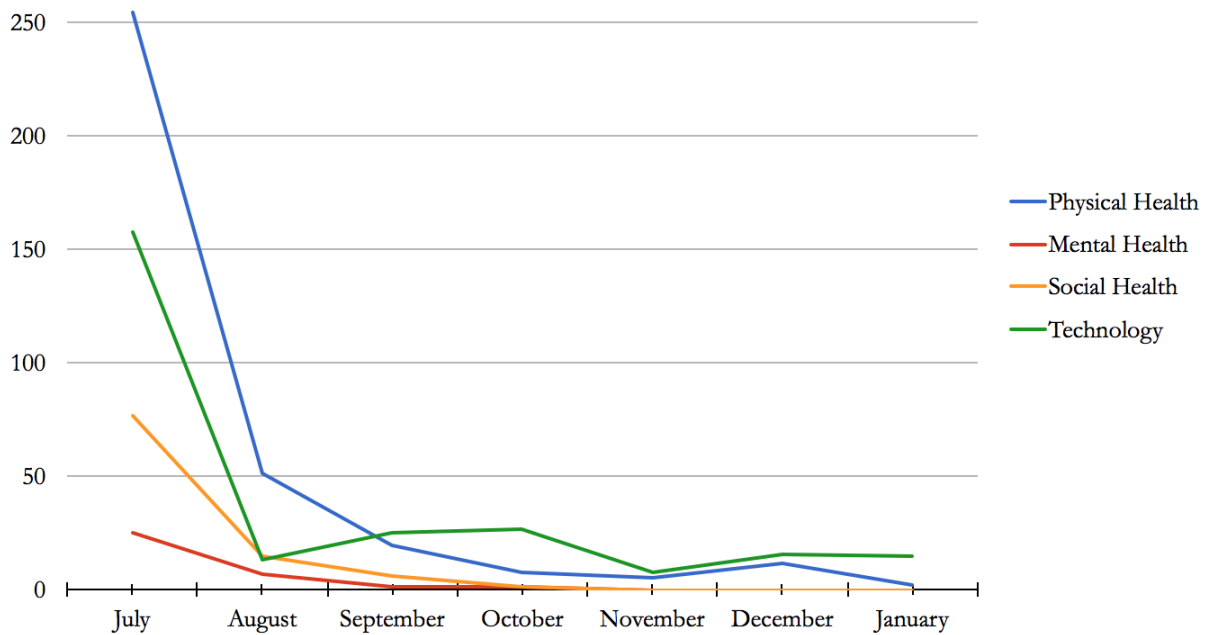


Figure 1: Tweets per month. Each line shows the tweet count for each category.

Physical health

Thirty-eight percent of the tweets (361 out of 943) fell into this category. Tweets in this category commented on the physical health of the individual tweeting. Physical health tweets included how the players increased their physical activity, how Pokémon Go was a motivation to get a physical workout, or how they were physically active because of the game. In this category, three additional themes emerged: positive, negative, and neutral perceptions.

Positive tweets expressed a positive view toward the impact that Pokémon Go had on the tweeter’s physical health. Seventy-five percent of physical health tweets (269 out of 361) fell into this category. A representative tweet in this category read, “#PokemonGO is just as amazing as I thought it would be. Went out for a quick stroll, end up being out for an hour and a half. #exercise”. Another stated, “Had LOTS of fun playing #PokemonGO with John [pseudonym] today! It's nice to do something other sit on the couch! #exercise?”. Both of these people indicated that Pokémon Go had a positive influence on their lives and has helped them to be more physically active.

Negative tweets conveyed a negative view of playing Pokémon Go and physical activity. This could be expressed as the game compelling them to perform activities they otherwise weren’t interested in or via metaphors of addiction. However, most tweets still indicated an increase in physical activity. Nineteen percent of physical health tweets (70 out of 361) were negative. A representative tweet stated, “#PokemonGo made me lose all my gains at the gym cause I’m walking so much #Health #Fitness #BodyBuilding”. Another tweet read, “Okay, #PokemonGo is evil. I’m outside, walking, getting sweaty, and trying to catch critters. This sounds like #exercise.”

