

WHY PEOPLE SHARE NEWS ABOUT VACCINATIONS ON FACEBOOK: A USES
AND GRATIFICATIONS APPROACH

A Thesis

presented to

the Faculty of the Graduate School
at the University of Missouri-Columbia

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

KAYLA CASTILLE

Dr. Shelly Rodgers, Thesis Chair

MAY 2016

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

WHY PEOPLE SHARE NEWS ABOUT VACCINATIONS ON FACEBOOK: A USES
AND GRATIFICATIONS APPROACH

presented by Kayla Castille,

a candidate for the degree of master of arts in journalism

and hereby certify that, in their opinion, it is worthy of acceptance.

Shelly Rodgers

Esther Thorson

Brian Houston

Len Bruzzese

DEDICATION

To my husband, Justin, for putting up with late nights and weekends spent hunched over my computer: Thank you for always believing I could do this.

To my daughter, Marlowe, for letting Mommy do homework alongside you: I hope you never lose your love of learning.

ACKNOWLEDGEMENTS

I would like to thank my thesis chair, Dr. Shelly Rodgers, for her guidance during this research. She was constantly supportive and considerate, even as I juggled conducting research between working full-time and parenting. Her assistance with my methods and the statistical analysis taught me so much, and her confidence in my research was endlessly encouraging.

I would also like to thank my adviser, Sarah Smith-Frigerio, for her support throughout my graduate program, and especially for guiding my seed of a research idea into a full-blown proposal. Her feedback throughout that process was immensely helpful.

And to the rest of my committee: Thank you to Dr. Esther Thorson, Dr. Brian Houston and Professor Len Bruzzese for being willing to serve, and for your excellent questions that pushed me to be better.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
LIST OF TABLES	iv
ABSTRACT	v
Chapter	
1. INTRODUCTION	1
Research Problem	
Literature Review	
Research Questions	
2. METHOD AND DESIGN	17
Sample and Timeframe	
Measures	
3. RESULTS	21
4. DISCUSSION	25
Theoretical Implications	
Practical Implications	
Limitations and Areas for Future Research	
Conclusions	
REFERENCES	31
APPENDIX	
A. ONLINE SURVEY	38
B. TABLES	50

LIST OF TABLES

Tables	Page
1. Survey statements, grouped by gratifications typology.....	50
2. Demographics of survey respondents.....	51
3. Factor analysis of uses and gratifications for sharing vaccination stories.....	52
4. Descriptive statistics for the four factors.....	53
5. Spearman's rho correlation coefficient.....	54
6. Vaccination hesitancy among respondents with young children.....	55

Why People Share News About Vaccinations on Facebook: A Uses and Gratifications

Approach

Kayla Castille

Dr. Shelly Rodgers, Thesis Supervisor

Abstract

Facebook, the world's largest social network, is now a significant source of news and information for U.S. adults. The primary way users access news on Facebook is via links to stories shared by others in their network, including friends, family and even media organizations. Users share links about stories on myriad topics, but one topic that is of particular interest to public health researchers is the focus of this study – childhood vaccinations.

This research employs a uses and gratifications theoretical framework to understand why people share links to news stories about vaccinations on Facebook, and how such needs are related to an individual's vaccine hesitancy. A survey of 202 Facebook users who have shared such links found that respondents gratified needs for agency-seeking, status-seeking, socialization/entertainment and information storage. Users who reported low vaccine hesitancy were more likely to experience agency-seeking gratifications; essentially, Facebook users who were strongly supportive of childhood vaccines were found to share news stories to feel empowered to have their say.

INTRODUCTION

In December 2014, a destination known worldwide for spreading happiness became known for spreading something else – the measles. An outbreak of the disease was traced to Disneyland, the popular tourist destination in California. By March 2015, it had spread to more than 146 people in 7 states ("U.S. Multi-state Measles Outbreak 2014—2015 | CDC," n.d.). The surge of cases led to a surge of media coverage of the anti-vaccination movement, which public health officials blamed for the outbreak. California's Orange County, which saw the greatest number of measles cases, also had one of the highest rates of vaccine refusal in the state, Jack Healy and Michael Paulson reported in *The New York Times* (2015). Parents' reasons for opting their children out of vaccinations vary, but most are tied to fears that the vaccines are more dangerous than the diseases they prevent. In particular, many non-vaccinating parents say they fear the shot for measles, mumps and rubella (MMR) is linked to a rise in autism cases, even though the study initially claiming that link has since been widely discredited (Healy & Paulson, 2015).

Media outlets covering the measles outbreak sought to explain the symptoms of the disease (Stobbe, 2015), the reasons for its recent resurgence, and the reassurances from scientists and public health officials that the vaccination to prevent it is safe and necessary (Salathé, 2015). Some of the coverage turned political, as public officials at the federal and state level began to weigh in on whether vaccinations should be mandatory, and what role personal choice plays in a parent's decision (Riccardi, 2015). Coverage of

the measles outbreak lasted several weeks, dominating headlines on both traditional news outlets and social media sites, including Facebook. The world's largest social networking platform has increasingly become a source for news. Of the two-thirds of U.S. adults using Facebook, more than half of them use it to consume news stories (Mitchell, Kiley, Gottfried, & Guskin, 2013). In addition to finding news on Facebook, users are also sharing it – 43% of adults surveyed in a Pew study (Mitchell et al., 2013) reported sharing or posting news stories. When users share a news story on Facebook, that increases its reach; the story is more likely to be seen by a larger group of people, and then potentially clicked on. More than two thirds of Facebook news consumers say they click on links to news stories they see on the site (Mitchell et al., 2013).

Research Problem

Public health officials and media organizations each have an interest in understanding why an individual might share a news story on vaccinations on Facebook. Health researchers have long understood that there are many influences on parents making decisions about vaccinating their children – from doctors to friends and family members to health websites. Media coverage of vaccines also has an impact on those decisions (Brunson, 2013). Thus Facebook, which sits at the crossroads between a traditional media outlet and a network of friends and family, is a platform of increasing interest to media and health scholars.

In an analysis of the most popular vaccination-related pages on Facebook, Buchanan and Beckett (2014) found that although both pro- and anti-vaccination pages were popular on the social networking platform, the anti-vaccination pages generated more interest – via frequent posts by moderators and members. These kinds of online

conversations have real-world implications. One study of the data from more than 100,000 social media users found a strong correlation between those users' vaccination views and the U.S. Centers for Disease Control and Prevention estimates of vaccination rates by region (Salathé & Khandelwal, 2011). That study also found that users tend to cluster themselves into groups with similar viewpoints, and that information about vaccines flows more freely among those like-minded groups. Media organizations, meanwhile, have an interest in understanding why users share their content on Facebook, because it can help them expand their online reach. News publishers are eager to make up for diminishing revenues on traditional outlets such as print and broadcast television by turning to their websites for advertising dollars. In order to do that, publishers need their content to reach as many people as possible, and Facebook's ubiquity provides an opportunity to reach readers – and customers – they might never have reached before. Organizations such as BuzzFeed have sprung up around that Facebook breadth; they rely on the social network's more than 1 billion users to post and share links to their content. That potential to drive web traffic has appealed to virtually all content publishers, to the point that Facebook is now responsible for up to 40 percent of some organizations' traffic (Benton, 2015).

Facebook may be an important factor in the spread of news stories about vaccinations. Those stories also have the power to influence vaccination activities. Thus, it is important for public health officials and the media to understand users' needs in reading and sharing vaccine-related information on Facebook, and the relationship between those needs and vaccination activity. Past research on vaccine information online has examined the flow of that information and its influence on parents'

vaccination decisions (Brunson, 2013; Salathé & Khandelwal, 2011). And past research on news sharing on Facebook has found a wide range of needs being gratified (Baek, Holton, Harp, & Yaschur, 2011; Krisanic, Rodgers, Peng, & Qiao, 2014; Namkee Park & Lee, 2014; Smock, Ellison, Lampe, & Wohn, 2011). But missing from both bodies of research are specifics on why parents share vaccine-related news stories on Facebook. A deeper understanding of an individual's need for vaccine-related news, and how these needs are being met through Facebook sharing activities, is warranted.

