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A Mixed-Methods Normative Case Study of Undergraduate Students' Attitudes and Behaviors towards Influenza and Vaccination in the Post-2009 Influenza A(H1N1) Pandemic Era

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UNDERGRADUATE STUDENTS AND INFLUENZA/VACCINATION

A Mixed-Methods Normative Case Study of
Undergraduate Students' Attitudes and Behaviors towards
Influenza and Vaccination in the Post-2009 Influenza A(H1N1) Pandemic Era

A DISSERTATION SUBMITTED TO THE FACULTY OF THE
SCHOOL OF EDUCATION OF THE UNIVERSITY OF ST. THOMAS
ST. PAUL, MINNESOTA

By

Christian T. K.-H. Stadtländer

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF EDUCATION

2017

UNDERGRADUATE STUDENTS AND INFLUENZA/VACCINATION

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UNDERGRADUATE STUDENTS AND INFLUENZA/VACCINATION

UNIVERSITY OF ST. THOMAS, MINNESOTA

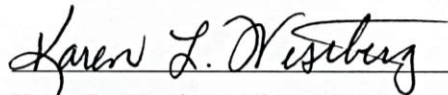
A Mixed-Methods Normative Case Study of
Undergraduate Students' Attitudes and Behaviors towards
Influenza and Vaccination in the Post-2009 Influenza A(H1N1) Pandemic Era

We certify that we have read this dissertation and approved it as adequate in scope and quality.
We have found that it is complete and satisfactory in all respects, and that any and all revisions
required by the final examining committee have been made.

Dissertation Committee



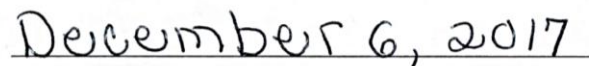
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Last, but not least, I would like to thank my wife Jeanne for her patience, understanding, and support during the years I spent working towards the doctoral degree in education.

DEDICATION

I dedicate this dissertation to my late father, Dr. med. Karl-Heinz Stadtländer, who had a major impact on stimulating my interest in science and research, as well as instilling in me a strong desire to use my education and training for the betterment of public health in society.

Father, you are greatly missed! I wish you would be here and had the chance to read and comment on this dissertation ...

ABSTRACT

The 2009 influenza A(H1N1) pandemic caused high morbidity and mortality in young adults, prompting recommendation for extension of routine annual flu vaccination to all healthy adults younger than 65 years old who do not have contraindications. But despite this recommendation, flu vaccination rates remained suboptimal in university students. The purpose of this study was to determine (a) how undergraduate students perceive influenza as a risk in light of risk information communicated by authoritative bodies; (b) where they seek advice and access educational information about influenza and methods of flu protection; (c) what attitudes they hold towards influenza and vaccination; and (d) when and why they engage in risk response behavior? This social science study, which involved 303 undergraduate students, included a written questionnaire, infographics, and interviews. Four theories (cultural theory of risk perception; structural constructivism; symbolic interactionism; and applied phronesis) were used to interpret the data.

The coding of students' answers allowed for the identification of ten themes, such as authoritative powers, identity, beliefs, infoglut, and reacting to risk. Students ranked influenza at the lower end of various risks discussed, considered their personal doctors as the most trusted source for influenza information, and were against mandatory flu vaccination. Although 48.6% of students self-reported flu vaccination during the 2014-2015 influenza season, vaccination was inconsistent in prior years. Perceived good health, vaccine complacency, a busy class schedule, vaccination confidence and convenience, were identified as factors contributing to vaccine hesitancy. Students developed a habit of using non-pharmaceutical flu interventions during their middle/high schools years, which was seen as a reason why flu vaccination was not their primary choice to protect against influenza. Students reported that they would seek information pieces

that matter to them in case of a major flu outbreak close to or on campus. However, infoglut would make it difficult to them to find the right information online. This study suggests a need for a stronger focus of influenza education on undergraduate students by considering the needs and wants of these young adults. Numerous suggestions were made for how authorities, especially the university, can play here a stronger role.

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INTRODUCTION

Life in a Changing World

We live today in a world that has undergone significant changes over the past few decades. For example, the world population has increased by approximately one billion people during the last twelve years, reaching an estimated 7.3 billion in mid-2015. If current trends in population growth continue, it is projected that the world population will reach approximately 8.5 billion in 2030 and 11.2 billion by 2100 (United Nations, 2015). Much of the growth occurs around urban areas, leading to mega-cities and eventually mega-regions (Florida, 2009). It has been estimated in 2014 that approximately 54% of the world's population live in urban areas, a number which is expected to increase to approximately 66% by the year 2050 (United Nations, 2014). This development has a major impact on the life of people in that they experience an environment with enormous population density and proliferation of communities, as well as significant demographic and socio-economic changes (Florida, 2009). Furthermore, globalization led to extensively developed trade networks, an unprecedented level of business and tourist travel, and the development and use of many technological advances, especially in digital communication (Schmidt & Cohen, 2013; World Tourism Organization, 2016; World Trade Organization, 2016). Global connectedness also led to a spread of cultural norms and practices, which Williams, Meth, and Willis (2009) defined as "cultural globalization" (p. 368). In sum, recent developments in societies revealed a level of crowdedness, interconnectedness, convergence, and complexity never seen before in human history, which all have an impact on how people deal with issues that concern them, especially those that require risk evaluation and response.

As human populations increase and expand their living spaces beyond the hinterlands of the mega-regions, they encroach on the natural habitats of wild animals, leading to more human-animal interactions and associated human exposure to infectious diseases. Furthermore, a larger human population requires intensified farming to meet increased demand for food, such as the farming of poultry and pigs (Institute of Medicine, 2015; Jernigan & Cox, 2013). Jones et al. (2008) described 335 emerging infectious diseases in the global human population that occurred between the years 1940 and 2004. They found that 71.8% of the diseases originated in wildlife and 60.3% were zoonoses (i.e., infectious diseases transmissible from animals to humans).

Both emerging and re-emerging infectious diseases, especially those caused by zoonotic viruses, pose major health risks to individuals and communities, as well as challenges to the public health system. This is particularly true when populations grow and live closer together, expand geographically towards the habitat of wild animals, and engage in activities such as global travel and mass gatherings of people—the latter which typically occur at social events and in educational institutions (Heymann, 2015; Institute of Medicine, 2015).

There are several examples of recent viral outbreaks, which include West Nile virus (WNV) and its spread to a vast region of the globe (Chancey, Grinev, Volkova, & Rios, 2015) and the severe acute respiratory syndrome (SARS), caused by the SARS-associated coronavirus (SARS-CoV), which was first reported in Asia in 2003 and subsequently spread to North America, South America, and Europe (Centers for Disease Control and Prevention, 2013b). There is also the new and ongoing Middle East respiratory syndrome (MERS), caused by a different coronavirus (MERS-CoV), which was first reported in Jordan and in Saudi Arabia in 2012 (Centers for Disease Control and Prevention, 2016a). Moreover, there is the largest and most complex epidemic of Ebola virus disease (EVD), which began in West Africa in 2014 and

then spread between several countries (World Health Organization, 2016b). Soon after, in 2015, the Zika virus (ZIKV) emerged in continental South America and began spreading to other regions, including the Caribbean, Central America, the United States of America, and Cape Verde in Africa (Centers for Disease Control and Prevention, 2016b; Passi, Sharma, Dutta, & Ahmad, 2017; Plourde & Ploch, 2016; Saiz et al., 2016; World Health Organization, 2016d). Besides these examples of recent viral outbreaks that pose a threat to humans, there is also great concern about resistance development of bacteria against antibiotics and the associated insufficient pipeline for novel antimicrobial drugs or other efficient treatment strategies (Vale et al., 2016; Woolhouse, Waugh, Perry, & Nair, 2016). Examples of threats to global public health include very high rates of antimicrobial resistance in *Escherichia coli*, *Klebsiella pneumoniae*, and *Staphylococcus aureus*, which can cause common healthcare-associated as well as community-acquired infections (World Health Organization, 2014a). Furthermore, there is the increasing prevalence of multidrug-resistant (MDR) and extensively drug-resistant (XDR) tuberculosis (TB) (Barry et al., 2012; Cooke et al., 2011; Rahman & Sarkar, 2017).

Influenza as a Communicable Disease Threat to Populations

Influenza (commonly known as ‘the flu’) is a viral disease which can cause both annual (seasonal) epidemics of varying severity and sporadic, unpredictable outbreaks of global reach (i.e., pandemics). Here, a novel flu virus emerges for which most people have little or no immunity, resulting in the spread of the virus over a relative short period of time (Monto & Webster, 2013; Wang & Palese, 2013). Researchers have evidence that several human influenza virus pandemics occurred over the past centuries (see Table 1). The single most deadly pandemic on record is the ‘Spanish flu,’ which occurred in 1918-1919 and killed an estimated 50-100

million people worldwide (Centers for Disease Control and Prevention, 2016d; Johnson & Mueller, 2002; Monto & Webster, 2013).

Table 1

Past and Recent Pandemics Caused by Influenza A Viruses

Name of pandemic	Date (years)	Influenza A viruses	Human deaths worldwide (estimates)	Comments
Russian flu ^{a,b}	1898-1890	H3N8 (?) H2N2 (?)	1 million (?)	Mortality estimates are difficult as record keeping was incomplete or nonexistent in many affected areas
Spanish flu ^c	1918-1919	H1N1	50-100 million	High mortality in healthy people, including in age group 20-40 years
Asian flu ^{c,d}	1957-1959	H2N2	1.1 million	Most deaths were in people aged 0-4 years and 65 years and older
Hong Kong flu ^c	1968-1969	H3N2	1 million	Most deaths were in people 65 years and older
Threat of a human pandemic: Avian ('bird') flu ^{e,f}	1997-present	H5N1	Over 400	Highly pathogenic virus; millions of chicken were killed to stop the outbreak but virus continues to circulate and causes sporadic human infections
H1N1 (swine') flu ^c	2009-2010	H1N1pdm09	150,000-570,000	Approx. 80% of deaths were in people younger than 65 years of age

Note. ^aValleron, et al. (2010). ^bTaubenberger, Morens, & Fauci (2007). ^cCenters for Disease Control and Prevention (2016d). ^dViboud et al. (2016). ^eWorld Health Organization (2017b). ^fLayne (2006).

The most recent influenza pandemic (the 'H1N1 pandemic' or 'swine flu') emerged in Mexico in spring of 2009, spread quickly and extensively in several countries across the globe, and lasted until 2010 (Centers for Disease Control and Prevention, 2009; World Health

Organization, 2010). It has been estimated that approximately 150,000 to 570,000 people died during the first year the virus circulated (Centers for Disease Control and Prevention, 2012a, 2016d; Dawood et al., 2012). These numbers could have been much higher if the influenza A(H1N1)pdm09 vaccine would not have become available in October and November of 2009 for high risk groups and in late December of that year for any person who decided to get immunized by the vaccine (Centers for Disease Control and Prevention, 2010c; Wei, Ekiert, Nabel, & Wilson, 2013).

It is known that young children, the elderly, pregnant women, and people with certain chronic medical conditions (e.g., asthma, heart disease, HIV/AIDS) are at the highest risk of complications from influenza during a typical annual flu season, but researchers observed that during both the Spanish flu and the 2009 H1N1 pandemic most of the deaths from influenza occurred in healthy people younger than 65 years old (Monto & Webster, 2013; Simonsen et al., 2013; World Health Organization, 2016c), which includes the age group of university students. In fact, Hayden and de Jong (2013) pointed out that this increased mortality in younger persons can extend for 5-10 years during the circulation of a pandemic virus and its subsequent seasonal progeny. The reason for this age-shift towards younger people is not clear but researchers who studied the pathogenesis of the 1918 flu pandemic in young adults believe that multiple mechanisms (e.g., the virulence of the pandemic virus; excessive host inflammatory responses; inability to clear the infection; and enhanced lung pathology) likely contributed to the susceptibility and extreme mortality observed in the young adult population (McAuley, Kedzierska, Brown, & Shanks, 2015; Shanks & Brundage, 2012).

It needs to be noted that annual influenza epidemics also have a deadly effect on the human population. In the northern hemisphere, every winter millions of people catch the flu,

many need medical care or hospitalization, and hundreds of thousands of people die as a result of severe influenza infection. The World Health Organization (2008) reported that in the United States an estimated 25-50 million cases of seasonal (i.e., inter-pandemic) influenza occur every year, leading to approximately 150,000 hospitalizations and 30,000-40,000 deaths. When these data are extrapolated to the total population of the world, the average global burden is approximately 1 billion cases of seasonal influenza infection, with around 3-5 million cases of severe illness, and an estimated 250,000-500,000 deaths (World Health Organization, 2016c).

Influenza does not discriminate. It is a highly contagious viral respiratory disease, which can potentially affect any person in any age group living anywhere in the world (Heymann, 2015; Mertz et al., 2013; Noah & Noah, 2013). In other words, every person is potentially at risk of contracting this disease. Influenza is an airborne disease, meaning that influenza viruses can be easily transmitted from person-to-person via flu-infected respiratory large-particle droplets and small-particle aerosols when coughing, sneezing, or talking. Person-to-person transmission of the virus is rapid with an average incubation period of only two days (the range is 1-4 days). It is believed that people who have the flu can spread it to others up to about six feet away. The flu can also spread by hands contaminated with influenza viruses, as well as by touching a surface or object (i.e., fomites) that has flu virus on it (Bridges, Peasah, & Meltzer, 2013; Carrat et al., 2008; Centers for Disease Control and Prevention, 2014a, 2016e; Heymann, 2015; World Health Organization, 2014b). It needs to be emphasized that even asymptomatic, yet flu virus infected, persons contribute to influenza virus transmission (Foy, Cooney, Allan, & Albrecht, 1987). Influenza is thus a disease which can spread easily, rapidly, and extensively through affected communities, especially in crowded environments, such as schools and colleges, nursing homes, shelters, businesses, cruise ships, and the military (Bridges et al., 2013; Centers for Disease

Control and Prevention, 2009; Jernigan & Cox, 2013; Ksiazek et al., 1980; Sonoguchi et al., 1986; World Health Organization, 2014b).

The first documented university outbreak of the 2009 H1N1 influenza pandemic occurred on April 27, 2009, at the University of Delaware. Here, an unexpected increase in the number of students were observed who sought care for a respiratory illness. Within only two days, more than 600 students visited the student health service on campus and reported having respiratory symptoms that fit those of the flu. Three days later, the first influenza A(H1N1)pdm09 cases on campus were confirmed (Guh, et al., 2011; Iuliano et al., 2009). Besides outbreaks of the H1N1 pandemic virus on university campuses, there are also well-documented seasonal influenza epidemic outbreaks at institutions of higher education. For example, during the winter of 1977-1978, extensive sequential seasonal epidemics of influenza A/Texas/77(H3N2) and A/USSR/77(H1N1) occurred on campuses of Marquette University, the University of Maryland, and Vanderbilt University. These epidemics also revealed high influenza attack rates in young students (Layde et al., 1980; Pons, Canter, & Dolin, 1980; Sobal & Loveland, 1982; Wright, Thomson, & Karzon, 1980).

In sum, a university community comprises a highly interconnected population. The risk of contracting and transmitting influenza viruses is high in this setting because of the close and ongoing contacts of students in classrooms and dormitories on-campus and because of social contacts of students with family, friends, and other members of the general public off-campus. In fact, recent molecular epidemiological studies of influenza in university settings, using whole genome sequencing of the 2009 pandemic H1N1 flu virus, showed multiple independent entries of the virus into the campus and extensive spatial mixing and clustering within the university community, indicating that transmission occurs through importation of flu viruses to campus as

well as through on-campus transmission (e.g., in classrooms, social areas, and dormitories) (Holmes et al., 2011; Virk et al., 2017). It is the crowding and participation in mass events, travel during school breaks, and commencement of school term that can have a strong effect on the transmission of influenza in the student community and beyond (Heymann, 2008; Peiris, 2012). One can imagine that an academic institution can easily become a center of a major influenza outbreak.

Influenza Vaccines and Other Means of Flu Protection

There are various methods of protection from influenza (e.g., hand hygiene, cough etiquette, face masks and respirators, social distancing, and school closures) as well as treatment options (e.g., the use of antiviral drugs, such as Relenza[®], Tamiflu[®], or Rapivab[®]) (Bridges et al., 2013; Ison & Hay, 2013; U.S. Food and Drug Administration, 2016b). However, health professionals emphasize that the most effective way to prevent influenza and severe outcomes from the illness is flu vaccination (Centers for Disease Control and Prevention, 2014b; World Health Organization, 2014c). Thus, flu vaccination serves as the primary approach for control of influenza in both persons and populations (Keitel, Neuzil, & Treanor, 2013) and supports the public health efforts to reduce influenza-associated morbidity and mortality (Wei et al., 2013).

Every year, the composition of the seasonal influenza vaccine changes to reflect the ongoing evolution (through genetic reassortment) of influenza viruses. Since the 1940s, influenza vaccines have become available, and, since 1977, contained a representative A(H1N1), A(H3N2), and B virus, a so-called *trivalent influenza vaccine* (Centers for Disease Control and Prevention, 2012b, 2016g; Keitel et al., 2013; Stöhr, 2013). There are now also quadrivalent formulations of vaccine available, but the ultimate goal is to develop a universal vaccine (the “Holy Grail of influenza vaccinologists”)—one that covers all different influenza subtypes and

ideally can provide life-long protection (Webster, Monto, Braciale, & Lamb, 2013, p. xvi).

Several groups of scientists are currently working towards such a vaccine as well as towards one that provides a longer lasting immunity, requiring vaccination every 5 to 10 years (Baumgarth, Carroll, & Gonzalez, 2013; Cimon, 2016; Lee et al., 2014; Stöhr, 2013; Turner, Doherty, & Kelso, 2013; Wei et al., 2013; Wong & Webby, 2013; Yewdell, 2013).

Positioning Myself as a Researcher in this Study

I became interested in science when I was in high school (*Ger.* Gymnasium) in Germany. My father was a primary care physician who greatly supported my interest in the natural and medical sciences, especially in biological and biomedical research. After having served for two years in the medical services corps of the German Navy (*Ger.* Bundesmarine), I enrolled at the University of Hannover, Germany, in 1980 and studied zoology, biochemistry, genetics and molecular biology, as well as microbiology, virology, and immunology, to name a few subjects. I eventually graduated in 1987 with a doctorate in microbiology. I have worked in industry and in academia over the following years and have gained extensive experience in bioveterinary and biomedical bench-level research with a focus on comparative medicine by studying many microbes that cause diseases in humans and in animals. For example, I was involved in an outbreak investigation while working at the University of Veterinary Medicine in Hannover, Germany, when a devastating epizootic (i.e., an epidemic in an animal population) occurred in harbor seals (*Phoca vitulina*) in the North and Baltic seas in 1988-1989. An estimated population of more than 17,000 harbor seals were wiped out, and dead and diseased seals were found washed up or stranded on the beaches, respectively (Osterhaus et al., 1990). After completion of this study, I accepted a fellowship to conduct research in the United States of America at the

University of Alabama at Birmingham (UAB), Schools of Medicine and Dentistry. Accepting this fellowship allowed me to make the transition from veterinary to medical microbiology.

Besides focusing over the years on studying the mechanisms of infectious diseases (i.e., microbial pathogenesis), I was also involved in my scientific career in vaccine research. More specifically, while being appointed a faculty member at Clemson University in South Carolina, I studied the immunogenicity and safety of a recombinant *Helicobacter pylori* urease vaccine in a preclinical trial. This research stimulated my interest in vaccinology for years to come. Later, back at UAB, I earned a graduate degree in public health with a focus on epidemiology. It was at that time that I developed a keen interest in international health as it relates to infectious diseases and the selection of appropriate epidemiologic surveillance systems and disease prevention strategies.

When I moved to Minnesota in the year 2000, I continued research and teaching. But, I became now more deeply engaged in writing activities when I enrolled in business and education graduate programs at the University of St. Thomas in St. Paul, Minnesota. Although I have had significant experience in managing research projects and leading students and staff, this was the first time that I received a formal training in administration, leadership, and ethics, as well as organizational theory and behavior, business law and policy, and strategic change management.

Since about 2005, I started publishing articles on issues related to influenza, including flu virus specimen security, seasonal and pandemic flu vaccinations, influenza information resources and campaigns, as well as the availability of scientific textbooks on influenza, zoonoses, and the One Health concept. I also wrote papers about qualitative and mixed-methods research approaches and on-the-ground public health practices. When the time came in the Ed.D. program to decide on a topic for my dissertation, I saw a great opportunity to combine my many

professional interests in infectious diseases, vaccinology, international health, epidemiology, policy development, and strategic management, and apply them to an issue important in education and leadership. More specifically, I wanted to study the attitudes and behaviors of undergraduate students towards influenza (a health risk) and methods of protection (especially vaccination). The project was not designed as a biomedical or epidemiological research study, but rather as a social science study, using four theories drawn from sociology, to explore the topic with a mixed-methods normative case study approach. Specific research questions I tried to answer in this dissertation study were the following:

- How do undergraduate students perceive influenza as a risk in light of risk information communicated by authoritative bodies?
- Where do undergraduate students seek advice and educational information about influenza and methods of flu protection?
- What attitudes do undergraduate students hold towards influenza and vaccination?
- When and why do undergraduate students engage in risk response behavior?

Summary

My life-long interest in studying infectious diseases combined with my recently gained interest in social science research were the main reasons for deciding on a dissertation topic about risk evaluation and response behavior, using influenza as an example of a risk and flu vaccination as an example of protection from this risk. Influenza was chosen as a disease not only because its health risk to humans is well documented in the literature but also because the influenza A(H1N1) pandemic of 2009 was well covered in the media. I chose undergraduate students as study participants because of several reasons. One of the reasons was that influenza vaccination rates are generally low among American adults (Centers for Disease Control and

Prevention, 2016c). In fact, they are well below the target of 70% coverage for adults aged 18 years and older, which include the age group of undergraduate students, and which is the *Healthy People 2020* goal (United States Department of Health and Human Services, 2014). These suboptimal vaccination rates were observed despite the fact that the World Health Organization extended its recommendation for flu vaccination to all healthy adults since the 2009 H1N1 pandemic (World Health Organization, 2009b, 2009c).

As a researcher in this dissertation project, I am aware that I wore many ‘hats.’ For example, as a microbiologist and public health professional, I believe in the development of vaccines against infectious agents, and I am thus a strong supporter of using immunization strategies against vaccine-preventable diseases, such as influenza. However, my investigation was not designed as an applied research study because my intent was not to influence undergraduate students to access certain information about the flu and vaccination, or even recommend influenza vaccination. Rather, I wanted to find out students’ opinions and actions as it relates to influenza. This does not mean that undergraduate students who participated in my study could have chosen to learn more about influenza and vaccination after the study was completed. In case this happened, my study would have been truly transformational for them.

Another hat I was wearing in this research project is that of a person who has experience as a faculty member at institutions of higher education. As such, I was trained in creating an environment of learning and mutual respect. I admit that I could not escape from the attempt to create such an environment in this research study, one of the reasons why I chose a narrative interview style as described in more detail later. Furthermore, like the study participants, I am currently a student at a university—the University of St. Thomas. I am eager to listen and learn,

and attempted in this survey to be open-minded and allow all possible outcomes. Being a student also gave me a feeling that my mental age is much younger than my actual age.

Lastly, as an immigrant who came from Germany to the United States of America, I entered into an English-speaking, multicultural society. This influenced my research study because English is not my native language and I needed to learn more about the practical aspects of multiculturalism. Beneficial to me was that I have had received formal training in intercultural communication and international leadership in the business and education programs I was enrolled in.

My hope is that the results of my study can be used by various audiences, including influenza researchers and public health professionals, infectious disease educators and policy makers, as well as university leaders and administrators, among others. After all, by definition, *public health* is

[a]n organized activity of society to promote, protect, improve, and, when necessary, restore the health of individuals, specific groups, or the entire population. It is a combination of sciences, skills, and values that function through collective societal activities and involve programs, services, and institutions aimed at protecting and improving the health of all the people (Last, 2007, p. 306).

CHAPTER ONE:

REVIEW OF LITERATURE

Historical Review of Literature**Introduction**

Influenza is a topic of great interest to researchers. A search in the PubMed database (<http://www.ncbi.nlm.nih.gov/pubmed>), using the keyword ‘influenza,’ showed that 94,461 articles have been published as of November 1, 2017. When I used the keywords ‘influenza’ and ‘vaccination’ together, the database showed 18,129 articles. The articles on influenza contain information about various subtopics, such as influenza outbreaks, preventive and therapeutic immunization strategies, and influenza pandemic preparedness and policies, as well as vaccination attitudes and practices, to name a few. Most important is the finding that there was a significant increase in publications about influenza between the years 2008 and 2009—a jump from 2,828 to 4,630 articles, respectively. This indicates that the H1N1 influenza pandemic of 2009 stimulated researchers to generate more data about this highly contagious viral disease. The number of influenza publications remained high since 2009, ranging roughly between 4,400 and 5,600 articles per year.

There are several publications that describe research about university students regarding their attitudes and behaviors towards influenza and vaccination. More specifically, researchers looked at vaccination coverage rates, knowledge, beliefs and opinions of students, and barriers to vaccination. However, the following historical review will show that the study of university students is relatively new. My literature research revealed that investigations about university students regarding influenza and vaccination can be grouped chronologically in three main categories. These categories are: (a) studies conducted before the 2009 influenza H1N1

pandemic; (b) studies conducted during the pandemic; and (c) studies conducted after the flu pandemic of 2009.

The Era Prior to the 2009 Influenza A(H1N1) Pandemic

Researchers who studied the topic influenza and vaccination in the pre-2009 flu pandemic era were primarily interested in population groups other than students: the elderly and health care workers.

The elderly population was of interest to researchers because this population is at a higher risk from influenza complications, such as primary influenza pneumonia and secondary bacterial pneumonia, which are more common in elderly people (Heymann, 2008; Liddle & Jennings, 2001; Morgan & King, 1996). Researchers showed that vaccination against influenza in old age (65 years of age and older) is associated with reductions in the rate of hospitalization and in deaths from influenza and its complications (Nichol, Margolis, Wuorenma, & Von Sternberg, 1994; Talbot, Libster, & Edwards, 2012).

Investigators were interested in studying health care workers because influenza outbreaks in health care facilities (i.e., nosocomial influenza outbreaks) can have potentially devastating consequences. For example, if health care workers are infected with the flu virus, they pose a significant health threat to vulnerable patient populations. Health care workers also carry an occupational risk while caring for patients in hospitals and nursing homes, as well as the risk to potentially transmit influenza viruses to their families (Betsch & Wicker, 2012; Bridges, Kuehnert, & Hall, 2003; Lee et al., 2012; Maltezou & Poland, 2014a, 2014b; Syndor & Perl, 2014). Researchers found that seasonal influenza vaccination coverage was low for various groups of health care workers during a 2004-2008 survey period, ranging from 32.0% to 52.3% (Caban-Martinez et al., 2010).

Prior to the 2009 H1N1 influenza pandemic, the World Health Organization (2014b) recommended annual influenza vaccination for the following groups (in order of priority): (a) nursing home residents (the elderly or disabled); (b) people with chronic medical conditions; (c) elderly individuals; and (d) other groups such as pregnant women, health care workers, and those with essential functions in society, as well as children from ages 6 months to 2 years. At that time, healthy adults (which include undergraduate students) were not included in these recommendations.

Researchers who studied university students before the 2009 influenza pandemic were predominantly interested in determining the prevalence of colds and influenza-like illnesses in the student population and their impact on student health, health care use, and educational performance, as well as the utilization of non-pharmaceutical interventions, such as hand hygiene and use of face masks (e.g., Aiello et al., 2012; Aiello, Coulborn et al.; 2010, Aiello, Murray et al., 2010; Nichol, D’Heilly, & Ehlinger, 2005, 2006; Perez, Galea, Kalbfleisch, Monto, & Aiello, 2010; Thumma, Aiello, & Foxman, 2009; White et al., 2003; White, Kolbe, Carlson, & Lipson, 2005).

There are only a few studies I came across in which vaccination of students was the main topic in the pre-2009 influenza pandemic era. Nichol, D’Heilly, and Ehlinger (2008) investigated flu vaccination effectiveness against influenza-like illnesses, and Uddin et al. (2010) studied the nature and scope of social correlates and how education level contributed to influenza and flu vaccination knowledge with a focus on parental education status and the carry-over to students. Merrill et al. (2010) conducted a cross-sectional survey of students at Brigham Young University in 2007. They found that prevalence of influenza vaccination was low in this student population, with only 12% of study participants reporting seasonal flu vaccination. These researchers also

found that only half of the surveyed students knew that influenza is a respiratory disease although the majority of them could identify signs and symptoms of the disease. Finally, a study by Nichol et al. (2010) was directed at studying the impact of various vaccination strategies including pre- and in-season vaccination using mathematical modeling techniques (i.e., computer simulations).

As it turned out, the studies about university students were part of a phase of influenza research that actually laid the foundation for future investigations during the H1N1 influenza pandemic of 2009 when it became clear that an age shift towards young healthy adults (in regard to influenza susceptibility) had occurred. The World Health Organization changed its recommendations as follows: It was recommended that health care workers be immunized as a first priority to protect the essential health infrastructure. Furthermore, influenza vaccination recommendations were extended to healthy adults (ages older than 15 years and younger than 65 years) because the highest morbidity and mortality during the pandemic occurred in this segment of the population (World Health Organization, 2009b, 2009c). Investigators realized then that significantly more research about college/university students was needed to understand what students think and do in regard to influenza and flu vaccination.

The Era during the 2009 Influenza A(H1N1) Pandemic

Most articles about influenza and university students stem from studies that were conducted during the 2009 H1N1 influenza pandemic. More than one reason explains this increase in publications about university student populations. First, and as I had mentioned earlier, there was the observed shift in the age group towards healthy adults during the pandemic. Second, it became very clear that university settings can be hot spots for influenza transmission. Third, investigators recognized a unique opportunity to study university students' attitudes and

behaviors during an ongoing worldwide influenza outbreak. Finally, researchers could investigate concurrently students' uptake of the 2009-2010 seasonal (trivalent) influenza vaccine and the pandemic influenza A(H1N1)pdm09 (monovalent) vaccine. Furthermore, some of the articles about university students and the 2009 H1N1 influenza pandemic have just only recently been published. This indicates that the topic of influenza and student populations is for researchers as important today as it was at the time of the 2009 H1N1 pandemic.

Researchers studying university student populations during the influenza pandemic of 2009 were interested in identifying some of the attitudes and behaviors of students. More specifically, they looked at various characteristics such as (a) the perceived and actual knowledge of students in regard to influenza and flu protection; (b) the acceptance as truth as it relates to perceived influenza susceptibility and risk perception; (c) health information practices (e.g., interpersonal and digital communication); and (d) the intentions and practices when it comes to methods of protection against influenza. It is important to mention that investigators used primarily self-administered survey questionnaires (i.e., a qualitative data collection instrument) but then chose a quantitative (statistical) analysis of the data. To my knowledge none of the investigators has attempted to conduct a mixed-methods (quantitative-qualitative) research approach in conjunction with using a combination of sociological theories (such as symbolic interactionism, the cultural theory of risk perception, structural constructivism, and applied phronesis) to interpret students' survey responses and explain the attitudes and behaviors of individuals and the groups and environments in which they live.

In public health, researchers are often urged to use the 'scientific' approach of quantification instead of more sociologically or anthropologically oriented approaches, which are (unfortunately) often considered less scientific (Berg & Lune, 2012; Curry, Shield, & Wetle,

2006; Denzin & Lincoln, 2011). However, non-quantitative approaches (i.e., qualitative research methods), such as observations, interviews, focus groups, and videotaping, have become popular in recent years (Bogdan & Biklen, 2007; Lincoln, Lynham, & Guba, 2011). Qualitative researchers realized that “all meaning is situated in a particular perspective or context, and, since different people and groups often have different perspectives and contexts, there are many different meanings in the world, none of which is necessarily more valid or true than another” (Gay & Airasian, 2003, p. 9).

In regard to influenza and methods of protection, researchers found that there are differences in university students’ preference and use of flu protection techniques. Students generally accepted hand washing, covering nose/mouth when coughing or sneezing as prevention methods during the 2009 H1N1 influenza pandemic, but social distancing (self-isolation) and face mask use were accepted to a lesser degree (Akan et al., 2010; Decker & Slawson, 2012; Mas, Olivárez, Jacobson, & Hsu, 2011; Seale, Mak, Razee, & MacIntyre, 2012). However, there are studies in which the majority of students reported that they had not adopted any specific lifestyle changes as a result of the H1N1 pandemic of 2009 (e.g., Hashmi et al., 2016; Van, McLaws, Crimmins, MacIntyre, & Seale, 2010).

In regard to influenza vaccination, the picture looks different. Poehling, Blocker, Ip, Peters, and Wolfson (2012), who studied the 2009-2010 seasonal influenza vaccine coverage during the 2009 H1N1 pandemic, reported that of a total of 4,090 college students from eight North Carolina universities only 20% of students (range 14%-30% by university) reported receiving the seasonal flu vaccine. Mas et al. (2011) found that only 10% of students at a major university in the southwestern United States had been immunized with the A(H1N1)pdm09 vaccine, and approximately half had no intention of getting vaccinated. Moreover, Sunil and

Zottarelli (2011) reported that older students and those living in dormitories were more likely to receive the H1N1 pandemic flu vaccine compared to their respective counterparts. The authors did not discuss the reasons for the observed differences in vaccination behavior. There was no significant difference between male and female students and between whites and non-whites regarding the odds of receiving the vaccine.

Other studies conducted in the United States of America during the pandemic also showed low vaccination rates among university students. For example, Ravert, Fu, and Zimet (2012) demonstrated that only 15.2% of 296 students reported having received the A(H1N1)pdm09 vaccine, and Ramsey and Marczinski (2011) found that only 15.8% of 514 students studied at Northern Kentucky University were planning on getting the H1N1 vaccine during the pandemic. While 53.1% of the students reported that they were not planning to get vaccinated, 31.1% were still undecided at the time of the survey. Interesting is that many students in this study thought that the vaccine would not work (29%), that there had not been enough testing (29%), that the vaccine would give them the H1N1 flu (20%), and that they worried about bothersome and serious side effects (21%). Furthermore, a study by Cole et al. (2015) revealed that African American college students differed in levels of comfort with uncertainty (e.g., vaccine efficacy beliefs), impacting pandemic H1N1 vaccination status.