Only six percent of physical health tweets (22 out of 361) were categorized as neutral. These tweets indicated that the tweeters were physically active, but they didn’t specifically indicate any positive or negative perceptions. For example, one representative player tweeted, “I’ve to walk 5km in order to open my egg. #pokemongo #sunstroke #yolo #workout”. Another stated, “Pokemon go is most of my exercise plan #PokemonGo #fitness”. Although these tweets acknowledge the physical activity requirement to play the game and use of the game to engage in physical activity, they do not convey whether they were positive or negative about the negative

experience.

Social health

Eight percent of tweets (75 out of 943) fell into the category of social health. These tweets included that the tweeter was using Pokémon Go with other people or to engage in social activities. The most common example of social activities in this category were walking with friends or observing other people playing Pokémon Go with friends. Two additional subcategories emerged, positive and neutral perceptions of playing Pokémon Go.

Seventy-six percent of social health tweets (57 out of 75) indicated that the tweeter enjoyed using Pokémon Go with others. A representative example of a tweet in this category is, “Just spent the last 3 hours outside running around playing #PokemonGo and met some amazing people #Social #Fitness #WorldPeace #TeamMystic”. Another example is “@Pokemon #PokemonGO everyone is out walking around right now! Meeting new people and getting #exercise. #PokeGoWalk”.

Twenty-four percent of social health tweets (18 out of 75) did not indicate if the tweeter was positive or negative about playing the game. One person wrote, “Pokemon go got me traveling and being extra social today #social #walking #PokemonGo #Bulbasaur #fitness”. Another said, “#PokemonGo is making everyone come together. #sunscreen #exercise #humans”.

Emotional health

Only three percent of tweets (25 out of 943) discussed emotional health. Tweets in this category included comments on the person's mental well-being such as feeling better. The majority of tweets (72%; 18 out of 25) in this category stated that Pokémon Go benefitted their mental health. One representative tweet stated, “#PokemonGo really has helped my #mentalhealth Spending time with family walking and collecting, and soon to be friends. Thanks @Pokemon”. Another player wrote, “#PokemonGo gives me--an overweight person with #mentalhealth issues--a reason to get out of bed every morning, exercise & meet new people.”

Technology

Another theme that emerged was on perceptions of using technology while playing Pokémon Go. Twenty-eight percent of the total tweets (262 out of 943) commented on the tweeter's use of technology. These tweets discussed how the player was using Pokémon Go with additional technologies (e.g., Fitbit as a physical activity monitoring tool). Tweets in this category also included their perceptions about the game as a technology itself and ways to improve the game. The subcategories that emerged were physical activity monitoring tool, positive, neutral, and negative.

Most of the tweets in this category talked about using Pokémon Go with the app Fitbit. More than half of the technology tweets (55%; 144 out of 262) mentioned Fitbit in relation to Pokémon Go. The most common tweets were people wanting to combine Pokémon Go and their Fitbit, such as in the following tweet “There needs to be some sort of #FitBit and #PokemonGO collaboration...#killingthesteppgame” People also talked about how the game is helping their step count on Fitbit. For example, “Dear #fitbit, this weekend's steps brought to you courtesy of #PokemonGo. #gottacatchthemall”

Sixty-two percent of the technology tweets (163 out of 262) spoke positively about technology use. Most of these tweets appreciated getting more steps on their physical activity monitoring tools by playing Pokémon Go. One representative tweet commented, “Crushed my #Fitbit goal with 18,000 steps today #PokemonGo”. Another similarly said, “Back-to-back days getting in

20K+ steps on my #FitBit thanks to #PokemonGO”.

Twenty-nine percent of the tweets about technology (77 out of 262) fell into the neutral category. For example, one person said “Made ½ of my steps goal on #Fitbit before 1:30am playing #PokemonGo on the streets of Manchester. Not sure how to feel.” Another person wrote, “OK, surely NOW with #PokemonGo AND #Fitbit I’ll start walking, right?”.

About nine percent of the technology tweets (25 out of 262) spoke negatively about the technology related to Pokémon Go. Most of these tweets talked about the Pokémon Go server being down. One person said, “Went out for a #walk. #pokemongo crashed. I #sweated for nothing.” Other negative tweets talked about different aspects of the game the tweeter didn’t like. One person wrote, “While I’m enjoying #PokemonGo I hope future updates along side #PokemonGoPlus help reduce the battery drain”

Conclusion/Discussion

This research investigated the current state of what and how people on Twitter mentioned and discussed Pokémon Go in terms of their perspectives on health and using technology. The most common tweets showed players’ perceptions of how Pokémon Go motivated them to increase their physical activity levels. The data also demonstrated that even though people may not have tweeted a positive perception of playing the game, they were still affected by it. For example, if they were negative about having to physically move to play the game, they were still indicating that the game helped them be more physically active. Health professionals and educators should note that this often meant the players were willing to do something they felt negative about—usually increasing their physical activity levels—to participate in something they valued—playing the game.