The purpose of this study was to apply the uses and gratifications theory to the sharing of news stories about vaccinations on Facebook, in order to understand how that action gratifies an individual's needs. The study utilized an online survey of Facebook users who have shared vaccine-related news stories on their Facebook pages to understand what drives that sharing activity, and what connection there is to a person's vaccination viewpoints and decision-making.

Literature Review

In the digital era, audiences have more choices than ever – from what content to consume, to which devices and platforms to use, to how to participate with that media. Perhaps no digital innovation is having a more significant effect on the news landscape than social media, where people can share and discuss content – including news stories – with networks of friends, acquaintances or even strangers. The largest of these social networks, Facebook, now boasts more than two-thirds of U.S. adults as members, and half of those users read news stories posted there (Mitchell et al., 2013). This trend has news organizations placing significant time and resources into understanding and trying to reach audiences on Facebook.

In addition, Facebook has emerged as an influential source of health information. People use functions such as Facebook Groups to discuss their health status (Walker, 2014) and cite social media as a credible way to share information about vaccinations (Avery & Lariscy, 2014; Frew et al., 2012). The intersection of these two Facebook functions – the sharing of news, and the spread of health information – is the focus of this study. As academics seek to understand social media behaviors, many are turning to the uses and gratifications theoretical approach (Rubin, 2009; Sundar & Limperos, 2013). Uses and gratifications (U&G) research suggests that individuals make choices about what kind of media to consume, based on how media meet their social and psychological needs. U&G's origins date back to the 1940s, when scientists sought to understand what needs were met – or what “gratifications” were experienced – when people listened to quiz shows or soap operas on the radio (Katz, Blumler, & Gurevitch, 1973).

Media organizations may benefit from a uses and gratifications approach, because it offers an opportunity to understand what kind of content – both in form and function – is most useful and gratifying to audiences. Katz (1973) argues that “instead of depicting the media as severely circumscribed by audience expectations, the uses and gratifications approach highlights the audience as a source of challenge to producers to cater more richly to the multiplicity of requirements and roles that it has disclosed” (p. 521). The U&G model – created by Lundberg and Hulten, as described in Katz (1973) – posits that: 1) audiences are active consumers, 2) media choices and resulting gratifications lie with the audience member, 3) the media compete with other sources for satisfying needs, 4) people are self-aware enough to report their own needs (via survey, for example), and 5)

value judgments about media choices should be suspended so that audience motivations can be fully explored (Katz et al., 1973, pp. 510–511).

For the purposes of understanding why people share news stories on social media, “needs gratification” can be defined as how a person’s social and psychological needs are met through media usage, whether through the content itself or through the process of consumption or participation (Katz et al., 1973; Rubin, 2009; Sundar & Limperos, 2013). To operationalize the concept of needs gratification, research in U&G typically asks consumers to self-report what gratifications are sought and met by media usage (Becker, 1979; Katz et al., 1973). Uses and gratifications should be distinguished from motivations research, which in the field of psychology is the study of “the energization and direction of behavior” (Deci & Ryan, 1985, p. 3). The energy of behavior is a function of needs, which can be either innate to the individual, or acquired through interaction with his or her environment. And the direction of that behavior is a matter of the processes and structures involved in meeting those needs (Deci & Ryan, 1985). While the concept of motivation is similar to uses and gratifications, the latter is more appropriate for understanding media usage and behavior, given its long history in media research and its specific opportunities in understanding newer, computer-mediated forms of communication (Ruggiero, 2000).

In order to quantitatively measure the gratification of needs, researchers must present a selection of possible experiences – or a typology of gratifications – from which respondents can choose (Becker, 1979). Many of the needs studied in early U&G research were fairly dichotomous – information vs. entertainment, surveillance vs. escape, etc. Later interpretations of the U&G approach found four functions: “diversion

(including escape from the constraints of routine and the burdens of problems, and emotional release); personal relationships (including substitute companionship as well as social utility); personal identity (including personal reference, reality exploration, and value reinforcement); and surveillance” (Katz et al., 1973, p. 513). This typology, or a variation of it, has been applied to the study of a wide variety of media activities in the forty years since it was conceived. For example, the framework has been used to explore both the gratifications of specific types of content, such as reality television or TV news, as well as specific types of technology or content delivery systems, such as the VCR (Rubin, 2009).

New Media Approaches

Despite significant advances in technology, many recent digital media studies continue to rely on this decades-old typology that was originally used for traditional media (Sundar & Limperos, 2013). For example, a 2012 study that sought to understand why people share news stories on social media grouped potential gratifications into these categories: information-seeking, entertainment, socialization and status-seeking (Lee & Ma, 2012). But what if entirely new, previously unidentified needs are being met by new media? Researchers S. Shyam Sundar and Anthony M. Limperos (2013) sought to identify these new gratifications, noting: “The interactivity of most modern media makes possible such a conceptualization whereby users are not always goal-directed at the beginning of their engagement of media, but tend to develop needs during the course of their media interaction” (p. 510). The researchers note that when using interactive media, people are not always driven by pre-existing and deeply felt needs. Moreover, an evaluation of U&G research over the past seventy years reveals that with the emergence

of each new media platform has brought with it new gratifications, or more nuanced perspectives on existing gratifications, such as information-seeking or entertainment (Sundar & Limperos, 2013).

Sundar and Limperos suggest four broad new gratifications for new media: modality, agency, interactivity and navigability (p. 513). In particular, the sharing of news stories on social media would likely be concerned with agency gratifications, that is, gratifications that arise from the fact that newer media allow audiences “to be agents or sources of information” (Sundar & Limperos, 2013, p. 513). These new agency gratifications include agency-enhancement, community building, bandwagon, filtering/tailoring and “ownness” (p. 514). In other words, new technologies have afforded audiences the ability to be gatekeepers of information and builders or participators in communities. Social media provide tools that facilitate this type of individual agency, and give rise to new gratifications around a person’s role in filtering, disseminating and discussing information. Similarly, the ability to easily see others’ online activities – what they buy, what they read, and what they think about a particular event – contributes to a “bandwagon” effect (Sundar & Limperos, 2013, p. 514). For example, seeing multiple friends share links on Facebook taking a stand on a controversial topic – such as vaccinations – could trigger an individual to share that same link, leading to gratification of bandwagon-related needs that perhaps did not exist before that person logged on to the website.

In understanding U&G, it is important to understand the specific source of the gratification – the content, exposure to the media itself, or the social context that typifies the situation of exposure (Katz et al., 1973). In this study, it is expected that the sources

of media gratification are both, in the sense that it is not only the content itself that gratifies a need, but the sharing of it with others in a particular setting – in the present research, Facebook. Human needs do not always exist independent of society; Katz argues that societal and environmental circumstances can give rise to unique media needs. For example, social situations can produce conflicts that people seek to resolve via media consumption, or can give rise to certain values that are affirmed and reinforced via media activities (Katz et al., 1973). The 2015 measles outbreak may be one such social situation in that news coverage of the event spotlighted a small but vocal group of parents who opposed vaccinations. Politicians and scientists weighed in, while some parents became defensive, feeling a need to explain their anti-vaccination viewpoints (Healy & Paulson, 2015). This suggests that media coverage itself may have helped to create conflict or confusion that individuals needed to resolve via media activities – such as through sharing news stories on Facebook. Similarly, much of the news coverage included strong language from scientists and activists, which may have given rise to a need to affirm values in support of, or opposition to, vaccination viewpoints. Researchers have found that information about vaccinations moves more freely within like-minded groups (Salathé & Khandelwal, 2011). This suggests that parents who were pro-vaccination or anti-vaccination may have sought to reinforce their own viewpoints among similarly minded individuals by sharing news stories on Facebook.