Researchers also conducted international studies about vaccination intention and practices of university students during the H1N1 influenza pandemic of 2009. For example, Akan et al. (2010) reported that during the pandemic the vast majority (92.8%) of 402 student respondents at the Yeditepe University in Istanbul (Turkey) indicated that they would not be vaccinated. The main concerns regarding vaccination had to do with the safety and side effects of the vaccine. Byrne, Walsh, Kola, and Sarma (2012) found that among 200 undergraduate

students, who participated in a survey at the National University of Ireland (Galway), non-intention to vaccinate was associated with a strong disbelief in its efficacy, in negative attitudes towards vaccination, and in lack of perceived threat, which was underscored by a disinterest in others' opinions, including authoritative bodies. Importantly, their findings suggested that there is resistance to the idea of vaccinations being mandatory.

Overall, the review of the literature about university students' attitudes and behaviors towards influenza and vaccination during the 2009 H1N1 flu pandemic indicates that there are significant discrepancies in research findings. For example, there are variations in the knowledge of students about influenza and vaccination, in perceived influenza susceptibility and risk, in the level of interest in the topic, and, last but not least, in flu vaccination coverage. The reasons for these differences remain largely unknown. However, what is known and not disputed among researchers is the fact that overall flu vaccination coverage is low in student populations, and that the vast majority of surveyed college and university students do not have sufficient knowledge about influenza and the benefits of flu vaccination. This provided the main justification for influenza researchers to continue studying university student populations after the recent H1N1 flu pandemic.

The Era after the 2009 Influenza A(H1N1) Pandemic

Research in the post-2009 influenza pandemic era concentrated on both students in the health sciences (especially medical and nursing students) and students who studied other subject areas. The reason for studying health science students is that they will eventually become doctors and other health care providers, who have direct contact with patients and other population groups, particularly those who are at very high risk of influenza infections and complications. Researchers hope that concentrating on identifying the key drivers that promote vaccination

uptake allows medical and allied health educators to improve students' health care curricula by including evidence-based education on vaccination and by emphasizing the value of flu vaccination to reduce not only the health threat to vulnerable patient populations, but also the occupational risk to health care workers, as well as the risk of transmitting the flu viruses to their families and friends (Betsch & Wicker, 2012; De Paula, De Paula, Cunegundes, & Moraes-Pinto, 2016; Edge, Heath, Rowlingson, Keegan, & Isba, 2015; Kelly, Macey, & Mak, 2014; Lee et al., 2012). In other words, researchers hope that these efforts in early health care education will create a culture of influenza vaccination uptake among students that lead to future generations of health care workers who better understand the risks of influenza as a highly contagious infectious disease and the benefits of flu vaccination (Aguilar-Díaz, Jiménez-Corona, & Ponce-de-León-Rosales, 2011; FitzSimons, Hendrickx, Badur, Vorsters, & Van Damme, 2014; Hakim, Gaur, & McCullers, 2011; Lehmann, Ruitter, Wicker, Chapman, & Kok, 2015; Prematunge et al., 2012).

Researchers who surveyed university students who were enrolled in programs other than the health sciences obtained important information about perceptions and behaviors related to influenza and vaccination. For example, Suresh, Thejaswini, and Rajan (2011) showed that flu vaccination coverage among university students remained very low in the post-pandemic period, and that doubts about the safety and effectiveness of the flu vaccine were key elements in their rejection. The authors discussed the need to provide accessible information about the vaccine safety by scientific authorities. Lawrence (2014) found that some college students believed that vaccines cause disease (including illnesses and conditions other than flu), that vaccines are toxic medicines and the body is better on its own, and that vaccines carry unknown, long-term, and population-wide risks. Furthermore, Shropshire, Brent-Hotchkiss, and Andrews (2013) studied

the effectiveness of mass media campaigns in increasing the rate of influenza vaccination in student populations. Here, student responses indicated that certain elements of the campaigns (e.g., the coupling with others forms of promotion and marketing initiatives) would influence their decision to get vaccinated. Finally, Benjamin and Bahr (2016), who surveyed students in January 2014 on the campus of California State University (Northridge), found that only 20.6% of the students reported that they received the seasonal influenza vaccine within the past six months. Among those students who did not take the flu vaccine, 47.8% believed that the vaccine could give them influenza and 41.6% worried about dangerous side effects from the vaccine. Interestingly, the majority of students who did not get vaccinated reported that neither cost of the influenza vaccine nor access to the vaccine were barriers.

Brief Overview of Traditional Age College Students

Developmental Periods

When entering college, undergraduate students experience a phase of transition from adolescence (ages 10 to 17) to young adulthood (ages 18-25) (U.S. Department of Health and Human Services, 2017). According to Karunan (2006), there are three different stages of adolescent development: early stage (10-13 years of age); middle stage (14-16 years of age); and late stage (17-19 years of age). Each of these stages differ with regards to physical, cognitive, emotional, and behavioral changes. What is important to know for my research study is that in the middle stage adolescents start developing a sense of personal identity and become more aware of the influence of peers. This personal identity is more fully established in the late stage when adolescents experience the transition from a life at home to a life at work and further schooling (e.g., entering into a college education). Although parents play an important role

during this transition process from home to college, there are differences in the level they participate, as I will describe in detail in the following section.

Birth Cohorts

Undergraduate students in my study belonged to two different birth cohorts: Generation Y (better known as ‘Millennials’) and Generation Z (short: ‘Gen-Zers’). Although the grouping of people into cohorts of Millennials and Gen-Zers turned out to be somewhat tricky because information about the exact range of birth dates for each cohort is described differently in the published literature, information provided by Lancaster and Stillman (2005, 2010) as well as Seemiller and Grace (2016) allowed me to compose the following birth date ranges: (a) Millennials: born between 1981 and 1994; and (b) Gen-Zers: born between 1995 and 2010. There are significant differences between Millennials and Gen-Zers, some of which I have listed in Table 1.1. For example, there are differences in the use of technology/tech-connections and the way information is accessed, as well as in the preferences for on-line/off-line identities. Furthermore, Millennials can experience the effects of ‘helicopter parenting,’ a kind of parental hovering over their children in college as well as hovering over higher education institutions by affecting “students’ learning, teaching, grading, curriculum, future employers, and the law itself” (Vinson, 2013, p. 423). Such over-parenting and over-controlling can have various negative effects on students, including lower student self-efficacy and maladaptive workplace responses (Bradley-Geist & Oslon-Buchanan, 2014), higher levels of depression and less satisfaction with life (Schiffirin et al., 2014), as well as dysfunctional family environments and over-burdened college administrators and counselors (Odenweller, Booth-Butterfield, & Weber, 2014). In contrast to Millennials, the role of parents has changed for Gen-Zers from the helicopter parenting phenomenon to parenting by being involved more as advisors and friends. Researchers

believe that, ideally, young adults of *all* generations who enroll in higher education should experience the college as a time for students’ self-realization, individual responsibility, autonomy, and independence (Gallivan, 2015; Schiffrin et al., 2014; Vinson, 2013).

Table 1.1

Some Differences between Millennials and Gen-Zers

Generation Characteristics	Millennials (Born: 1981-1994)	Generation Z (1995-2010)
Technology	Techno-savvy	Prefers smart-tech
Tech-connection	Connected	Hyper-connected (if not connected, they feel paralyzed)
Information load	More information accessible than was available in previous generations	Have to deal with infoglut
Information access	Accustomed to many different sources	At their finger tips
Role of parents	Coached by parents ('Helicopter parents')	Parents are seen more as friends and advisors
College tuition	Have some concern about how to afford college education	Have great concern about how to pay for college
Freedom	Are more accustomed to authority	Are concerned about limitations on personal freedom
Events	First cases of AIDS; space shuttle Challenger explodes; Chernobyl nuclear power plant explosion; Persian Gulf war; European Union ratified; Ethnic cleansing in former Yugoslavia	Catastrophes: 9/11 terrorism attack; hurricane Katrina; swine flu pandemic; bird flu threat; West Nile virus; SARS; school shootings
Consumption	Started to drink and smoke less	Drink and smoke significantly less than previous generations
Social relationship management	On-line and off-line	Prefer multiple on-line platforms (Twitter, forums, blogging, personal websites, etc.)
Identity	On-line and off-line identity	On-line and off-line identity (more private in on-line environment)

Note. Data were compiled from Ganzel (2009), Lancaster and Stillman (2005, 2010), Pandit (2015), and Seemiller and Grace (2016), and adapted to fit this dissertation research project.

Summary

Researchers have repeatedly shown that a large proportion of university students lack understanding of the significance of influenza as a highly contagious respiratory disease, and abstain from flu vaccination for a variety of reasons, resulting in overall low vaccination rates in this population. My literature research revealed that studies conducted prior to the influenza H1N1 pandemic of 2009 laid the foundation for accelerated research during the pandemic. This phase of heightened research activity continued after the H1N1 pandemic was declared over in 2010.

In the publications I reviewed, there are differences in the student subpopulations chosen by researchers. For example, in some instances only undergraduate students *or* graduate students were studied, while in other instances both undergraduate *and* graduate students were surveyed together. There are also publications about influenza and vaccination that deal only with international graduate students or with students of color. Because my investigation concentrated on undergraduate students in regard to risk evaluation and response, using influenza as an example, I present in Table 1.2 some major findings of selected researcher groups who studied specifically this segment of the student population. I included in this table information about the time frame of the study (i.e., before, during, or after the influenza H1N1 pandemic of 2009) as well as the location at which the study was conducted.

The findings of researchers, as presented in Table 1.2, showed that influenza research about undergraduate students is still in its infancy. The continued study of this segment of the university student population is important because seasonal influenza outbreaks occur every year and students are at risk of contracting and transmitting the flu virus to other people. Yet, flu

vaccination rates remain low, only about 32% for adults 18-49 years of age for the 2015-2016 flu season (Centers for Disease Control and Prevention, 2016c) and were reported to be even lower (as low as 10% on some campuses) among university students (Mas et al., 2011).

Finally, researchers believe that future pandemics of influenza are inevitable. Over the past decades, we have seen the emergence of influenza viruses other than the H1N1. For example, there is the highly pathogenic H5N1 influenza virus in domestic poultry, which was first detected in 1997, or several other more recently reported novel (reassorted) flu viruses, such as the H5N6, H7N1, H9N2, and H10N8 influenza viruses, which are capable of crossing the host-species barrier. Because researchers doubt that it is possible to eradicate the primary natural reservoir of influenza viruses, which is in wild waterfowl, the threat from influenza will continue (Fineberg, 2014; Heymann, 2015; Monto & Webster, 2013; Parrish, Murcia, & Holmes, 2015; Trombetta, Piccirella, Perini, Kistner, & Montomoli, 2015; World Health Organization, 2016a). As Fineberg (2014) put it, “In the current state of scientific knowledge, ... no one can predict with confidence which influenza virus will become dangerous to human health and to what degree” (p. 1341).

Table 1.2

Major Findings of Selected Publications from Research about Undergraduate Students’

Attitudes and Behaviors towards Influenza and Protection

Selected publication	Era of study (as it relates to the 2009 H1N1 influenza pandemic)	Location of study	Major findings
Uddin et al. (2010)	Before	University of Michigan	Parental education status is associated with higher vaccination rates among students
Merrill et al. (2010)	Before	Brigham Young University	Students who were vaccinated were more motivated by perceived severity of influenza than by perceived risk of contracting the illness
Ravert et al. (2012)	During	Midwestern public university	Health beliefs (e.g., vaccination history, perceived vaccine safety and efficacy) have an impact on vaccine decisions among students
Ramsey & Marczinski (2011)	During	Northern Kentucky University	Students lack knowledge of vaccination safety, effectiveness, and necessity; misconceptions were common
Nyhan, Reifler, & Richey (2012)	During	Large public university in the southeastern United States	Health discussion networks that support vaccination is a predictor of beliefs of H1N1 vaccine safety and intention; parents, friends, and spouses appear to be most influential discussants
Decker & Slawson (2012)	During	Medium-sized university in Canada	Students worried about H1N1 and reported making changes in hygienic behavior, but the majority of students was not planning on getting vaccinated
Benjamin & Bahr (2016)	After	California State University (Northridge)	Low seasonal flu vaccination rate; freshmen and sophomores were more likely to receive the vaccine. Almost half of unvaccinated students feared the risk of contracting influenza from the vaccine or that the vaccine has dangerous side effects

Review of Analytical Literature

Introduction

Curry et al. (2006) pointed out that qualitative research designs can offer public health researchers important benefits. These designs tap into theoretical frameworks not found in the positivist and post-positivist frameworks of quantitative research, which deal only with observable entities and objective reality (Lichtman, 2006). Qualitative approaches include the use of frameworks drawn from the social sciences, including the psychological and behavioral sciences, which are particularly well suited for a research project about university students' attitudes and behaviors towards risks such as influenza.

I believe that making use of social science theories to interpret undergraduate students' risk evaluation and response behavior provided me the opportunity to shed significantly more light on the various barriers students have to inform themselves about influenza and immunization, and to make decisions about vaccination. Furthermore, I found that using theories from the social sciences to analyze data from in-depth, face-to-face interviews with undergraduate students alleviated some of the tensions and gaps in the literature I described in the previous sections. To my knowledge, no researcher has attempted to view the research topic through any of the following sociological lenses alone nor through a combination thereof:

- The cultural theory of risk perception (Douglas & Wildavsky, 1983)
- The theory of structural constructivism (Bourdieu, 1989, 1990, 1993, 1998, 2003, 2004, 2013, 2014; Bourdieu & Passeron, 2015)
- The theory of symbolic interactionism (Blumer, 1969/1998)
- The theory of applied phronesis (Aristotle, trans. 2014a, trans. 2014b; Flyvbjerg, 2001; Flyvbjerg, Landman, & Schram, 2012).

Cultural Theory of Risk Perception

The cultural theory of risk can be traced back to anthropological theory. Over the years, the theory has been further developed and applied to contemporary issues of risk. There are two major dichotomies in risk research. These are (a) the technical analyses of risk, which examine, for example, magnitude and probability of exposure; and (b) the social or perceptual analyses of risk, which evaluate the individual and aggregate perceptions of various risk factors. The cultural theory emerged from the second category of risk analysis (Tansey & O’Riordan, 1999).

Mary Douglas (1921-2007) is credited with being the founder of the cultural theory of risk. She published with Aaron Wildavsky (1930-1993) the book *Risk and Culture* (Douglas & Wildavsky, 1983), in which they discuss risk perceptions of technological and environmental (pollution) hazards. They believe that research about risk perception can reveal what different characteristics of social life elicit certain responses to dangers. They ask questions such as: Can we know the risks we face? Why are some risks hidden and others selected? Why do people emphasize certain risks while they ignore others? How do people decide what kind of risks to take and which ones to ignore? Who is to control whom in regard to which aspects of life? Douglas and Wildavsky argue that judgments humans make about what is or is not a danger to them are socially selected. In other words, risk is a collective construct, “a bit like language and a bit like aesthetic judgment” (p. 186).

Douglas and Wildavsky (1983) discussed the interactions of groups (e.g., individuals and movements) with scientists and politicians, and suggested that when people pretend that their fears of danger are rational, they essentially deny the involvement of personal, moral, and political values that influence their attitudes and behaviors. Applying the cultural theory of risk perception to the topic influenza and vaccination turned out to be useful in this research project

because it allowed me to analyze social force formation among students and the interaction of students with scientific, public health, university-administrative, and political entities. More specifically, it allowed me to evaluate how attitudes and behaviors of undergraduate students are affected by the social construction of risk, in which they take part. It also allowed me to describe information about the actual risk of influenza, based on current scientific evidence, presented by the authorities to students in comparison to what students perceive as a risk based on their perceived knowledge about influenza and vaccination. In other words, the approach of using the cultural theory of risk perception allowed me to determine whether or not students feel there are hidden risks they should have been warned about, such as influenza as a risk to *their* health, or a vaccine which can potentially have side effects or a lesser than disclosed efficacy.

Douglas and Wildavsky (1983) also described group behavior and discussed issues such as scientific disagreements, political power displays, levels of public policy, and attempts by bureaucracy to maintain hierarchy and stability by resisting change. They believe that this can lead to mistrust and opposition of individuals and the formation of groups to engage in (argumentative) power struggles. The cultural theory of risk perception was thus also suitable in this study to analyze the level of mistrust and opposition of students to vaccination efforts undertaken by public health professionals, educational practitioners, and campus health organizers. In sum, Douglas and Wildavsky' theory proved useful in this research project for the evaluation of aspects of fear, trust, and culture in light of the collective construct created between authorities and an undergraduate student population.

Theory of Structural Constructivism

The French sociologist and anthropologist Pierre Bourdieu (1930-2002) developed various theories in diverse fields of study related to cultural practices and broader social

processes. For example, he developed theories about issues related to linguistic exchange, the material and symbolic nature of power, the political uses of language, social structures and conditions, value and judgement, and education (in its broadest sense, encompassing more than only the process of formal school education). In short, his “wide-ranging work cuts across established academic disciplines and provides a powerful and highly productive model for social analysis in diverse fields of activity” (Johnson, 1993, p. 1). Bourdieu’s theories were, in part, influenced by the works of social scientists like Max Weber, Émile Durkheim, Ludwig Wittgenstein, and Michel Foucault, as well as others. Bourdieu described three main concepts within the framework of structural constructivism. These are: ‘habitus,’ ‘field,’ and ‘symbolic power.’

Habitus. Bourdieu (1993) defines *habitus* as the system of “principles which generate and organize practices and representations that can be objectively adapted to their outcomes without presupposing a conscious aiming at ends or an express mastery of the operations necessary in order to attain them” (p. 5). Habitus has essentially to do with the development of characteristic habits and preferences, and can be seen as “cognitive and motivating structures” (Bourdieu, 2013, p. 78). It is kind of a “feel for the game” or a “practical sense” (Bourdieu, 1993, p. 5). It shapes individual action but without being necessarily accompanied by a strategic calculation. Using habitus as a concept allowed me to interpret certain aspects of undergraduate students’ risk evaluation by looking at the information sources students accessed and preferred. More specifically, it helped me analyze by what personal feel or practical sense students were led to access information about influenza and vaccination, and determine if this behavior occurs in a manner that is not always calculated and not simply a question of conscious acceptance of the

meanings assigned to them by official structures (e.g., the government, health care specialists, and the university) and social groups of society (e.g., family, friends, and the media).

Field. Bourdieu (1993) developed the concept *field* to describe concrete social situations and contexts, those that are governed by a set of objective social relations. He believes that any social formation is structured by a hierarchically organized series of fields, and that each of these fields is a structured space which has its own laws and modes of operation. Although each field is relatively autonomous, it is structurally homologous with the other fields (Bourdieu, 1993). Bourdieu's concept of field turned out to be useful in this research project because it let me examine undergraduate students' positioning within the social space of a particular institution (here: a university) within the context of higher education. More precisely, universities represent a *field* in which education is provided through its unique academic structures of higher learning, which is offered by faculty (i.e., the experts in their respective fields) who interact not only with each other but also with the recipients (here: the undergraduate students) of their service to society through lectures and guidance. Using the concept also helped me evaluate changes in the field, such as changes in organizational structures over time as well as their legitimization through maintaining or changing viewpoints (Bourdieu, 1993, 2014; Bourdieu & Passeron, 2015).

Symbolic violence. Bourdieu's third concept amounts to a form of non-physical *violence* in that it strategically uses various modes of interactions, especially those that lead to social and cultural domination. It is not meant to be violence in its narrowest interpretation but rather a kind of a 'soft' force, one that is present but difficult to recognize or, perhaps better, easy to misrecognize. According to Bourdieu (1998),

[s]ymbolic violence is the violence which extorts submission, which is not perceived as such, based on “collective expectations” or socially inculcated beliefs. Like the theory of magic, the theory of symbolic violence rests on a theory of belief or, more precisely, on a theory of the production of belief, on the work of socialization necessary to produce agents endowed with the schemes of perception and appreciation that will permit them to perceive and obey the injunctions inscribed in a situation or discourse. (p. 103)

Bourdieu described many effects of symbolic violence. For example, he wrote that symbolic violence imposes meanings and incarnates itself in both objectivity (in the form of specific organizational structures and mechanisms) and subjectivity (in the form of mental structures and categories of perception and thought). Furthermore, and perhaps most important, symbolic violence can impose the meanings as legitimate by concealing the existing power relations, which are the basis of its force (Bourdieu, 1998; Bourdieu & Passeron, 2015). It even can lead to a transfiguration of the relations of domination and submission into a form of relations that are perceived as being affective (i.e., the transfiguration of power into charisma). According to Bourdieu (1989), this is the magic power that leads to socially constituted collective expectations and beliefs, and exercises a certain kind of action from a distance, without any physical contact to its recipients. Bourdieu believes that “the principal mode of domination has shifted from overt coercion and the threat of physical violence to forms of symbolic manipulation” (Swartz, 1997, p. 82). Symbolic violence can thus be considered a very powerful instrument of domination (Bourdieu, 2003).

Bourdieu’s concept of symbolic violence was used in this research study to examine the underpinnings of the development and implementation of seasonal and pandemic influenza preparedness and response plans, which are developed by the various experts in the field, and

how their power influences undergraduate students' thinking and behavior. In its broadest sense, it is an examination of intellectual and scientific position-taking, which Bourdieu considers "semi-conscious *strategies* in a game in which the conquest of cultural legitimacy and of the concomitant of legitimate symbolic violence is at stake" (Bourdieu, 1993, p. 137).

In sum, in this research project, the concept of habitus was used for researching relations between undergraduate students and structures, while field provided a valuable concept for studying the meaning of space and operation of culture at a more institutional level. Finally, symbolic violence is a concept that was found to be useful for examining power relations on various levels.

Theory of Symbolic Interactionism

Herbert Blumer (1900-1987), an American sociologist, coined the term *symbolic interactionism*. His interest in this topic was greatly influenced by the social psychologist George Herbert Mead who stressed the idea that the symbolic nature of human behavior and communication makes them distinctive from animals because humans are capable to communicate and interact by exchanging 'significant' symbols (Sandstrom, Lively, Martin, & Fine, 2014). Morrione (2004) pointed out that Blumer introduced the term *symbolic interactionist* in "an attempt to label philosophers, sociologists, and social psychologists sharing a pragmatist position regarding the nature of social phenomena" (p. xi). Thus, Blumer is regarded as "a key founder of the modern interactionist approach" (Sandstrom et al., 2014, p. 9). It needs to be mentioned that the theory of symbolic interactionism has such a great influence as a research method in sociology that many use it synonymously with qualitative research (Bogdan & Biklen, 2007; Lichtman, 2006).

Blumer (1969/1998) described symbolic interactionism as “a label for a relatively distinctive approach to the study of human group life and human conduct” (p. 1). He suggested that meanings derive from the interactions of people or groups of people, which means, from the social process. Thus, human groups or society exist in action and must thus be analyzed through their actions. Blumer puts it this way: “In the study of human conduct, wherein human actors are carving out lines of action, it is of utmost importance to take their roles and get inside of their framework of operation” (p. 99). In short, symbolic interactionism is about the human social act and the use of images through which “humans point out to themselves various possibilities of action” (p. 95).

Blumer viewed symbolic interaction as *the* essential process through which all social phenomena (including structures) are created, maintained, and changed. For example, when people view things as “right” or “wrong,” confused or clear, novel or routine, or whether or not their thoughts and acts are rational, tinged with fear, love, jealousy, panic, hatred, anger, lust, greed, or envy, their interpretations of situations constitute frames in regard to which humanly enacted realities are achieved. (Morrione, 2004, p. xi)

The theory of symbolic interactionism turned out to be useful for this study of undergraduate students because it provided important information about (a) how students act towards things (here: the risk of influenza) on the basis of the meanings that these things have for them; (b) where the meanings are derived from (e.g., the social interaction that a student has with peers or other people); and (c) how these meanings are handled in, and modified through, an interpretive process used by the student in dealing with the things he or she encounters. According to Blumer (1969/1998), these are the three premises which set the boundaries for the symbolic interactionist perspective.

Since people (including undergraduate students) encode their meanings and intentions through language (i.e., part of the rhetorics of attitudes) and other symbol systems, research using symbolic interactionism as an analytical approach must be much about decoding these systems. This is not an easy task because humans develop, assign, and can change subjective meanings they impose on objects, events, and behaviors over time. Using symbolic interactionism as a theoretical lens was invaluable in this research project because it allowed me to focus on an area that provided explanations for how students behave based on what they believe and not just only on what is considered objectively true (Berg & Lune, 2012; Blumer, 1969/1998; Morrione, 2004).

Theory of Applied Phronesis

The theory of phronesis goes back to the Greek philosopher Aristotle (384-322 B.C.E.) and his teaching on virtues. It is part of the *Nicomachean Ethics*, a collection of ten books, in which he discussed happiness, virtue and the mean, voluntariness and responsibility, justice, and incontinence (weakness), as well as friendship, pleasure, and practical wisdom (i.e., phronesis) (Aristotle, trans. 2014a, trans. 2014b). The *Nicomachean Ethics* is widely considered one of the most important historical philosophical works, and impacted the thoughts of many philosophers throughout the centuries. In more recent years, there has been an increased interest in the theory of phronesis, as seen in a number of new translations and interpretations of the original work (e.g., Aristotle, trans. 2014a, trans. 2014b) as well as the application of phronesis to address some of today's social problems in various contexts (e.g., Flyvbjerg, 2001; Flyvbjerg et al., 2012; Glossop, 2003; Kinsella & Pitman, 2012; Stefanazzi, 2012).

Phronesis is generally defined as “practical wisdom or knowledge of the proper ends of life” (Kinsella & Pitman, 2012, p. 2). Phronesis complements several other intellectual virtues,

including episteme and techne. While *episteme* has been characterized as knowledge that is “invariable [and] context independent” (Kinsella & Pitman, 2012, p. 2) and as “universal truth” (Flyvbjerg et al., 2012, p. 1), *techne* has been defined as “the [technical] know-how associated with practicing a particular craft” (Flyvbjerg et al., 2012, p.16). Flyvbjerg et al. (2012) pointed out that

[e]ven in Aristotle’s original interpretation, phronesis is seen as the most important of the intellectual virtues, because it is needed for the management of human affairs, including the management of episteme and techne, which cannot manage themselves. Phronesis, in this sense, is knowledge that is sensitive to its application in specific settings and is therefore able to manage itself (and more), which is what gives it prominence in social thought and action. (p.1)

Crisp (in Aristotle, trans. 2014a) mentioned that Aristotle pointed to the importance of the deliberation process in phronesis. He wrote: “Good deliberation, like virtue in itself, involves getting it right, that is, achieving something good by using the right steps in one’s reasoning. Deliberation, then, is itself a part of being practically wise” (p. xxv). The use of the theory of applied phronesis turned out to be invaluable in this research project because it supported the interpretation of identified indicators, trigger points, and predictors of behavior of undergraduate students in regard to confronting influenza as a risk to their health and vaccination as a possible protection method. In other words, Aristotle’s theory helped assign meaning to the words of undergraduate students when they described to me in this survey their thoughts and actions in particular circumstances, especially when confronted with influenza, a highly contagious infectious disease.

Crisp (in Aristotle, trans. 2014a) also mentioned that Aristotle recognized that

[h]uman action is variable and complex, and so practical wisdom concerns matters that are inexact. Its acquisition requires experience, and consists in one's becoming able to see what matters in certain circumstances, and why. It is closely related to common sense, except that its sphere is that of the virtues as a whole. It is important also to remember that it consists not merely in the ability to see or to understand, but in the capacity to give orders. Unlike judgment, practical wisdom involves the virtuous person's commanding himself to perform what is called for in the circumstances (p. xxv).

I believe it is in this statement where it becomes most evident that phronesis has to do with leadership. It is not only the self-leadership of each individual undergraduate student who makes decisions (after deliberation) based on what he or she believes is the right thing to do in a particular circumstance, but also the organizational leadership, represented by policy makers who develop risk guidelines (after deliberations) and expect from university administrators that they are being followed.

Summary

The 2009 influenza A(H1N1) pandemic greatly influenced the interest of researchers in university students' attitudes and behaviors towards influenza and vaccination. Thus, this latest flu pandemic provided a suitable framework to study this topic in the post-2009 H1N1 pandemic era. I have demonstrated through my literature research that the phase after this latest influenza pandemic is not well researched, in particular regarding the interpretations of social correlates by using theoretical lenses developed by sociologists, anthropologists, philosophers, and political scientists. In my opinion, the continuation of research about university students regarding influenza and vaccination was/is particularly important because recently released reports by the Centers for Disease Control and Prevention (2016c) showed that seasonal influenza vaccination

rates for American adults (which includes the age group of undergraduate students) were below 50% during all of the past seven consecutive influenza seasons (i.e., the 2009-2010 through 2015-2016 flu seasons).

The four theoretical lenses I have described in this chapter are (a) the cultural theory of risk perception; (b) the theory of structural constructivism; (c) the theory of symbolic interactionism; and (d) the theory of applied phronesis. I mentioned that the cultural theory of risk perception was selected to obtain valuable information about the decision-making process of undergraduate students with regards to the cultural determinants and group behavior, while the theory of structural constructivism allowed me to examine the meaning assigned and the rules set by organizations students came in contact with. Looking through the lens of symbolic interactionism was invaluable for the interpretation of students' attitudes and behaviors by pinpointing symbolic meanings of words such as 'influenza' and 'flu vaccination.' Finally, the theory of applied phronesis was used to interpret undergraduate students' reasoning, self-leadership, and decision-making processes. I believed and found that employing these four frameworks gave me a better overall understanding of undergraduate students' attitudes and behaviors towards influenza and vaccination, as I will describe in detail in Chapters 3-6.

Since these theoretical frameworks are rather complex, I felt it would be a good idea to present a table in which I provide a brief description of each theory and compare them to each other by pointing out their individual applications as well as their methodological limitations and implications when used in this mixed-methods research project. I included in this table also the time of publication of the four theories and information about the authors and their different sociological orientations. Table 1.3 provides this comparison of the four sociological frameworks.

Table 1.3

Comparison of Sociological Frameworks and Their Uses in the Research Study

Theory	Cultural theory of risk perception	Theory of structural constructivism	Theory of symbolic interactionism	Theory of applied phronesis
Characteristics				
Authors	Mary Douglas ¹ and Aaron Wildavsky ²	Pierre Bourdieu	Herbert Blumer	Bent Flyvbjerg ³ (Aristotle ⁴)
Information about the authors	¹ British anthropologist (1921-2007) ² American political scientist (1930-1993)	French sociologist and anthropologist (1930-2002)	American sociologist (1900-1987)	³ Economic geographer and social science philosopher (1952-) (⁴ Greek philosopher) (384-322 B.C.E)
Time of publication(s)	1983	1970s-2000s	1969	2001, 2012 (350 B.C.E.)
Orientation	Cultural anthropology and political science	Traditional anthropology and sociology	Chicago School of thought (sociology)	Modern social science theory/Ancient Greek philosophy
Influences	Émile Durkheim	Max Weber, Émile Durkheim, Ludwig Wittgenstein, Michel Foucault, et al.	George Herbert Mead	Aristotle (Plato and Socrates)
Description	Fear, trust, and culture (collective construct)	Dynamics of power in society (bureaucracy, science, education, etc. as a specific complex of social relations)	Subjective meaning of social life	Applied wisdom (virtue ethics)
Use in research project	For the interpretation of how cultural determinants and group behavior affect students' risk perception of influenza	For the interpretation of the meanings assigned and rules set by organizations and the interpretation of these by students	For the determination of the symbolic meaning of influenza as a social construct	For the interpretation of how students and organizations make (wise) decisions in difficult circumstances (e.g., a threat from influenza)
Methodological limitations	Developed for technological and environmental (pollution) dangers	Developed in the 1970s - 2000s; societies have become increasingly more global and complex	Could have been problematic if students had never heard about influenza and/or vaccination	Originally drafted two and a half millennia ago for noblemen in a city state of tens of thousands
Methodological implications	Required adaptation to infectious disease (influenza) research topic	Theory required adaptation to today's (global) problems and research topic	Since students heard about influenza, the theory was applicable	Required re-interpretation of Aristotle's thoughts to adapt to our time and the research topic

CHAPTER TWO:
RESEARCH METHODOLOGY

Introduction

Several researchers have pointed out the different philosophical and methodological strengths and goals of quantitative and qualitative research (e.g., Bogdan & Biklen, 2007; Curry et al., 2006; Lichtman, 2006; Luborsky & Sankar, 2006; Maxwell, 2013; Sale, Lohfeld, & Brazil, 2008). Perhaps Sale et al. (2008) best describe these differences, using health science research as an example: “[E]ach of these methods is based on a particular paradigm, a patterned set of assumptions concerning reality (ontology), knowledge of that reality (epistemology), and the particular ways of knowing that reality (methodology)” (pp. 364-365). While quantitative research is concerned with numbers and focuses on numerical data, qualitative research produces descriptive data and focuses on personal experiences, attitudes, and behaviors, among others. Denzin and Lincoln (2011) pointed out that “Qualitative research consists of a set of interpretive, material practices that make the world visible ... [thus] qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them” (p. 3).

When it is feasible, a mixed-methods approach should be considered as the most appropriate study design because it can maximize the advantages of both types of research. The mixing of data sets from both designs can provide a researcher with a better understanding of the topic under investigation than if either data set has been used alone (Creswell & Plano Clark, 2007, 2011; Morse, Wolfe, & Niehaus, 2006; Östlund, Kidd, Wengström, & Rowa-Dewar, 2011; Sale et al., 2008). In this dissertation research project, the use of both a quantitative and a qualitative component was warranted because of the following reasons:

- The overarching research topic of risk evaluation and risk response behavior was quite complex
- The specific phenomenon under study (i.e., undergraduate students' attitudes and opinions about influenza, and their behaviors and actions such as seeking vaccination or other means of protection) was believed to be multidimensional
- My literature research revealed that other investigators used predominantly a quantitative analytical approach (i.e., without using the described four sociological theories to interpret the data) in order to answer their research questions about influenza and vaccination in university student populations

In sum, during the planning phase of this research project, I felt that a mixed-methods (quantitative-qualitative) study design could provide the most detailed answers to the research questions I had raised.