Another notable finding was that players also talked about more than one dimension of health at a time. For example, a representative tweet in the emotional health section, “#PokemonGo gives me--an overweight person with #mentalhealth issues--a reason to get out of bed every morning, exercise & meet new people.”, specifically points towards a perception of playing the game as benefitting their mental health while improving their physical health and increasing their social health. This finding agrees with research on social support’s (Bland & Sharma, 2017) benefits for physical activity and physical activity’s positive association with mental health (Doré, O’Loughlin, Beauchamp, Martineau, & Fournier, 2016; Rangul, Bauman, Holmen, & Midthjell, 2012).

This study also found that people were using additional technologies while playing Pokémon Go. People monitored their physical activity levels (e.g., steps) especially by using Fitbit. Most physical health tweets discussed how the game has helped increase their steps, and many of them posted their Fitbit step count along with their tweets to validate their claim. Other researchers have also found the game helps people increase their step counts (Althoff et al., 2016; Howe et al., 2016). Similar to our findings about increasing physical activity no matter how they perceived their physical health, we found that both positive and neutral perspectives on technology were accompanied by claims of increased step counts.

There are a few limitations to this study. Data collection sampled specific a priori hashtags and only looked at one week per month. Changing the sampling method or using a larger pool would strengthen the findings. Conducting a study on social media has additional limitations: Twitter, for example, has a 140 character count limit for tweets that can be posted and a complicated threading system. This research further didn’t follow external links from tweets that may have

provided additional context for interpretation.

Future research could be done to combat the limitations of our study and to get a more in-depth idea of player perceptions for their health when they play Pokémon Go. Previous research (Althoff et al., 2016; Howe et al., 2016) found increased step counts for the first four and five weeks after initially downloading the game. After the fifth week, the study participants' average step counts returned to the levels prior to downloading the game. This study's results do not directly address this finding, though our data shows a steep decline in tweets one month after the release of the game (see Figure 1). In-depth interviews with current and previous players can help uncover how their perceptions and behavior changes are intertwined in the context of Pokémon Go with ramifications for other exergames and interventions.

Acknowledgements

This research was funded by Blugold Commitment Differential Tuition funds through the Student/Faculty Research Collaboration program at the University of Wisconsin-Eau Claire. Special thanks go to Alura Patrin, Emily Delaney, and Kevin Harris.

References

- Althoff, T., White, R., Horvitz, E., (2016). Influence of Pokemon Go on physical activity: study and implications. *arXiv*. WOS:000376444400010
- Ayers, J. W., Leas, E. C., Dredze, M., Allem, J.P., Grabowski, J. G., & Hill, L., (2016). Pokémon GO-A new distraction for drivers and pedestrians. *JAMA Internal Medicine*, 176 (12), 1865-1866. Retrieved from <http://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2553331>
- Bland, V., & Sharma, M. (2017). Physical activity interventions in African American women: A systematic review. *Health Promot Perspect*, 7(2), 52-59. doi:10.15171/hpp.2017.11
- Buckingham, David and Sefton-Green, J (2004) Gotta catch 'em all: structure, agency and pedagogy in children's media culture. In: Pikachu's Global Adventure: The rise and fall of Pokémon. *Duke University Press*, pp. 12-33.
- Coulter, M., & Woods, C. B. (2011). An exploration of children's perceptions and enjoyment of school-based physical activity and physical education. *J Phys Act Health*, 8(5), 645-654.
- Doré, I., O'Loughlin, J. L., Beauchamp, G., Martineau, M., & Fournier, L. (2016). Volume and social context of physical activity in association with mental health, anxiety and depression among youth. *Preventive Medicine*, 91, 344-350.
- Duncan, M., & Dick, S. (2012). Energy expenditure and enjoyment of exergaming: a comparison of the Nintendo Wii and the gamercize power stepper in young adults. *Medicina Sportiva*, 16(3), 92-98.
- Etherington, D. (2016, July) Pokémon Go has an estimated 7.5M U.S. downloads, \$1.6M in daily revenue. *Tech Crunch*. Retrieved from <https://techcrunch.com/2016/07/11/pokemon-go-daily-revenue-downloads/>
- Gao, Z., Zhang, P., & Podlog, L. W. (2014, September 3). Examining elementary school children's level of enjoyment of traditional tag games vs. interactive dance games. *Psychology, health & medicine*, 19(5), 605-613. doi: 10.1080/13548506.2013.845304
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: strategies for qualitative research*. Chicago, IL: Aldine Publishing Company.
- Howe, K., Suharlim, C., Howe, D., Kawachi, D., Rimm, E., (2016). Gotta Catch'em all! Pokémon GO and Physical Activity Among Young Adults: Difference in Differences study. *BMJ*, 355, 6270. doi: <https://doi.org/10.1136/bmj.i6270>
- La Rosa, A. (2013). Harvesting the Twittersphere: Qualitative Research Methods Using Twitter. *Pace University*. Retrieved from http://digitalcommons.pace.edu/honorscollege_theses/120
- Lanningham-Foster, L., Foster, R. C., McCrady, S. K., Jensen, T. B., Mitre, N., & Levine, J. A. (2009). Activity-promoting video games and increased energy expenditure. *The Journal Of Pediatrics*, 154(6), 819-823. doi:10.1016/j.jpeds.2009.01.009
- Lanningham-Foster, L., Jensen, T. B., Foster, R. C., Redmond, A. B., Walker, B. A., Heinz, D., & Levine,