Gratifications of Social Media Usage

The present study seeks to understand what specific needs are gratified by sharing news stories about a measles outbreak on Facebook. Previous research has applied the U&G theory broadly to both the sharing of health information online, and the needs

gratified by sharing news on social media. The breadth of gratifications for social media usage has been well-documented in the literature. Lee and Ma (2012) surveyed users of a variety of social media platforms and found that they were gratifying needs for information-seeking, socialization and status-seeking. Hanson and Haridakis (2008) found that people shared YouTube clips from comedic news programs such as *The Daily Show* to be entertained, as well as to share information and socialize. Several studies that examined Facebook use have found gratifications that, though their named typologies may vary slightly, fall into Katz's (1973) four categories of diversion, personal identity, personal relationships and surveillance (Krisanic et al., 2014; Park & Lee, 2014; Zhang, Tang, & Leung, 2011).

But do gratifications for all Facebook activity fit neatly into that relatively broad and generic typology? Facebook's common uses have expanded beyond its initial functions of connecting with friends, and now encompass a wide range of activities, from email-like messaging to viewing videos and photos to sharing news stories or listening to music. Because of the varied features on a social network site such as Facebook, it is worthwhile to examine whether specific functions of the site – status updates, wall posts, chat, Groups – gratify different needs. Smock, Ellison, Lampe and Wohn (2011) found differences between motivations for general Facebook use and motivations for specific features. They suggest that “studying Facebook as a toolkit of features, each with a different set of affordances, as opposed to a singular tool, may provide more insight into why people are using the site and what they expect to achieve through their use” (Smock et al., 2011, p. 2236).

Another study, two years later, reinforced the notion that emerging tools and

applications on Facebook indicate that the gratifications are shifting from simply social connections to more entertainment or time-wasting uses. A survey found four key gratifications: social connection, social network surfing, wasting time and using applications (Giannakos, Chorianopoulos, Giotopoulos, & Vlamos, 2013). Several studies have taken to exploring some of these specific functions of Facebook. For example, Namsu Park, Kee and Valenzuela (2009) found that college students use Facebook Groups – a function, similar to a message board, on a specific topic – for socializing, entertainment, status-seeking and information.

An important function of Facebook is the sharing of links, which often includes links to news stories. Previous research in the area of generating content online – of which link-sharing on Facebook is one possible form – has found that the activity is psychologically empowering, most commonly gratifying needs for recognition and socialization (Leung, 2009). Baek et. al. sought to understand Facebook linking in particular, and found a range of motivations, but generally that people share links in order to seek and share information. Those who were highly motivated to share information were those who shared links to Facebook more frequently, and those who were more educated were also more likely to share links to news stories (Baek et al., 2011). The authors noted that “Facebook accelerates the role of the Internet as a means of social interaction and information seeking and enhances the individual’s role as a gatekeeper or filter of information for a given community (i.e., ‘friends’)” (p. 2246).

Online Health Information’s Influence

This role of an individual as a gatekeeper in a community is an important one when it comes to understanding how information about vaccinations spreads, and how

that information influences people. Researchers have found that patients are increasingly turning to the internet for health information, particularly when they are dissatisfied with the level of care from their doctors (Tustin, 2010). In communities with low vaccination rates, a parent's social network – both online and offline – is the most important factor in vaccination decisions (Brunson, 2013). In fact, Brunson's study found that the variable most predictive of parents' vaccination decisions was the percent of people in a parent's social network who recommend not conforming to the federal vaccination guidelines. Brunson, in an interview with *Time* on the study, explained the significance of the findings. "Parents' people networks matter a ton," says Brunson, now an assistant professor of anthropology at Texas State University. "Having those conversations with your sister, with your parent, with your friends matter a lot more than we thought" (Rochman, 2013).

Those conversations matter, but in online communities, it can be difficult for different viewpoints to permeate like-minded groups. In a study of more than 400,000 Tweets published over a six-month period during the height of the swine flu (H1N1) outbreak in 2009 and 2010, researchers analyzed the vaccine sentiment of the messages, categorizing them as positive, negative or neutral (Salathé & Khandelwal, 2011). The messages' GPS information was also retrieved, allowing the researchers to identify the cities and states where the Twitter updates originated. The researchers found a strong correlation between the sentiment of those Twitter messages and the U.S. Centers for Disease Control and Prevention's estimated vaccination rates at the regional and state level; essentially, areas where many people spoke negatively of vaccines on Twitter also showed low vaccination rates. The researchers also examined the networks of Twitter

users, looking at the Tweets of people they followed, and found that vaccine information flowed more freely within groups with similar views on vaccinations, noting that this finding signifies that “online social media can act as an ‘echo chamber’ where personal opinions that affect individual medical decisions are predominately reaffirmed by others” (Salathé & Khandelwal, 2011, p. 3).

Still, there is evidence that social media can play a role in vaccination decision-making. In studying influenza vaccine acceptance in ethnically diverse areas of the South, researchers found that those who received the H1N1 vaccine indicated that Facebook and Twitter could be useful communication channels to reach others (Frew et al., 2012). Avery and Lariscy’s findings (2014) also support the idea that social media are an effective tool for communicating vaccine information. Facebook also has the power to influence health-care workers’ vaccination decisions. A survey of medical students and current health care workers in Spain found that 44 percent of them would be willing to engage with a Facebook page that provided information about the influenza vaccine (Mena et al., 2012).

These studies build on a wide body of literature about the influence of traditional media coverage in vaccination decision-making. For example, a 2010 study found that newspaper headlines and television stories about the influenza vaccine – particularly those noting a delay or shortage in vaccine availability – had an effect on the number of people receiving the vaccine (Byung-Kwang Yoo, Holland, Bhattacharya, Phelps, & Szilagyi, 2010). A 2013 survey of college students found that those who are most dependent on the Internet for news were also most likely to perceive risk regarding the H1N1 or swine flu (Lin & Lagoe, 2013). Essentially, students who said they relied on the

Internet, TV and newspapers for health information were more likely to view the H1N1 virus as dangerous, and were more likely to make plans to get vaccinated against the disease.

Research Questions

What is largely missing from the literature is an understanding of why an individual seeks or shares vaccination information on social media. Several studies have applied the uses and gratifications approach to other types of health communication, and these studies provide some insight into distinctive gratifications for health information seekers and sharers. For example, one study of cancer patients who blog found some distinctive gratifications that did not fit neatly into the categories typically applied to U&G research, namely that blogging most significantly gratified patients' needs for emotion management (Chung & Kim, 2008). Similarly, a study of users of the site CaringBridge, which allows people with serious illnesses to update and interact with supporters, found that emotional and psychological support was among the most commonly gratified need (Anderson, 2011). These studies built on earlier research by Rodgers and Chen (2005) that showed that women who participated in breast cancer forums online obtained powerful psychosocial benefits from this activity, via the giving and receiving of information and social support. Those benefits also improved over time, with the percentage of women reporting pessimism about their breast cancer dropping from 24.4% to 11% over the period of several years of participating in the discussion boards. The women also reported an improved mood, increased coping skills and decreased stress (Rodgers & Chen, 2005).

While Baek et. al. (2011) is one of only a few studies to examine the U&G of posting links on Facebook, the results were broad and varied. The sheer amount of content available online for reading, sharing, and discussing on Facebook suggests that an individual's experienced gratifications for linking vary broadly as well. And given that the sharing of vaccination news is a more specific activity than what has been examined in previous studies, it is difficult to hypothesize about what needs might be gratified by this activity. This leads to the following research question:

RQ1: What are the uses and gratifications of sharing links to news stories about vaccinations on Facebook?

Just as Baek et. al. found a range of gratifications for Facebook linking, it is expected that a range of gratifications will be found for sharing vaccination stories on Facebook. The type of content users choose to link on their Facebook pages is associated with certain groups or motivations, such as education level and need for information (Baek et al., 2011). Therefore, it is important to explore not only the gratifications experienced by sharing vaccination stories, but also how those relate to other variables. Previous research on the U&G of blogging about chronic illnesses (Anderson, 2011; Chung & Kim, 2008) suggests that personal experience with disease can affect the gratifications obtained from media usage.