Interpretive Framework

Conceptual Approach: A Normative Case Study

The primary conceptual approach to the qualitative inquiry is the use of normative case study research. A *case study* is “a study that investigates a contemporary phenomenon in depth and in its real-world [natural] context” (Yin, 2014, p. 237), “bounded by space and time” (Hancock & Algozzine, 2011, p. 15). This type of investigation explores a phenomenon (in my study: the risk evaluation and response behavior of undergraduate students with a focus on influenza and vaccination) in a specific school system (here: in a university setting) during a specific time period (here: during the 2015-2016 influenza season). The research was conducted through detailed, in-depth data collection using multiple sources of information (questionnaires, interviews, and information graphics [*infographics*: influenza flyer documents]) leading to a

“case description” and “case themes,” which are, according to Creswell (2013, p. 97), the ultimate goals of case study research. Bogdan and Biklen (2007) mentioned that “[t]he general design of a case study is best presented by a funnel” (p. 59). In my investigation, the detailed examination of undergraduate students began with a rather broad exploratory beginning in a pilot study and then progressed in the dissertation study through a more directed (funneled) data collection and subsequent detailed analysis of all data that eventually led to the description of case themes.

Although Creswell (2013) described case study research as one of five established *qualitative* approaches (the other four are narrative research, phenomenology, grounded theory, and ethnography), it is important to mention that Yin (2014) supports the idea of using both qualitative and quantitative approaches to case study development, which is typically not suggested for the other qualitative approaches. He phrased it this way: “The use of a mix of quantitative and qualitative evidence, along with the necessity for defining a “case,” are but two of the ways that case study research goes beyond being a type of qualitative research” (p. 19). Thus, my case study approach appeared to be well suited for a mixed-methods research investigation about undergraduate students’ risk evaluation and response behavior with a focus on influenza and vaccination.

There is no doubt that the usual case study research is a powerful method and research strategy on its own, but it can be amplified with a normative aspect. Thacher (2006) believes that a normative case study approach advances our understanding of phenomena because this type of study combines empirical observation with normative assessment. More precisely, it contributes to our understanding of important public values (here: the value of vaccination to protect the individual person and the community). I decided that normative case study research promised to

be particularly useful for my investigation because it allowed me to analyze thick ethical concepts such as values and ideals, courage, (self-) leadership, and obligations of the individual undergraduate student that led to either vaccination or refusal of vaccination against influenza—a highly contagious viral respiratory disease. Thacher pointed out that normative case study contributes to normative theory and adds to Aristotle’s notion to do things that are (generally) good or bad for a human being (i.e., phronesis as a virtue) by examining “things that are *intrinsically* valuable,” which means, things that we value “because they are desirable in their own right, not just as means to some other objective, so we would pursue them even if no other good consequences followed from their achievement” (p. 1635).

Thacher (2006) mentioned that a normative case study approach can also be useful for policy-oriented research. Because undergraduate students rely on institutions for receiving information about influenza, the existence and meaning of “institutional facts” in students’ minds play a significant role in the decision-making process about vaccination (p. 1663). In public health, one of the most significant tasks policy makers (i.e., the policy experts) perform is the setting of appropriate guidelines for public objectives, which means, determining the ends of government action (here: to reach high influenza vaccination coverage in the population) but not necessarily the means how to get there. Thus, according to Thacher, a normative case study approach “can help professional communities to clarify, elaborate, or even fundamentally revise the way they define these ends” (p. 1633). In this respect, I hoped that the use of a normative case study approach would have wide-ranging implications.

Survey Approach: A Cross-Sectional Study

There are several different types of observational study designs. Longitudinal and cross-sectional studies are two of those designs, and both are often used in surveys. While

longitudinal surveys involve the collection of survey data over time (i.e., the information obtained from study participants is collected from more than one point in time), cross-sectional studies involve data collection at a single point in time—like a snapshot of a group of people (Fink, 2013; Rothman, 2002). Cross-sectional studies are typically used in the form of a survey when there is no hypothesis as such, but there is the aim to describe a population (e.g., the population of university students) or a subgroup within the population (here: undergraduate students) at a given time point with respect to an outcome or a set of (risk) factors. The advantages of this type of research approach include the following (Levin, 2006): (a) many factors (here: as it relates to risk evaluation and response behaviors of undergraduate students) can be assessed; (b) there is no loss of study participants to follow-up; (c) the approach is useful for the generation of hypotheses; (d) the study is relatively inexpensive to conduct; (e) the field research takes relatively little time (note: time limitation was a factor in this dissertation project); and (f) this research approach is useful for public health planning (Levin, 2006).

In sum, my research project is a population-based, mixed-methods (quantitative-qualitative), cross-sectional, normative case study of undergraduate students aimed at exploring how this subpopulation of university students evaluates certain risks (especially influenza) and how it responds to these risks (with a focus on influenza vaccination and other forms of flu protection).

Data Collection Methods

The population of interest in this study consisted of students 18 years and older who were enrolled in undergraduate programs at Laketree University. I used the name ‘Laketree’ as a pseudonym to protect the identity of the university at which this study was performed. Laketree University was chosen as the location for this research project because of several reasons: (a) the

university has two urban campuses that are directly connected to the same metropolitan community, offering plenty of interactions between on-campus and off-campus populations; (b) the university has a large population of students (over 10,000 students, of whom over 6,000 students are enrolled in undergraduate programs), which allowed me to conduct the comprehensive research project I had proposed; (c) Laketree University offers programs in diverse areas of education, which gave me the opportunity to capture undergraduate students' opinions and behaviors in regard to influenza and vaccination from the various different viewpoints they were believed to have as it relates to their specific academic education (e.g., business students vs. students of arts and sciences); (d) the university offers values-based education, which made this location especially suitable for the conduct of a normative case study about students' opinions regarding influenza and vaccination; and (e) Laketree University is located in the Midwestern United States, which presents itself as a location with a combination of a regional feel, yet a metropolitan life-style, a general sense of moderation with a focus on the common good, and an international flair as students enrolled in programs at this university come from more than 60 different countries.

I chose to study undergraduate students because, in the majority, they can be considered 'traditional students.' This student subpopulation is more homogenous (when compared to non-traditional students) and more similar to those found at other institutions of higher education. Traditional students can be characterized as follows: (a) they are typically enrolled at the university immediately following graduation from high school; (b) most of them are older than 18 years but typically under the age of 30 years; (c) they study on a continuous and most often full-time basis at least during the fall and spring semesters; (d) they are enjoying the university lifestyle; (e) they are often financially dependent on others (e.g., parents or some type

of official financial aid); (f) they typically have no children to care for; (g) they consider the university education as their primary responsibility; (h) they are typically employed only on a part-time basis, if at all, during the academic year; and (i) they complete a bachelor's degree program in approximately 4-5 years at a relatively young age. This is in contrast to 'non-traditional students' who are more diverse in professional backgrounds, are typically older, can greatly vary among academic institutions, and typically have to deal with an array of responsibilities in life while, at the same time, try to complete a degree program at an institution of higher education (Center for Institutional Effectiveness [Kennesaw State University], 2004; Shah, 2010).

In this project, a total of 303 undergraduate students from Laketree University participated in the cross-sectional, normative case study about undergraduate students' attitudes and behaviors towards influenza and vaccination (see Table 2.1). The survey consisted of two parts: (a) a quantitative component and (b) a qualitative component, resulting in a mixed-methods survey research design. Yin (2014) pointed out that this approach "forces the methods to share the same research questions" but allows for collecting complimentary data and a richer array of evidence to answer more complicated research questions than would have been possible by using any single method alone" (p. 65). The survey instrument, a paper questionnaire I describe in detail later, essentially provided "a bridge between the qualitative and quantitative paradigms" (Onwuegbuzi & Leech, 2006, p. 474). While the quantitative aspect of the research project provided significant information about the number of students involved in certain behaviors and holding specific beliefs (Nardi, 2014), the qualitative part of the study (i.e., the interviews) allowed me to capture the own words and emotions of undergraduate students when confronted with the topic influenza and vaccination. In other words, it gave me access to the

context of students’ behavior and thereby provided a different way to learn in more detail the meaning of that behavior (Seidman, 2006).

Table 2.1

Enrollment of Undergraduate Students in the Mixed-Methods Survey

Enrollment Survey component	Number of students in pilot study (2014)	Number of students in main study (2015-2016)	Comments
Quantitative component of the survey (anonymous)	0	288	288 students were asked to <ul style="list-style-type: none"> • fill out a written questionnaire
Qualitative component of the survey (non-anonymous)	3	12	15 students were asked to <ul style="list-style-type: none"> • fill out a written questionnaire • discuss the questionnaire during an interview • view and discuss infographics
Numbers of study participants	3	300	Total enrollment: 303 students

The recruitment procedure was as follows: I chose at random undergraduate students while walking on the two campuses of Laketree University. Locations selected for recruitment included numerous student gathering places such as the hallways of campus educational buildings, gymnasiums, libraries, and book stores, as well as seating areas, cafeterias, and offices with part-time employed undergraduate students. I avoided classrooms because I did not want to disturb students who were actively engaged in studying. I asked any student I passed if he or she is at least 18 years of age, is enrolled in an undergraduate program at Laketree University, and

would be interested in participating in a survey, which content I explained to them. In technical terms, this method for recruiting study participants is typically known as convenience sampling through face-to-face invitation.

It needs to be mentioned that using convenience sampling (i.e., non-probabilistic sampling) has many advantages. For example, (a) it is frequently used in health research projects; (b) it is suitable in attitude and opinion surveys, including in studies of student populations; (c) it is typically employed in qualitative inquiries in fields of research such as sociology, psychology, and anthropology; (d) it is cost-effective; and (e) it allows to gather data even when facing obstacles (e.g., a low response rate in quantitative surveys when a truly random sampling technique is used) (Daniel, 1995; Fink, 2013; Lee et al., 2012; Nardi, 2014; Seale et al., 2012; Skowronek & Duerr, 2009; Wilson & Huttlinger, 2010).

For the quantitative part of the survey, I asked 288 students to fill out a short written, hard-copy (paper-and-pencil), self-administered questionnaire consisting of 28 questions that relate to the overarching topic influenza and vaccination. The questionnaire contained three sections (in sequential order): Section A: 'Measures of Demographics;' Section B: 'Measures of Attitudes and Opinions;' and Section C: 'Measures of Behaviors and Actions.' These three categories are typically considered the main components of a questionnaire (Nardi, 2014). Most questions were designed to have standardized answers, which means, they are closed questions. Several questions were developed using a Likert-type 5-point rating scale. Furthermore, there were a few spaces provided for fill-in answers as well as a space at the end of the questionnaire for participants' additional comments. The questionnaire, which was pilot-tested by a randomly selected Laketree University undergraduate student, is shown in Appendix A. The quantitative survey was anonymous, and the time to fill out the questionnaire took approximately 10-15

minutes. The overall response rate was 90.3%, with the lowest response rate of 77.3% on one survey day and the highest response rate of 97.6% on another day. A total time of nine days was needed to collect the 288 responses. Students who declined my invitation to participate in the quantitative survey gave the following reasons for their refusal: (a) "I have no time," "this is not a good time," or "this is a bad time;" (b) "I have not eaten lunch yet;" (c) "I have class in a few minutes," "I have a presentation in a few minutes," or "I have a quiz in a few minutes;" (d) "no," "no thanks," or "I pass;" (e) "I have no interest;" (f) "I don't speak English well;" and (g) "can I take the survey later?" or "I can do it if you asked me at a later time." Among all the respondents, only one undergraduate student did not complete the entire questionnaire; the partial data set of this student was not used for the analysis. In all, 288 fully completed survey questionnaires were used for quantitative analysis.

For the qualitative part of the survey, I invited 12 undergraduate students to complete the same written questionnaire and then participate in a face-to-face, semi-structured interview, which took between 30-60 minutes (the average time was 47.5 minutes). The identity of these students was known to me, but pseudonyms were used for each of their names to protect their identity. I used a culturally-sensitive and narrative interview style to bridge cross-cultural differences and to let study participants feel comfortable (Maxwell, 2013). During the interviews, I discussed in more depth individual aspects of the completed questionnaires, including issues such as flu risk perception, ranking of various risks (e.g., smoking, texting while driving, Ebola versus influenza outbreak, etc.), information access, trust, and choice, as well as attitudes and behaviors towards vaccination and other flu protection measures. The Interview Discussion Guide is presented in Appendix B.

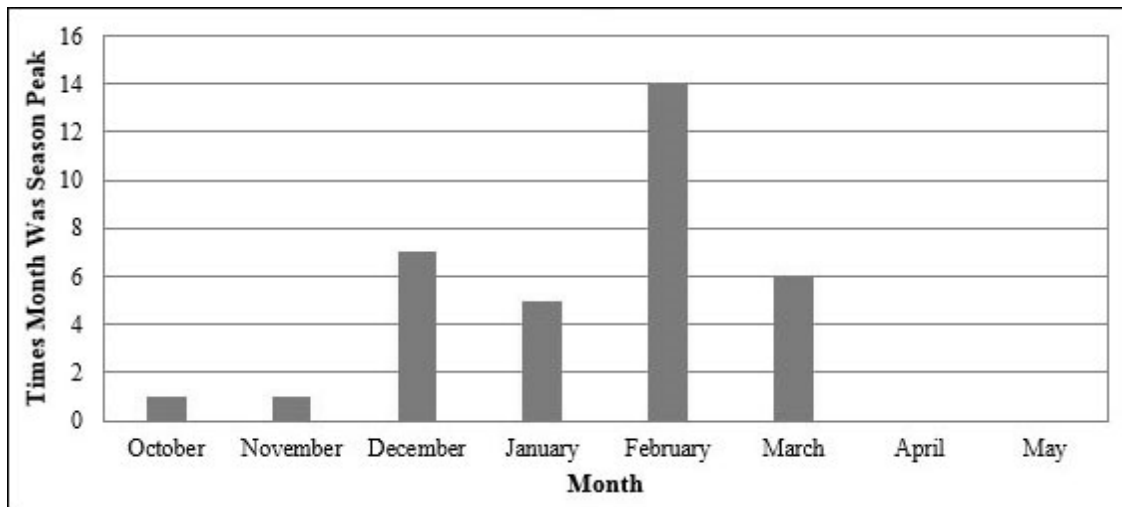
During the conversation, I showed each of the 12 students three infographics (i.e., flyers/posters with texts and images) containing various information about influenza and vaccination (see Appendix C). I obtained these infographics from reputable Internet websites, including the websites of the Centers for Disease Control and Prevention (www.cdc.gov) and the Department of Veterans Affairs (www.publichealth.va.gov). I asked each student what they think about the information provided on these infographics and let them indicate what information they considered most useful to them and why, and what information they feel was missing but important to them. The presentation of these infographics allowed me to get a clearer picture of what specific information undergraduate students want and need about influenza and vaccination in comparison to what the infographics offer. The overall response rate of the qualitative part of the survey was 24.0%, with the lowest response rate of 16.7% on three field research days and the highest response rate of 50.0% on two other days. The most common reason for declining to participate in the interviews was the time commitment needed.

In addition to the 12 interviews described above, I also analyzed information from interviews with three undergraduate students I conducted at Laketree University in 2014, which were part of a pilot study. This brought the total number of interviews to 15 (see Table 2.1). This number of 15 study participants provided ample opportunity for me to identify patterns in the data and interpret them in terms of social theories (Creswell, 2013; Kohlbacher, 2006).

The time for the mixed-methods survey was placed within the peak months of typical seasonal flu activity, which is between December through March (see Figure 2.1). More precisely, the field research began on December 4, 2015 and ended on March 21, 2016. As it turned out, the 2015-2016 influenza season in the United States started a little later and was milder than the previous three flu seasons, but there were reports of severe illnesses from

influenza and deaths. The Centers for Disease Control and Prevention (2016c) reported that influenza activity began to increase in late December of 2015 and continued to slowly increase through early March of 2016. The peak week of influenza activity for the 2015-2016 season was the week ending on March 12, 2016. It has also been reported that the influenza A(H3N2) virus predominated early during this season, while the A(H1N1) virus was more common later in the season (Centers for Disease Control and Prevention, 2016h). Data about the overall effectiveness of the 2015-2016 influenza seasonal vaccines (e.g., the trivalent and quadrivalent flu vaccines, which included the H1N1pdm09 vaccine component) are still being evaluated, although preliminary data indicate that the vaccine was this season overall a good match for the encountered influenza viruses (Centers for Disease Control and Prevention, 2016f).

Figure 2.1. Peak month of influenza activity for the 1982-1983 flu season through 2015-2016 flu season (Source: Centers for Disease Control and Prevention, <http://www.cdc.gov/flu/about/season/flu-season.htm>).



Creswell and Plano Clark (2007) pointed out the importance of deciding in what order the quantitative and qualitative methods should be employed. In this research project, the quantitative data set was collected first, followed by the qualitative data set. The decision of this sequential timing was primarily based on the belief that an initial analysis of the quantitative data would allow me to formulate more directed questions during the interviews.

Modes of Data Analysis

Processing of Quantitative Data

After completion of the field research phase, each questionnaire was assigned a number in the order in which they were retrieved from large file folders, which I had offered students for the anonymous and random collection of the completed questionnaires. All entries were checked to make sure they were complete and in order.

For the quantitative part of the survey, the following steps were taken, as suggested by Fink (2013), Fowler (2009), and Nardi (2014): (a) data file formatting, (b) data content management, and (c) statistical analysis. For data file formatting, each question per section of the questionnaire was assigned a number (see Appendix A). All question numbers were in sequential order, which means, the first question of the survey (in Section A) was assigned the number 1, and the last question (in Section C) had the number 28. This reduced the error of misplacing answers between and within respondents. For the quantitative coding of data, each answer to a closed question were given a number code. This is “a set of rules that translate answers into numbers and vice versa,” which is helpful when analyzing quantitative data statistically (Fowler, 2009, p. 146). For ease of use, the quantitative codes (i.e., the assigned numbers) were written directly on the questionnaire behind each standardized answer (see Appendix A). The creation of a separate code book was found not to be necessary because the questionnaire itself already

contained the quantitative codes. However, once I started the analysis, I felt that combining some of the codes (e.g., Likert scale items ‘very high/high’ versus ‘low/very low’) was in some cases necessary to obtain a better understanding of the data. Also, special codes were created to evaluate, for example, whether students who self-reported influenza vaccination remembered the 2009 H1N1 flu pandemic, resided on- or off-campus, or were enrolled in a science or business curriculum.

Statistical measurements of frequencies and proportions were primarily used to analyze the answers students provided on the written questionnaire. Descriptive statistics played here the major role as it allowed me to best summarize the quantitative information collected about undergraduate students’ attitudes and behaviors towards influenza and vaccination. Although this survey contains a substantial portion of quantitative data, it is important to point out that this information was used to form a kind of a framework for the qualitative data—the ‘spoken words’ of students I collected during the interviews. In other words, this dissertation project was primarily designed and analyzed as a normative case study, which follows a qualitative research tradition.

In some cases, however, it was desirable to identify factors that were statistically significantly associated with students’ vaccine acceptance or refusal (e.g., a determination of a potential association of students’ belief in flu vaccine effectiveness and self-reported influenza vaccination). For this, inferential statistics (here: Chi-Square tests of independence) were used. A p -value of less than 0.05 was considered statistically significant. Bonferroni corrections were used in cases of multiple comparisons. This post-hoc method sets a stricter significance threshold by dividing the p -value by the number of comparisons. Chi-Square analyses were completed using Social Science Statistics software available at <http://www.socscistatistics.com/>.

Furthermore, average variabilities (variances of the mean) were calculated to determine whether the collected demographic data of the study samples represented those of the population of the research setting. Here, 95% confidence intervals were computed to decide whether a sample was randomly selected from the population (see below).

Because in this research project a convenience sampling method was used, it was desirable to find out whether the convenience sample approximated the total population of undergraduate students at Laketree University. For this, the Fall 2015 Census data from the undergraduate population at Laketree University were compared to selected demographic data from the convenience sample (see Tables 2.5 and 2.6), using the statistical technique proposed by Cochran (1977) and later described in detail by Sousa, Zauszniewski, and Musil (2004). This evaluation was performed for students who participated in the anonymous quantitative part of the survey and for those who participated in the non-anonymous qualitative part of the survey (the interviews).

For students who participated in the quantitative survey, it was found that under a normal approximation, 95% of the convenience sample's count of males was expected to fall between 156.65 ± 1.96 multiplied by the square root of 34.789, which equals 145.1 to 168.2. Since the sample count for males was 147, which lies in the acceptable range of the computed confidence interval (145.1, 168.2), the result suggested that the sample of male undergraduate students was representative of the total population of male undergraduate students at Laketree University. A calculation for the female undergraduate students (convenience sample of 141) revealed a confidence interval of (120.0, 142.7), thus suggesting 95% confidence that the research sample for females also represented the total female undergraduate population. Statistical calculations were also performed for data on place of origin, campus residence, age groups (redefined as

18-19; 20-21; 22+), ethnicity, and religious affiliation, as well as year and field of study. While results suggested with 95% confidence that the samples for most of these categories represented their respective categories of the total undergraduate population at Laketree University, calculations for 'Person of color' and 'Multiracial/other' (Ethnicity), 'Minnesota,' 'Out of state,' and 'Out of country' (Place of Origin), 'Education,' and 'Social Work' (Field of Study), as well as 'Other' and 'None' (Religious affiliation) did not fall within the required confidence interval ranges and were thus considered non-representative for these segments of the total undergraduate population at Laketree University.

For students who participated in the qualitative part of the survey (the interviews), it was found that approximation calculations for gender, campus residence, '18-19 years' (Age Group), '2nd year,' '3rd year,' and 4th + years (Year of Study), 'Arts and Sciences,' 'Business', and 'Engineering' (Field of Study), 'Out of state' (Place of Origin), 'Non-Hispanic White' and 'Person of color' (combined groups Black/African American/Hispanic' (Ethnicity) fell within the required 95% confidence interval ranges and were thus considered representative for the corresponding segments of the total undergraduate population at Laketree University. In contrast, '20-21 years' and '22 + years' (Age Group), '1st year' (Year of Study), 'Education' (Field of Study), 'Minnesota' and 'Out of country' (Place of Origin), and 'Multiracial' (Ethnicity), as well as 'Catholic,' 'Christian,' and 'None' (combined groups 'None' and 'Agnostic') (Religious Affiliation) fell outside of the computed confidence interval ranges and were thus considered non-representative for these segments of the total undergraduate population at Laketree University.

Processing of Qualitative Data

For the qualitative survey, data from the interview were processed as outlined by Bazeley (2013), Berg and Lune (2012), and Bogdan and Biklen (2007), as well as Creswell (2013), and Marshall and Rossman (2011). These steps included (in sequential order): (a) organizing documents and visual data; (b) transcribing audio recordings into text; (c) reading through the data and writing observer comments and memos; (d) qualitative coding of the data to identify regularities and patterns, and subsequently develop conceptual categories; and (e) identifying themes and generating theoretical constructs.

For organizing documents and visual data, the completed questionnaires were labeled with pseudonyms of the interviewees, and a number was assigned in ranking order based on the time of the interview. The three infographics (influenza flyers) were shown to students in the order displayed in Appendix C; they were labeled with numbers ranging from 1 to 3 prior to the interviews. Audio data obtained from the interviews, which were recorded on two Sony digital recorders (ICD-BX132 and ICD-PX333), were transcribed into typed (written) documents using Sound Organizer 1.6 and Microsoft Office Word 2013. The transcribed interviews yielded almost 300 pages of single-spaced text, formatted in 12-point font size. I decided to transcribe the data myself because it helped me properly describe nuances and unique features of the students' spoken words (note: English is not my first language). It also helped me identify and interpret specific meaning units such as ideas, beliefs, and concepts, which a computer software program cannot do on the same level. In short, self-transcribing the interview data allowed me to get overall a better understanding of my data (Bazeley, 2013; Wargo, 2013). All transcripts were ultimately formatted for conversation analysis in a way that I was able to distinguish my own words as the researcher and interviewer from the words of the students who responded to my

questions. Text with wide margins were used on the transcripts, and line numbers were introduced to facilitate subsequent data processing.

The transcripts also contained observer comments (OCs), which are my own thoughts and feelings, incidences observed in other interviews, and ideas I generated while reading through the survey data. I also wrote memos to myself, which helped me point to analogies, play with metaphors, and develop concepts and themes. Bogdan and Biklen (2007) pointed out that both OCs and memos can stimulate critical thinking by reflecting on methods and analysis, ethical dilemmas and conflicts, and the observer's frame of mind. Finally, I wrote operational notes on the transcripts, which described response rates per interview, start and stop times of recordings, and single-letter designations for the first names of study participants (e.g., *C* for Christian; *E* for Eduardo).

The next step in the analysis was the qualitative coding of data. I used here the methods that were outlined by Bazeley (2013), Marshall and Rossman (2011), and Saldaña (2013). A code in qualitative inquiry has been described as "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2013, p. 3). In my dissertation research project, the total word data set was less than 1,000 pages of text, which allowed me for hand-coding and labeling of qualitative data. This manual coding method has the advantage over coding using computer software that the words' individual character, richness, variety, and meaningfulness were best preserved and data trends were easier recognized (Basit, 2003; Brod, Tesler, & Christensen, 2009; Ryan & Bernard, 2003; Saldaña, 2013). The coding was done not only on text of the transcripts but also on text students added into the fill-in spaces provided on the questionnaire. It needs to be noted that 54 students out of the 288 students (i.e., 18.8%) who participated in the

anonymous part of the survey wrote additional comments about their attitudes and behaviors towards influenza and vaccination in the space I had provided at the end of the questionnaire.

The qualitative coding procedure involved first cycle (initial or open) coding, second cycle (focused) coding, and third cycle (theme) coding. The first cycle coding was done through line-by-line coding and was used to search for regularities and patterns in the text data, while the second cycle coding was used to group the codes and develop more analytical categories and subcategories that reflected commonalities among the qualitative codes. In the third cycle, the previously identified codes were revisited and studied with the goal to develop theoretical themes. I also performed the coding procedure to search for words that may have had symbolic meaning. The coding was conducted in a bilingual fashion. Because English is not my native language, I chose to write some codes in German on the transcripts and on the questionnaires, and then later translated them into English, using the dictionary *Langenscheidts Handwörterbuch Englisch* (Messinger & Rüdberg, 1981). All codes were eventually transferred to ruled, white 3" x 2.5" index cards. These cards were then sorted which allowed me to group individual codes into categories and subcategories, ultimately leading to the identification of themes. In all, 173 initial codes were identified, which were organized through focused coding into 21 categories and 39 subcategories. The categories eventually synthesized into 10 themes. In addition, four symbol theme codes were identified. Tables 2.2, 2.3, and 2.4, as well as Figure 2.2 show the results of the coding of qualitative data.

Analysis Decision for Mixed-Methods Data

Because I had decided to use a mixed-methods approach, it needed to be determined (a) what the weighing of the quantitative and qualitative methods would be and (b) how the quantitative and qualitative methods would be mixed (Creswell and Plano Clark, 2007). I decided to use unequal weighting by placing a greater priority on the qualitative methods because, as I had mentioned earlier, the study was primarily designed as a normative case study, which follows a qualitative research tradition. The quantitative methods were used to generate data that formed the framework for the data generated by the qualitative methods. In regard to the data mixing, I decided to merge the data sets during the interpretation phase of the research project. This decision was based on the belief that merging data sets would provide the most comprehensive answers to the research questions I had raised.

All data from the quantitative and qualitative parts of the survey were presented in form of tables and figures created in Microsoft Office Word 2013. In addition, I developed a concept map which served as a strategy to summarize all data from this survey. This map is essentially a visual tool useful for developing theory by displaying concepts and the relationships among them. In other words, it as “a picture of what the theory says is *going on* with the phenomenon” under study. (Maxwell, 2013, p. 54). The concept map was designed in Microsoft PowerPoint 2013, displayed in Appendix F, and discussed in detail in Chapter 6.

Table 2.2

Selection of First Cycle (Initial) Codes (Presented in Alphabetical Order)

Codes A-D	Codes E-H	Codes I-N	Codes O-R	Codes S-Z
Acceptability of risk	Easy access desired	Identity	Optimism bias	Safety
Accessibility	E-mail(s)	Images	People’s opinion(s)	Self-leadership
Advice	Emergency	Immortality	Panic	Self-protection
Age (and health)	Experiences (past and current)	Inconvenience	Paranoid	Severity of illness
Angst (Ger.) (fear, anxiety)	Expert(s); expertise	Individualism	Participation	Show me the numbers
Appropriateness of information	External sources	Influences	Perception(s)	Side effects (vaccine)
Attention-grabbing	Face mask	Influenza	Power (authority)	Situation dependent (outbreak)
Attitudes	Family (extended)	Information overload	Presentation of self	Social dynamics
Authority (ies)	Fitness	Instant communication	Professional(s)	Stereotypes (of age groups)
Availability of protections	Flexibility	Intention (to act)	Professor (guidance needed?)	Student colleagues
Avoidance	Flu vaccination (flu shots)	Interest in topic	Protection of other people	Subculture (students)
Awareness	Flyers (infographics)	It’s a non-topic	Public safety	Support group
Awkward feeling	Freedom of choice	Lack of full disclosure	Real versus ideal	Symbolic meaning
Behavior (health and school)	Friends	Location matters	Reassurance that I am o.k.	Technology is for us
Beliefs	Generational thing	Low susceptibility	Reference group	Threshold of action
Benefits	Global connection	Mandatory vaccination	Regulation	Trust
Busy schedule	Guidance (wanted)	Manipulated information	Relationship management	Unbedingt notwendig (Ger.) (imperative)
Closeness to outbreak	Hand-held technology devices	Mass media	Rejecting vaccinations	Uncertainty of knowledge
Concern(s)	Hand sanitizer	Matching of flu strains	Relevance	Understandability
Confusion	‘Heads up’ information	Millennials	Religion	Vaccination (vaccine; vaxxer)
Convenience	Health (healthy)	Misinformation	Reminders	Values
Decision-making	Help when needed	Missing school	Residing (on- or off-campus)	Viewer ratings (media)
Denial	Herd behavior	Needles (fear of)	Resources (I have my ...)	Wishful thinking (it’s not gonna happen to me)
Doctor(s)	Hesitation	Network(s)	Risk	Worries
Don’t tell me what to do	Hoping not to get sick with the flu	Nuclear family	Routine (daily ...)	Worse than a cold

Table 2.3

Second Cycle (Focused) Codes

Categories	Subcategories
Level of trust in industry ^a	<ul style="list-style-type: none"> • Perception of business strategy • Perception of concern about power relations of industry, government, and doctors
Level of trust in government agencies ^a	<ul style="list-style-type: none"> • Perception of knowledge and expertise • Perception of openness and honesty • Perception of concern
Level of trust in Laketree University ^a	<ul style="list-style-type: none"> • Perception of care
Level of trust in the media and Internet ^a	<ul style="list-style-type: none"> • Perception of honesty and care • Perception of concern
Knowledge of the concept of influenza ^b	<ul style="list-style-type: none"> • Familiarity with the concept
Uncertainty of risk ^b	<ul style="list-style-type: none"> • Residing off-campus • Residing on-campus in a dormitory • Uncertainty of vaccine side effects
Information sources ^c	<ul style="list-style-type: none"> • Communication channels
Information pieces ^c	<ul style="list-style-type: none"> • Specific influenza information
Information overload ^d	<ul style="list-style-type: none"> • The problem defined • The role of Laketree University
Attention to information ^e	<ul style="list-style-type: none"> • E-mails from Laketree University • Government infographics
Influenza as a symbol ^f	<ul style="list-style-type: none"> • Meaning
Flu vaccination as a symbol ^f	<ul style="list-style-type: none"> • Meaning
Mask as a symbol ^f	<ul style="list-style-type: none"> • Meaning
Age as a symbol ^f	<ul style="list-style-type: none"> • Meaning
Effectiveness of influenza vaccines ^g	<ul style="list-style-type: none"> • Expressions of understanding • Expressions of concern and uncertainty
Mandatory flu vaccination ^g	<ul style="list-style-type: none"> • Proponents' view • View of the undecided • Opponents' view
Cultural and religious beliefs about vaccination ^g	<ul style="list-style-type: none"> • Beliefs defined • Vaccination behavior
Influence of other students' behavior to seek flu vaccination ^g	<ul style="list-style-type: none"> • Influence declined • Reminder effect • Herd behavior
Student identity ^h	<ul style="list-style-type: none"> • Millennials and Generation Z • Undergraduate students' subcultures
Risk behavior ⁱ	<ul style="list-style-type: none"> • Past vaccination behavior • Influenza outbreak behavior • Ranking- and shifting-risk behavior
Needs and wants ^j	<ul style="list-style-type: none"> • Yes to information • What Laketree University needs to know

Note. Categories^{a-j} led to the theme codes shown in Figure 2.2. ^aAuthoritative powers. ^bKnowledge and uncertainty of risk. ^cInformation sources and pieces matter. ^dInfoglut. ^eAttention-grabbing information. ^fSymbolic meanings. ^gBeliefs. ^hIdentity. ⁱReacting to risk. ^jNeeds and wants.

Figure 2.2. Third cycle (theme) codes.