- J. A. (2006). Energy expenditure of sedentary screen time compared with active screen time for children. *Pediatrics*, 118(6), E1831-E1835. doi:10.1542/peds.2006-1087
- Lin, J. (2015). "Just Dance": The effects of exergame feedback and controller use on physical activity and psychological outcomes. *Games for Health Journal*, 4(3), 183-189. doi:10.1089/g4h.2014.0092
- Marks, D. W., Rispen, L., & Calara, G. (2015). Greater physiological responses while playing Xbox Kinect™ compared to Nintendo Wii™. *International Journal of Exercise Science*, 8(2), 164-173. Retrieved from <http://digitalcommons.wku.edu/ijes/vol8/iss2/7>
- Middelweerd, A., Te Velde, S. J., Abbott, G., Timperio, A., Brug, J., & Ball, K. (2017). Do intrapersonal factors mediate the association of social support with physical activity in young women living in socioeconomically disadvantaged neighbourhoods? A longitudinal mediation analysis. *Plos One*, 12(3), e0173231. doi:10.1371/journal.pone.0173231
- Nathan, D., Huynh, D. Q., Rubenson, J., & Rosenberg, M. (2015). Estimating physical activity energy expenditure with the Kinect Sensor in an exergaming environment. *Plos One*, 10(5), e0127113-e0127113. doi:10.1371/journal.pone.0127113
- Oliver, D. (2016). Health Buzz: Pokemon GO Has Everyone Exercising. *USnews*. Retrieved from <http://health.usnews.com/wellness/articles/2016-07-11/pokemon-go-has-everyone-exercising>
- Perez, S. (2016, July 16). Pokémon Go tops Twitter's daily users, sees more engagement than Facebook. *Tech Crunch*.
- Rangul, V., Bauman, A., Holmen, T. L., & Midthjell, K. (2012). Is physical activity maintenance from adolescence to young adulthood associated with reduced CVD risk factors, improved mental health and satisfaction with life: the HUNT Study, Norway. *The International Journal of Behavioral Nutrition and Physical Activity*, 9, 144. <http://doi.org/10.1186/1479-5868-9-144>
- Scheer, K. S., Siebrant, S. M., Brown, G. A., Shaw, B. S., & Shaw, I. N. A. (2014). Wii, Kinect, and Move. Heart Rate, Oxygen Consumption, Energy Expenditure, and Ventilation due to Different Physically Active Video Game Systems in College Students. *International Journal of Exercise Science*, 7(1), 22-32. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4831895/>
- Siegel, S. R., L.Haddock, B., Dubois, A. M., & Wilkin, L. D. (2009). Active Video/Arcade Games (Exergaming) and Energy Expenditure in College Students. *Int J Exerc Sci*, 2(3), 165-174. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2856349/>
- Tobin, J., (2004). *Picachu's Global Adventure- The Rise and Fall of Pokémon*. Durham, NC: Duke University Press. Retrieved from: <https://www.dukeupress.edu/pikachus-global-adventure>