It is important, then, to understand both the vaccine-related attitudes, and behaviors, of those who share such news on Facebook. Public health researchers created a measurement to do just that. "Vaccine hesitancy" is defined as "delay in acceptance or refusal of vaccination despite availability of vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place and vaccines. It is influenced by

factors such as complacency, convenience and confidence.” (MacDonald, 2015, p. 3). The vaccine hesitancy survey tool (Larson et al., 2015) seeks to understand both what people think about the safety and efficiency of vaccines, as well as what choices they make about vaccinating their own children.

RQ2: What is the vaccination hesitancy among those who share news stories about vaccines on Facebook?

RQ3: How does vaccine hesitancy relate to uses and gratifications for sharing news stories about vaccines on Facebook?

Women, and mothers in particular, have long been the target of vaccination campaigns, as they are seen as the gatekeepers to children’s health. Early vaccine messages in the 1960s and 1970s came amid the women’s movement and were often framed around the idea that when a child became sick with something like the mumps, a mother might have to miss work or lose her job entirely in order to provide care (Conis, 2013). Before long, the women’s movement began to influence healthcare, leading women to challenge a medical establishment run primarily by men, as they questioned the safety of birth control pills and other drugs and treatments specifically for women. This movement soon extended from women to their children, as mothers began questioning whether the vaccines doctors recommended were truly safe (Conis, 2013). Because mothers are primarily involved in vaccination decision-making in families, it is important to understand whether mothers are also the ones involved in the sharing of vaccination information online.

RQ4: What are the demographics of those who share news stories about vaccines on Facebook?

METHOD AND DESIGN

Surveys have been used by prior studies to examine U&G for particular media, and recent research has identified U&G for a variety of Facebook functions using online surveys (Baek et al., 2011; Lee & Ma, 2012; Namsu Park et al., 2009; Smock et al., 2011). Thus, an online survey was used in the present study, which is an appropriate method for identifying U&G and for understanding activity on social networks. Scholars who have studied the U&G approach have suggested that people are self-aware enough to report their own motivations for media use (Katz et al., 1973). Recent research has found that consumers remain confident in their ability to assess their own motivations for media use, but that their confidence varies by platform, with users being most certain of their gratifications for internet use (Strizhakova & Kremer, 2003). This study, therefore, employed an online survey of Facebook users who have shared links to vaccination news stories on their Facebook profiles about what needs are gratified by this activity. Details of how this was accomplished are provided below.

Sample and Timeframe

The population for this survey included all adults over the age of 18 in the United States who have shared a news story about vaccinations on Facebook. Because Facebook users have varying privacy settings, it is difficult for researchers to identify and directly contact individuals who have shared news about vaccinations on Facebook. Therefore, in order to get a quality sample, respondents were recruited from Amazon Mechanical Turk. Amazon Mechanical Turk, or MTurk, is an online marketplace that matches workers with

those offering payment for “human intelligence tasks,” or HITs. The platform has become an increasingly popular recruitment pool among social science researchers. Studies have found that MTurk workers are similarly representative of the entire U.S. population, and in at least one study on judgment and decision-making, there was no difference in response between the MTurk pool and the traditional subject pool (Paolacci, Chandler, & Ipeirotis, 2010). For this study, subjects were pre-screened for those who were U.S. residents over 18 years old and who self-identified as having shared a link to a news story about vaccinations on Facebook in the past year before taking this survey, which was administered and completed by all 202 participants on February 1, 2016. Each respondent was paid \$1.25 for completing the survey.

Measures

The survey included measures in four areas: frequency of Facebook use, needs gratified by sharing vaccination news, vaccination hesitancy and basic demographics. Previous studies on Facebook have found that needs gratified through usage can vary based on how often and for how long a person uses Facebook (Park & Lee, 2014). For this study, Facebook usage will be measured with an instrument created by Ellison et. al. (2007) and also adapted in Park and Lee (2014). This Facebook intensity scale asks about the respondent’s number of Facebook friends and average time spent on Facebook per day, and then presents six statements anchored by a 5-point Likert scale: (1) “Facebook is part of my everyday activity,” (2) “I am proud to tell people I’m on Facebook,” (3) “Facebook has become part of my daily routine,” (4) “I feel out of touch when I haven’t logged onto Facebook for a while,” (5) “I feel I am part of the Facebook community,” and (6) “I would be sorry if Facebook shut down.” To answer RQ1, the survey asked

respondents to rate, on a 5-point Likert-type scale, whether they agree with a series of statements related to seven types of media gratifications: information-seeking, entertainment, socialization, status-seeking, agency-enhancement, community-building and bandwagon. This typology was identified as the most likely to encompass the wide range of gratifications obtained from social news sharing, based on a review of the literature. The first four categories are drawn from U&G research, and they have been frequently found in studies involving new media (Hanson & Haridakis, 2008; Lee & Ma, 2012; Leung, 2009; Shao, 2009). The three additional gratification areas are based on Sundar and Limperos' review of U&G literature (2013) with an eye toward identifying new motivations for digital media use. Table 1 shows the statements that were used to measure these gratifications, which were adapted from past studies on the U&G of social media use (Hanson & Haridakis, 2008; Lee & Ma, 2012) as well as Sundar and Limperos' recommended measures for new agency-related gratifications (2013).

To address RQ2 and RQ3, an instrument adapted from Larson et. al (2015) was used to measure vaccine hesitancy by asking respondents to answer questions about whether they have ever refused vaccines for their own children, as well as asking them to rate their agreement with a variety of vaccination-related statements on a Likert-type scale (i.e., "Childhood vaccines are effective," "Having my child vaccinated is important for the health of others in my community.") Previous research indicates that those with anti-vaccination viewpoints tend to come from specific demographic backgrounds; mothers are the vaccine decision-makers in families, and those who opt their children out of vaccinations tend to be white, educated and upper-middle class (Smith, Chu, & Barker,

2004). In order to answer RQ4, a section to measure demographics was included. The entire survey instrument is included in Appendix A.

RESULTS

A total of 202 people participated in the survey. Of those who noted their gender, 118 were men (58.7%) and 81 (40.3%) were women. A total of 79.5% described themselves as White / Caucasian, 7.5% as Black or African American, 6.0% as Hispanic and/or Latino, 6.4% as Asian and 0.5% as American Indian or Alaska Native. The mean age of respondents was 33.15 years ($sd=8.58$), and 58 respondents (28.9%) indicated they have a child or children ages 6 or younger. Most respondents (86.1%) had at least some college education. They were also heavy Facebook users; 63.9% reported using Facebook an average of at least 30 minutes a day. All respondents were also asked their feelings about Facebook's role in their daily lives, and these variables were combined to make a composite score on Facebook intensity. Most respondents (88.6%) had at least neutral feelings about Facebook, and 45.3% had positive Facebook views. Table 2 summarizes the demographics of respondents.

Twenty-three questions relating to reasons for sharing links to news stories about vaccinations on Facebook were factor analyzed using principal component analysis with Varimax rotation and Kaiser Normalization. This analysis yielded four factors explaining a total of 58.02% of the variance for the entire set of variables. Seven of the 23 variables yielded high factor loadings ($>.4$) on two components, and one variable yielded factor loadings of $>.35$ on three components; these were removed from the analysis. The statements removed from the analysis included: I can connect with others; It allows me to review the opinions of others before I make decisions; It allows me to assert my identity;

It allows me to expand my social network; It comforts me to know the thoughts and opinions of others; It helps me to keep up to date on the latest news and events; I enjoy it; It makes me realize I am part of a community. The remaining 15 statements revealed four patterns of survey responses that differed somewhat from the typology presented in the literature review, drawn from Sundar and Limperos (2013).