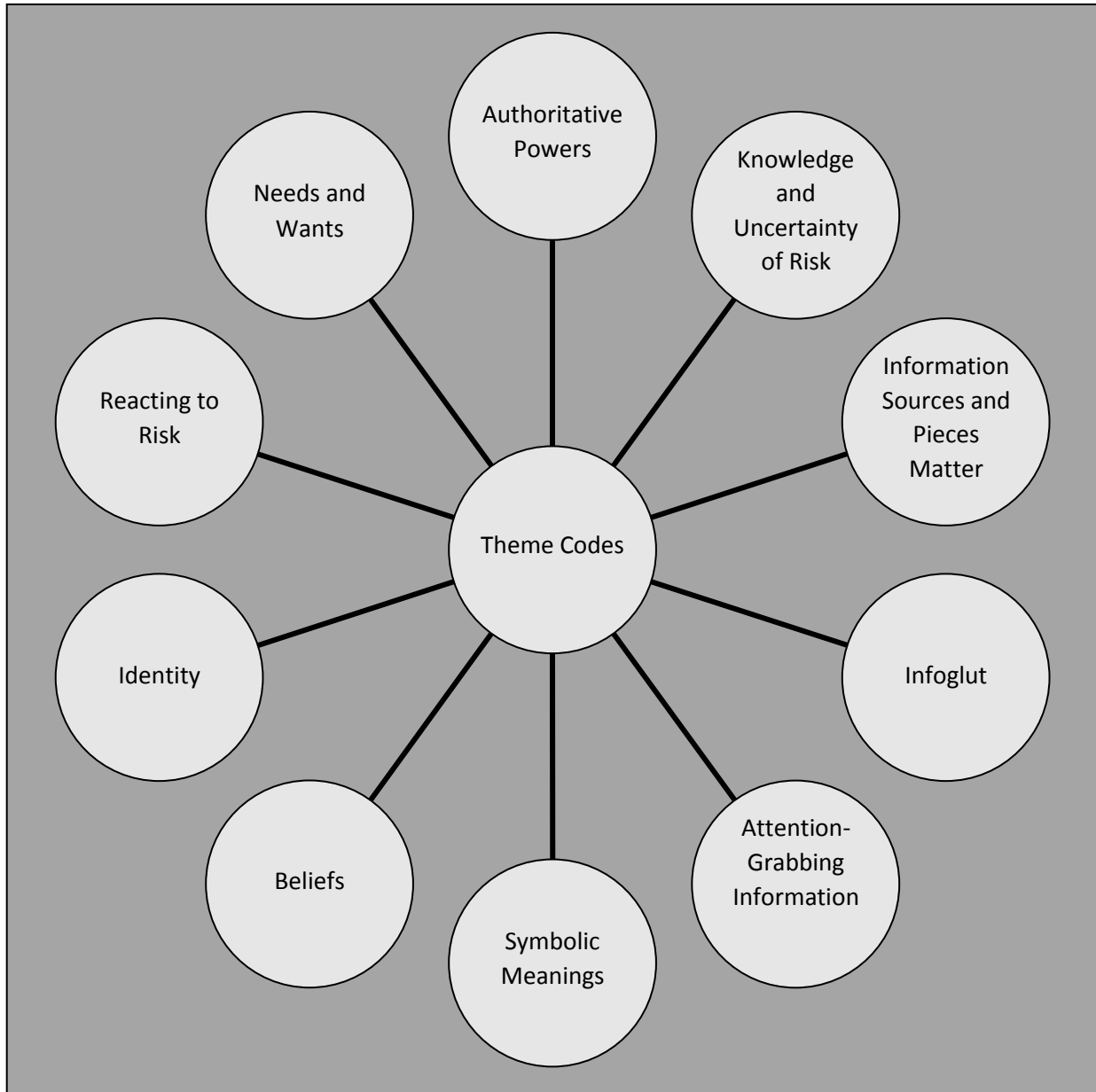


Table 2.4

Symbol Theme Codes

Symbols	Categories	Subcategories (examples)
Influenza	Disease	<ul style="list-style-type: none"> • Viral • Contagious • Air-borne
Flu vaccination	Pharmaceutical product	<ul style="list-style-type: none"> • Protection • Herd immunity • Side-effects
Mask	Non-pharmaceutical product	<ul style="list-style-type: none"> • Uncertainty • Awkwardness • Protection
Age	Social group identity	<ul style="list-style-type: none"> • Stage of life • Healthy generation

Data Integrity and Limitations

Any researcher who conducts a study, whether it has a quantitative or qualitative design, or a mixed-methods design, hopes that the research findings are trustworthy. In other words, “To have any effect on either the practice or the theory of a field, research studies must be rigorously conducted; they need to present insights and conclusions that ring true to readers, practitioners, and other researchers” (Merriam & Tisdell, 2016, p. 238). Conversations about the assessment of trustworthiness (sometimes called quality or credibility) of qualitative versus quantitative studies have gone on for decades, and opinions differ greatly among researchers and scholars (Creswell & Plano Clark, 2011; Krefting, 1991; Lincoln et al., 2011; Merriam & Tisdell, 2016; Noble & Smith, 2015). However, there is no doubt that issues of data integrity and limitations need to be discussed. The problem is that qualitative research is still all too often evaluated against criteria that have been found appropriate for quantitative research. So, qualitative researchers began

looking for assessment tools of trustworthiness that can parallel those tools used in traditional quantitative approaches (Creswell, 2013; Krefting, 1991; Noble & Smith, 2015).

Over the years, qualitative researchers have described numerous assessment tools for the trustworthiness of a study, some of which are interlinked, overlapping, or defined in different ways. These include, for example, criteria such as reliability, generalizability, and representativeness (Bogdan & Biklen, 2007), validity, authenticity, and reflexivity (Lincoln et al., 2011), generalizability and transferability (Bazeley, 2013), truth value, applicability, consistency, and neutrality (Krefting, 1991), and confirmability, objectivity, credibility, and dependability (Marshall & Rossman, 2011). In the end, it comes down to the point that every qualitative researcher has to decide which types of assessment tools he or she will use to describe data integrity and limitations. For my survey research study, I focused on validity, reliability, and generalizability.

Validity

There are various ways of looking at validity. For example, Fink (2013) pointed out that valid information from surveys comes from two sources: (a) valid survey instruments (known as measurement validity) and (b) the context in which the survey takes place (known as design validity). Creswell (2013) suggested researchers use “multiple validation strategies regardless of type of qualitative approach” (p. 250). He meant here qualitative approaches such as narrative research, phenomenology, grounded theory, ethnography, or case study. In general, there are several threats that can impact the validity of a survey. Researchers typically look at threats that affect the internal validity and those that affect the external validity of a study (Fink, 2013).

Internal validity. Frankel and Wallen (2006) described four main threats to internal validity: (a) mortality, (b) location, (c) instrumentation, and (d) instrument decay. In regard to the

first threat, in my study, mortality (i.e., participants' attrition from the study) was not really an issue because I conducted a cross-sectional study and I lost only one undergraduate student who decided not to complete the entire survey questionnaire. A mortality threat arises typically in longitudinal studies where follow-up of study participants is crucial and the risk of losing (a larger number of) subjects is much greater. Second, in regard to location, which refers to the place where survey data were collected, I did not collect any information from students about their attitudes and opinions about Laketree University, which questions students may have found 'risky' to answer as they may have been afraid that their answers could have negative effects on their academic progress at this institution. Third, instrumentation is an important issue. To reduce the instrumentation effect, the survey instrument (here: the questionnaire) remained the same throughout the dissertation research study. In regard to the fourth threat (instrument decay), which refers to the condition of the researcher during the interviews, I can ensure that it did not affect the outcome of this study. I was the lone interviewer, had sufficient time to conduct the study (i.e., to complete the survey sometime during the 2015-2016 influenza season) and did not experience feelings of tiredness or other forms of physical or mental exhaustion during the survey.

Fink (2013) discussed additional threats to internal validity in survey research. These threats include (e) the selection of study participants, (f) a history effect, and (g) a 'testing' effect. In regard to the student selection (the fifth threat), it needs to be reiterated that in my survey the selection of study participants was based on convenience sampling (i.e., a non-probability sampling method). To determine whether or not there was a possible selection bias (e.g., a selection of a much larger number of males than females), I conducted mathematical calculations of average variability (Cochran, 1977; Sousa et al., 2004), which results I had

reported in detail earlier in the section titled 'Processing of Quantitative Data.' Put briefly, the data confirmed that the survey respondents generally exhibited similarities to the undergraduate student body (e.g., in the distribution of male and female students), although not in all its category characteristics (e.g., place of origin).

In regard to another potential selection bias, I believe it was not likely that primarily undergraduate students with pre-existing health conditions were selected who could have had increased awareness of influenza risk. It needs to be emphasized that for the qualitative survey, the aim was not necessarily to seek statistical significance but rather to provide insight into the various thinking modes and behaviors (i.e., the subjective views and actions in regard to risks such as influenza) of the 15 undergraduate students who participated in the interviews.

Sixth, a history effect needs to be considered when (unanticipated) events (e.g., here: a flu campaign) occur while the survey is in progress. Laketree University did conduct a flu campaign during the 2015-2016 influenza season, but, to my knowledge, my survey began when the flu campaign was over at this academic institution. Lastly, a testing effect can be a threat to internal validity when a survey participant learned information from one 'test' (here: a survey) and then used that knowledge in a subsequent 'test' (here: a second type of survey). In my study, undergraduate students who participated in the anonymous quantitative survey were ineligible to participate again in the non-anonymous qualitative survey. Furthermore, the three undergraduate students who participated in the pilot study in 2014, were ineligible to participate again in the survey conducted in 2015/2016.

Finally, numerous researchers have emphasized the importance of triangulation as a strategic choice in survey research (Bazeley, 2013; Berg & Lune, 2012; Bogdan & Biklen, 2007; Creswell & Plano Clark, 2011; Lichtman, 2006; Marshall & Rossman, 2011; Merriam & Tisdell,

2016; Yin, 2014). According to Merriam and Tisdell (2016), this method is “[p]robably the best-known strategy to shore up the internal validity of a study” (p. 244). Triangulation in mixed-methods research is a methodological metaphor that (a) can facilitate the integration of quantitative and qualitative findings; (b) help investigators to clarify their theoretical proposition and the basis of their results; (c) can lead to a better understanding of the links between theory and empirical findings; (d) challenge theoretical assumptions; and (e) develop theory (Östlund et al., 2011). But, despite the fact that triangulation is widely used in research, Bogdan and Biklen (2007) advised against using the term *triangulation* because investigators significantly expanded its use causing confusion. They suggest to rather state what different multi-data sources or theoretical perspectives investigators used. In my dissertation research study, I made use of (a) different survey designs (a quantitative and a qualitative survey) and analyzed the data using a mixed-methods approach; (b) different data collection techniques (paper-surveys, interviews, and viewing of documents [infographics]); (c) collecting data from many students about the same topic; and (d) four different sociology-derived theoretical lenses to analyze all survey data.

External validity. Fink (2013) described the following threats that can affect the external validity of survey research data. For example, there is (a) the multiple program interference, (b) the reactive effect of study participation, and (c) the reactive (sensitizing) effect of ‘testing.’ First, an interference effect can occur when undergraduate respondents participated in other complimentary activities (here: other influenza/flu vaccination surveys). To my knowledge, such a multiple program interference did not occur during the conduct of my study. Second, a reactive effect of study participants is a threat to validity when undergraduate students behave uncharacteristically because they become aware of being ‘chosen’ for the study or being recorded during the interviews. Although I attempted to create an environment of comfort, trust,

and openness during my field study by using a culturally-sensitive approach to the mixed-methods investigation and a narrative interview style, I cannot say for certain that a reactive effect has occurred in study respondents. What I can say is that I as a researcher was nervous on the first day of the quantitative survey as well as on the first day of the qualitative survey. Third, in regard to the reactive effect of ‘testing’ (note, a few students thanked me for the ‘quiz’ after having completed the questionnaire), it is possible that students who participated in the qualitative survey were sensitized to some degree to the topic influenza and vaccination after having completed the written survey before they were interviewed and/or viewed the infographics about influenza and flu vaccination. In order to minimize this potential effect, I kept the order of (1) filling out the questionnaire, (2) interviewing, and (3) viewing of influenza infographics the same throughout the qualitative survey.

A final issue that can affect the outcome of a survey research project relates to (d) the personal characteristics of the researcher and his or her status during the fieldwork. Although it is known that both quantitative and qualitative researchers operate with a certain belief system, in quantitative studies researchers typically try to be “value-free rather than value-laden” (Lichtman, 2006, p. 17). This is different with qualitative research because here the researcher and the subject frequently experience an evolving research project relationship (Berg & Lune, 2012). To use Bogdan & Biklen’s (2007) words: “To subjects, you are likely to be seen not just as a researcher” (p. 94).

Numerous scholars have pointed out the importance of clarifying a researcher’s biases right from the outset of the study so that any reader will clearly understand the researcher’s position and any of the biases and assumptions that may have an impact on the research outcome (Bogdan & Biklen, 2007; Creswell, 2013; Lichtman, 2006; Marshall & Rossman, 2011; Merriam

& Tisdell, 2016). In my dissertation, I have described in the Introduction section how I positioned myself within this research study by revealing my personal characteristics like being from another country (Germany) and speaking English as a second language, residing in Minnesota, and being a former faculty member, as well as being a microbiologist and public health professional who believes in immunization against vaccine-preventable diseases. These characteristics as well as the fact that I held the ‘rank’ of a doctoral student in this research project most likely created some form of a power relation between me and undergraduate students who participated in the survey. In fact, the Institutional Review Board guidelines for this research project required me to disclose to undergraduate students during the invitation phase that I am a doctoral student at a university. Also, several students asked me during the qualitative survey if I am a scientist because of the way I asked them questions about influenza and vaccination. Finally, numerous students asked me during the qualitative *and* quantitative survey where I am from because I speak English with a foreign (German) accent. It turned out that having an accent was an advantage for me in this research project because several students (in particular female students) seem to have liked listening to my accent and encouraged me to ‘keep talking’ beyond my typical introduction speech during the survey invitation phase.

Reliability

Reliability is about consistency of the measure. Nardi (2014) pointed out that “Just because a measure is valid doesn’t necessarily mean it is reliable, and validity means little if the measure used is not reliable” (p. 63). There are several ways to determine whether or not the measures used in a research project are reliable. In my study, I have tested for inter-item reliability by comparing responses to similar items within the questionnaire to see if there is consistency in the measurements. An example are two questions on the questionnaire about flu

shots. In one question I asked ‘Did you receive a flu shot last year?’ and in the subsequent question ‘How many flu shots have you received in the last 3 years?’ If a student had answered ‘Yes’ to the first question but then filled in the number ‘0’ for the second question, I would have known that my survey instrument had a weakness as it may have caused confusion in study participants. Furthermore, I compared responses students gave on the questionnaire with those given during the interview as well as during the discussion of the infographics about influenza and vaccination. I did not come across any inconsistencies in the survey responses as it concerns inter-item reliability.

Creswell (2013) mentioned that reliability of the data can be further enhanced by obtaining detailed field notes, by using a good-quality tape for recording, and by self-transcribing the recordings. In this research project, I obtained detailed field notes, employed two high-quality digital recorders, and transcribed all of the recordings myself.

Generalizability

The tendency of survey research studies is to seek generalizability. This means to make conclusions about students not surveyed by using the information obtained from those who participated in the study (Fink, 2013). Factors that can influence generalizability include in particular sample size and selection (Endacott, & Botti, 2007). A limitation to statistical generalizability of the data obtained from my survey is the choice of the convenience sampling strategy. Convenience samples are limited in regard to generalization because they typically do not truly represent the total target population. However, I have described earlier that the sample count for many categories (e.g., gender, year of study, campus residence, etc.) lies within the acceptable range of the computed confidence intervals, suggesting with 95% confidence that these research samples represent the respective categories of the total undergraduate student

population at Laketree University. Furthermore, since the main focus of this study was to survey *only* undergraduate students (i.e., traditional students), who are typically more similar to undergraduates found at other universities (when compared to non-traditional students), I believe my research results can be used by other investigators for comparison to their data about the attitudes and behaviors of traditional students regarding influenza and vaccination.

Finally, as Maxwell (2013) pointed out, in qualitative research investigators rarely make explicit claims about the generalizability of their findings. The reason is that they usually study a single setting or a small number of individuals. Thus, the main goal of most qualitative studies is not to generalize but rather to provide “a rich, contextualized understanding of some aspect of human experience through the intensive study of particular cases” (Polit & Beck, 2010, p. 1451). Given the fact that the undergraduate students who accepted my invitation to be interviewed came from diverse settings (e.g., from different states within the United States of America or from other countries, from various ethnicities and having various religious affiliations, as well as from different levels of undergraduate education (freshman, sophomores, juniors, and seniors) allowed me to feel confident about the internal generalizability of the study. In short, I was aware that “A key issue for internal generalizability is to adequately understand the *variation* in the phenomena of interest in the setting or group of people studied” (Maxwell, 2013, p. 137).

Ethical Considerations and Regulatory Constraints

Gaining permissions to conduct the survey played an important role in my dissertation research project. Since I surveyed human subjects (undergraduate students) and conducted the study at an institution of higher education (Laketree University), I needed to get approval for my project from multiple individuals and levels of organization. These included the approval from the Institutional Review Board (IRB) of my university and the approval from the Dean of

Students at Laketree University. The IRB approved my application on November 30, 2015 (IRB # 833932-1), which included a permission to present in my dissertation also the research data of the pilot study, which I had conducted in 2014 (IRB # A11-205-01). The IRB Application document for the dissertation study is presented in Appendix D.

It was a requirement of the IRB to prepare a Consent Form for undergraduate students to sign prior to the qualitative survey. This document is presented in Appendix E. This form was signed by all students who accepted my invitation to participate in the qualitative survey. Since the quantitative survey was anonymous, a consent form was here not required.

Participation in this study was entirely voluntary and students were free to withdraw at any time up to and until the completion of this project. In case a student decided to withdraw from this study, the data collected were not used for analysis. Students were also free to skip any questions I asked on the paper survey as well as during the interviews and subsequent discussion of the influenza infographics.

All records of this dissertation study were kept confidential, which includes information that might have made it possible to identify study participants. Since each student who participated in the qualitative survey was known to me, pseudonyms were chosen for their names to protect their identity. The type of records I created include completed questionnaires and audio recordings, transcripts of the recordings for data analysis, and computer data records. The information contained in these records are currently stored in my business office at my private residence. Only I have access to the complete set of data. In addition, members of the research team (i.e., members of the dissertation committee) or members of the IRB can have access upon request. After the completion of the dissertation project, which may include subsequent publication of data in scientific journals, all data will be transferred to USB drives and stored

indefinitely in a safe deposit box I have rented at U.S. Bank. Files stored on my office computer and on the network storage at the University of St. Thomas will then be deleted.

Finally, there was no financial compensation of students participating in this study. However, every student received a BiC Round Stic Ball Pen for filling out the written survey questionnaire. In addition, students who participated in the interview received a SanDisk ‘Cruzer U’ 16 giga bytes USB Flash Drive. These incentives were given to each study participant at the beginning of the survey, and any student who withdrew from the study could keep the items.

Participant Introduction

In this dissertation research project, a total of 303 undergraduate students participated in the survey I conducted at Laketree University. More precisely, (a) 288 undergraduate students completed the written questionnaire during the anonymous quantitative survey and (b) 12 undergraduate students participated in the non-anonymous qualitative survey, which consisted of filling out the questionnaire, followed by the interview discussing the answers students gave on the questionnaire, followed by a discussion of the influenza infographics. This resulted in a total of 300 undergraduate students who participated in the mixed-methods survey conducted during the 2015-2016 influenza season. In addition, (c) the qualitative data of 3 undergraduate students who participated in the pilot study in 2014 were included in the analysis of this dissertation research project. This brought the total number of undergraduate students who participated in the qualitative survey to 15. The demographic information about all undergraduate students who participated only in the quantitative part of the survey is presented in Table 2.5.

Table 2.5

Demographic Characteristics of Undergraduate Students Who Participated in the Anonymous Quantitative Survey at Laketree University (N = 288)

Characteristics	Students	Number of respondents (n)	Percentage of total respondents (%)
Gender:			
Male		147	51.0
Female		141	49.0
Year of study:			
1st year		69	24.0
2nd year		77	26.7
3rd year		62	21.5
4th year		60	20.8
5th/6th year		19	6.6
Beyond 6th year		1	0.4
Field of study (College/School)*:			
Arts and Sciences		129	44.8
Education		14	4.9
Business		107	37.1
Engineering		29	10.1
Social Work		6	2.1
Not specified		3	1.0
Campus residence:			
On-campus		108	37.5
Off-campus		180	62.5
Place of Origin:			
Minnesota		213	74.0
Out of state		64	22.2
Out of country		11	3.8
Age group:			
18		46	16.0
19		65	22.6
20		64	22.2
21		64	22.2
22		24	8.3
23		12	4.2
24+		13	4.5

Note. *Based on the majors students entered on the questionnaire, I checked Laketree University’s catalog of undergraduate programs and grouped these majors by colleges/schools. (Table continues on next page)

Table 2.5 (continued)		
Students	Number of respondents (<i>n</i>)	Percentage of total respondents (%)
Ethnicity:		
American Indian or Alaska Native	1	0.3
Asian	18	6.3
Black or African American	18	6.3
Hispanic	15	5.2
Native Hawaiian or other Pacific Islander	1	0.3
Non-Hispanic White	222	77.1
Multiracial or Other	13	4.5
Religious Affiliation:		
Buddhist	3	1.0
Catholic	129	44.8
Christian	101	35.1
Islamic	10	3.4
Jewish	0	0
Other	12	4.2
None	33	11.5

In the following sections, I introduce the undergraduate students who accepted my invitation to participate in the qualitative survey of both the dissertation study conducted during the 2015-2016 influenza season and the pilot study conducted in 2014. Table 2.6 provides a summary table of the demographic data for these students.

Eduardo

Eduardo is a 24-year old male from Minnesota. He resides off-campus and lives with his parents. Eduardo is enrolled in an undergraduate program at Laketree University and has chosen physics as the major field of study. He is in his third year of undergraduate study. Eduardo identified himself as a non-Hispanic white with a Catholic religious affiliation.

Fiona

Fiona is 20 years old. She is from Minnesota and lives off-campus while studying at Laketree University. She is in her third year of undergraduate study with a major in operations and supply chain management. She described herself as a non-Hispanic white women with a Christian religious belief.

Frank

Frank is a 32-year old male from Minnesota who lives off-campus with his parents and is enrolled at Laketree University as a fourth-year student in accounting. He identified himself as a non-Hispanic white and holds a Christian religious affiliation.

Henry

Henry is 19 years old. He has chosen biochemistry as his major while being enrolled as a second-year undergraduate student at Laketree University. He resides on-campus in a dormitory. Henry is from Minnesota, a non-Hispanic white, and described his religious affiliation as 'Agnostic.'

Jim

Jim is a 22-year old. He is from Minnesota, lives off-campus in an apartment, and is a fourth-year undergraduate student at Laketree University. His academic focus is on entrepreneurship, real estate, and finance. Jim has a Catholic religious affiliation and identified himself as a non-Hispanic white male.

Kelly

Kelly is a 19-year old female from Minnesota. She is studying biology (pre-med) in her first year as an undergraduate student at Laketree University. While at Laketree, she lives on-campus in a dormitory. Kelly is a Christian and a non-Hispanic white.

Bee

Bee is 22 years old. She identified herself as a multiracial female from Minnesota with a Christian religious affiliation. She studies entrepreneurship in her fourth year as an undergraduate student at Laketree University. Bee lives on-campus in a dormitory.

Chris

Chris is a 22-year old male who comes from Minnesota and lives off-campus while being enrolled in an undergraduate program at Laketree University. He studies operations and supply chain management and is in his fourth year of study. He characterized himself as a non-Hispanic white male with no religious affiliation.

Grace

Grace is 19 years old and from Wisconsin. She studies business/entrepreneurship in her first year as an undergraduate student at Laketree University. Grace lives in a dormitory on-campus. She has a Catholic religious affiliation and identified herself as a non-Hispanic white female.

Jane

Jane is 20 years old, from Minnesota, and lives off-campus in a house. She is in her third year of undergraduate study in accounting at Laketree University. She is a non-Hispanic white female and described herself as a Christian.

Sarah

Sarah is a 19-year old female. She is from Florida and lives on-campus in a dormitory while being enrolled in an undergraduate program at Laketree University. She studies music and business in her second year, has a Hispanic ethnic background, and disclosed that she has no religious affiliation.

Darius

Darius is 20 years old. He is from Minnesota and studies communication and journalism, as well as political science as a third-year undergraduate student at Laketree University. He lives off-campus with his parents. Darius identified himself as a non-Hispanic white male holding a Christian religious affiliation.

Ben

Ben participated in the pilot study. He is 19 years old and from Minnesota. He studies economics in his second year as an undergraduate student at Laketree University. Ben is a non-Hispanic white male.

Carlo

Carlo was also a participant in the pilot study. He is a non-Hispanic white male and 20 years old. Carlo is from Minnesota and in his third year of undergraduate study at Laketree University with a major in engineering.

David

David is 19 years old and from Cameroon. He is an undergraduate student at Laketree University and chose biochemistry as a major. He is in his second year of undergraduate study and participated in the pilot study. David identified himself as a Black/African American.

Table 2.6

Summary Table of the Demographic Information about Undergraduate Students Who Participated in the Qualitative Survey at Laketree University (N = 15)

Gender		<u>Males</u> 9	<u>Females</u> 6	
Year of study	<u>1st year</u> 2	<u>2nd year</u> 4	<u>3rd year</u> 5	<u>4th year</u> 4
Field of study	<u>Arts and Sciences</u> 5	<u>Business</u> 8	<u>Education</u> 1	<u>Engineering</u> 1
Campus residence ^a		<u>On-campus</u> 5	<u>Off-campus</u> 7	
Place of origin	<u>Minnesota</u> 12	<u>Wisconsin</u> 1	<u>Florida</u> 1	<u>Cameroon</u> 1
Age group	<u>18-19</u> 6	<u>20-21</u> 4	<u>22-23</u> 3	<u>24+</u> 2
Ethnicity	<u>Non-Hispanic white</u> 12	<u>Black/African American</u> 1	<u>Hispanic</u> 1	<u>Multiracial</u> 1
Religious affiliation ^b	<u>Catholic</u> 3	<u>Christian</u> 6	<u>Agnostic</u> 1	<u>None</u> 2

Note. ^{a, b}The 3 students who participated in the pilot study were not asked these questions.

CHAPTER THREE:
AUTHORITY AND ITS IMPACT ON STUDENTS' PERCEPTIONS OF
KNOWLEDGE AND RISK

Introduction

Influenza presents a significant threat to human health not only during pandemics but also during seasonal epidemics. This is a scientific fact that is undisputed by scientific authorities as it is well documented through overwhelming evidence accumulated over the past century by influenza researchers from around the globe. Yet, the research community is only one part of the large authoritative body that together influence us how we think about influenza as a risk and how we respond to it. In my study, undergraduate students were the recipients of all kinds of health information about influenza provided by various authorities, including the government, public health agencies, the pharmaceutical industry, health care professionals, and last, but not least, the university. All these entities together created a web of interactions that ultimately led to a social construct that was carefully engineered by the various parties through power relations and overlapping interests.

In this research project, one of the questions I set out to answer was: How do undergraduate students perceive influenza as a risk in light of risk information communicated by authoritative bodies? I explore in this chapter the roles of different authoritative bodies and describe how students perceive authority as well as their own knowledge about influenza and vaccination, and how they interpret risk. Based on the coding I performed on students' answers, I uncovered the following two themes: authoritative powers, and knowledge and uncertainty of risk. For the interpretation of these themes, I used the theory of culture, fear, and trust, developed by Douglas and Wildavsky (1983) and the concept of field described by Bourdieu (1993, 2003, 2004, 2014) and Bourdieu and Passeron (2015).

Authoritative Powers

When we think about authoritative power, we may have difficulties defining it. So it is perhaps best to look first at the word *power* and then add the word *authoritative*. Northouse (2007) pointed out that

[t]he concept of power is related to leadership because it is part of the influence process.

Power is the capacity or potential to influence. People [and organizations] have power when they have the ability to affect others' beliefs, attitudes, and courses of action. ...

When they do, they are using their power, the resource they draw on to affect change in us (p. 7).

When we add the word authoritative to power, we indicate that there is “[a]n accepted source of expert information or advice” (Pickett, 2000, p. 121). This implies that there is someone authorized, considered legitimate, and in control to make decisions. In the following sections, I will briefly describe the main authoritative bodies that take part in influenza prevention and control, and then look at undergraduate students' perceptions of knowledge and risk that was influenced by the kind of information authoritative powers communicated.

Developing influenza vaccines is a complex process. It involves the development of candidate vaccines, the testing through various clinical trial phases, and the approval by regulatory bodies (e.g., the U.S. Food and Drug Administration) before companies are authorized to produce vaccines in certain quantities (Stöhr, 2013; U.S. Food and Drug Administration, 2016a). The product development cycles for new vaccines can take up to 8-12 years at a cost ranging between \$300 million to \$1 billion, and most vaccine companies spent approximately 10-25% of their revenues for research and development (Stöhr, 2013).

The Centers for Disease Control and Prevention (CDC) is another authoritative body that came up several times during the survey. The CDC is a public health institute of the United States (i.e., a government institution), that takes on roles such as detecting and responding to new and emerging health threats, putting science and technology into action to prevent disease, and developing public health leaders and building capabilities to protect society from health threats (Centers for Disease Control and Prevention, 2017). The Advisory Committee on Immunization Practices (ACIP), a group of medical and public health experts, releases every influenza season its recommendations on a variety of issues, including the composition of the flu vaccine by selecting particular influenza strains, such as A(H1N1)pdm09, A(H3N2), and influenza B. They also provide information on vaccine efficacy, effectiveness, and safety, as well as the rationale for vaccination of specific population segments. Furthermore, these experts discuss antiviral drug use and provide information about the reporting of adverse events (Grohskopf et al., 2016). Although the CDC has primarily a national (United States) focus, its capacity for developing and applying disease prevention and control methods are used around the world, and its recommendations are often adopted by the World Health Organization (WHO).

The WHO is an international organization created by member states of the United Nations in 1948. It has offices in more than 150 countries, and is a special agency that is responsible for developing policies and programs aimed at attaining the highest possible standard of health for *all* people. More specifically, the responsibilities and functions of the WHO include coordinating international health by assisting governments in strengthening health services, establishing and maintaining administrative and technical services, stimulating the eradication of diseases, and promoting cooperation among scientific and professional groups (World Health Organization, 2017a).

Academic institutions like Laketree University as well as doctors and other health care providers depend on the guidelines provided by organizations such as the CDC. In fact, it was the CDC which developed guidance and communication tools for institutions of higher education during the 2009 H1N1 flu pandemic, which included fact sheets (action steps to prevent the spread of flu), posters, and template letters for students, faculty, staff, and parents (Centers for Disease Control and Prevention (2010a). It was mentioned in one of its guides (Centers for Disease Control and Prevention (2010b), which are regularly reviewed and updated based on advances in preparedness and response planning, that

[i]nstitutions will need to tailor the guidelines to their own unique circumstances, taking into account the size, diversity and mobility of their student body, faculty, and staff; their location and physical facilities; programs; and student and employee health services.

Decisions about which strategies to implement should balance the goal of reducing the number of people who become seriously sick or die from flu with the goal of minimizing educational and social disruption (pars. 4-5).

Bourdieu (1993, 2004) pointed out with his theoretical model of field that any social formation is structured through a series of hierarchically organized fields, and that each of these fields can be seen as a structured space in which its members follow its own laws and engage in modes of operations that are relatively autonomous and different from other fields, yet structurally homologous with all the other fields. For example, the scientists work in the scientific field and are constantly adjusting to the expectations inscribed in this particular field. The rules and regularities that have been created in this field essentially determine the behavior of scientists (Bourdieu, 2004). The same is true for the other fields, such as those carved out by industry, the CDC and the WHO, health care professionals, and the university. Despite the fact

that these entities have their own authoritative powers, emphasize hierarchy, and make their opinions about topics clearly known, their structures are all socially constructed and are thus dynamic. They can even have the same goal and work in concert, as is the case in influenza prevention and control. Here, all entities came to recognize influenza as a dangerous infectious disease and attempted to create a functional powerful relationship between the various field sources.

Data from this research project showed that some undergraduate students believe in the authoritative powers of the organizations I have mentioned above, while others are more skeptical. I present below some comments students made during the interviews as well as comments made on the questionnaire by students who participated in the anonymous quantitative survey. All these comments allowed me to identify the following data analysis categories: level of trust in industry, level of trust in government agencies, and level of trust in the university. I will add here also some comments of students about their trust in the media and in the Internet because these two sources serve essentially as carriers for the transfer of information, and the perception of their trustworthiness and presentation style can influence students' perceptions of trust in authoritative powers.

Level of Trust in Industry

Perceptions of business strategy.

Lately, I do see many companies advertising 'Get Flu Shot Here.' Makes me wonder if profit is involved. Also, my work sent me an email to take it (Male student, 5th/6th year).

I am in operations and supply chain management, and we looked at what one can do with supply when [the] H1N1 [flu] came. And [it was] said that there are huge issues with hand sanitizers. [More specifically,] there were not enough hand sanitizers to be distributed. Everybody was using it, it was in high demand. But [the companies] did not want to produce more hand sanitizers because [this product] has a shelf life of, let's say, six months, or whatever it is. So, when the virus [outbreak] went down, so went the

demand for hand sanitizers ... and then it was wasted capital. That was a big issue (Chris).

These two statements reflect the basic function of a business, which is, to make profits by following the economic model of supply-and-demand (Rohlf, 2002). Chris provided an example of shortage/surplus caused by under-/over-production of hand sanitizers that can cost companies significant losses in profits and can lead to a deterioration in a corporation's competitive market position.

There is another example of inadequate production during the flu pandemic of 2009: excess production of the influenza A(H1N1)pdm09 vaccine. During the pandemic, the WHO released numerous global influenza alerts. One of these alerts was the declaration of a phase 6 pandemic (widespread human infection) on June 11, 2009, which led to intensified responses to reduce the impact of the outbreak on society at the global level (World Health Organization, 2009d). The other was the announcement on August 10, 2010, that the pandemic was over (World Health Organization, 2010). Some critics believe that the WHO created panic and confusion, and caused governments to over-stockpile the H1N1pdm09 vaccine during the pandemic. It was reported, for example, that several European countries "have found themselves in the unexpected position of having millions of doses of surplus vaccine that they are now trying to offload" (note that the initial assumption was that two doses of vaccine were needed for sufficient immunization) (Shetty, 2010, p. 75). Other critics questioned the link of the WHO to pharmaceutical companies, such as GlaxoSmithKline and Sanofi-Aventis, which made big profits from producing the A(H1N1)pdm09 vaccine (Nebehay, 2010).