Factor 1, which alone accounted for 35.71% of the variance, showed loadings of >0.5 on the following items: It helps me feel important when sharing news; it helps me to gain status when sharing news stories; it helps me to look good when sharing news stories; it allows me to build social capital; and it gives me the power to broadcast to my followers. Three of these items were initially categorized in Table 1 as traditionally status-seeking gratifications. The final two were categorized as community-building and agency-seeking, respectively. But ultimately, all of these gratifications are related to how respondents are perceived by their peers on social networks, and thus can be combined into a single variable measuring “status-seeking” gratifications ($\alpha = .85$). The second factor, which accounted for 9.18% of the variance, showed factor loadings of >0.5 on the following items: It allows me to have my say; it is an effective way to exchange ideas with other people; it allows me to send my thoughts to many; and it allows me to compare my opinions with those of others. This factor contains items initially categorized in Table 1 as agency-seeking, socialization and bandwagon. However, each is related to a respondent’s ability to feel empowered to speak out and be heard by others, and thus can be combined into a single variable measuring “agency-seeking” gratifications ($\alpha = .79$). The third factor accounted for 7.96% of the variance, and contained high loadings on items related to both socialization and entertainment-seeking gratifications, and thus can be

combined into a single variable measuring “social / entertainment” gratifications ($\alpha = .68$). The fourth factor accounted for 5.18% of the variance, showing high factor loadings on “It helps me to store useful information” and “It is easy to retrieve information when I need it,” and thus can be combined into a single variable measuring “information storage” ($\alpha = .74$). All of these factor loadings are detailed in Table 3. The factor analysis suggests that this survey has identified four patterns of uses and gratifications for sharing links to stories about vaccinations on Facebook: to seek status, to seek agency, to socialize / be entertained and to store information. To create composite scores for each of these factors, the means of items that had their primary loadings on each factor were calculated. A lower mean score, as listed in Table 4, indicated respondents more strongly identified with that category of uses and gratifications experienced when sharing news stories about vaccinations on Facebook. Though the factor analysis did not reinforce the typology of gratifications outlined in Table 1, the framework presented in that table may be useful in other circumstances. For example, given the gratifications’ focus on community and agency, which are reflective of some of the unique aspects of social media platforms and personal health, that typology may be useful in other studies.

Respondents were also asked about their views on childhood vaccinations. Those who identified themselves as parents (28.7%, N=201) overwhelmingly agreed (94.7%) that vaccines could protect their children from serious illness. But their responses also revealed some reservations: 34.5% of parents said they had been reluctant or hesitant to get a vaccine for their child, and 13.8% said they had refused a vaccine for their child (see Table 5). All respondents, parents and non-parents, were asked another set of questions about vaccination viewpoints, and these variables were combined to create a

composite score on vaccine hesitancy. The mean score of vaccine hesitancy was 1.88 ($sd=.78$) on a 5-point Likert scale, with 1 indicating the greatest agreement with statements about the safety and importance of childhood vaccinations.

To answer RQ3, a Spearman rho correlation coefficient was calculated for the relationship between participants' vaccine hesitancy and each of the other previously identified uses and gratifications for sharing vaccination news on Facebook. Though the Spearman rho is weaker than the Pearson correlation coefficient in determining the strength of a relationship between two variables, the Pearson requires both variables to be normally distributed. In the case of gratifications for Facebook sharing – specifically agency-seeking – the results were not normally distributed, with a majority of respondents noting a strong identification with agency gratifications. Therefore, the Spearman's rho was used, and a positive correlation was found ($\rho(192) = .242, p < .001$) between vaccine hesitancy and agency-seeking gratifications, indicating a significant relationship between the two variables. Those with stronger positive viewpoints on vaccinations tend to share vaccination news in order to seek agency and feel empowered. No other statistically significant correlations were found between vaccine hesitancy and other uses and gratifications.

DISCUSSION

Facebook is a powerful tool for both the dissemination of news and the sharing of health information. The uses and gratifications theoretical approach has provided a useful framework for this study's attempt to understand both behaviors by putting audience needs at the forefront. An audience-centric approach is particularly useful in understanding the sharing of vaccination information, as decisions about childhood vaccinations are deeply personal but with larger implications for public health. A successful vaccination program depends on widespread adoption, which is aided by the spread of information from trusted sources. Thus, examining the sharing of news stories about vaccinations on Facebook has provided an opportunity to understand audience needs, with an eye toward the successful spread of accurate information about vaccination information on the Internet.

Theoretical Implications

Past studies of the U&G of Facebook use have found gratifications that fall roughly into one of four categories that have long been found in a variety of traditional media studies, namely: diversion (entertainment), personal identity (status), personal relationships (socialization) and surveillance (information) (Krisanic et al., 2014; Park & Lee, 2014; Zhang et al., 2011). This study provided an opportunity to test out emerging uses and gratifications typologies that are specific to new media platforms, specifically those involving agency-seeking, community building and bandwagon (Sundar & Limperos, 2013). This study found that sharing links to news stories about vaccinations

on Facebook gratifies some of these new media-specific needs, as well as needs associated with traditional media. The results showed people share news about vaccinations on Facebook in order to feel empowered to have their say (agency-seeking), to look good in front of their friends (status-seeking), to socialize, to be entertained and to store information.

Social media, unlike most traditional media, is a two-way communication platform, and sharing links is an active state for users, different from more passive consumption states that are typically studied in U&G research. Past research on online content generation, such as blogging, has found that the activity is psychologically empowering (Leung, 2009), and the present study demonstrates similar results for Facebook link sharing. Respondents found it gratified needs for a sense of agency, or a need to be heard. In addition, Baek et al. (2011) found link sharing on Facebook is primarily for seeking and sharing information, and this too was verified by the present study — information storage was a particular need identified in the factor analysis. This has theoretical implications for future U&G research, as it confirms that future studies of Facebook usage – particular those involving a more active state, such as creating or sharing content – should incorporate Sundar and Limperos' new media typologies.

Research on the sharing of vaccine information has found that social media can play a role in vaccination decision-making (Frew et al., 2012) just as traditional media have long had a similar effect (Byung-Kwang Yoo et al., 2010). Though this study did not examine vaccination decision-making, the findings about agency-seeking gratifications have related theoretical implications. They suggest that people who are strongly in support of childhood vaccinations share links on Facebook to feel

empowered, and the logical extension of that empowerment is that these users feel they may have an effect on others' vaccination decisions by spreading trustworthy information to them. The democratization of news dissemination via social media platforms, while providing many benefits to news consumers, has also facilitated the spread of misinformation and false news stories about a range of topics, including vaccinations. Facebook and other social networks have taken efforts to fight the spread of false information (O'Donovan, 2015), but as news continues to compete with rumors and half-truths for space on a Facebook feed, audiences may feel powerless to counteract falsehoods. As CDC Director Dr. Tom Frieden told NBC News during the height of the 2015 measles outbreak, "...the Internet is a big, open place, and people may think that all of the information on the Internet is relatively of the same validity" (Fox & Jackson, 2015). Sharing a link to a news story on Facebook is perhaps one way that a pro-vaccination user can take back his or her individual power, by spreading trustworthy information about childhood vaccines.

Also of interest in these findings was the identification of status-seeking as the component that explained the greatest variance in the factor analysis. A smaller overall percentage of respondents experienced this gratification – 20% agreed or strongly agreed with these gratifications, compared with 74% for agency-seeking gratifications. But the analysis showed a clear pattern among those that experience status-seeking gratifications – they clearly feel important when sharing news about vaccinations on Facebook. This phenomenon is observed by digital editors in the sharing of science and technology news stories, as *The Boston Globe's* Sonya Song noted that readers often share such stories to

look “hip and smart” (Song, 2013). Further research into the gratifications experienced by sharing science stories may shed light on this topic.

Practical Implications

This study has real-world implications for both public health officials and media companies. Research on the vaccination program has often focused on the effectiveness of media in informing the public about vaccines and improving vaccine adoption rates. And while this study focuses primarily on the sharing of news about vaccines, and not about vaccination behavior, it offers insight into information-sharing behaviors that can be useful for public health officials crafting vaccination messages and campaigns. In particular, this study suggests that one such avenue for spreading accurate information about the vaccination program is people who are already pro-vaccination, as they have a strong need to feel empowered by sharing trustworthy information — such as news stories — about vaccinations on Facebook. For media companies, this study offers insight into users’ needs that can affect how to craft Facebook messages with the aim toward wider sharing. For example, understanding that users share vaccination information on Facebook in order to seek agency, status, socialization, entertainment and information can provide news managers with insight into crafting Facebook posts. If users who are supportive of vaccinations are seeking to feel empowered by sharing news stories, news managers may find it effective to create stories and Facebook posts that are framed around this empowerment and exchange of ideas, such as “Here are some common misconceptions about vaccinations that you can share with your friends.”

Limitations and Areas for Future Research

There are limitations to this study, and to what the U&G approach can explain. Many media organizations are interested in improving the reach of their stories on social media, and while the U&G approach seeks to understand an individual's needs, it cannot explain why certain stories are shared more widely than others. There are many other variables that might affect why a specific story "goes viral" – whether it is the way a story is framed, or the words included in the headline, or the image associated with the story. In addition, this study cannot explain whether viewing a news story about vaccinations on Facebook affects an individual's vaccination viewpoints or decision-making. Although this study's findings did demonstrate a need by users to feel heard when sharing news stories, it is not clear whether their intended audience for a Facebook post is actually doing any hearing. In short, this study cannot explain whether the act of sharing news stories about vaccinations on Facebook leads to real-world activity, such as a decision to receive or opt out of vaccinations. However, examining vaccination decision-making as a result of social media activity is a logical extension of this study and a promising area of future research.

This study also cannot explain how the format or framing of a particular news story on Facebook might have affected a user's gratifications sought and experienced. For example, it is possible that sharing news stories that debunk myths about vaccinations gratified a certain type of needs. This is a particularly compelling area of future research; if Facebook users are looking to share a specific kind of news story on vaccinations in order to gratify deeply felt needs to provide news to counteract misinformation, this has implications for both public health officials and news organizations. Finally, this study is primarily concerned with Facebook, and it is possible that different or distinctive

gratifications for vaccine-news sharing might be found on other social networks, such as Twitter. Future research may examine the U&G found on these platforms and whether they are similar to Facebook.

Conclusion

Sharing news on social networks has become an integral part of the new media landscape. News organizations now expect their audiences to spread information through networks such as Facebook, and those audiences expect their Facebook connections to keep them informed on major issues of public concern. Media companies continue to pour significant resources into understanding the spread of news content on social networks, but much of these resources tend to focus on the content itself – how to write social media-friendly headlines, how to optimize links for social sharing, how to select stories that will “go viral.” Little of this corporate research focuses on how users’ needs drive them to share content. Studies such as this one can help media companies, advocacy groups and public health officials understand the very particular needs – such as a need to feel empowered – that people gratify when they share news about vaccinations. This offers those interested in influencing vaccine behavior an opportunity to reach pro-vaccination audiences with content specifically aimed at gratifying that need to feel empowered. Given that past research indicates those who hold anti-vaccination viewpoints may be swayed by those in their social circle, this is one possible method for indirectly influencing anti-vaccination viewpoints – by empowering their pro-vaccination friends through sharing news on Facebook.

REFERENCES

- Anderson, I. K. (2011). The Uses and Gratifications of Online Care Pages: A Study of CaringBridge. *Health Communication, 26*(6), 546–559.
- Avery, E. J., & Lariscy, R. W. (2014). Preventable Disease Practices Among a Lower SES, Multicultural, Nonurban, U.S. Community: The Roles of Vaccination Efficacy and Personal Constraints. *Health Communication, 29*(8), 826–836.
- Baek, K., Holton, A., Harp, D., & Yaschur, C. (2011). The links that bind: Uncovering novel motivations for linking on Facebook. *Computers in Human Behavior, 27*(6), 2243–2248.
- Becker, L. B. (1979). Measurement of Gratifications. *Communication Research, 6*(1), 54–73.
- Benton, J. (2015, March 23). Facebook wants to be the new World Wide Web, and news orgs are apparently on board. Retrieved from <http://www.niemanlab.org/2015/03/facebook-wants-to-be-the-new-world-wide-web-and-news-orgs-are-apparently-on-board/>
- Brunson, E. K. (2013). The Impact of Social Networks on Parents' Vaccination Decisions. *Pediatrics, 131*(5), e1397–e1404.
- Buchanan, R., & Beckett, R. D. (2014). Assessment of vaccination-related information for consumers available on Facebook®. *Health Information & Libraries Journal, 31*(3), 227–234.
- Byung-Kwang Yoo, Holland, M. L., Bhattacharya, J., Phelps, C. E., & Szilagyi, P. G. (2010). Effects of Mass Media Coverage on Timing and Annual Receipt of

- Influenza Vaccination among Medicare Elderly. *Health Services Research*, 45(5p1), 1287–1309.
- Chung, D. S., & Kim, S. (2008). Blogging activity among cancer patients and their companions: Uses, gratifications, and predictors of outcomes. *Journal of the American Society for Information Science and Technology*, 59(2), 297–306.
- Conis, E. (2013). A Mother's Responsibility: Women, Medicine, and the Rise of Contemporary Vaccine Skepticism in the United States. *Bulletin of the History of Medicine*, 87(3), 407–435.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. Springer Science & Business Media.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*, 12(4), 1143–1168.
- Fox, M., & Jackson, H. (2015, February 4). CDC Chief to Vaccine Worriers: Ignore the Internet Myths. Retrieved March 22, 2016, from <http://www.nbcnews.com/storyline/measles-outbreak/cdc-chief-vaccine-worriers-ignore-internet-myths-n300286>
- Frew, P. M., Painter, J. E., Hixson, B., Kulb, C., Moore, K., del Rio, C., ... Omer, S. B. (2012). Factors mediating seasonal and influenza A (H1N1) vaccine acceptance among ethnically diverse populations in the urban south. *Vaccine*, 30(28), 4200–4208.
- Giannakos, M. N., Chorianopoulos, K., Giotopoulos, K., & Vlamos, P. (2013). Using Facebook out of habit. *Behaviour & Information Technology*, 32(6), 594–602.

- Hanson, G., & Haridakis, P. (2008). YouTube Users Watching and Sharing the News: A Uses and Gratifications Approach. *Journal of Electronic Publishing, 11*(3).
- Healy, J., & Paulson, M. (2015, January 30). Vaccine Critics Turn Defensive Over Measles. *The New York Times*. Retrieved from <http://www.nytimes.com/2015/01/31/us/vaccine-critics-turn-defensive-over-measles.html>
- Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and Gratifications Research. *Public Opinion Quarterly, 37*(4), 509.
- Krisanic, K., Rodgers, S., Peng, W., & Qiao, F. (2014). Consumers' Motivations for Social Networking Site Use and Behavior Toward Advertisements on Facebook. Presented at the American Academy of Advertising.
- Larson, H. J., Jarrett, C., Schulz, W. S., Chaudhuri, M., Zhou, Y., Dube, E., ... Wilson, R. (2015). Measuring vaccine hesitancy: The development of a survey tool. *Vaccine*.
- Lee, C. S., & Ma, L. (2012). News sharing in social media: The effect of gratifications and prior experience. *Computers in Human Behavior, 28*(2), 331–339.
- Leung, L. (2009). User-generated content on the internet: an examination of gratifications, civic engagement and psychological empowerment. *New Media & Society, 11*(8), 1327–1347.
- Lin, C. A., & Lagoe, C. (2013). Effects of News Media and Interpersonal Interactions on H1N1 Risk Perception and Vaccination Intent. *Communication Research Reports, 30*(2), 127–136.