Those supportive of the vaccine industry also presented their perspective on these issues (Abelin, Colegate, Gardner, Heme, & Palache, 2011). These authors argued that

the vaccine industry has an essential role to play when called on by public health authorities. In answering this call, the manufacturers' role is clear: the rapid development, production and supply of safe and effective pandemic vaccines to enable the immunization of local populations. However, fulfilling this role is challenging.

Influenza vaccine manufacture is complex and time consuming, and requires specialist facilities and highly trained personnel. In addition, the timely provision of vaccines is not entirely controlled by manufacturers, and involves the collaboration of other organizations, for instance to ensure efficient regulatory review to provide logistical infrastructure.

Following the emergence of the 2009 A(H1N1) pandemic strain, a broad collaboration of international institutions, governments, public health authorities, scientists and vaccine producers came together to address these challenges. These partners went on to mount the most complete pandemic response ever undertaken (p. 1136).

Abelin et al. (2011) suggested that “[e]stablishing vaccine supply agreements beforehand would avoid the need for complex discussions during a period of intense time pressure” (p. 1135). These examples demonstrate tensions and position-taking of different entities in the quest for maintaining field positions. This is exactly what Bourdieu predicted would happen within a field when its stakeholders engage in the struggle for power and for maintaining or changing hierarchy. Bourdieu (2014) phrased it this way:

The field of forces is also a field of struggle, a socially constructed field of action in which agents equipped with different resources confront each other in order to gain

access to exchange and to preserve or transform the currently prevailing relation of force (p. 199).

Jim, a student in his fourth year of study in entrepreneurship, real estate, and finance, expressed his thoughts about this topic by including the medical field itself as represented by doctors. His comments are presented below.

Perceptions of concern about power relations of industry, government, and doctors.

I mean it takes a ton of money to come up with a new drug. You go through a lot of tests, you take a lot of risks, and then send [the drug] overseas and [test it] over there. I am not worried about the drugs [that are] here. I am worried about the drugs from outside the U.S. that may not be approved [here]. I worry we are missing out on drugs [before] they are coming [to the U.S.].

So, if there is any [drug] out there that isn't in the U.S. but, for example, in Europe, doctors really want to use them because they work. But, [doctors] have to wait another 3-5 years because [these drugs] have not been approved [here]. So I am always wondering if there is something for the flu they are making over there [that] is good for us. But because we are on that 3-5 year waitlist, we are missing out on it.

In my mind, the more laws you create and regulate, the more you let the government become a part of it. So, when I look at the medical field, a lot of doctors get out of the medical field because they see that the things are not going well between them and the government. So I look at it as when we take more and more money out of the industry, we are going to miss out on opportunities ... we are losing the minds behind it and the money needed to support it. And companies leave here because of regulations. So all that is why I have concerns. [However], you need to have regulations so that not the bad companies come in. And I agree with the regulations to make sure that the drugs work, by all means (Jim).

Jim points to the tensions between industry, government, and doctors. Like the members of other fields, doctors have also carved out their own space within the hierarchy and not only operate in existing structured structures, but also participate in structuring structures (Bourdieu, 2003; Swartz, 1997). More specifically, doctors have their own rules (e.g., the Hippocratic Oath and guidelines of medical associations) and behave in a way other health care professionals expect from them. Yet, they depend on the products (e.g., vaccines and drugs) and information (e.g., drug use instructions and leaflets for patients) of industry and government agencies.

Level of Trust in Government Agencies

One of the questions I had asked students in the survey was directed at the level of trust in the information about influenza provided by the authorities. Data from the quantitative survey showed (see Table 3.1) that the majority of undergraduate students (176/288, 61.1%) had trust in the information government agencies provide about the flu. Most students had a high level of trust (149/288, 51.7%) and some (27/288, 9.4%) had even a very high level of trust. It needs to be noted that the level of trust in government agencies was similar for both male and female students. A relatively small number of students (22/288, 7.6%) had ‘low’/‘very low’ trust in the authorities, while 90/288 (31.3%) had a neutral opinion. Table 3.1 shows all statistics related to this question on the questionnaire.

Table 3.1

Trust of Undergraduate Students in the Information about Influenza Provided by Government Agencies

Gender	Students' responses				
	Very high <i>n</i> (%)	High <i>n</i> (%)	Neutral <i>n</i> (%)	Low <i>n</i> (%)	Very low <i>n</i> (%)
Male <i>n</i> = 147	16 (10.9)	74 (50.3)	45 (30.6)	10 (6.8)	2 (1.4)
Female <i>n</i> = 141	11 (7.8)	75 (53.2)	45 (31.9)	9 (6.4)	1 (0.7)
Total <i>N</i> = 288	27 (9.4)	149 (51.7)	90 (31.3)	19 (6.6)	3 (1.0)
	176 (61.1%)			22 (7.6%)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

The issue of trust in authoritative powers was also studied by other researchers. For example, Byrne et al. (2012) studied 200 undergraduate students (142 females and 58 males) and measured trust in authorities by looking at ‘trust in government’ and ‘trust in the Health Service Executive’ by asking who provided the best possible advice regarding students’ health. In this study, participants were invited to respond to the statement on a scale ranging from 0-100. The authors then computed a mean of the two items and used it as a measure of ‘trust.’ They found that students’ trust in authorities was less than 50%. In contrast, my study revealed a higher level of trust: 176/288 (61.1%) for the combined Likert scale items ‘very high’/’high.’

I present below some of the comments students made during the interviews. Overall, the coding revealed a trust/mistrust dichotomy. But because there were different levels, I grouped the responses into the following subcategories: knowledge and expertise (trust), openness and honesty (trust), and concern (mistrust).

Perceptions of knowledge and expertise within government agencies.

I think when [government agencies] give information it usually turned out to be true. I just trust their research and judgment. They want to help (Jane).

I know from experience that they do their research. And because it’s actually from them, they are not tainted documents from another source. They are the actual documents, so it’s straight forward. The facts! I trust it because I know how the CDC works, how the organization works. I definitely depend on the expert knowledge. I do. I trust their knowledge (Jim).

I believe in the science. Their vaccines have been working before. They stopped other things before. I mean vaccines have gotten rid of the measles, mumps, and all these things. So, I trust them [and marked] ‘high’ but not ‘very high’ [on the questionnaire] because they can be wrong too. Everybody can be wrong. I believe it’s the most accurate information out there (Darius).

Perceptions of openness and honesty in government agencies’ messaging.

I feel like if the government is putting out information about the flu or any type of disease, [its agents] generally want to be truthful about it and get out all the information they have. They don’t want people in their country get to sick and not be able to work.

That's important for the economy too. They are trying to give you all the information they can (Henry).

My trust [in authority] is 'high' because ... [well,] I am analyzing the situation maybe too far ... I said it's 'high' but not 'very high' because I feel like if there was an epidemic or pandemic, the government might have reason to possibly withhold information to stop a panic. You know when people panic, they could loot stores or disrupt civilization. And the reason why I [did not mark] 'neutral' is because it's [government's] right or its responsibility to [provide] the public with information. So, the government is always looking for the greater good ... for the majority of the people. I trust how they deliver the information. You know, it is a good product. I trust the information. I don't believe [government] mislead[s] anybody unless [it] knew it would cause a huge panic (Chris).

Perceptions of concern about government agencies.

I believe the influenza vaccine is merely the government trying to make money. However, I don't believe in many other vaccines either. I rarely put medicines in my body. I don't trust it (Female student, 4th year).

I like to hope that we are always informed about [influenza], but sometimes there might be something really scary, something [the government] may not want to notify us before they know more about it. Sometimes I wonder if [the government is] not telling us about everything because it doesn't want that people freak out (Kelly).

The government is always late. So, I feel like by the time [the diseases break out], half the people are already dead (Ben).

Do not trust incompetent government agencies [!] (Male student, 3rd year).

Well, I am sure that the information [government] gives on influenza is accurate and true. It is just that I have low trust in government agencies in general. [It] may be conspiracy. I watch a lot of X-files. [I heard] about how they handled Ebola in West Africa and how they handled the resources. So, it's like ... I don't know how much I can trust you all. I think that I would be a stupid person if I would believe everything the government would say. Yes, you should question things, challenge things, even from authorities. Have you seen the X-files? Well, that's where it all came from (Bee).

These statements by students revealed quite different perceptions of trust/mistrust in government agencies in regard to influenza information and outbreak response. Students touched upon issues ranging from knowledge, good judgement, truthfulness, and avoiding a panic (i.e., an issue of national security), to economic importance and profit-making, and to late response

and sheer incompetence. What this means with regards to vaccination acceptance or refusal is a topic of another chapter in this dissertation.

A question about trust in information provided by Laketree University was not on the questionnaire. However, since the issue of trust came up several times during the interviews, I present here two comments students made about Laketree University's perceived role during an influenza outbreak on campus.

Level of Trust in the University

Perceptions of care provided by Laketree University.

I trust the school to actually make the decision what the severity of the outbreak is, and to tell us when it is safe. So, I am not really worrying about it because somebody has decided about it already (Eduardo).

If the university would tell us it's not safe [to come to school], they would cancel classes. So, like they would be obligated to keep us protected ... us students. I can trust them with that (Chris).

These statements point to a genuine belief that the university will take care of students during emergencies such as an outbreak of influenza.

In the final two sections, I will address students' perception of power of the media and of power of the Internet. As I had mentioned earlier, these two sources of information are discussed in this chapter solely as carriers of information provided by other authoritative powers. The access to and preference of information sources will be discussed in detail elsewhere.

Level of Trust in the Media and Internet

Trust in media.

You know the flu is not something I would be worried about being biased in the media. [This is] not like [in] politics or sports, or something like that. It is unbiased information [in the media with the goal] to keep the community safe and healthy. So, I would say that my trust level is very high in regard to the portrayal of sickness (Fiona).

Mistrust in media and Internet.

I feel like the media in general can sometimes make you feel a certain way ... [the media] kind of scare you ... [for example, if there is an] outbreak, words [are being used] that may it sound like it is the end of the world (Carlo).

If I hear something on the news, you think 'wow.' Or in movies ... [when] all these diseases spread and everything. And when your friends are sick

[Also,] WebMD and all those Internet sites. The things look a lot worse when you go on the Internet. [For example,] you have a stomach ache and you go to WebMD, and your symptoms fit Ebola or something, and then you think you have Ebola (Ben).

The comments students made about their perceptions of the media and the Internet indicate that both of these information carriers use their powers in two different ways. On the one hand, they report information in a manner that is perceived by undergraduate students as trustworthy (unbiased). On the other hand, they present information (modified) that can lead to a certain (emotional) response in people.

Knowledge and Uncertainty of Risk**Knowledge of Influenza**

In my research project, I did not ask undergraduate students specific knowledge-based questions about influenza. This is in contrast to other investigators (e.g., Betsch & Wicker, 2012; Lee et al., 2012; Merrill et al., 2010) who asked questions such as: What are common symptoms of influenza? What is the mortality rate of influenza? What are the priority groups for receiving the flu vaccine? Has the efficacy of vaccines been proven? The reason for not asking those types of questions was that my survey was not designed as a test of students' specific knowledge about influenza and vaccination, but was rather designed as a normative case study to explore how students' attitudes influence their behaviors towards the flu and vaccination. Interestingly, when I asked students at the end of each interview what their expectations were when they agreed to participate in my survey, three students gave the following answers:

I don't really know if this is a big deal, but I [thought] you would ask me more about my knowledge, what I do know about it. I mean I know the basics but not in-depth. I mean like being tested [by you]. But, I was not really sure what to expect (Kelly).

So, at the beginning I thought you were asking questions more on: Do you know how the flu virus starts? What kind of symptoms there are? And you would go down that path ... and your personal demographics, and: Why you feel like that would be a personal issue in how to protect yourself? (Chris).

I was a little skeptical because I was worried that you would ask questions about what it is, what the symptoms [of influenza] are, something I wouldn't know for sure. But I am glad you didn't [ask] because then I would have [had] to circle 'I don't know' for a lot of [the questions on the questionnaire]. I would say this [interview] exceeded my expectations. It was easier, it was not ... I don't know how to put it ... it was not uptight. I felt very comfortable ... I really liked the conversation. I felt very comfortable. It was good. Yes, it was worthwhile (Grace).

I need to mention here that I did ask students some questions that touched upon knowledge. For example, I asked students if they are familiar with the concept of influenza (a.k.a. 'the flu'). Another question was about the memory of the influenza pandemic of 2009. A third question was directed at exploring the extent students felt they were informed about the protective measures that could be taken if a flu outbreak would occur. The answers students gave to these questions in the survey are discussed below. I will also discuss what other researchers found.

It turned out that the vast majority (267/288, 92.7%) of undergraduate students at Laketree University felt that they are familiar with the concept of influenza. This was true for freshmen (66/69, 95.7%), sophomores (68/77, 88.3%), juniors (59/62, 95.2%), and seniors (74/80, 92.5%). Only very few students (21/288, 7.3%) marked on the questionnaire that they have heard of the concept, but were not exactly sure what it means. Male and female students across the stratum 'year of education' reported similar perceptions of familiarity with the concept influenza.

I was surprised about the high percentage of students who considered themselves relatively familiar with the concept of influenza because other investigators (e.g., Koskan, Foster, Karlis, Rose, & Tanner, 2012; Seale et al., 2012; Young, 2012) reported a rather high degree of students' uncertainty about their knowledge of influenza. Also, in some studies only very few students were able to accurately describe what (pandemic) influenza actually meant. In the interviews I explored the question of knowledge about the concept of influenza in more detail. Some comments undergraduate students at Laketree University made include the following, which shows how they interpreted the concept influenza:

I took it that everyone gets sick during the winter. That is what the concept is. And, normally, one gets sick, and suddenly everyone gets sick. That's kind of how I took it (Ben).

I would say it is a sickness that is commonly spread and is commonly caught during influenza seasons (Grace).

It means just sick. I have actually never seen anybody with the flu. So I don't actually know what it exactly is. It makes you sick and it is dangerous (Eduardo).

I basically understand how a virus works. It comes back and it mutates. And we have some doctors and scientists who have to come up with a vaccine every year that hopefully matches the virus (Carlo).

Thanks for making it clear [on the questionnaire] that influenza is known as the flu. I was unaware of this. We should be more familiar with the terms and definitions of diseases like influenza (Female student, 1st year).

When I asked students whether or not they remember the swine flu pandemic of 2009, 279/288 (96.9%) students marked 'yes' on the questionnaire. I followed up by asking students in the interviews why they remember this swine flu outbreak. Below are their responses:

I actually had a lot of close friends who got it. And I was very scared because I heard on the media sources, on the radio, how serious it was. When I knew my friends were very sick, I was really scared. I was really scared getting it myself. That was a while ago. I don't exactly remember when it happened. I think I was in middle school.

Teachers talked about it. It was a big deal. It was because students were getting it. The teachers told us to take precautions [and] to make sure we are all aware of it. So, everybody knew about it, and they made sure we knew about it (Kelly).

I was in high school when H1N1 was going on. But it was like in a joking manner. But it was also a serious thing that was going on when people got the influenza virus (Chris).

I think when the influenza came out the first time I was in middle school. [That outbreak] was well advertised, it was addressed. The swine flu was the one we mostly talked about. The news talked about it a lot, and also my teachers talked about it (Sarah).

[I heard about it] on television and on reading it on my phone. And then I had a friend who got sick with the swine flu (Darius).

These comments of students indicated that they remember the 2009 H1N1 influenza pandemic from the time they were still in school. They are memories that apparently touched students in various ways: (a) they became aware that other students became sick from the swine flu; (b) they heard about the pandemic in the media (note: the H1N1 flu pandemic of 2009 was well covered in the media); (c) teachers talked to students about the swine flu and advised them to take precautions; and (d) students perceived the flu pandemic as something that is scary. In sum, students became knowledgeable about the flu (here: the 2009 pandemic flu) at a relatively young age and received information about it from various sources.

I explored further in my research study the issue of memory about the flu by asking students about protective measures. I did not ask them about specific measures, but rather explored to what extent students felt they were informed about the various protective measures that could be taken in the event of a flu outbreak. The results to this question are displayed in Table 3.2.

Table 3.2

Undergraduate Students' Knowledge about Protective Measures against Influenza

Gender	Students' responses				
	Very well informed <i>n</i> (%)	Well informed <i>n</i> (%)	Somewhat informed <i>n</i> (%)	Little informed <i>n</i> (%)	Not informed at all <i>n</i> (%)
Male <i>n</i> = 147	11 (7.5)	27 (18.4)	65 (44.2)	38 (25.8)	6 (4.1)
Female <i>n</i> = 141	11 (7.8)	30 (21.3)	50 (35.5)	45 (31.9)	5 (3.5)
Total <i>N</i> = 288	22 (7.6)	57 (19.8)	115 (40.0)	83 (28.8)	11 (3.8)
	79 (27.4%)			94 (32.6%)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

Broadly speaking, considerably more undergraduate students at Laketree University perceived their own knowledge about measures of protection from the flu more suboptimal than considered themselves at least pretty well informed. More specifically, when data from male and female students were combined, it could be shown that only 22/288 (7.6%) students felt they are very well informed and 57/288 (19.8%) students are well informed. The vast majority of students (115/288, 40%) believed that they are somewhat informed, while 83/288 (28.8%) students marked on the questionnaire 'little informed' and 11/288 (3.8%) marked 'not informed at all.' The number of male students in the 'somewhat informed' group was slightly higher with 65/147 (44.2%) when compared to female students (50/141, 35.5%). When I analyzed the data by year-of-study in the undergraduate program, perception of knowledge about protective measures against influenza was similar in each year category (Table not shown). For example, while 16/147 (10.9%) 1st-year male students felt that they were somewhat informed about flu protective measures, 15/141 (10.6%) 1st-year female students felt the same.

Although my study was not aimed at explaining a possible link between how students viewed current perception of knowledge about the flu and their memories of the 2009 H1N1 pandemic (the latter took place during their middle/high school years, as discussed above), there is an indication that the flu pandemic made an impression on students. This can be seen in the way students spoke about the outbreak: the pandemic was “a big deal,” “a serious thing,” “well advertised,” and “mostly talked about.”

Knowledge plays an important role when it comes to the understanding and communication of aspects of risk. Students at Laketree University depend on what influential groups communicate, which is based on interests, beliefs, and preferences of these groups (Douglas & Wildavsky, 1983). But, what exactly is risk and how do undergraduate students perceive risk from influenza? This is a question I explore in the following section.

Sense of Uncertainty of Risk

In non-technical contexts, *risk* has been defined as “situations in which it is possible but not certain that some undesirable event will occur” (Hansson, 2014, para. 2). This implies that when there is a risk, there must be something that is not known or something that has an unknown effect or outcome. Risk involves the potential of losing or gaining something *we* value (in the case of influenza: physical health and/or emotional well-being) by engaging in a certain type of behavior, which can be an action or an inaction. Risk is a mental concept, and risk perception is thus a subjective judgment and can vary from person to person and from population to population. It can be examined from many different perspectives, especially from the perspective of the individual and that of the group (Douglas & Wildavsky, 1983; Fischhoff & Kadavany, 2011; Jeffery, 1989; Renn, 2010; Vaughan, 2011).

Bracken (2013) pointed out that risk perception can also be investigated from the perspective of time, such as a life-time risk or a risk per year. The annual influenza outbreak would be an example of a risk that occurs every year. Thus, undergraduate students at Laketree University need to decide every flu season how they should handle this risk. Furthermore, risk perception can be examined from the view point of a risk that was induced by technology (Douglas & Wildavsky, 1983; Morgan, 1981). An example relevant to my study is the development of protective measures against influenza, which include the proper annual selection of flu virus strains and the safe propagation of these viruses in laboratory environments, as well as the successful assembly and mass production of the flu vaccine with the goal to provide society with an effective and safe seasonal influenza vaccine (Stöhr, 2013). There is also the technological risk that sophisticated networks for disease surveillance (e.g., the Global Influenza Surveillance and Response System [GISRS]) and the communication channels to the public (e.g., the media and Internet) can break down before, during, and after flu outbreaks, affecting influenza epidemic or pandemic preparedness and response (Jernigan & Cox, 2013; Nelson & Sifakis, 2007).

According to Douglas and Wildavsky (1983), risk has three peculiarities: (a) there is significant disagreement about the problem (What is risky? How risky is it?); (b) people worry differently about the various risks they encounter (the personal or group perception of risk, i.e., the social construct of risk); and (c) there seems to be no synchronization between knowledge of a risk and action (e.g., I know the risk, but what should I do?). Of course, as the authors pointed out, one could follow the principle of doing the most in order to prevent the worst damage, but the biggest problem is that nobody can really precisely calculate the total risk we face. Thus, there is always the uncertainty, leading to fear of a risk. Douglas and Wildavsky (1983) believe

that “[f]ear of risk, coupled with the confidence to face it, has something to do with knowledge and something to do with the kind of people we are” (p. 2).

In my study, I asked undergraduate students how they would assess their personal risk of getting the flu during an annual influenza season. The results from the quantitative survey are displayed in Table 3.3. The data revealed that most students believe they have some risk of getting the flu. The proportions of risk perception were similar between males and females (79/147, 53.7% and 80/141, 56.7%, respectively). It turned out that risk perception was also similar when calculations were made for students’ program enrollment status (year of education) (Table not shown). More precisely, 34/288 (11.8%) freshmen, 47/288 (16.3%) sophomores, 41/288 (14.2%) juniors, and 37/288 (12.8%) seniors perceived influenza as some risk to their health.

Table 3.3

Undergraduate Students’ Perceived Personal Risk of Getting Influenza.

Gender	Students’ responses				
	Very high risk <i>n</i> (%)	High risk <i>n</i> (%)	Some risk <i>n</i> (%)	Very little risk <i>n</i> (%)	No risk <i>n</i> (%)
Male <i>n</i> = 147	2 (1.4)	16 (10.9)	79 (53.7)	46 (31.3)	4 (2.7)
Female <i>n</i> = 141	3 (2.1)	13 (9.3)	80 (56.7)	44 (31.2)	1 (0.7)
Total <i>N</i> = 288	5 (1.7)	29 (10.1)	159 (55.2)	90 (31.3)	5 (1.7)
	34 (11.8)			95 (33.0)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

When I explored further the topic of students' influenza risk perception during the interviews, I heard the following comments, which I grouped into two subcategories: (a) residing off-campus and (b) residing on-campus (i.e., in a dormitory). Although these subcategories were identified through the qualitative coding procedure of the research data, it turned out that they already existed on the questionnaire (in the section on demographics) when I asked students: Where do you reside?

Residing off-campus.

I live off-campus in a student home, less than a mile away from here. Personally I think there would be a decreased risk [of contracting influenza] if you live off-campus because you are not living among a large student body. However, since I am still attending Laketree University and go to classes, I am still at risk. I am with other students who are living in dormitories and have high risk. So even if I am more protected outside of Laketree University, when I come [to campus], I am entering that high risk environment (Chris).

The risk is that I am in public. I am at school all the time. If, for example, you are at the Mall, then I would say you have a high risk. There are many people around you. But here at Laketree University, there are also people [around you]. But [it is] especially at the beginning of the semester when everybody is mixing together and then the germs start flying. That's the biggest risk. And after a few months, everybody is exposed almost to everyone (Eduardo).

I live with other students in a house. I think it's not as a high risk as the dorms because in the dorms there are more interactions among students. I mean there is still a risk for me (Jane).

I live off-campus with my parents. I feel much safer off-campus than on-campus in a dorm mostly because of [personal] experience. I lived in dorms for two years here at Laketree University. Infections and bacteria spread there like nothing because people live so close together, using the same showers and bathrooms, walking on the same floors and touching the same things. You know if one person gets the flu down the hall, it will go all around (Darius).

Residing on-campus in a dormitory.

I definitely feel there is a difference. I live in a dormitory with five other humans. That puts me at more risk to get an infectious disease, and it increases the spread of these diseases. And when I get home, I get to wash my hands a lot to not bring the outside germs inside. So, yes, it makes a difference (Bee).

I think living so close with other students in a dormitory is different. I take more protective measures when people cough in the dormitory (Henry).

I would like to mention that Wilson and Huttlinger (2010) conducted a study at New Mexico State University (Las Cruces) during the H1N1 pandemic of 2009. They surveyed undergraduate students (primarily first- and second-year students) who were housed in dormitories on campus. These researchers asked: “Do you believe you are more likely to get the flu because you live in a dorm than if you lived off campus?” (Table 2, ques. 5). It turned out that 99/167 (59.3%) students answered *yes*, while 68/167 (40.7%) answered *no/don't know*. The authors interpreted the data as follows: “Students in this sample do not perceive (60%) dormitory living to be a greater health risk, even though the proximal distance among students diminishes by sharing bathrooms and sleeping quarters” (Discussion and Conclusion section, para. 4).

Although I did not ask in my survey whether or not students who participated in the interview received the flu vaccine during the pandemic, Eduardo, Jane, and Henry indicated that they got vaccinated during the 2015 influenza season, while Chris and Darius did not. Bee could not remember.

In the quantitative part of the survey, most students indicated they were not worried about getting sick from the influenza vaccine (see Table 3.4). More specifically, 100/288 (34.7%) marked ‘little worried’ and 96/288 (33.4%) answered ‘not worried.’ Only 7/288 (2.4%) and 42/288 (14.6%) marked on the questionnaire ‘very worried’ or ‘worried,’ respectively. The answers students provided were similar regarding their gender self-identification. These data indicated that the vast majority (196/288, 68.1%) of undergraduate students at Laketree University had only little or no worries about influenza vaccine side effects.

Table 3.4

Worries of Undergraduate Students They Will Get Sick from the Influenza Vaccine

Gender	Students' responses				
	Very worried <i>n</i> (%)	Worried <i>n</i> (%)	Neutral <i>n</i> (%)	Little worried <i>n</i> (%)	Not worried <i>n</i> (%)
Male <i>n</i> = 147	0 (0.0)	17 (11.6)	22 (15.0)	54 (36.7)	54 (36.7)
Female <i>n</i> = 141	7 (5.0)	25 (17.7)	21 (14.9)	46 (32.6)	42 (29.8)
Total <i>N</i> = 288	7 (2.4)	42 (14.6)	43 (14.9)	100 (34.7)	96 (33.4)
	49 (17.0)			196 (68.1)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

Some undergraduate students commented on the risk perception of side effects from the flu vaccine during the interviews or wrote a comment on the questionnaire:

Uncertainty of vaccine side effects.

You keep hearing vaccines cause 'xyz.' For example, autism or something? That preconception, does that affect something? Does that affect your thoughts about getting a flu vaccine? (Eduardo).

I have heard negative things about the flu shot and I don't think it is effective (Female student, 3rd year).

I know I probably should vaccinate but I am always afraid I'll get a 'mini' flu from the shot (Male student, 4th year).

Experts at the CDC pointed out that a flu shot cannot cause the flu (Centers for Disease Control and Prevention, 2013a). They referred to data from randomized blinded studies, where some people received the flu shot while others got shots containing only salt-water (i.e., physiological salt solution). The only symptoms or side-effects observed in study participants

were “increased soreness in the arm and redness at the injection site among people who got the flu shot. There were no differences in terms of body aches, fever, cough, runny nose, or sore throat” (para. 1).

The issue of students’ perception of influenza risk and flu vaccine side effects was also studied by other investigators. In many of these studies, students perceived the flu as a rather low (to moderate) risk to their health and pointed to safety concerns about the flu vaccine (e.g., Akan et al., 2010; Hashmi et al.; 2016; Wilson & Huttlinger, 2010; Lawrence, 2014; Lee et al., 2012; Lehmann et al., 2015; Ramsey & Marczinski, 2011; Ravert et al., 2012; Suresh et al., 2011).

It is known that influenza vaccines can have side effects. These include the above described (minor) reactions at the injection sites and other rather uncommon, but more serious, adverse events such as hypersensitivity reactions and systemic reactions. However, influenza vaccines are considered by the authorities to be among the safest medical interventions that have been developed (Keitel et al., 2013). Douglas and Wildavsky (1983) discussed the issue of hidden risks, which means, risks people feel they should have been warned about, and if they would have known, might have chosen to avoid. In my study, the two main risks undergraduate students were asked to discuss were the perceived risk of contracting influenza and the risk of making a decision they might perceive later as questionable. But, Douglas and Wildavsky (1983) tell us that decisions about risks are not that easy. For example,

[t]he mark of an intelligent man, it is said, is that the more he learns, the more he becomes aware of how much more there is to know. The advance of science increases human understanding of the natural world. By opening up new realms of knowledge, however, science simultaneously can increase the gap between what is known and what it is desirable to know (p. 3).

This means that risk perception has to do with knowledge, or perhaps better, *current* knowledge. But, the problem with risk is that “[b]ecause no one knows it all, there can be no guarantee that the very dangers people seek to avoid are those that actually will harm them the most” (Douglas & Wildavsky, 1983, p. 3). The CDC and the WHO disclosed over the years a large body of information about the risk influenza viruses pose to human health as well as information about the benefits of vaccination and the potential risks of unwanted side effects (e.g., Centers for Disease Control and Prevention, 2013a, 2014a, 2016d, 2016e; World Health Organization, 2014b, 2014c). A lack of knowledge or misconceptions about seasonal influenza and flu vaccines can be dangerous. But, like with other risks humans face, there is no single correct conception of risk because risk is a concept that is developed through cultural relationships, and the perceived value of health-related information is thus influenced by the interaction between people and the interpretation and judgements individuals and groups make about the threat of any kind of danger (Douglas & Wildavsky, 1983).

Summary

In this chapter, I attempted to answer one of the questions I had asked at the beginning of this dissertation research project: How do undergraduate students perceive influenza as a risk in light of risk information communicated by authorities. I started out by identifying the authoritative bodies that participate in influenza preparedness and response. These bodies include the vaccine industry, the CDC and the WHO, health care providers (doctors), and the university. Furthermore, the media and the Internet were discussed as carriers of influenza information.

Using the theoretical model of field, developed by Bourdieu (1993, 2003, 2004, 2014), I could show that each of these entities has significant authority and has engaged in power struggles to maintain authority. This became particularly evident during the H1N1 influenza

pandemic of 2009. Although the interactions of the authoritative powers were complex and dynamic, as well as of political nature, they were able to work together in the fight against a highly contagious disease (influenza) in order to protect the public. The university's role was to receive and evaluate the information from other authoritative bodies, especially the CDC, and to implement influenza preparedness and response plans as was seen fits best the circumstances on campus.

Undergraduate students at Laketree University were the audience for information and guidance provided by the various authoritative bodies. It turned out that students perceived authoritative powers in different ways. While some students recognized industry as an important producer of protective measures (vaccines and hand sanitizers) against influenza, other students were skeptical in that they saw industry as an organization which focuses on making profits. The importance of drug regulation and its limitations were also discussed. Data from the quantitative survey revealed that the majority of undergraduate students (61%) trusted the authority of governmental bodies (e.g., the CDC) in providing information about influenza. This percentage was higher when compared to studies conducted about university students by other researchers. Undergraduate students who participated in my survey in the face-to-face interviews perceived government agencies as knowledgeable and trustworthy, but there were also significant concerns, such as incompetence and late response to infectious disease outbreaks. The university was seen as a caring institution which undergraduate students trust in making the *right* decisions, but which was also viewed as being obligated to protect students from harm. The media and Internet were perceived as both helpful and anxiety-inducing when it comes to the dissemination of information about influenza.

Students' knowledge was also investigated. The results from the quantitative survey showed that the vast majority of undergraduate students felt familiar with the concept of influenza, but the interviews revealed differences in knowledge. Although I did not ask specific knowledge questions about influenza in this survey, students mentioned at the end of the interviews that they had expected I would ask those questions. Almost all (96.9%) undergraduate students remembered the H1N1 swine flu pandemic of 2009, which occurred when these students were in middle or high school, suggesting a history/cohort effect. The collective memory of this pandemic was based on the news coverage of the outbreak, teachers' advice on what to do, and on students' observations that friends/other students became sick from the H1N1 influenza virus. The knowledge about protective measures was found to be suboptimal as the majority of students felt being only somewhat informed about these measures. The perceived knowledge was here similar between male and female students.

Furthermore, the uncertainty of risk was a major topic I discussed in this chapter. I defined risk from various viewpoints (e.g., from the perspectives of the individual and groups, by time, and through the lens of technology). The theoretical model of risk perception, developed by Douglas and Wildavsky (1983) was used here for the interpretation of students' perception of risk. More specifically, I pointed out that risk is viewed as a social concept and developed through cultural relationships, in which undergraduate students take part. The majority of students perceived influenza as posing 'some risk' to their health, and there was no difference in this perception between males and females. Furthermore, students perceived residing off-campus as somewhat safer than living in a dormitory on-campus, but pointed out that arrival on campus for school puts them at a similar risk of contracting influenza. This shows that students understood the role of crowding in increasing the chances for influenza virus transmission.

Students' perception of the safety of the flu vaccine was also investigated. Here, most students marked on the questionnaire 'little worried' or 'not worried' about flu vaccine safety, with similar results between the two sexes. There was, however, uncertainty about vaccine side effects, especially the perception that the flu shot might give a student a 'mini' flu. This misconception was clarified by referring to information provided by the CDC.

Finally, I discussed the importance of knowledge, which can be obtained through up-to-date information about influenza. I mentioned here Douglas and Wildavsky's (1983) comments that advances of science can lead to important knowledge, but can also lead to one that may not necessarily be desirable to know. What kind of information sources and advice undergraduate students at Laketree University seek about influenza and protective measures is the topic of the following chapter.