- MacDonald, N. E. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine*.
- Mena, G., Llupià, A., García-Basteiro, A. L., Aldea, M., Sequera, V.-G., & Trilla, A. (2012). The Willingness of Medical Students to Use Facebook as a Training Channel for Professional Habits: The Case of Influenza Vaccination. *CyberPsychology, Behavior & Social Networking*, 15(6), 328–331.
- Mitchell, A., Kiley, J., Gottfried, J., & Guskin, E. (2013, October 24). The Role of News on Facebook. Retrieved November 30, 2013, from <http://www.journalism.org/2013/10/24/the-role-of-news-on-facebook/>
- O'Donovan, C. (2015, January 21). What does Facebook's new tool for fighting fake news mean for real publishers? Retrieved from <http://www.niemanlab.org/2015/01/what-does-facebooks-new-tool-for-fighting-fake-news-mean-for-real-publishers/>
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). *Running Experiments on Amazon Mechanical Turk* (SSRN Scholarly Paper No. ID 1626226). Rochester, NY: Social Science Research Network. Retrieved from <http://papers.ssrn.com/abstract=1626226>
- Park, N., Kee, K. F., & Valenzuela, S. (2009). Being Immersed in Social Networking Environment: Facebook Groups, Uses and Gratifications, and Social Outcomes. *CyberPsychology & Behavior*, 12(6), 729–733.
- Park, N., & Lee, S. (2014). College Students' Motivations for Facebook Use and Psychological Outcomes. *Journal of Broadcasting & Electronic Media*, 58(4), 601–620.

- Riccardi, N. (2015, February 6). Debate Over Vaccine Requirements Forges Strange Alliance. Retrieved February 13, 2015, from <http://abcnews.go.com/Health/wireStory/vaccine-skeptics-find-unexpected-allies-conservative-gop-28771806>
- Rochman, B. (2013, April 15). How Social Networks Influence Parents' Decision to Vaccinate. *Time*. Retrieved from <http://healthland.time.com/2013/04/15/how-social-networks-influence-a-parents-decision-to-vaccinate/>
- Rodgers, S., & Chen, Q. (2005). Internet Community Group Participation: Psychosocial Benefits for Women with Breast Cancer. *Journal of Computer-Mediated Communication*, 10(4).
- Rubin, A. M. (2009). The uses-and-gratifications perspective of media effects. In M. B. Oliver & J. Bryant (Eds.), *Media Effects: Advances in Theory and Research* (pp. 165–184). Taylor & Francis US.
- Ruggiero, T. E. (2000). Uses and Gratifications Theory in the 21st Century. *Mass Communication & Society*, 3(1), 3–37.
- Salathé, M. (2015, February 3). Why a few unvaccinated children are an even bigger threat than you think. *The Washington Post*. Retrieved from <http://www.washingtonpost.com/posteverything/wp/2015/02/03/why-a-few-unvaccinated-children-are-an-even-bigger-threat-than-you-think/>
- Salathé, M., & Khandelwal, S. (2011). Assessing Vaccination Sentiments with Online Social Media: Implications for Infectious Disease Dynamics and Control. *PLoS Computational Biology*, 7(10), 1–7.

- Shao, G. (2009). Understanding the appeal of user-generated media: a uses and gratification perspective. *Internet Research, 19*(1), 7–25.
- Smith, P. J., Chu, S. Y., & Barker, L. E. (2004). Children who have received no vaccines: who are they and where do they live? *Pediatrics, 114*(1), 187–195.
- Smock, A. D., Ellison, N. B., Lampe, C., & Wohn, D. Y. (2011). Facebook as a toolkit: A uses and gratification approach to unbundling feature use. *Computers in Human Behavior, 27*(6), 2322–2329.
- Song, S. (2013, November 15). Sharing fast and slow: The psychological connection between how we think and how we spread news on social media. Retrieved November 30, 2013, from <http://www.niemanlab.org/2013/11/sharing-fast-and-slow-the-psychological-connection-between-how-we-think-and-how-we-spread-news-on-social-media/>
- Stobbe, M. (2015, February 4). Why you should, and shouldn't, worry about measles. *The Washington Post*. Retrieved from http://www.washingtonpost.com/national/health-science/why-you-should-and-shouldnt-worry-about-measles/2015/02/04/8b4f12e6-accb-11e4-8876-460b1144cbc1_story.html
- Strizhakova, Y., & Krmar, M. (2003). Do We Have Access to Our Viewing Motive? Assumptions in and Extentions of Uses and Gratifications. In *Conference Papers -- International Communication Association* (pp. 1–33). International Communication Association.
- Sundar, S. S., & Limperos, A. M. (2013). Uses and Grats 2.0: New Gratifications for New Media. *Journal of Broadcasting & Electronic Media, 57*(4), 504–525.

- Tustin, N. (2010). The Role of Patient Satisfaction in Online Health Information Seeking. *Journal of Health Communication, 15*(1), 3–17.
- U.S. Multi-state Measles Outbreak 2014—2015 | CDC. (n.d.). Retrieved March 31, 2015, from <http://www.cdc.gov/measles/multi-state-outbreak.html>
- Walker, K. K. (2014). Cognitive and Affective Uses of a Thoracic Outlet Syndrome Facebook Support Group. *Health Communication, 29*(8), 773–781.
- Zhang, Y., Tang, L. S.-T., & Leung, L. (2011). Gratifications, Collective Self-Esteem, Online Emotional Openness, and Traitlike Communication Apprehension as Predictors of Facebook Uses. *CyberPsychology, Behavior & Social Networking, 14*(12), 733–739.

APPENDIX A

Online Survey

Consent Form

You are being invited to participate in a research study about the sharing of news stories on Facebook. This study is being conducted by Kayla Castille from the University of Missouri. The purpose of this research study is to understand what motivates people to share vaccination news and information on Facebook. If you agree to take part in this study, you will be asked to complete an online survey/questionnaire. This survey/questionnaire will ask about your frequency of Facebook usage, your previous Facebook posts and your viewpoints about childhood vaccinations, and it will take you approximately 20 minutes to complete.

Upon successful completion of this survey, you will be compensated \$1.25, to be distributed via your Amazon Mechanical Turk account. We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach of confidentiality is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by separating your name from your survey results and storing those results on a secure server.

Your participation in this study is completely voluntary and you can withdraw at any time. If you have questions about this project or if you have a research-related problem, you may contact the researcher, Kayla Castille, at kcxt5@mail.missouri.edu. If you have any questions concerning your rights as a research subject, you may contact the University of Missouri Institutional Review Board at 573-882-9585 or UMCRESEARCHCIRB@missouri.edu. By clicking “I agree” below you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study. Please print a copy of this page for your records.

I Agree

I Do Not
Agree

Screening questions

Are you a resident of the United States?

- Yes
- No

If No Is Selected, Then Skip To End of Survey

Are you at least 18 years of age?

- Yes
- No

If No Is Selected, Then Skip To End of Survey

Do you use Facebook?

- Yes
- No

If No Is Selected, Then Skip To End of Survey

In the past year, have you shared a link to a news story about vaccinations on your Facebook profile?

- Yes
- No

If No Is Selected, Then Skip To End of Survey

Facebook intensity

About how many total Facebook friends do you have?

- 50 or fewer
- 51-100
- 101-150
- 151-200
- 201-250
- 251-300
- 301-400
- More than 400

In the past week, on average, approximately how much time per day have you spent on Facebook?

- Fewer than 10 minutes
- 10-30 minutes
- 31-60 minutes
- 1-2 hours
- 2-3 hours
- More than 3 hours

Please choose the response that best fits your level of agreement with each of the following statements.

Facebook is part of my everyday activity.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

I'm proud to tell people I'm on Facebook.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Facebook has become part of my daily routine.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

I feel out of touch when I haven't logged into Facebook for a while.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

I feel I am a part of the Facebook community.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

I would be sorry if Facebook shut down.

- Strongly Agree
 - Agree
 - Neither Agree nor Disagree
 - Disagree
 - Strongly Disagree
-

Uses and Gratifications

Think about the reasons you have previously shared news stories about vaccines on Facebook. For each of the items below, choose the answer most closely reflects your level of agreement with the statement. "I shared this story on Facebook because...."

I can interact with people when sharing news.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It helps me pass time.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It helps me feel important when sharing news.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

“I shared this story on Facebook because....”

It allows me to have my say.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It helps me to store useful information.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

I can connect with others.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

“I shared this story on Facebook because....”

It allows me to review opinions of others before I make decisions.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It is easy to retrieve information when I need it.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It's entertaining or amusing.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

"I shared this story on Facebook because...."

It helps me keep in touch with people.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It helps me to gain status when sharing news stories.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It allows me to assert my identity.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

"I shared this story on Facebook because...."

It allows me to expand my social network.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It comforts me to know the thoughts and opinions of others.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It helps me to keep up to date on the latest news and events.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

“I shared this story on Facebook because....”

I enjoy it.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It is an effective way to exchange ideas with other people.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It helps me to look good when sharing news stories.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

“I shared this story on Facebook because....”

It allows me to send my thoughts to many.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It makes me realize that I am part of a community.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It allows me to compare my opinions with those of others.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

“I shared this story on Facebook because....”

It allows me to build social capital.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

It gives me the power to broadcast to my followers.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Demographics

Please note your gender.

- Male
- Female
- Other / prefer not to say

Please note your ethnicity.

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic and/or Latino
- Native Hawaiian or Other Pacific Islander
- White / Caucasian
- Other

Please note your age (in years)

What is your highest level of education?

- Some high school
- High school diploma
- Some college
- Associate's degree
- Bachelor's degree
- Some graduate school
- Master's degree or equivalent
- Doctorate, law or medical degree or equivalent
- Not sure / not applicable

What is your annual household income?

- Less than \$30,000
- \$30,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$124,999
- \$125,000-\$199,999
- \$200,000 or more

Vaccine hesitancy

Do you have a child or children ages 6 or younger?

- Yes
- No

If No Is Selected, Then Skip To End of Block**

Do you believe that vaccines can protect your children from serious diseases?

- Yes
- No

Do you think that most parents like you have their children vaccinated with all the recommended vaccines?

- Yes
- No

Have you ever been reluctant or hesitated to get a vaccination for your child?

- Yes
- No

Have you ever refused a vaccination for your child?

- Yes
- No

***Please choose the response that best fits your level of agreement with each of the following statements.*

Childhood vaccines are important for children's health.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Childhood vaccines are effective.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Having children vaccinated is important for the health of others in my community.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

All childhood vaccines offered by the government program in my community are beneficial.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

New vaccines carry more risks than older vaccines.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

The information I receive about vaccines from the vaccine program is reliable and trustworthy.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Getting vaccines is a good way to protect children from disease.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Generally I do what my doctor or health care provider recommends about vaccines.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

I am concerned about serious adverse effects of vaccines.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Children do not need vaccines for diseases that are not common anymore.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

TABLES

Table 1. *Survey statements, grouped by gratifications typology*

<p><u>Information-sharing</u></p> <ul style="list-style-type: none"> • It helps me to store useful information. • It is easy to retrieve information when I need it. • To keep up to date on the latest news and events. 	<p><u>Entertainment</u></p> <ul style="list-style-type: none"> • It helps me pass time. • It's entertaining or amusing. • I enjoy it. 	<p><u>Socialization</u></p> <ul style="list-style-type: none"> • I can interact with people when sharing news. • To keep in touch with people. • It is effective to exchange ideas with other people.
<p><u>Status-seeking</u></p> <ul style="list-style-type: none"> • It helps me feel important when sharing news. • It helps me to gain status when sharing news stories. • It helps to look good when sharing news stories. 	<p><u>Agency-enhancement</u></p> <ul style="list-style-type: none"> • It allows me to have my say. • It allows me to assert my identity. • It allows me to send my thoughts to many. • It gives me the power to broadcast to my followers. 	<p><u>Community-building</u></p> <ul style="list-style-type: none"> • I can connect with others. • It allows me to expand my social network. • It makes me realize that I am part of a community. • It allows me to build social capital.
<p><u>Bandwagon</u></p> <ul style="list-style-type: none"> • It allows me to review opinions of others before I make decisions. • It comforts me to know the thoughts and opinions of others . • It allows me to compare my opinions with those of others. 		

Table 2. *Demographics of survey respondents*

<u>Age</u>	<u>N</u>	<u>Valid Percent</u>
20-30	95	47.5
31-40	72	36.0
41-50	25	12.5
51-60	7	3.5
61-69	1	0.5
<hr/>		
<u>Gender</u>	<u>N</u>	<u>Valid Percent</u>
Male	118	58.7
Female	81	40.3
Other / prefer not to say	2	1.0
<hr/>		
<u>Ethnicity</u>	<u>N</u>	<u>Valid Percent</u>
American Indian or Alaska Native	1	0.5
Asian	13	6.5
Black or African American	15	7.5
Hispanic and/or Latino	12	6.0
White / Caucasian	158	79.4
<hr/>		
<u>Education</u>	<u>N</u>	<u>Valid Percent</u>
Some high school	2	1.0
High school diploma	26	12.9
Some college	51	25.4
Associate's degree	31	15.4
Bachelor's degree	67	33.3
Some graduate school	6	3.0
Master's degree or equivalent	16	8.0
Doctorate, law or medical degree or equivalent	2	1.0
<hr/>		
<u>Annual household income</u>	<u>N</u>	<u>Valid Percent</u>
Less than \$30,000	51	25.4
\$30,000-\$49,999	70	34.8
\$50,000-\$74,999	37	18.4
\$75,000-\$124,999	37	18.4
\$125,000-\$199,999	5	2.5
\$200,000 or more	1	0.5

Table 3. *Factor analysis of the uses and gratifications for sharing vaccination stories on Facebook (N=202)*

Item	Greatest Beta 	Factor
It helps me feel important when sharing news.	.62	1
It helps me to gain status when sharing news stories.	.80	1
It helps me to look good when sharing news stories.	.79	1
It allows me to build social capital.	.80	1
It gives me the power to broadcast to my followers.	.65	1
It allows me to have my say.	.68	2
It is an effective way to exchange ideas with other people.	.78	2
It allows me to send my thoughts to many.	.74	2
It allows me to compare my opinions with those of others.	.69	2
I can interact with people when sharing news.	.51	3
It helps me pass time.	.69	3
It's entertaining or amusing.	.77	3
It helps me keep in touch with people.	.60	3
It is easy to retrieve information when I need it.	.81	4
It helps me to store useful information.	.77	4

Table 4. *Descriptive statistics for the four uses and gratifications for sharing vaccination news on Facebook (N=202)*

	<u>No. of items</u>	<u>M (SD)</u>	<u>Skewness</u>	<u>Kurtosis</u>	<u>Cronbach's A</u>
Status-seeking	5	2.95 (.85)	-.16	-.48	.85
Agency-seeking	4	1.94 (.62)	1.01	2.80	.79
Social / entertainment	4	2.34 (.66)	.32	-.11	.68
Information-seeking	2	2.32 (.89)	.55	-.41	.74

Table 5. *Spearman's rho correlation coefficient for vaccine hesitancy and agency seeking*

Spearman's rho		Agency seeking	
	Vaccine hesitancy	Correlation Coefficient	.242
		Sig. (2-tailed)	.001
		N	194

Table 6. *Vaccination hesitancy among respondents with young children*

	<u>Frequency</u>	<u>Percent</u>	<u>Valid Percent</u>
Do you have a child or children ages 6 or younger?			
Yes	58	28.7	28.9
No	143	70.8	71.1
Do you believe that vaccines can protect your children from serious diseases?			
Yes	54	26.7	94.7
No	3	1.5	5.3
Do you think that most parents like you have their children vaccinated with all the recommended vaccines?			
Yes	54	26.7	93.1
No	4	2.0	6.9
Have you ever been reluctant or hesitated to get a vaccination for your child?			
Yes	20	9.9	34.5
No	38	18.8	65.5
Have you ever refused a vaccination for your child?			
Yes	8	4.0	13.8
No	50	24.8	86.2