CHAPTER FOUR:
HIERARCHIES OF INFORMATION

Introduction

According to Pickett (2000), *information* can be defined as “knowledge derived from study, experience, or instruction;” it is essentially a “collection of facts or data;” and has to do with the “communication of knowledge” (p. 899). A university provides students with exceptional opportunities in learning and practicing critical thinking skills through the enrollment in various academic programs and extracurricular activities. Laketree University is a denominational academic institution which not only prepares students for productive and satisfying careers, but also encourages interactions with faculty, staff, and other students in order to open new perspectives on life, experience the value of responsibility, and learn how to make sound judgements about various topics. Put differently, it is a knowledge-intensive organization in which students are trained in accessing and evaluating information from various sources and across disciplinary boundaries. Its organizational mission is to build students’ capacity for creativity and to practice problem-solving and informed decision-making. Beyond this generic (university) mission, Laketree University contains distinctive mission and cultural traits, as do all universities, especially private ones. In sum, undergraduate students in my survey were exposed to a particular organizational culture—the culture of Laketree University—and its methods of research, (re-)production of knowledge, transformational teaching, and dissemination of all sorts of information.

In this chapter, I explore several issues that relate to the access and preference of information about influenza. More specifically, I look at the various sources and communication channels that can provide undergraduate students with information about influenza and flu

preventative/protective measures. I also look at the type of information students would like to receive in case a flu outbreak would occur on campus of Laketree University. This chapter is not about an exploration of the topic of 'information' from the perspective of the interactions of powerful organizations with each other, nor is it from the perspective of perception of that power by students or the perception of self-risk and knowledge. It is rather an attempt to answer the second question I had raised at the outset of this dissertation research project, that is: Where do undergraduate students seek advice and educational information about influenza and methods of flu protection? The coding procedure I performed on the answers students gave during the mixed-methods survey allowed me to identify three themes: information sources and pieces matter, infoglut, and attention-grabbing information. I relied upon the theoretical concepts of field, habitus, and symbolic violence, developed by Bourdieu (1989, 1990, 1993, 1998, 2003) and Bourdieu and Passeron (2015), to analyze these issues.

Information Sources and Pieces Matter

Information Sources

Information about influenza can come from various sources, including from personal experiences, other people, professional organizations, and one's university, as well as the media, websites, and books, to name a few. I invited undergraduate students in my survey to mark on the questionnaire, using a 5-point Likert scale, how important nine pre-determined information sources are in regard to learning about influenza and flu vaccination. The results are displayed in Table 4.1. It shows that the vast majority of undergraduate students (176/288, 61.1%) considers their doctor as a very important source of information about influenza and flu vaccination. The choice of using a doctor as the preferred communication channel for influenza information was

similar for male and female students (89/147, 60.5% and 87/141, 61.7%, respectively) (Table not shown).

Table 4.1

Importance of Sources of Information about Influenza and Flu Vaccination

Information sources	Students' responses				
	Very important <i>n</i> (%)	Important <i>n</i> (%)	Moderately important <i>n</i> (%)	Not very important <i>n</i> (%)	Unimportant <i>n</i> (%)
Ask other students	20 (6.9)	37 (12.8)	114 (39.6)	85 (29.6)	32 (11.1)
Ask a professor at Laketree University	12 (4.2)	60 (20.8)	103 (35.8)	83 (28.8)	30 (10.4)
Contact the Health Clinic at Laketree University	99 (34.4)	115 (39.9)	44 (15.3)	23 (8.0)	7 (2.4)
Ask my doctor	176 (61.1)	74 (25.7)	26 (9.0)	10 (3.5)	2 (0.7)
Ask my family	72 (25.0)	102 (35.4)	77 (26.7)	29 (10.1)	8 (2.8)
Watch television	28 (9.7)	54 (18.8)	98 (34.0)	72 (25.0)	36 (12.5)
Search the Internet via a computer	87 (30.2)	103 (35.8)	61 (21.2)	28 (9.7)	9 (3.1)
Read the newspaper	9 (3.1)	39 (13.6)	81 (28.1)	101 (35.1)	58 (20.1)
Listen to the radio	10 (3.5)	30 (10.4)	82 (28.5)	100 (34.7)	66 (22.9)

Note. Percentages for the Likert scales per information source were calculated based on $N = 288$. The highest responses in each row are shown in bold.

Undergraduate students marked as the next highest rankings (i.e., as 'important') Laketree University's Health Clinic (115/288, 39.9%), searches for information on the Internet (103/288, 35.8%), and consulting the family (102/288, 35.4%). Moderately important were sources such as asking other students (114/288, 39.6%), asking a professor (103/288, 35.8%), and watching television (98/288, 34.0%). Students considered not very important the newspaper (101/288, 35.1%) and the radio (100/288, 34.7%).

I present in Table 4.2 the three highest ranking sources of information about influenza and flu vaccination by combining the categories ‘very important’ and ‘important.’ Also this calculation revealed that the doctor ranked highest with 250/288 (86.8%), followed by the Health Clinic of Laketree University (214/288, 74.3%) and searching for information on the Internet (190/288, 66%).

Table 4.2

Three Highest Ranking Sources (‘Very Important’/‘Important’) of Information about Influenza and Flu Vaccination

Information sources	Students’ responses		Combined categories: ‘Very important’/‘important’ n (%)
	Very important n (%)	Important n (%)	
Ask my doctor	176 (61.1)	74 (25.7)	250 (86.8)
Contact the Health Clinic at Laketree University	99 (34.4)	115 (39.9)	214 (74.3)
Search the Internet via a computer	87 (30.2)	103 (35.8)	190 (66.0)

Note. Percentages for the Likert scales per information source were calculated based on $N = 288$. Data for the combined categories are presented in ranking order (highest to lowest).

When I asked students during the interview why the doctor is very important as an information source to them, I got the following answers:

If I need to know something about the flu, he’s gonna know. He is the expert (Eduardo).

I feel like my doctor would have more experience ... [sees] more people, [and] would [thus] more understand. [I mean he understands] the big picture. I also feel like a doctor understands the health risks, so [he] would know what kind of risks we have with influenza (Carlo).

I explored during the interviews with undergraduate students the reasons for the ranking of all these information sources listed in Table 4.1. It turned out that students used several terms during the interviews to describe sources of information about influenza and flu vaccination. For example, they used terms such as *primary* versus *secondary* information sources, and *direct* versus *indirect* information sources. While primary information sources are those that provide original data or documents (i.e., first-hand information), secondary sources are using the original information by, for example, summarizing, interpreting or modifying it in some other way, depending on their role in the dissemination process of information. Direct sources are often used synonymously with primary sources, while indirect sources are associated with secondary sources (Ford et al., 2012; Profit, 2016). Furthermore, there is also a distinction between the terms *subjective* and *objective* information sources and those that are *official* and *unofficial*. While subjective information sources are those that typically rely on word-of-mouth information, objective sources are considered impersonal and are believed to be sometimes more credible (Cooley & Madupu, 2009). Finally, official information sources indicate some level of legitimacy, while the legitimacy of unofficial sources is not clear (Yaqub, Castle-Clarke, Sevdalis, & Chataway, 2014). Students also used terms such as *expert* and *professional*. While an expert is a “person who has a high degree of skill or knowledge of a certain subject ... as the result of experience or training” (Pickett, 2000, p. 625), a professional is a person who is “engaged in, or suitable for a [particular] profession” (e.g., a doctor) (Pickett, 2000, p. 1400). I present below some of the comments students made during the interviews, which revealed reasons for their choices:

A professor is not a professional. I mean I am in the business school and [a professor is] not a doctor (Frank).

I think that all the information I need is on my cell phone or my computer. Newspaper is pretty much a dated method for my generation. And, information can change. So one minute you hear this information and the next it can change. You wouldn't find this in a newspaper (Bee).

Asking a professor is a secondary source. Contact the University Health Clinic is [also] a secondary source, but a little bit more reliable. The doctor would have more information and knows how it works. Family, [is] still [a] secondary source. TV, I feel is more accurate in regard to message, [it provides] more recent information (Chris).

I and my friends typically don't talk about the flu. So in college, if somebody is sick, you assume it is a hang-over. But if there is the flu, then I would most likely call my family doctor or ask my mom. But if I have symptoms and the doctor would not be available, or if it would be at night and my parents would be sleeping, then I would use the Internet to look up my symptoms (Fiona).

[Regarding 'ask other students:'] I think it is still important, but you get more information or better information from a doctor or someone older (Jane).

[Regarding 'ask professors:'] I feel like that they would know someone on it. I mean they would know more than a student would, or at least tell us who would know more about it. So it would be a little more important [to me] than [asking other] students. [And the Health Clinic:] the experts. [And a doctor:] Same thing, [he/she is] the expert. [The family:] Well, I can go to my family and get advice, and I can ask them where they get that information from, but I don't know how much they know. I don't even know if they have gotten the flu before. They know what they heard from their doctor. But they are not the legit doctor (Kelly).

Other researchers have also studied students' access and preference of various health information sources. For example, Betsch and Wicker (2012) reported that medical students considered health professionals and reference books as the most important sources of information, while the Internet was rated as less important, and television and radio as the least important information sources. Koskan et al. (2012) reported that many college students relied on opinion leaders (e.g., parents, professors, friends, and physicians) to help them "filter and respond to information" during the H1N1 pandemic of 2009 (p. 426). Furthermore, Nyhan et al. (2012) described that health discussion networks (that include parents, friends, and spouses) appear to be influential on students. Finally, Wilson and Huttlinger's (2010) research on health

communication strategies of undergraduate students showed that their top four sources for health information were (in ranking order): (1) family, (2) online, (3) friends, and (4) television. The doctor was chosen in fifth place. University flyers, the Student Health Center, and professors were the least likely sources for information, among others. An interesting observation is that health professionals were considered a very important information source both in my survey with undergraduate students and in the study by Betsch and Wicker (2012) with medical students. In contrast, undergraduate students in Wilson and Huttlinger's (2010) investigation revealed much different results regarding the preference of sources for influenza information. The reason for this phenomenon is not clear, but one may speculate that students at Laketree University are more exposed to health risk information provided by professionals such as a doctor or are in some way stimulated by past own experiences with the topic of influenza.

Using Bourdieu's (1993) theory of field, it can be said that undergraduate students at Laketree University represent a group of learners who occupy their own field within the social hierarchy. They are the end-receivers of information about influenza, and their behavior is created through the social contact with people from other fields, including family, health care professionals, and last, but not least, professional educators. This could have led to certain patterns of behavior that, according to Bourdieu (1990, 2013) and Bourdieu and Passeron (2015), are shaped by past experiences and structures, and are enduring, generative, and transferrable from one context to another. This concept is what Bourdieu defined as *habitus*. I have shown in the previous chapter that students have had past experiences with the topic influenza (i.e., the H1N1 flu pandemic of 2009) during their middle or high school years and were advised by teachers to take precautions. This disposition at younger age could have conditioned students, and the resulting behavior could have been later reproduced unconsciously and not necessarily

by a strategic calculation. In other words, it could have ultimately shaped students' current practices, such as listening and seeking advice from medical professionals (especially physicians) or being strongly encouraged to do that. Put another way, the H1N1 influenza pandemic experience in their region was a collectively significant experience to have continuing influence on their habitus. So much so that their hierarchy of trustworthy flu knowledge was much more like those studying to become doctors than other reported college students.

Information Pieces

I asked students in my survey what specific information about influenza they would like to receive in the event an influenza outbreak would occur on campus of Laketree University. I felt it was important to ask this question because it allowed me to find specific answers to what kind of advice undergraduate students seek regarding influenza and flu preventative and protective measures. The results are shown in Table 4.3.

The data revealed that all but one of the information pieces listed in Table 4.3 are considered as very important by students who participated in this survey. The highest four responses were (in ranking order): (1) how the flu can be treated (178/288, 61.8%); (2) which preventive measures against the flu are available to students (174/288, 60.4%); (3) what the best protection method is (163/288, 56.6%); and (4) information about the severity of the flu outbreak (161/288, 55.9%).

Table 4.3

Importance of Pieces of Information in Case of an Influenza Outbreak on Campus

Information pieces	Students' responses				
	Very important <i>n</i> (%)	Important <i>n</i> (%)	Moderately important <i>n</i> (%)	Not very important <i>n</i> (%)	Unimportant <i>n</i> (%)
What the symptoms of the flu are	112 (38.9)	112 (38.9)	45 (15.6)	16 (5.6)	3 (1.0)
How the flu spreads	148 (51.4)	101 (35.1)	29 (10.1)	9 (3.1)	1 (0.3)
The severity of the flu outbreak	161 (55.9)	96 (33.3)	28 (9.8)	2 (0.7)	1 (0.3)
How long the flu outbreak will last	111 (38.5)	106 (36.8)	60 (20.9)	9 (3.1)	2 (0.7)
My risk of catching the flu	148 (51.4)	97 (33.7)	30 (10.4)	12 (4.2)	1 (0.3)
How I can find out if I have the flu	146 (50.6)	95 (33.0)	35 (12.2)	10 (3.5)	2 (0.7)
If I can potentially transmit the flu to other people	133 (46.2)	105 (36.5)	41 (14.2)	9 (3.1)	0 (0.0)
How the flu can be treated	178 (61.8)	85 (29.6)	21 (7.3)	3 (1.0)	1 (0.3)
Which preventive measures against the flu are available to me	174 (60.4)	81 (28.1)	27 (9.5)	5 (1.7)	1 (0.3)
What the best protection method is	163 (56.6)	93 (32.3)	28 (9.7)	4 (1.4)	0 (0.0)
Where I can get information about the flu and protection methods	101 (35.1)	107 (37.1)	59 (20.5)	19 (6.6)	2 (0.7)

Note. Percentages for the Likert scales per information piece were calculated based on $N = 288$. The highest responses in each row are shown in bold.

It was surprising to observe that information on *where* to seek advice about the flu and protection methods was not considered as very important by the majority of students in this survey. But, it was still marked as 'important' with 107/288 (37.1%) responses. Although it is not clear why this latter piece of information is not as important as the other pieces listed in

Table 4.3, a reason could be that students already know where to get the most valuable information about influenza, which is from their doctor (see Tables 4.1 and 4.2). In fact, one student, Jim, who marked on the questionnaire ‘not very important’ for this piece of information, mentioned in the interview that “It’s not important because I have my personal doctors.”

I invited students during the interviews to expand upon their responses on the questionnaire. Below are some of their comments:

If I know what the symptoms are, then I can better assess myself. And when I am sick, I can take measures so that people don’t get sick by me. You know, [I mean] washing my hands and covering my mouth when coughing. So when I know how the flu spreads, then I can better protect myself. So when my friend is sick and he has the flu, and if it spreads through coughing, I can get away from him to protect myself.

It is not super important to me how long [the outbreak] will last because I have to get through it no matter how long it lasts (Henry).

[In regard to severity:] When everyone is at school, I want to know if I need to stay away from everyone, or if I even should go to school or rather stay away. It is also important what the symptoms are, but if everyone has it, then it is more important to know how severe the flu outbreak is. It depends on the severity and on how many people have it.

I don’t really care how long a flu outbreak will last. It is more like [a question of] ‘is it done or is it not.’ If I have [the flu], I want to know how I can treat it. I know already a little bit about it [i.e., the preventive measures]. I like more information. It would be helpful, but it is not a necessity. If the disease would be more severe and if there would be 80% of the people on campus who have [the flu], that would change. Then I would look for more information (Frank).

These two [‘my risk of catching the flu’ and ‘what the best protection method is’] are a little less important because I am more interested [in] what is best for me, not what the best protection method is (Bee).

[Information about the length of the outbreak:] I guess I feel it doesn’t really help you. Like washing hands is what you do all the time, and getting the flu shot is what they are telling you anyway. So knowing about how long the outbreak will last is not that important. I want to know what the symptoms of the flu are, how the flu spreads, how severe the outbreak is, how I can find out if I have the flu, and so on. It helps about planning what to do. Also, what your chances are to getting sick (Jane).

[Knowing the length of the outbreak is ‘important’:] So that you don’t stop protecting yourself too soon. You know some germs tend to linger (Sarah).

Bourdieu (1990) pointed out that habitus should not be viewed as a fixed or permanent behavior as it can change depending on situations and environments. Thus, practices of people should be interpreted in light of the fluid nature of habitus. Since students in my study were enrolled in programs at an institution of higher education (Laketree University), they were exposed to intense training in reasoning in almost every course and across disciplinary boundaries. The comments students made above revealed reasoning and calculation of the value of each information piece listed in Table 4.3. I suggest here to interpret students' comments as a sign for a developmental process in regard to the perception of influenza information, which began with basic conditioning of influenza practices at younger age (in middle or high school years) to advanced training in reasoning and calculation capabilities at an older age (at Laketree University). Bourdieu (1990) phrased it this way:

It is, of course, never ruled out that the responses of the *habitus* may be accompanied by a strategic calculation tending to perform in a conscious mode the operation that the *habitus* performs quite differently, namely an estimation of chances presupposing transformation of the past effect into an expected objective (p. 53).

Infoglut

We live today in the information age, which period began in the 1970s and is characterized by “abundant publications, consumption, and manipulation of all kinds of information” (Pickett, 2000, p. 899). This era in human history became possible through the development of new technologies, especially computers and platforms for their interconnectivity via all-digital, long-distance, fiber-optic cable and satellite communication networks that allowed private citizens, businesses, government, and other organizations to participate in the communication of information around the world. The Internet with its Web browsers, e-mail,

digital phone and video, as well as the creation of complex wireless capabilities and applications changed how we view our society. In fact, we now call it the *information society* because it can be distinguished from the previous industrial and agrarian societies in that it is a knowledge-based society created by a high-tech, global information superhighway (Aspray, 2015; Halal, 2004; Messenger, 2012; Pickett, 2000).

The accelerating power of technology produced so-called ‘big data’ (Schmidt & Cohen, 2013; Skiba, 2014; Wu, Zhu, Wu, & Ding, 2014). These are data which have been collected to such a large amount that it became difficult to read and interpret them all. While big data have the advantage that they contain a vast amount of information about all sorts of things (including health information), they have the disadvantage that they take time to be read and interpreted correctly. The access and interpretation of big data requires skills, not only technological skills (i.e., the correct use of computers and software packages) but also skills in selecting the right keywords, cross-referencing of online information, good time management, a degree of imagination to guess where perhaps the most useful answers might be hidden, and, last but not least, logic during the interpretation phase of selected information. Also, a user need to be aware that accessing too many data does not necessarily mean that knowledge in a specific field (e.g., science and health care) will automatically increase. It does mean, however, that people who decided to engage in big data interpretation have chosen to be a participant in the information age with all its benefits and shortcomings.

In science and health care, big data are the norm today. A ‘Google Search’ on the Internet on November 1, 2017, using the keyword *influenza*, revealed about 50,800,000 results. Every person, including undergraduate students, can be overwhelmed by information that is available today in various formats and on numerous websites. There is a term for this overload of

information, which is called ‘information glut’ (or short: ‘infoglut’). Kennewick (1999) described infoglut as a “constant saturation by too much information” (Introduction section, para. 2). He sees several problems with infoglut, including the fact that information is hard to find, and that one needs to decide how to organize or share findings. Zeldes (2009) recognized infoglut as “the disease of the new millennium” (Title section, para. 1). Yet, as overwhelming as infoglut can be, it contains important information about topics such as influenza and preventative/protective methods. Accessing and using this information can increase *health literacy*, which has been defined as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Ratzan & Parker, 2000, Introduction section, para. 7).

Infoglut and the Role of Laketree University

One of the perhaps easiest sources of information available to undergraduate students are those that are provided where they study day-by-day, which is at Laketree University. I asked students in this survey whether or not they would be interested in receiving information about influenza from this academic institution and would thus consider it as a source of advice. The results of the quantitative part of the survey are displayed in Table 4.4.

The data in Table 4.4 revealed that the majority of undergraduate students have only a moderate interest in receiving influenza information from Laketree University. More specifically, 73/147 (49.7%) of male students and 76/141 (53.9%) of female students marked ‘moderate interest’ on the questionnaire. When I combined the gender data, I found that 149/288 (51.8%) undergraduate students felt this way, while ‘high interest’ in flu information from Laketree University was selected by 71/288 (24.7%) students and very high interest by only

24/288 (8.3%) students. ‘Little interest’ was marked on the questionnaire by 39/288 (13.5%) students and ‘no interest’ by 5/288 (1.7%) students.

Table 4.4

Interest of Undergraduate Students in Receiving Information about Influenza and Flu Prevention and Protection Measures from Laketree University

Gender	Students’ responses				
	Very high interest <i>n</i> (%)	High interest <i>n</i> (%)	Moderate interest <i>n</i> (%)	Little interest <i>n</i> (%)	Not interest <i>n</i> (%)
Male <i>n</i> = 147	14 (9.5)	39 (26.5)	73 (49.7)	19 (12.9)	2 (1.4)
Female <i>n</i> = 141	10 (7.1)	32 (22.7)	76 (53.9)	20 (14.2)	3 (2.1)
Total <i>N</i> = 288	24 (8.3)	71 (24.7)	149 (51.8)	39 (13.5)	5 (1.7)
	95 (32.9)			44 (15.3)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

In the interviews, students commented on this issue as follows:

If [a flu outbreak] involves the campus, then yes, then I would want [information about the flu] provided by the university. But, if it would be just [an outbreak] throughout Minnesota, then I would just use the news to get information and, maybe, use the web a little bit (Frank).

I mean in my head I think that any information Laketree University is sending out is secondary information—a secondary source—, and I’d rather hear it directly from the primary source (Jim).

To have more information available would be very important in case there would be a severe outbreak. It's better to have that information available than not (Darius).

Swartz (1997) pointed out that Bourdieu's habitus has not only to do with internalizing experiences (e.g., successes and failures of practices), but it has also to do with the transformation of them into expectations of oneself and others. The comments made by Frank and Darius pointed to expectations of receiving influenza information from Laketree University *in case* a flu outbreak would occur. This is in agreement with comments of Eduardo and Chris about their perceptions of care provided by Laketree University, as I had discussed in the previous chapter. In brief, these two students mentioned that they trust the university to take care of them during emergencies such as an outbreak of influenza: "If the university would tell us it's not safe, they would cancel classes" (Chris); "I trust the school to actually making the decision what the severity of the outbreak is, and to tell us when it is safe" (Eduardo).

Attention-Grabbing Information

My survey was not designed to explore the marketing aspect of flu campaigns, which often use attention-grabbing strategies to encourage flu vaccination and inform the public about other flu protective and preventative measures (e.g., hand washing, covering nose and mouth when sneezing and coughing). However, the coding of student answers of survey data allowed me to identify two categories which led to the theme of attention-grabbing information: e-mails from Laketree University and infographics from government agencies. It is well documented that information sources can elicit various emotions in people, ranging from disgust and other unpleasant feelings, to empathy and sympathy, to liked or disliked, and to positive or negative stimuli for research, learning, and action (Dijksterhuis & Aarts, 2003; Estes & Verges, 2008; Mulckhuyse, Talsma, & Theeuwes, 2007; Pratto & John, 1991; Schwager & Rothermund, 2013; Silva, Montant, Ponz, & Ziegler, 2012; Unkelbach, Fiedler, Bayer, Stegmüller, & Danner, 2008;

Wentura, Rothermund, & Bak, 2000). This is especially true when it comes to the attention-grabbing power of threat-related information (Calvo & Castillo, 2005; Calvo, Castillo, & Fuentes, 2006). I describe below some of the comments students made during the interviews about both e-mails on influenza information from Laketree University and about flu information in form of infographics provided by government agencies.

E-mails from Laketree University

[In general,] I look at my e-mails and when there is something there, like a news feed, then I go online to find out what is going on. [And e-mails from Laketree University:] I would skim through it, but not click on it. Honestly, I would just only delete it. To be honest. Even if I would get something else in my e-mail inbox, I would not click on it. If there would be pictures in the news feed, then I may say 'Let's have a look at it' (Jim).

I would not do further research unless it would be a new name of a flu. That would make it scarier for the general public [if] it has a name (Fiona).

I only use e-mail to do what is important. Otherwise, I don't. If there would be something really important in the title or the subject, then I would probably read it. But the newsletter they send out every week: Delete! Delete! Delete! (Frank).

These comments showed that undergraduate students react stronger to e-mails they receive in their inbox only if the information has attention-grabbing content (e.g., a news feed with pictures; a new 'scary' name of a flu; or something in the title/subject line) and is perceived by students as important.

Infographics from Government Agencies

I included in the qualitative part of my survey the presentation of infographics to undergraduate students, which were developed by U.S. government agencies (see Appendix C). Although the idea behind showing these infographics was to find out what information students considered most useful to them and why, and what information they feel was missing but important to them (note: a detailed exploration of these aspects of the research project is presented in a later chapter), several students commented on two of the infographics (No. 1 and

No. 3; see Figures 4.1 and 4.2) from the perspective of attention-grabbing information.

Comments students made about this marketing phenomenon include the following (here as concerns Figure 4.1):

The picture with the coughing ... that's just gross! (Frank).

It would get my attention, [but] the person sneezing, that's gross to me. And the negative look on the faces of the other people ... I would most likely not read the bottom (Chris).

I feel like the flyer [is] like advertisement. They like to make money of the flu, [I mean], the vaccinations (Sarah).

This one does not do anything for me. It's more like they try to play on the fear [of people] by saying somebody around me is sick. Yes, it only says somebody is sick around me. It does not give me any information I am looking for. It does not do anything for me. It doesn't tell me anything. I would probably glance at it and then walk away (Eduardo).

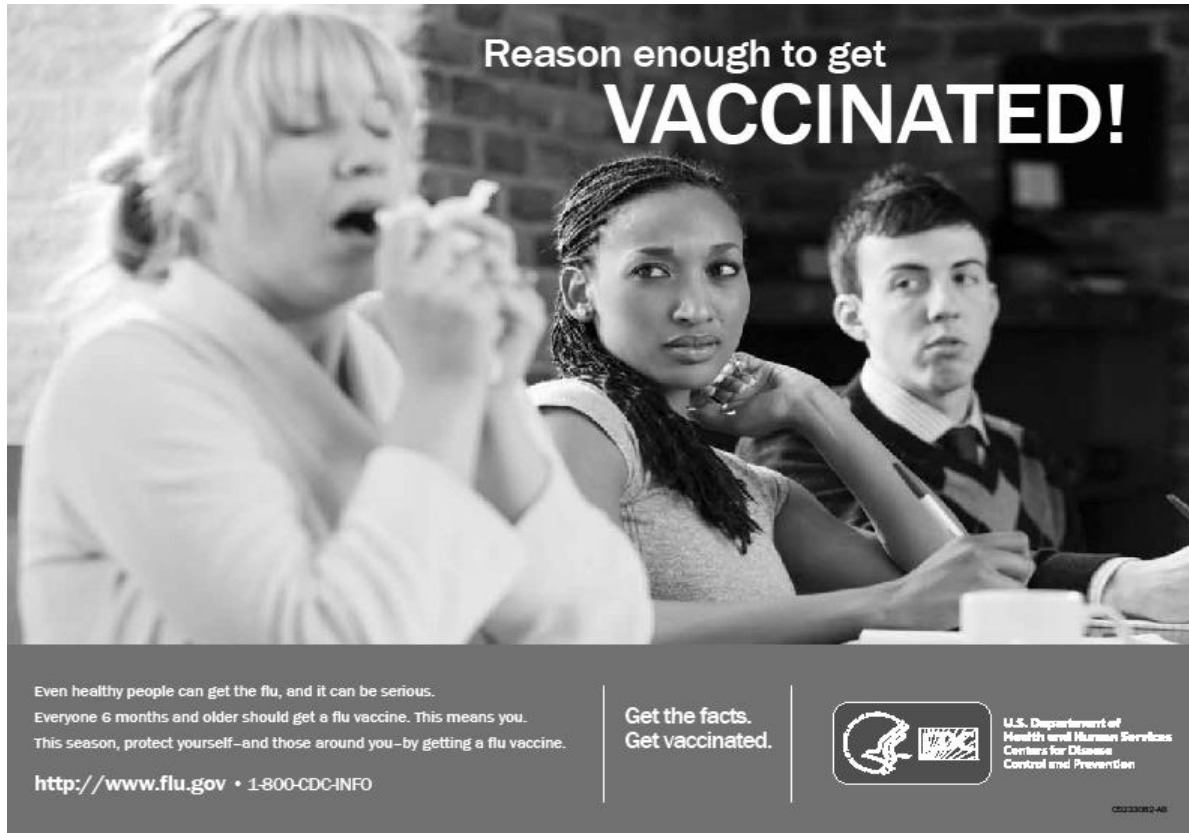
Something I see is missing is that she kind of looks like she has a cold. There are no flu symptoms as I see them. You cannot really show fever through marketing, and showing a stomach bug, because that would be kind of gross. She just has a cold, that's how I see it.

When I think of the flu, I think of someone in bed with a fever, but when I see someone in class, then I think more of someone with a cold. So, it is kind of unrealistic what is shown in this picture. But what I like is that it shows that someone can get sick, and it can get people around you sick (Fiona).

I probably wouldn't take much notice of it. This one is very corny. Like sneezing and ... ah! no! (Sarah).

This one is o.k.: 'Reason enough to get vaccinated!' But then I like to see the reason for getting vaccinated. I would like to see how a vaccination prevents the flu. Sometimes it seems like: Vaccinate! Vaccinate! Vaccinate! And then nobody really knows why and how. And that creates hesitation (Darius).

Figure 4.1. Influenza infographic no 1.



I would like to add a comment Ben made when I showed him this infographic. His comment has nothing to do with infographics about influenza but is worth mentioning here because it points to the fear factor anti-smoking campaigns use to attract attention and elicit emotions:

What really is a good advertisement is the cigarette commercials, where they show how people died (Ben).

Figure 4.2. Influenza infographic no. 3.



As concerns the images projected in Figure 4.2, the general consensus was that it certainly wasn't gross, it was inaccurate and misleading:

I like this one actually because I have been in a choir and stuff, and it is really catchy ... the headphones (Carlo).

So this one has just two people listening. I feel like I get their point that these are two people in close quarters, and if they get the flu they can spread it. But how I see this, I would not think about that I should get a vaccine. I would think it is an advertisement for headphones or something, to be honest with you (Henry).

I mean it says here ‘Spread the music, not the flu.’ They can be spreading the flu to each other right now! Yes, they are in close contact. That would be an easy way to spread the virus (Kelly).

This one here is bad. It looks like a music act. ‘Spread the music, not the flu’ ... that’s weird. This one has nothing to do with the flu. They are all happy and not sick, they are listening to music. I mean they may be happy because they have prevention ... I don’t know (Bee).

It’s kind of confusing ‘Spread music, not flu.’ I kind of don’t know what that means. It’s kind of weird. I don’t like it (Chris).

This doesn’t tell me anything. I mean it looks nice, but it doesn’t tell me anything. And if I would be walking by, I wouldn’t even be thinking about the flu (Frank).

I don’t even know [what it means:] ‘Spreading music, not flu.’ It doesn’t really relate to me (Jim).

It’s kind of a weird comparison. It’s like playing on words, but it’s kind of random. I think they are trying to get people’s attention (Jane).

It has barely any information about the flu or the vaccine. And I thought it was about music at first (Darius).

Kotler (2000) pointed out that advertisement (a) is essentially a public presentation and confers a kind of legitimacy on the product (here: the flu vaccine); (b) has a pervasive character in that the message is typically repeated many times and often in different forms (here on two infographics: “Reason enough to get VACCINATED!” and “Spread Music. Not Flu.”); (c) provides opportunities for dramatizing the product (here the fear factor: if no flu vaccination, then there is the risk of influenza) as well as the organization (here: referring to the authoritative power of the CDC as a U.S. government agency). This dramatization is known as *amplified expressiveness*; and (d) presented through impersonality because the communication is essentially a monologue, not a dialogue with the reader. The two infographics shown above (Figures 4.1 and 4.2) were designed to attract the attention of students enrolled in programs at institutions of higher education. Yet, the comments made by undergraduate students who

participated in my survey showed that the message of the CDC did not reach them as was intended. Thus, these two infographics must be seen as examples of failed advertisement as they apparently missed the target audience (college and university students) as well as the objective (i.e., to interest students in flu vaccination).

Bourdieu (1989, 2003) developed the concept of symbolic violence to describe a form of social domination by authoritative bodies (i.e., those who exercise power) over those who are positioned in a field lower in the social hierarchy (i.e., those who feel the effects of power). Symbolic violence is a form of power—a kind of subordinate force—that utilizes the power of words and commands to produce and reproduce beliefs that influence social habits. Because it is transfigured and has a legitimate appearance, this symbolic form of power is not easily recognizable. Bourdieu and Passeron (2015) phrased it this way:

Every power to exert symbolic violence, i.e. every power which manages to impose meanings and to impose them as legitimate by concealing the power relations which are the basis of its force, adds its own specifically symbolic force to those power relations (p. 4).

Symbolic violence plays a major role not only in everyday life but also in any kind of pedagogic action, including the reproduction in education, culture, and society (Bourdieu, 1993, 1998, 2003; Bourdieu & Passeron, 2015). There is no doubt that symbolic violence is used by authoritative powers (e.g., government agencies such as the CDC) in an attempt to influence students' behavior by using words and commands such as "Spread Music. Not Flu." (see Figure 4.2). It is also used in form of an emotion-grabbing force by using a fear factor (a person sneezing, indicating sickness) to make students realize that there is "Reason enough to get VACCINATED!" (see Figure 4.1). In other words, symbolic violence is essentially used as a

vaccination strategy by authoritative powers not only to convince individual undergraduate students through advertisement (here: infographics) to understand that vaccination is important (i.e., an aspect of education) but also to create a culture of vaccinators on campus (i.e., an aspect of culture). One would assume that symbolic violence is so powerful that it always works. But this is not the case as I have shown in this study by presenting these two infographics to undergraduate students and by listening to their voices.

Since flu vaccination is not mandatory (but recommended) for members of academic institutions like Laketree University, authorities can only hope that their efforts (the use of symbolic violence) to increase flu vaccinations will eventually lead to protection from influenza of a larger segment of the population (i.e., an aspect of society as a whole). But Bourdieu (1989) teaches us that “the holders of bureaucratic authority never establish an absolute monopoly, even when they add the authority of science to their bureaucratic authority” (p. 22).

Summary

This chapter covered the broad topic of information. I started out by describing the link between information and knowledge, and I pointed out that a university (here: Laketree University) is a knowledge-intensive organization which provides students with excellent opportunities for receiving and evaluating all kinds of information and for practicing critical thinking skills, problem-solving, and informed decision-making.

I examined a set of data from my mixed-methods survey that focused on the perceived importance of various sources and pieces of information about influenza and preventative/protective measures. It turned out that 61.1% of undergraduate students at Laketree University considered a doctor as the preferred communication channel for information about influenza. Students chose the doctor because they considered him or her an expert in the field

who has experience and understands the ‘big picture’ as well as the health risks students have. I presented findings of researchers from other universities and noted that undergraduate students in my study were more similar to medical students than to other undergraduate students in regard to choosing a doctor as the preferred information source. I speculated that two reasons for this phenomenon are (a) the exposure of students at Laketree University to health risk information provided by professionals such as a doctor and (b) and the stimulation to seek information influenced by students’ past experiences with the topic of influenza. I showed that students considered the health clinic at Laketree University as well as the family and the Internet as important (but not as very important) sources, while professors, television, the newspaper, and the radio were even less important. It became clear during the interviews that undergraduate students seek current influenza information that is from a primary source, especially if it is provided by a professional (e.g., a doctor).

I used Bourdieu’s concept of field to describe the undergraduate population at Laketree University as a group of learners who are the intended audience for information about influenza provided by authoritative powers. I applied Bourdieu’s concept of habitus to explain that students’ past experiences with the 2009 H1N1 flu pandemic, which occurred during their middle and high schools years, could have notably conditioned students’ thinking about influenza as they were told by teachers to take precautions. This conditioning of listening and seeking advice could have been reproduced unconsciously in later years, especially when students were exposed to a similar structural (academic) and motivating environment such as that they found at Laketree University. I mentioned that Bourdieu sees habitus not as a fixed or permanent behavior but rather as one that is fluid and changeable, especially when reasoning and calculation are added to the mix. Students’ answers about the value of different pieces of

information about the flu (e.g., symptoms, severity, spread, risk of contracting, etc.) clearly indicated that students made use of reasoning and strategic calculation when they marked their answers on the questionnaire, as was revealed later during the interviews.

Infoglut was another theme that emerged from the survey data. I mentioned that we live today in a knowledge-based, so-called *information society*, which utilizes high-tech, global information systems to produce big data that are difficult to sort out, read, and interpret correctly. I conducted a ‘Google Search’ to demonstrate that information about influenza can be indeed overwhelming as over 50 million results appeared accessible on the Internet screen. I mentioned that despite the fact that infoglut has its shortcomings (i.e., it delivers too much information), it is beneficial in that it can increase health literacy. When I asked undergraduate students in my survey whether or not they would like to receive information about the flu from Laketree University, the majority of male and female students (49.7% and 53.9%, respectively) showed only a moderate interest. However, students mentioned in the interviews that they expected to receive information about influenza *in case* a flu outbreak would occur. Using again Bourdieu’s concept of habitus, I interpreted students’ responses as an indication for a transformation of past experiences with the topic of ‘influenza’ into expectations (here: the expectation that Laketree University will take care of them if a flu outbreak would occur).

Finally, I talked in this chapter about attention-grabbing information. I pointed out that although my research was not aimed at exploring the marketing aspects of flu campaigns, some students made comments about the marketing value of two of the three infographics I presented to them during the interviews. These infographics were developed by U.S. government agencies to attract college and university students’ attention and stimulate them to seek flu vaccination. I found out that students did not like two of the infographics because they felt that the images were

either gross (a person sneezing) or misleading ('Spread Music. Not Flu'). I discussed the role of advertisement in marketing and used Bourdieu and Passeron's concept of symbolic power to show that authoritative bodies (here: the U.S. government) used infographics to impose meanings and let information appear as legitimate by concealing power relations that actually exist between authoritative bodies and the receivers (here: undergraduate students) of the influenza messages.

Finally, I came to the conclusion that these two infographics must be considered a failure when used as a vaccination strategy because they lacked educational value and would fail to create a culture of flu vaccinators on campus. I also asked students about the role of e-mails from Laketree University, which contain information about the flu. Undergraduate students mentioned that e-mails would attract their attention if they would contain pictures or something that is attention-grabbing in the title or subject line (e.g., a new name of a flu). However, it became also clear during the interviews that students do not always read e-mails from Laketree University, including the weekly newsletter.

CHAPTER FIVE:

ATTITUDES AND INTERPRETATIONS OF THE FLU AND ASSOCIATED PREVENTION PRACTICES

Introduction

I will analyze in this fifth chapter a set of survey data that pertain to the third question of my dissertation research project: What attitudes do undergraduate students hold towards influenza and vaccination? To answer this question, I captured students' expressions of attitudes when they read the words 'influenza' and 'flu vaccination' on the written survey. I will also report on students' beliefs about the effectiveness of the flu vaccine and on their thoughts about mandatory influenza vaccination. Furthermore, I will discuss whether or not undergraduate students felt that their cultural/religious beliefs would inhibit them from seeking vaccination. Finally, I will describe if the behavior of other students to seek flu vaccination would influence students in my survey to also seek vaccination.

Since this part of my dissertation research project concentrates on the meaning of attitudes, I felt that Blumers (1969/1998) theory of symbolic interactionism could serve as the most powerful tool for the interpretation of students' attitudes. Blumer believed that people encode meanings of attitudes and intentions through language and other symbol systems, and that it is up to the researcher to decode these systems. The encoding of students' attitudes as expressed by their words is what I intended to do in the following sections. The coding of students' answers allowed me to identify two themes: symbolic meanings and beliefs. I will start out my discussion with the theme 'symbolic meanings.'

Symbolic Meanings

My study was conducted in the post-2009 influenza A(H1N1) pandemic era, in which flu vaccination is now also recommended for young healthy adults such as undergraduate students. I felt it was important to find out in my survey what symbolic meanings students assigned to the words ‘influenza’ and ‘flu vaccination’ because these meanings may have influenced students’ vaccination behavior. Although the words ‘influenza’ and ‘flu vaccination’ were pre-selected by me on the questionnaire to probe for meanings, I found out through the coding of students’ answers that two additional words have also symbolic meanings. These words are ‘mask’ and ‘age’.

I will begin with the presentation of the various words undergraduate students used to describe ‘influenza’ and ‘flu vaccination.’ In order to evaluate the symbolic meanings of these words, I decided to use word cloud displays. Word clouds allowed me to show the most frequently used words students mentioned to describe influenza and flu vaccination.

Symbolic Meaning of ‘Influenza’

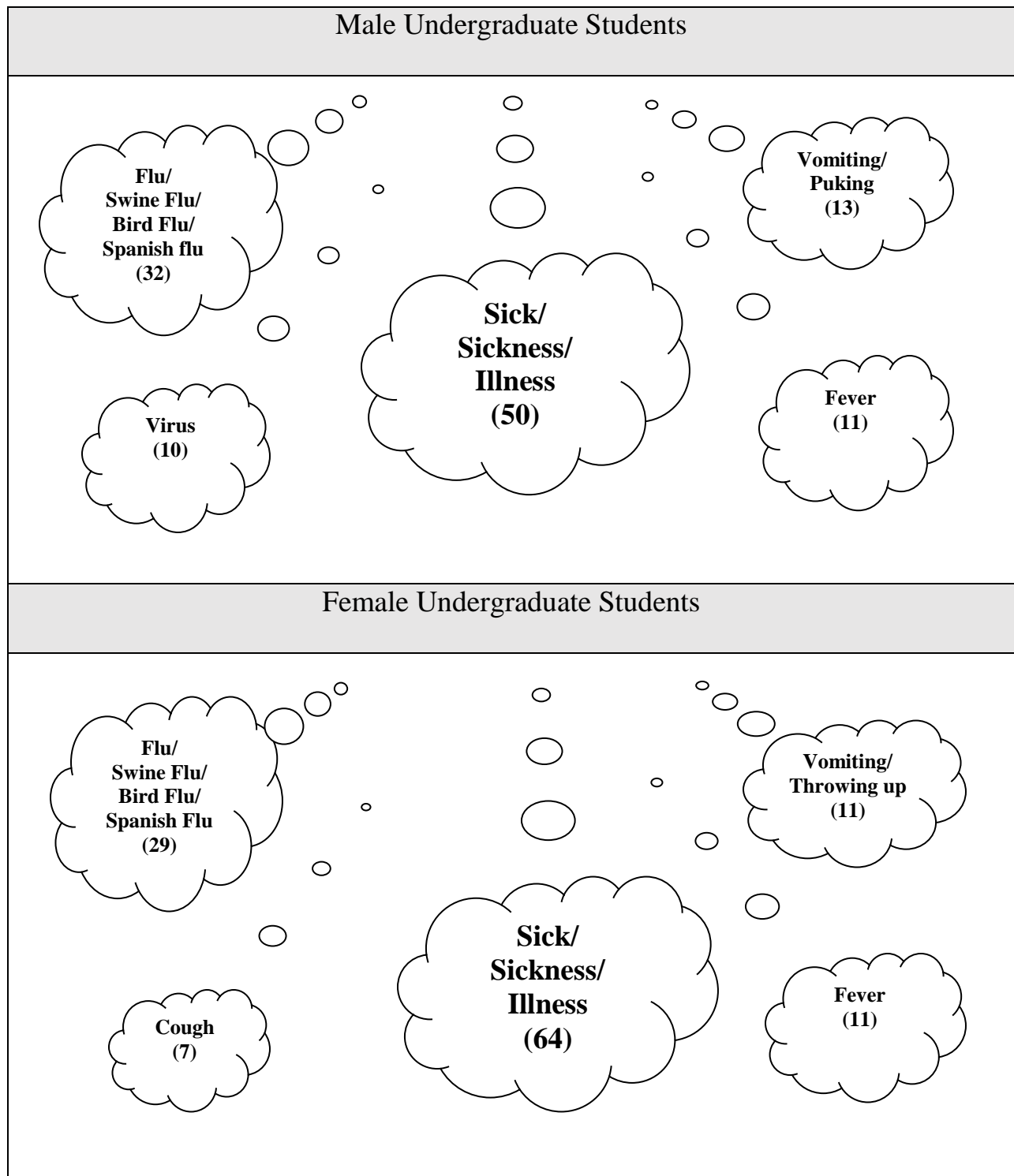
Figure 5.1 (word clouds display) shows that the vast majority of both male and female undergraduate students who participated in the quantitative survey at Laketree University associated the word ‘influenza’ with a sickness or illness, or with being sick. More specifically, 50/147 (34.0%) of male students and 64/141 (45.4%) of female students used these language terms to describe what influenza means to them. Words such as flu, swine flu, bird flu, and Spanish flu were also used by students, but at a lower frequency (i.e., 32/147, 21.8% by males; and 29/141, 20.6% by females). Moreover, vomiting (puking or throwing up) was entered on the questionnaire by 13/147 (8.8%) male students and by 11/141 (7.8%) female students. Fever, virus, and cough were also words frequently used by students to describe influenza. There were

numerous other words undergraduate students chose, but these were entered into the boxes on the questionnaire less often and are not shown in Figure 5.1. However, all words are significant because they are labels students used, have symbolic meanings, and are a part of undergraduate students' expressions of attitudes.

As Morrione (2004) pointed out, Blumer believed that a person's use of a particular word is not an automatic application of established meanings. Instead, it stems from social interaction and is formed through processes of the person's interpretation (i.e., handling meanings) and self-reflection (i.e., self-interaction and self-communication). An interesting observation is that only two students associated influenza with risk groups: 'children and elderly' and 'older people.' There was no mention of the risk group 'young adults.' I will come back to this issue later when I discuss the symbolic meaning of 'age.'

The data from the quantitative survey did not allow me to determine whether or not students used words for 'influenza' during the survey which are different to those they would have chosen at another time (e.g., before or during the H1N1 pandemic of 2009, or after the pandemic up to the 2015-2016 influenza season). But one may speculate that events such as students' knowledge about a person who got seriously sick or even died from the flu influenced their choices of words over time. If this was the case, it would have been an example of what Blumer (1969/1998) meant by the premise that meanings are heavily influenced by personal experience.

Figure 5.1. Word clouds of students' most frequent symbolic meanings of 'influenza.'



Note. Responses of 116 male and 122 female undergraduate students are shown, grouped by the most frequently chosen words to describe 'influenza.'

I asked students during the interviews why they chose the words they entered for ‘influenza’ into the box on the questionnaire. Here are some of their answers (note: Words in bold-face are those students had entered):

I guess the feeling of **sick** would be vulnerable, vulnerable to this disease. You need to be in bed, you need to be quarantined, probably (Bee).

You feel emotionally **sick** as well as you look physically sick. So, that’s what pops in my mind (Grace).

I think I used the term ‘**the flu**’ because it is just shorter. I have heard the word influenza, for example, when I go to the doctor or when people are sick. They typically say: I have [the] flu (Jane).

When I hear the word influenza, I think more about **pandemic and epidemic**, and the whole world is kind of involved. Panic for me has to do with fear, a kind of fear of the unknown. You don’t know if you get sick and you don’t know how to prevent it (Henry).

Chills and fever. I think of symptoms immediately. Yes, ... these are symptoms, right? (Darius).

The comments and *all* words undergraduate students entered on the questionnaire revealed that they interpret influenza in quite different ways and that every word a student chose in this mixed-methods survey has a meaning. More precisely, these words are meaningful symbols to each individual student and are expressed either in terms of images (e.g., ‘older people’ and ‘hospital’), metaphors (e.g., ‘worse than a cold’), or simple slogans (e.g., ‘missing class’). While symbols such as ‘Spanish flu,’ ‘horrible,’ and ‘death’ may reveal students’ fear of danger, other symbols (e.g., ‘annoying’) may mean less fear of the flu and more concern for other issues, such as ‘missing class.’ In the following section, I describe student’s word choices for ‘flu vaccination.’

Symbolic Meaning of ‘Flu Vaccination’

Figure 5.2 shows that the most frequently chosen words for ‘flu vaccination’ were shot(s) and flu shot(s), which were entered on the questionnaire by 50/147 (34.0%) male and 63/141

(42.9%) female undergraduate students during the quantitative survey. This was followed by prevention/preventative/precaution/protection, entered by 31/147 (21.1%) and 22/141 (15.6%) male and female students, respectively. Words such as ‘beneficial/helpful/useful,’ ‘needles,’ and ‘pain/painful/hurts,’ and ‘virus/dead virus’ were used less frequently, among others not displayed in Figure 5.2.

In the qualitative part of the study, students explained their word choices for flu vaccination as follows (note, I highlighted students’ chosen words in bold-face):

If I hear the word vaccination, I think about **shots**. Vaccinations are shots. I think they now also [offer] nasal sprays. But, I typically think about shots for vaccinations because everybody calls it a shot (Frank).

Because I always get **shots**. My dad is a doctor, so I am used to the shot route. But, there is now also the nasal spray (Grace).

And for flu vaccination, I think of **shot** or **risk**. Don’t they [offer] now also a nasal spray? But I think of the shot right away. And then the risk because you can get sick from it if [the vaccine] doesn’t match [the flu strains]. A [shot means to me more like needles (Darius).

It is the first thing that comes to my mind: **Needles** are used to give you the vaccine. You can get sick from the needles, sometimes. The arm is a little sore. The first thing that comes to my mind is the picture of the needle. You watch over [your shoulder] and then you see how they give [the vaccine] to you. That is what comes to my mind (Eduardo).

Needles. Just like taking the shot, and putting the bandage on. That’s what I think when I hear the word flu vaccination (Chris).

Well, the first thing that comes to my mind is **needles** because when I get any kind of vaccination it is always done with needles. Although I think there is now also a spray you can take (Henry).

Oh, I **hate** it. It is the needle, it **hurts!** I don’t know, but I don’t like vaccinations very much because they are so mandatory (Sarah).

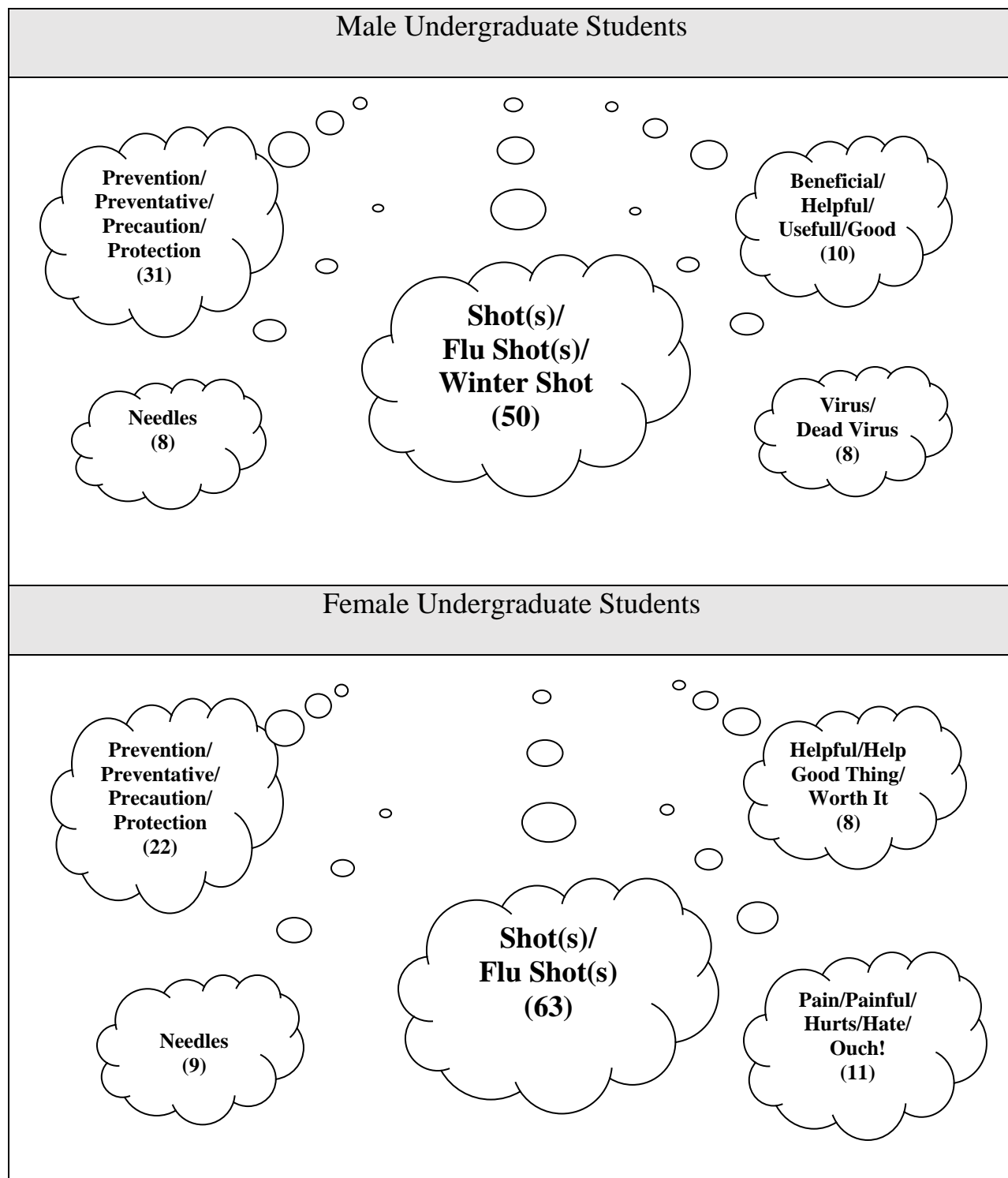
Like you are getting vaccinated for it, like the flu shot. It’s **every year** (Jane).

Necessary with a question mark because I don’t know. Because I had a conversation, very brief, very uneducated, with people of whether the flu vaccination is necessary. I had a friend here and she never gets the flu vaccination, never I believe. My

understanding of the flu vaccination is that there is a small amount of the live virus in there, and I wonder if it makes you sick. And then, it may depend on that person's immune system. Can a person get sick from the vaccine? So, the question is: Is it necessary? (Bee).

Frank's statement (i.e., "everybody calls it a shot") indicated that his word choice 'shots' was essentially based on a collective description of the image of vaccination. Although it is unknown what he exactly meant by 'everybody,' he most likely did not mean literally every person, but meant quite a large number of people who act as a group with a strong influence on generating images with symbolic meaning. Darius associated flu vaccination with a risk, the risk of potentially getting sick from the flu shot itself. Furthermore, Eduardo, Chris, Henry, and Sarah interpreted flu vaccination more in terms of the application route of the vaccine, and Jane viewed flu vaccination from the perspective of the time of application of the flu vaccine. Interesting is the observation that four students (Frank, Grace, Darius, and Henry) mentioned that flu vaccination can also be given as a nasal spray. This showed that these students kept up with recent developments in influenza vaccination practices and used images which point out to them three possibilities of actions: (a) to choose the injectable flu vaccine; (b) to choose the flu vaccine in form of a nasal spray; or (c) to abstain from flu vaccination. Finally, Bee provided a critical evaluation of the flu vaccination program. She questioned if the flu vaccination is necessary per se. She also expressed fear of getting sick from the flu shot.

Figure 5.2. Word clouds of students' most frequent symbolic meanings of 'flu vaccination.'



Note. Responses of 107 male and 113 female undergraduate students are shown, grouped by the most frequently chosen words to describe 'flu vaccination.'

As I had mentioned earlier, I identified through the coding of students' answers two additional words which I believe have symbolic meanings for undergraduate students at Laketree University. These words are 'mask' and 'age.' I will describe in the following sections what these meanings are.

Symbolic Meaning of 'Mask'

Masks come in various different forms, but most are typically worn over or on the face. They are being used as cultural objects during religious ceremonies and traditional rituals, serve as expressive facial disguises to hide or reveal characters during theater performances, play a role in war to instill fear in the enemy, and have important applications as protective devices in sports (e.g., ice hockey masks), warfare (e.g., gas masks), and medicine (e.g., surgical masks), as well as in man-made and natural disasters (e.g., protective filter masks) (Centers for Disease Control and Prevention, 2016e; Cowling et al., 2009; Macaulay, 2014; Wingert, 2012). In other words, masks "have been as varied in appearance as in their use and symbolism" (Wingert, 2012, para. 1).

I asked students during the interviews what they think about wearing a mask for protection from influenza. They provided the following answers:

I have never seen anybody coming to class with a mask. I think it would be strange wearing a mask. Again, I have never seen anybody at Laketree University with a mask (Fiona).

I would feel weird going to class with a face mask. But if everyone or the majority of people on campus were wearing a mask, I probably would. But if I would be the only one, then I wouldn't (Henry).

It might be a good idea [wearing a mask]. But generally I would not bother. It just would feel awkward [to wear a mask] all day. When you go to the airport with wearing a mask, people would ask: Are you sick? You cannot trust [the person] if he makes you sick ... or not! (Eduardo).

If there would be several people on campus with Ebola, I would definitely wear a mask, or I would choose not to show up (Jim).

I am not that paranoid that I have to wear a face mask. I would feel funny. I mean [people] would probably understand that I don't want to get sick, but I [certainly] would get some weird looks (Grace).

[The mask:] It's either [for] protecting others or protecting yourself (Jane).

It would be like [in] China or something, that's what I thought (Ben).

It's not something people do here in the U.S. And if you see it, you wonder: Why are they wearing a mask? And you are thinking: Are they very sick and they try you from not getting sick, or are they very sick and they don't want to get it. You see [people wearing masks] in Southeast Asia all the time. But here in the U.S., I think people would start to panic (Darius).

I asked Darius during the interview what he would have done if I would have come to the interview wearing a face mask. His response was as follows:

I would certainly not shake your hand. But I would be more curious, I guess. But if Health Services would give out masks and saying you should wear these, then I would wear it. Something like that (Darius).

I also asked Bee what she would have done if I would have come to the interview wearing a mask. She gave an interesting answer to my question, which I will present right after her general comments about the mask.

Just the other day, we had a business competition and I had a cold. It was really embarrassing, but I put on [a mask]. I gave my presentation to a panel of 20 judges with my face mask on. Everybody was looking at me. Everybody was wondering what is going on. They were keeping their distance. And the people who were talking to me were trying to be nice. One person was asking me what was going on. And she was very thankful because she has a low immune system and got a cold and was out for a whole month. I think she has an immune deficiency. She really appreciated that I was wearing [a mask]. She was the only person who said something about it (Bee).

Bee commented to my other question:

I would probably think you are sick and you don't want other people to get sick. I would not be fearful, I mean irrationally fearful. [But,] I would probably not like to sit next to you (Bee).

Comments students made about the mask indicate that they assign different symbolic meanings to wearing a mask. I have summarized some of these comments in form of subcategories (Table 5.1).

Table 5.1

Subcategories Developed from Students' Words for 'Mask'

Symbolic meanings of 'mask'	
Subcategories	Expressions of Attitudes
Discomfort	It would be strange (Fiona) I would feel weird (Henry) It just would feel awkward (Eduardo) I would feel funny (Grace) It was really embarrassing [wearing a mask] (Bee) I would get some weird looks (Grace) They would probably understand that I don't want to get sick (Grace) I think people would start to panic (Darius)
Reactions to others' mask	You wonder: Why are they wearing a mask? (Darius) Are you sick or not? (Eduardo) Everybody was wondering: What is going on? (Bee) One person was asking me what was going on (Bee) She was very thankful [that I protected her from getting sick] (Bee) They were keeping their distance (Bee) I would be more curious (Darius)
Reasoning	Self-protection <i>and</i> protection of other people (Jane) It's not something people do here in the U.S. (Darius) It would be like [in] China or something (Ben) If there would be several people on campus with Ebola, I would definitely wear a mask (Jim) I am not that paranoid (Grace) I would certainly not shake your hands (Darius)

Note. All students listed participated in the interviews.

Like the students who participated in the interviews, I had also asked the 288 undergraduate students, who were enrolled in the anonymous quantitative survey, to mark on the questionnaire if they would come to class and wear a mask in the event of a flu outbreak on

campus at Laketree University. It turned out that the vast majority of students (214/288, 74%) marked ‘untrue of me’/‘somewhat untrue of me,’ which indicated that they would most likely not wear a mask on campus (Table 5.2). This opinion was shared by male and female undergraduate students.

Table 5.2

Undergraduate Students’ Opinions about Wearing a Mask in Class in the Event of a Flu Outbreak on Campus

Gender	Student responses				
	True of me <i>n</i> (%)	Somewhat true of me <i>n</i> (%)	Neutral <i>n</i> (%)	Somewhat untrue of me <i>n</i> (%)	Untrue of me <i>n</i> (%)
Male <i>n</i> = 147	5 (3.4)	16 (10.9)	18 (12.2)	37 (25.2)	71 (48.3)
Female <i>n</i> = 141	2 (1.4)	19 (13.5)	14 (9.9)	34 (24.1)	72 (51.1)
Total <i>N</i> = 288	7 (2.4)	35 (12.2)	32 (11.1)	71 (24.7)	143 (49.6)
	42 (14.6)			214 (74.3)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

There are some interesting data about this topic that have been collected by other researchers. For example, Akan et al. (2010) showed that students at the Yeditepe University in Istanbul, Turkey, believed that face mask use (besides hand washing and quarantine) is an effective measure for prevention of influenza. Suresh et al. (2011), who surveyed students at a university in India during the post-pandemic phase, also showed that students believed that

wearing a face mask protects from influenza. Yet, Mitchell et al. (2011) found that only a very small percentage (10.5%) of student survey participants, who had an acute respiratory infection during the H1N1 pandemic of 2009, reported having actually worn a face mask.

The findings presented in Table 5.2 support for the most part Darius's thoughts about wearing a mask, which is: "It's not something people do here in the U.S." Fritscher (2016, para. 4) pointed out that "[m]asks distort the wearer's appearance, causing him to look strange and unusual. Also, most masks do not feature moving mouths, so when the wearer speaks, the sound appears to come out of nowhere." There is no doubt that wearing a mask has a certain mystique to it—a kind of a secret behind the mask an observer cannot easily explain, and which meaning he or she may or may not want to discover. It is interesting to note that in several Asian countries, especially in Japan, many people apparently like wearing face masks in recent years for purposes other than protection from infectious agents, pollen, and pollution. Here, an increasing number of young people are using surgical masks (some of which are decorated with polka dots or floral designs) for not being bothered by other people (Baseel, 2014; Stein, 2015). I need to mention that I observed during my survey that many students at Laketree University wore earphones. Perhaps, a reason why young people in this country (America) wear earphones in public is that they also want to be left alone and prefer communicating via social media and e-mails rather than through face-to-face interactions. I will come back to this topic in Chapter 6 when I discuss various communication channels (e.g., e-mails and cell phones) and their importance for undergraduate students' management of social relationships in light of generational trends, identity, attitudes, and behaviors.

An important issue I need to mention at the end of my discussion about the symbolic meaning of 'mask' is whether or not face masks are considered by authorities as an effective

protective measure against influenza viruses. The Centers for Disease Control and Prevention (2016e) provides here valuable guidelines:

A facemask is meant to help block large-particle droplets, splashes, sprays or splatter that may contain germs (viruses and bacteria) from reaching your mouth and nose.

Facemasks may also help reduce exposure of the wearer's saliva and respiratory secretions to others. While a facemask may be effective in blocking splashes and large-particle droplets, a facemask, by design, does not filter or block very small particles in the air [i.e., small-particle aerosols] that may be transmitted by coughs, sneezes or certain medical procedures (Appendix section., para. 1.).

Although these guidelines were developed for personnel working in health care settings, the information is also useful for the general population. Face masks without a filter may not protect effectively against influenza viruses but they are better than nothing, or, as a physician at the Mayo Clinic phrased it: "It can't hurt and it might help," (Steckelberg, 2016, para. 1).

Symbolic Meaning of 'Age'

Age has been defined as "[o]ne of the stages of life" (Pickett, 2000, p. 32). Schoemann and Branscombe (2011) emphasized that age can be considered a social category because members of a particular social group (in my study: undergraduate students as young adults) will eventually change group membership and belong to other social groups (i.e., older adults and then elderly). Although aging is the natural progression of a person's life, young people often do not want to imagine their own aging because of fears of events that are typically associated with older/old age, including an increase in age-related disorders and diseases (e.g., hearing loss, osteoporosis, arthritis, Alzheimer's disease, cardiovascular disease, or cancer), as well as the prospect of dying and death (Hayflick, 2004; Konar, Singh, & Thakur, 2016; Montesanto, Dato,

Bellizzi, Rose, & Passarino, 2012; Williams, Pham-Kanter, & Leitsch, 2009). There is great interest in the research community to explain various issues associated with age and aging, including (a) self-perceptions of age (Montepare & Lachman, 1989); (b) aging anxiety, especially of young adults (Rittenour & Cohen, 2016), (c) attitudes of younger adults about older adults with a focus on age stigma, stereotypes, and biases (Chasteen & Cary, 2015); and (d) aspects of communication disorders between these social groups (Gabel, Searl, & Fulks, 2003). Furthermore, researchers studied (e) attitudes of young adults about older adults through the lens of caring and cultural assimilation (Khan, 2011); (f) perceptions of anti-aging actions, such as attempts by older people to look younger (Schoemann & Branscombe, 2011); and (e) aspects of the relationship between religious attitudes and fear of death (Nazarzadeh, Sarokhani, & Sayehmiri, 2015).

In my survey, undergraduate students mentioned the relevance of age during the discussion of influenza, which later allowed me through the coding of their answers to identify ‘age’ as an object that has symbolic meaning. I present below some of the comments students made about age and discuss what these expressions of ‘age attitudes’ mean to them as young adults when confronted with the topic ‘influenza.’ The data presented were collected from both the anonymous and non-anonymous parts of the survey.

I think there is a bias against age groups. Seniors are more likely to get disease. So, the younger you are ... (David).

I mean you always hear cases where people are still getting [the flu]. It’s usually the elderly when their immune system is not going up anymore (Frank).

I mean if you are elderly you can die from the flu. But for me right now, I am pretty healthy, and I have gotten the flu before and it sucks, but I am o.k. (Darius).

I think babies are always sick, old people are always sick, young children are always sick. We think we are immortal and can’t die (Ben).

[Influenza:] It’s something that is so concerning, that’s for all ages (Kelly).

I feel that a lot of people get the flu shot [but] my probability of getting the flu is low (Male student, 2nd year).

Since I have a history of health, I don't feel concerned about the flu. When I do become of higher risk for it, I would certainly take preventative measures (Male student, 2nd year).

I am confident in my own immune system to overcome the flu. I would get a vaccination more to protect others. I do not because I avoid needles whenever I can (Male student, 2nd year).

And then there is the vaccination, usually for the young and old. And when there is a shortage, then you give it to the very young and the very old people who are more susceptible of getting the flu. Personally, I am young and active, and I usually don't get a flu shot, but take other preventative measures: washing hands more regularly, covering your mouth when you cough, and avoiding sick people, taking vitamin C, and things like that (Fiona).

I grouped the comments students made about 'age' into subcategories. The subcategories shown in Table 5.3 indicated that undergraduate students assigned to the word 'age' various different meanings, ranging from stereotypic views and biases (e.g., "babies, children, and old people are always sick;" "there is a bias against age groups") to perceptions of fitness, health, and immortality (e.g., "I am young and active;" "I am pretty healthy;" "we think we are immortal and can't die"), perception of flu susceptibility (e.g., "my probability of getting the flu is low"), and perceptions of vaccination priority groups (e.g., "usually for the young and old").

Chasteen and Cary (2015, p. 100) pointed out that "[m]embership in an age group comes with a prescribed set of expectations about how one ought to behave and how one ought to look." The most striking observation during the discussion of age with undergraduate students at Laketree University was their willingness to reveal their own age and emphasize the characteristics of their age group (young adults) by pointing to their perceived own health, fitness, and even immortality. This was an indication that these students highly identified themselves with their age group and appeared to be "motivated to protect their in-group's

positive distinctiveness” from other age groups, such as the age groups of babies, children, and older adults (Schoemann & Branscombe, 2011, p. 87). To phrase it differently, the images and expectations undergraduate students created for themselves when discussing age represented the experienced reality of their lives within the context of their own age group in comparison to other age groups. The symbolic meaning of age was thus for undergraduate students shaped by ideology, culture, and the way social organization is structured (Blumer, 1969/1998).

Table 5.3

Subcategories Developed from Students’ Comments about ‘Age’

Symbolic meanings of ‘age’	
Subcategories	Expressions of attitudes
Perception of age, fitness, and health	I am young and active (Fiona, 20 years old) I am pretty healthy (Darius, 20 years old) I have a history of health (Male student, 19 years old) I am confident in my own immune system (Another male student, 19 years old) I am healthy. I don’t get sick anymore (Frank, 32 years old) We think we are immortal and can’t die (Ben, 19 years old) I think there is a bias against age groups. Seniors are more likely to get disease (David, 19 years old) Babies, children, and old people are always sick (Ben, 19 years old)
Perception of influenza susceptibility and flu vaccine priority groups	My probability of getting the flu is low (Male student, 20 years old) If you are an elderly you can die from the flu (Darius, 20 years old) Elderly people get it when their immune system is not going up anymore (Frank, 32 years old) [Influenza:] It’s something that is so concerning, that’s for all ages (Kelly, 19 years old) Vaccination is usually for the young and old because they are more susceptible of getting the flu. (Fiona, 20 years old)

Note. Students listed by name participated in the interviews, while students listed by gender participated in the quantitative part of the survey.

Beliefs

Attitudes about the Effectiveness of Influenza Vaccines

The topic of the effectiveness of the flu vaccine, as perceived by college and university students has been discussed by other researchers, especially during the influenza A(H1N1) pandemic of 2009. For example, Teitler-Regev, Shahrabani, and Benzion (2011) found that 27% of students who responded to the survey believed that the flu vaccine is not effective. Ramsey and Marczinski (2011) observed a similar percentage of students (28.6%) who thought that the influenza vaccine would not work. Also Ravert et al. (2012) showed that the perceived effectiveness of the vaccine was an issue for students. Finally, Suresh et al. (2011) reported that 3.1% of students perceived the flu vaccine as being ineffective, while 15.5% perceived it as having a low effectiveness. In their survey, 62.3% of students thought that the influenza vaccine is effective.

The continued evaluation of this topic is important because if a student does not believe in the effectiveness of the flu vaccine, why should he or she then decide to get vaccinated? In my survey (see Table 5.4), the vast majority (168/288, 58.3%) of undergraduate students at Laketree University believed that the flu vaccine is 'usually' effective to protect from influenza, while 18/288 (6.3%) responded that they believe it is 'always' effective. 69/288 (23.9%) students thought that the flu vaccine is 'sometimes' effective. Only a few students marked on the questionnaire that the vaccine is 'seldom' or 'never' effective (31/288, 10.8% and 2/288, 0.7%, respectively). It turned out that both male and female students felt similar about the effectiveness of the flu vaccine when looking at students' answers per Likert scale item. Table 5.4 provides all statistics pertaining to this question on the questionnaire.

Table 5.4

Undergraduate Students' Perception of the Effectiveness of the Flu Vaccine

Gender	Student responses				
	Always <i>n</i> (%)	Usually <i>n</i> (%)	Sometimes <i>n</i> (%)	Seldom <i>n</i> (%)	Never <i>n</i> (%)
Male <i>n</i> = 147	10 (6.8)	90 (61.2)	34 (23.1)	12 (8.2)	1 (0.7)
Female <i>n</i> = 141	8 (5.7)	78 (55.3)	35 (24.8)	19 (13.5)	1 (0.7)
Total <i>N</i> = 288	18 (6.3)	168 (58.3)	69 (23.9)	31 (10.8)	2 (0.7)
	186 (64.6)			33 (11.5)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

Students who participated in my survey explained their beliefs about the effectiveness of the flu vaccine. I present below the comments of both students who participated in the interviews (students are listed by their names) and those who entered their comments in the box provided at the end of the paper questionnaire (students are listed by gender). I have grouped students' responses into the following two subcategories: (a) expressions of understanding and (b) expressions of concern and uncertainty.

Expressions of understanding.

People's understanding of herd immunity may affect answers (Female student, 3rd year).

Over the years I heard that vaccines are most effective. With the flu vaccine, I heard that they sometimes misjudge. The vaccine should be targeting the right strains—there are different strains of the flu. And if it doesn't match, then it is not effective. It is really like a guess. One doesn't really know what will happen. And when they guessed the wrong strains, then the vaccine is not that effective. I know it's a dead vaccine, it's not alive. I don't worry about that too much of getting sick from the vaccine. I would never get a live vaccine. There I would worry (Eduardo).

I [marked] ‘usually’ [on the questionnaire] because for the most part [the vaccine] is effective. I don’t know if the flu vaccination is 100% effective—I just don’t know. But [it is] mostly effective. It definitely helps your immune system to fight off the flu (Henry).

I mean we only know so much about the human body and we can only let so many things work. And the body always reacts differently to any kind of treatment, any kind of vaccine, anything. And that’s just the way life is. And for the most time it works, but sometimes you get the flu. It’s just life ... (Jim).

I [marked] ‘always’ because from my perspective, I’ve never gotten the flu. And I’ve gotten the vaccination every year. [I asked Kelly: Let’s assume you would have gotten sick one year, would that have changed your thinking?] Yes! Then I would probably say ‘usually’ or ‘sometimes’ because then, from my personal perspective, it would not have always been effective (Kelly).

Expressions of concern and uncertainty.

I always get the flu shot, but they always say it is not 100% protection from the flu. So, you still have some risk, but you are trying to prevent it as much as you can (Jane).

I think flu shots are relatively effective, but significantly limited by the rate of mutations in the influenza genetic code. In the last three years I’ve had three flu shots and had the flu two times. I don’t follow directions well. Sorry about the cursive (Male student, 5th/6th year).

Flu vaccines don’t seem to be very common. I didn’t get the shot last year and didn’t get sick, whereas a few of my friends who did get vaccinated got sick, which I think changes people’s thoughts on effectiveness (Male student, 5th/6th year).

From personal experience and observation—for what it’s worth—I have noticed that people who consistently get the flu shot tend to be more susceptible to getting sick. Whereas I have not gotten the shot in nearly 10 years and hardly ever come down with any sickness, and never the flu (Male student, 3rd year).

Interestingly enough, I’ve had one flu shot. That year was the only year I got the flu! (Male student, 2nd year).

My family got ill once after [they] all received a flu vaccination. (Male student, 1st year).

[I chose ‘seldom’] mostly because I have friends who got the vaccination, and I think they got sick more often than I did (Sarah).

I believe the flu vaccine is not necessary. It depends on a person’s immune system. ... The vaccine itself could possibly give [you] the flu, but also help prevent it. It was only 28% or so effective last year (Male student, 2nd year).

I have heard negative things about the flu shot and I don't think it is effective (Female student, 3rd year).

The answers students gave in my survey revealed that while some students believed in the importance of the flu vaccine for protection from influenza (including *herd immunity*, i.e., the immunity of a large proportion of people in the community—which is the goal of influenza vaccination efforts), other students recognized that the flu vaccine has varying effectiveness because of the fact that every influenza season is different and seasonal flu vaccines must thus be adapted based on what experts believe are the most common influenza strains during an upcoming flu season (Grohskopf et al., 2016). Also noteworthy is that several students mentioned cases in which people received the flu vaccines and still got sick from influenza. An example is the statement of a male student who is in his 5th/6th year of study at Laketree University: “I didn't get the shot last year and didn't get sick, whereas a few of my friends who did get vaccinated got sick, which I think changes people's thoughts on effectiveness.” These expressions of students' attitudes showed that the meanings students assigned to the effectiveness of the flu vaccine are derived from each student's observations and interactions with other people (Blumer, 1969/1998).

Attitudes about Mandatory Influenza Vaccination

Mandatory flu vaccination is a much debated issue in society. Walkingshaw (2011b), who discussed vaccination policies in international settings, mentioned that vaccination practices and enforcement vary greatly around the world. For example, children in the United States are required to be vaccinated for several designated communicable diseases before they attend school, while other countries (e.g., Australia) use financial incentives to increase compliance rates. There are certain exemptions that people can request, such as those based on medical,

philosophical, and/or religious reasons, but the way these exemptions are handled often differ greatly in communities across the United States. Walkingshaw (2011a) described some of the typical arguments people use when discussing mandatory vaccination: “Advocates say vaccines are safe and exemptions should be minimal. Opponents counter that vaccines are hazardous to health and that any limitation on exemptions is a violation of constitutional rights” (p. 1830).

Legislative attorneys Cole and Swendiman (2014) pointed out that

[h]istorically, the preservation of the public health has been the primary responsibility of state and local governments, and the authority to enact laws relevant to the protection of the public health derives from the state’s general police powers. With regards to communicable disease outbreaks, these powers may include the enactment of mandatory vaccination laws (Summary section, para. 1).

Cole and Swendiman (2014) mentioned that many of today’s school vaccination laws stem from outbreaks of measles in the 1960s and 1970s. Immunization schedules for children include vaccinations against diphtheria, measles, rubella, and polio, among others. There are now also various state laws that require incoming college and university students to be vaccinated against meningococcal disease and hepatitis B, and, as is the case in the District of Columbia, require vaccination of female students against the human papillomavirus (HPV). Although influenza vaccination is not mandatory, but recommended, for the general population (which includes college and university students), there are some cities/states (e.g., New York) which have begun requiring influenza vaccination for children in preschool and daycare centers (Cole & Swendiman, 2014). Furthermore, there are universities and hospitals which adopted the mandatory flu vaccination policy. For example, beginning with the 2012-2013 influenza season, Johns Hopkins University mandated flu vaccination “for all Health Care Personnel, and medical

staff who have privileges at a JHHS [Johns Hopkins Health System] entity, including the Johns Hopkins University School of Medicine, School of Nursing, and Bloomberg School of Public Health ... to protect patients, employees, employees' family members and the community from influenza infection through annual immunization" (Johns Hopkins Medicine, 2011, p.1).

During public health emergencies (e.g., an outbreak of an infectious disease), the power to order mandatory vaccinations rests with the governor of each state or with a state health officer. He or she can supplement a state's existing compulsory program for vaccinations by ordering additional programs. In case a person refuses to be vaccinated, the authorities have the power to quarantine that person during such a public health emergency (Cole and Swendiman, 2014).

One of the questions I had asked undergraduate students during my survey was what they think about mandatory influenza vaccination. Students' responses from the quantitative part of the survey are displayed in Table 5.5. The data revealed that the majority of students believed that flu vaccination should not be mandatory. More specifically, 121/288 (42.0%) students were against mandatory flu vaccination (for the combined categories 'Disagree'/'Strongly disagree'), while 88/288 (30.6%) students believed that flu vaccination should not be mandatory (for the combined categories 'Strongly agree'/'Agree'). 79/288 (27.4%) students had a 'neutral' opinion about this topic. The data also showed that opinions about mandatory influenza vaccination were similar among male and female students in each Likert scale item.

Table 5.5

Undergraduate Students' Opinions about Mandatory Influenza Vaccination

Gender	Student responses				
	Strongly agree <i>n</i> (%)	Agree <i>n</i> (%)	Neutral <i>n</i> (%)	Disagree <i>n</i> (%)	Strongly disagree <i>n</i> (%)
Male <i>n</i> = 147	10 (6.8)	32 (21.8)	41 (27.9)	39 (26.5)	25 (17.0)
Female <i>n</i> = 141	12 (8.5)	34 (24.1)	38 (27.0)	41 (29.1)	16 (11.3)
Total <i>N</i> = 288	22 (7.6)	66 (23.0)	79 (27.4)	80 (27.8)	41 (14.2)
	88 (30.6)			121 (42.0)	

Note. Percentages for gender were calculated based on *n* = 147 for males and *n* = 141 for females. Percentages for the Likert scales total were calculated based on *N* = 288. The highest responses in each row are shown in bold. Last row shows combined categories.

Undergraduate students commented as follows, which I have grouped in three subcategories: (a) proponents of mandatory influenza vaccination; (b) neutral opinion/it depends on the situation; and (c) opponents of mandatory influenza vaccination. Note, students who participated in the interviews are listed by their names while students who participated in the anonymous survey are listed by gender.

Proponents of mandatory influenza vaccination.

My mom is a nurse, so I get a lot of information on flu vaccinations from her. I highly support the mandatory requirement of everyone getting a flu shot because it is unlikely to get sick from the vaccine unless you are sick when you get it (Female student, 1st year).

I believe flu shots should be mandatory as long as there is no risk to have an allergic reaction (Male student, 4th year).

I strongly feel [that] flu shots for individuals in high population areas/elderly people should be mandatory (Male student, 4th year).

In my personal opinion, it works. But now since you bring it up, it may not work for some people. I would want people to get [the vaccine]. I think it is beneficial. [Note: I asked Grace: Let's assume there would be a very mild influenza season, would you still 'strongly agree?'] I think it would not be as mandatory. I just think people should always get [the vaccine], no matter the severity of the outbreak. I think it is just a good thing (Grace).

I don't strongly agree, but I agree. I agree because it is easier for everyone if everyone gets vaccinated. Then there would be less sick people, and people would be happier. But, at the same time, it should be your choice, that's why I don't strongly agree. I would say it should still be your decision to be vaccinated, but should be very, very pushed by the government to get vaccinated (Henry).

Neutral opinion/it depends on the situation.

I am 'neutral' because it depends on the situation. If there is a massive outbreak, then that would be probably a good idea to be mandatory. If there is not, then it's up to you (Frank).

The reason why I am 'neutral' is because I like my opinion being based on the situation. [I mean:] Whatever is going on in society. For example, if there is an Ebola outbreak or the swine flu and [these diseases] all over the [city] area, sure, then make it mandatory that year to get the vaccine. But if there is nothing going on and you make it mandatory, I think there [will] be a lot of complaints. There [will] be a lot of push backs. I personally don't think it's worth that (Jim).

Well, I think it would be nice if it would be mandatory. It would reduce the number of people who get [the flu] if we have an epidemic. It would reduce the numbers. But I also feel bad if we had to do it for people who did not want to [get vaccinated] (Kelly).

Opponents of mandatory influenza vaccination.

I think: Don't tell me I should get a flu shot (Ben).

Many people either get their yearly shot or have never gotten an influenza shot. I think it's their decision to start getting [vaccinated] or not (Female student, 3rd year).

Although I am well educated about the flu and preventative measures, I have a hard time making it mandatory due to the high variability of the flu vaccine. I think it's difficult to fight something that's constantly changing and evolving (Female student, 4th year).

I believe vaccines are very important but shouldn't be required – even though evidently they save lives (Male student, 1st year).

We are all unique individuals with different bodies and immune systems. Why then does it have to be mandatory for everybody? (Bee).

I think it's freaky to make something like that mandatory because the people who make the vaccine don't know 100% what strains will come, and I don't like to have that in my system (Sarah).

If it would be 100% effective every time, I would be more for mandatory. But since it's not ... I guess I am not for many things being mandatory at all. The free choice! Because, you know, it's a slippery slope. I think it is freedom versus security. If you would have asked if the flu vaccination should be highly encouraged, then I would have circled 'strongly agree. But mandatory is too far for me (Darius).

So, I disagree because I think the people have freedom of choice. Personally, if you are looking at the big picture, I think it's good for people, for everybody to have the flu vaccination. But ethically, I think even if it's free, it is putting people in a situation where the government, or whoever it is, is overstepping their boundaries according to our social laws (Chris).

I think vaccination should be mandatory when there are diseases that are more serious, for example polio. I believe that should be completely mandatory. I am not an anti-vaxxer at all, but something like the flu? (Fiona).

The arguments undergraduate students presented to me, either as proponents or as opponents of mandatory flu vaccination, mirrors those Walkingshaw (2011a) had mentioned as typical arguments people use when discussing this topic. However, students in my survey who have a neutral opinion about this topic emphasized that making a decision about mandatory flu vaccination is not that easy. Especially the arguments from Frank ("if there is a massive outbreak, then that would be probably a good idea to be mandatory") and from Jim ("if there is ... the swine flu ... then make it mandatory that year to get the vaccine") showed that deciding on mandatory vaccination should depend on the situation. Whether or not this line of argumentation about mandatory vaccination could be used as a suitable format for discussions in the general public of the American society, in which individualism and the protection of constitutional rights are held dearly by its citizens, need to be seen.

Culture/Religious Beliefs and Vaccination

My survey also included a question about the religious affiliation of undergraduate students (see Table 2.5 ‘Demographic Characteristics’) and a follow-up question about whether or not students felt that their cultural/religious beliefs would inhibit them from seeking vaccination. As I had presented in Table 2.5, the majority of students who participated in this survey identified themselves as Catholics (44.8%), followed by Christians (35.1%), students without religious affiliation (11.5%), students with other than the pre-selected and listed religious affiliations (4.2%), Islamist (3.4%), and then Buddhist (1%). Based on the analysis of the quantitative part of the survey (see Table 5.6), 280/288 (97.2%) students felt that their culture or religious beliefs would not inhibit them from seeking vaccination. Only 4 (1.4%) students answered the question with *yes* and another 4 (1.4%) students were not sure. Male and female students responded in a similar way to this question per answer option.

I decided not to discuss further with students the topic of religious beliefs during the face-to-face interviews because in the culture in which I grew up (i.e., the German culture), talking about religion is rather a private matter. But, I need to mention that it was suggested during the drafting of the questionnaire to include questions about religious affiliation and its potential impact on undergraduate students’ vaccination decisions because Laketree University is a denominational institution of higher education.

Table 5.6

Perceived Inhibition from Seeking Vaccination Due to Cultural or Religious Beliefs

Answer	Yes <i>n</i> (%)	No <i>n</i> (%)	I am not sure <i>n</i> (%)	Total
Gender				
Male	2 (1.4)	143 (97.2)	2 (1.4)	147
Female	2 (1.4)	137 (97.2)	2 (1.4)	141
Total	4 (1.4)	280 (97.2)	4 (1.4)	<i>N</i> = 288

Note. Percentages for gender were calculated based on *n* = 147 for male students and *n* = 141 for female students. Percentages for ‘Total’ (last row) were calculated based on *N* = 288. The highest responses in each row are shown in bold.

The topic of religion in conjunction with vaccination behavior is undoubtedly important because some religions put restrictions on vaccinations (i.e., an active form of immunization) and/or acceptance of immuno-globulins (i.e., a passive form of immunization). Grabenstein (2013) recently reviewed over 60 reports/evaluations about infectious disease outbreaks, those which are vaccine-preventable and which occurred in various religious communities. He discussed numerous populous religious groups, including Hinduism, Buddhism, Jainism, Judaism, Christianity, and Islam, and found that in multiple cases “ostensibly religious reasons to decline immunization actually reflected concerns about vaccine safety or personal beliefs among a social network of people organized around a faith community, rather than theologically based objections per se” (p. 2011). Yet, there are also groups who have objections to vaccines because they consider the body to be sacred and should rather heal naturally or by God’s intervention, and not through the receipt of chemical therapeutics or blood/tissue products from animals. There are also groups who have ethical concerns to vaccination, especially when human tissue cells are used to develop vaccines (The College of Physicians of Philadelphia, 2017).

Alcorta and Sosis (2005) mentioned that sacred symbols depend on the recognition of their meaning by its religious members and that rituals would not work without the participation of members of the religious community. They wrote that “[f]ormality, patterning, sequencing, and repetition are basic components of religious ritual, and signals of condition, status, and intent constitute ‘action releasers’ embedded within that structure” (p. 331). It has also been described that religion can provide a person’s civic identity, be used to either include or exclude other people from civic relationships, and to either support or inhibit collaborations across religious divides and status in society (Lichterman, 2008). But, whether people are religious or not religious, one thing is common among them, which is, they all seek to establish meaning in their lives that shape their own behavior through social interaction and the use of symbols (Blumer, 1969/1998; Sandstrom et al., 2014).

Attitudes about the Influence of Other Students to Seek Influenza Vaccination

One of the questions I had asked undergraduate students at Laketree University is if the behavior of other students to get immunized with the flu vaccine would influence their behavior to also seek this vaccination. I describe below what students expressed during the interviews. I grouped students’ comments into three subcategories: (a) no influence, (b) reminder effect, and (c) herd behavior.

No influence.

It would not [influence me]! Students are not the experts (Frank).

I would probably check [the information] and then forget about it. Who knows what he told me (Ben).

I would routinely get a flu shot regardless of other students’ decisions (Male student, 2nd year).

I always get the flu shot once a year because I personally think it's important to avoid the illness. Others' perception of the shot has no effect on my thoughts on it (Male student, 5th/6th year).

I already take preventative measures [and] don't need other people to influence my decisions (Male student, 5th/6th year).

Reminder effect.

I would [probably] wait until September or October, but when somebody would talk about it, it would remind me to get the shot (Jane).

Herd behavior.

I think it's like with everything. If a lot of people are doing something, it makes you getting the picture a little bit more. For example, well it is a little [bit] off but, if everybody would talk about the new batman movie or the new star wars movie, then it becomes more important to you. You kind of get the vaccine and get the movie. If everybody is doing it, it must be good! And then you do a little bit more research [about it]. That's kind of what I think.

I took a psychology class and we saw a video in which somebody fell and all people just walked by. But when one person helped, other people stopped and helped. How is this called? *Initiation*, I think (Chris).

These expressions of attitudes indicate that some students would not be influenced by other students to seek flu vaccination, and there are different reasons for this. For example, while Frank mentioned that he needs an expert opinion ("students are not the experts"), a male student (5th/6th year) felt that making the vaccination decision alone matters most to him ("don't need other people to influence my decisions). In contrast, Jane recognized students who received the flu vaccine as a good reminder for her: "it would remind me to get the shot"). Then, there is Chris who said: "If a lot of people are doing something, it makes you getting the picture a little bit more." Although it may take one person to start a certain behavior (i.e., the 'initiation'), it would take a number of people to have *herd behavior*. Herd behavior is typically recognized as a form of instinctive behavior in animals (e.g., fleeing from danger), but the term has also been

applied to human behavior, meaning, doing what other people are doing, being influenced by the power of crowds, and following the masses (Banerjee, 1992; Chen, 2008; Teraji, 2003).

I present in Table 5.7 responses of undergraduate students at Laketree University to the question of whether or not they would be influenced by other students who received influenza vaccination to seek flu vaccination. The results from the quantitative part of the survey showed that 138/288 (47.9%) undergraduate students at this university believed that other students' opinion to receive the flu vaccine would not influence their own decision to also receive this form of active immunization. However, there was a number of students (110/288, 38.2%) who felt that other students' opinions would matter to them. Few students (40/288, 13.9%) were not sure. The data in Table 5.7 also showed that both male and female students had overall similar opinions about this topic. Furthermore, data were similar when I computed the responses by year of study (Table not shown).

Table 5.7

Influence of Other Students on the Decision to Seek Influenza Vaccination

Answer	Yes <i>n</i> (%)	No <i>n</i> (%)	I am not sure <i>n</i> (%)	Total
Gender				
Male	57 (38.8)	68 (46.3)	22 (14.9)	147
Female	53 (37.6)	70 (49.6)	18 (12.8)	141
Total	110 (38.2)	138 (47.9)	40 (13.9)	<i>N</i> = 288

Note. Percentages for gender were calculated based on *n* = 147 for male students and *n* = 141 for female students. Percentages for 'Total' (last row) were calculated based on *N* = 288. The highest responses in each row are shown in bold.

Summary

I explored in this chapter various attitudes undergraduate students at Laketree University expressed during the mixed-methods survey and interpreted them through the lens of symbolic interactionism, a theory developed by Blumer (1969/1998). More specifically, I looked at the symbolic meanings students assigned to two pre-selected words, which are ‘influenza’ and ‘flu vaccination.’ Two additional words (‘mask’ and ‘age’) were found through coding to have also symbolic meanings to students, and they were analyzed accordingly. Furthermore, I interpreted not only students’ thoughts about the effectiveness of the influenza vaccine and the issue of mandatory flu vaccination, but also the cultural/religious influences on vaccination attitudes as well as the impact of other students’ opinions on the potential behavior of surveyed students to seek flu vaccination.

In regard to the symbolic meaning of influenza, most students pictured it as a “sickness” or “illness,” or as “being sick.” I could demonstrate that students recognized the flu not only by names (e.g., sickness or illness) or feelings (e.g., being sick), but also by many other descriptions, such as symptoms (e.g., coughing), cause (e.g., virus, contagious), perceived risk group (i.e., children and elderly), outcomes (e.g., “kills numerous people”), protection (e.g., flu vaccine), and sources for help (e.g., a doctor). The analysis also revealed that students expressed their thoughts about influenza in terms of images (e.g., hospital), metaphors (e.g., “worse than a cold”), and simple slogans (e.g., “missing class”).

Most students chose words such as shot(s) and flu shot(s) for the description of flu vaccination. The statement by Frank that “everybody calls it a shot” indicated that a collective description of the image of flu vaccination was created. Students also expressed meanings in terms of the application technology of the vaccine (e.g., needle and spray), feelings (e.g., ouch!),

reasons/justification (e.g., prevention), and qualities (e.g., helpful, control), among others. Furthermore, the mention by several students of the availability of a nasal spray for flu vaccination demonstrated that students kept up with recent developments in influenza vaccination practices.

The symbolic meaning of the word ‘mask’ was described in light of its use as a cultural object in religious ceremonies and rituals, as facial disguises, and as protective devices (especially surgical face masks). It turned out that the word mask elicits in undergraduate students at Laketree University a variety of responses, including feelings (e.g., “it would be strange”), uncertainty (e.g., “are you sick or not?”), reasoning (i.e., for “self-protection *and* protection of other people”), and culture (e.g., “it would be like [in] China” and “it’s not something people do here in the U.S.”), to name a few. The quantitative analysis revealed that 74% of undergraduate students in my survey would not wear a mask in class in the event of a flu outbreak on campus, and this opinion was shared by both male and female students. I pointed to the mystique of a face mask (i.e., it hides a kind of a secret) and mentioned that in Asian countries, especially in Japan, face mask use has become both a fashion trend, as masks come these days decorated with polka dots and floral designs, and a sign for not wanting to be disturbed by other people. I also discussed how effective a face mask is for protection from influenza by referring to guidelines of the Centers for Disease Control and Prevention.

I then turned my attention to the symbolic meaning of age and showed that undergraduate students emphasized the characteristics of their own age group (i.e., young adults) by pointing to their perceived health (“I am pretty healthy”), age and fitness (“I am young and active”), and even immortality (“we think we are immortal and can’t die”). I discussed this phenomenon as a sign for the protection of young adults’ positive distinctiveness from other age groups, especially

babies, children, and older adults. I concluded that undergraduate students' perception of age was shaped by culture, ideology, and the way social organization is structured, which follows Blumer's (1969/1998) premises expressed in his theory of symbolic interactionism.

I also examined students' attitudes about the effectiveness of the flu vaccine and found that 58.3% of undergraduate students believed that this vaccine is usually effective. While some students showed an understanding of the fact that the flu vaccine may not reach 100% effectiveness, other students had concerns and feelings of uncertainty like those expressed by a male student: "I didn't get the shot last year and didn't get sick, whereas a few of my friends who did get vaccinated got sick, which I think changes people's thoughts on effectiveness." I also discussed here the overall goal of influenza vaccination efforts, which is to achieve immunity of a large proportion of people in the community, which is known as *herd immunity*.

Another important topic I have discussed in this chapter is that of mandatory influenza vaccination. Students' rhetorics of attitudes about mandatory vaccination showed that most students did not like the idea of making flu vaccinations mandatory because of several reasons, which I interpreted mainly as expressions of American individualism (e.g., "Don't tell me I should get a flu shot") and of the importance to protect their constitutional rights (e.g., "I think the people have freedom of choice"). Students' answers to the question about the influence of cultural/religious beliefs revealed that almost all students in this survey did not believe it would inhibit them from seeking vaccination.

The final section of this chapter focused on the evaluation of undergraduate students' attitudes about the influence of other students, who sought flu vaccination, on deciding to also seek this type of vaccination. The results of the survey indicated that some students believed they would not be influenced (e.g., "It would not! Students are not the experts"), while one student

pointed to the benefit of a reminder effect (“it would remind me to get the shot”). There was also the mention of a behavior known as *herd behavior*. I explained, using information from the published literature, that herd behavior means doing what other people are doing and being influenced by the power of crowds, which essentially means, a behavior of following the masses. This discussion was initiated by a comment of a student (Chris) who stated, by using the examples of a new batman or star wars movie, that “if everybody would talk about it, then [it] becomes more important to you”). Finally, I presented data from the quantitative part of the survey which showed that the majority (47.9%) of undergraduate students at Laketree University would not be influenced by other students, who received the flu vaccine, to also seek this vaccination.

In sum, this chapter was about the evaluation of students’ expressions of attitudes about a number of issues related to influenza and flu vaccination. I used Blumer’s (1969/1998) theory of symbolic interactionism to decode the meaning students imposed on (a) objects such as influenza, mask, age, and the effectiveness of the flu vaccine, (b) events such as flu vaccination and the prospect of mandatory influenza vaccination, and (c) behavior like the influence of other students’ hypothetical actions to receive the flu vaccine. I showed how undergraduate students at Laketree University experienced and pictured these things and how they presented them through language (i.e., words) to themselves, by marking answers on the questionnaire, as well as to other people, in this case to me as a researcher during the face-to-face interviews. In other words, I placed undergraduate students in this mixed-methods survey in a situation in which they were invited to express subjective meanings—meanings they have created for themselves and in which they believe. These meanings were constructed through human interactions and interpretations, and were decoded by me as a researcher of this project.

CHAPTER SIX:

DETERMINANTS OF INFLUENZA AVOIDANCE BEHAVIOR

Introduction

In this sixth chapter, I explore what stimulates undergraduate students at Laketree University to either seek or abstain from flu vaccination and from obtaining information about influenza. More specifically, this chapter is about finding answers to the fourth and final question I had raised at the beginning of this dissertation research project: When and why do undergraduate students engage in risk response behavior? For this, I will discuss the communication channels undergraduate students prefer for obtaining daily news and other general-type information. I will also discuss what students would do if they hear a flu outbreak has reached the campus of Laketree University. I will present students' self-reported flu vaccinations during the influenza season prior to my survey (i.e., the 2014-2015 flu season) and also provide the number of flu shots students reported to have received within the three previous flu seasons from 2012-2013 through 2014-2015. Moreover, I will describe whether or not undergraduate students at Laketree University knew that this academic institution offers annual flu vaccination. I will also discuss what students believed it would take for them to start taking regularly flu avoidance measures. This chapter includes an analysis in which I examined associations between students' vaccination behavior and variables such as campus residence, field and year of study, memory of the 2009 influenza H1N1 pandemic, and belief in flu vaccine effectiveness, among others. Finally, I present a theoretical model in form of a concept map in which I incorporated data from Chapters 3-6 to reveal the key barriers and stimulators/enablers for undergraduate students to seek information about influenza and to decide about receiving or abstaining from flu vaccination.

The coding of the data set I will describe in this chapter (Chapter 6) allowed me to identify the following three themes: (a) identity, (b) reacting to risk, and (c) needs and wants. For the interpretation of this set of data, I revisited the cultural theory of risk perception (Douglas & Wildavsky, 1983) as well as the concepts ‘field’ and ‘habitus,’ which are part of the theory of structural constructivism (Bourdieu, 1989, 1990, 1993, 1998, 2003; Bourdieu & Passeron, 2015). Furthermore, I used the theory of applied phronesis (Aristotle, trans. 2014a, 2014b; Flyvbjerg et al., 2012; Kinsella & Pitman, 2012) to interpret undergraduate students’ reasoning and response behavior to various risks (e.g., smoking; Ebola; or driving without wearing a seat belt) in direct comparison to the risk influenza. Here, the focus was on understanding undergraduate students’ deliberation practices, decision-making, and self-leadership.

Identity

Pickett (2000, p. 871) defined *identity* as “[t]he set of behavioral or personal characteristics by which an individual is recognizable as a member of a group.” This definition, when applied to undergraduate students in my survey, implies that individual students have certain characteristics that can be found among other students who belong to the same group(s) within a university setting. I had already discussed in previous chapters some of the characteristics of undergraduate students. More precisely, I had mentioned in Chapter 1 that students in my survey belong to the cohorts ‘Millennials’ and ‘Gen-Zers.’ In Chapter 2, I pointed out that most undergraduate students are considered ‘traditional students’ who as members of a student subpopulation represent a more homogenous group when compared to ‘non-traditional students’ who are typically older, have diverse professional backgrounds, and have to deal with various responsibilities in their lives. Furthermore, I had discussed in Chapter 3 that undergraduate students hold a certain ‘field’ position within the hierarchy in that they are at the

receiving end of information about influenza and vaccination provided by various authoritative entities, including government agencies, the industry, and Laketree University. However, this discussion focused solely on students' perception of authoritative power and on the issue of trust in authority and in influenza information. Finally, I had described in the previous chapter (Chapter 5) the identification of undergraduate students as 'young adults,' and the words they used to describe their perceived good health, fitness, and even immortality, which they believe made them distinct from other age groups, such as babies, children, and older adults.

In this chapter, I will explore in more detail undergraduate students' identity as members of Generation Y ('Millennials') and Generation Z who hold various beliefs and behave in ways that distinguishes them from other generations such as Baby Boomers (like me) and members of Generation X). Furthermore, I will explore characteristics of various subcultures of undergraduate students, especially the characteristics of young students who experience the transition of moving out of home and going to college, which "mark a movement toward adulthood" (Burke, Ruppel, & Dinsmore, 2016, p. 180). I had already briefly touched upon this topic in Chapter 1. I felt that these two identities (members of Generations Z/Millennials and members of a student subculture) needed to be discussed here because undergraduate students in my survey made several comments about it.

Millennials and Generation Z

As I had mentioned in Chapter 1, the grouping of people into cohorts of Millennials and Gen-Zers was based on information provided by Lancaster and Stillman (2005, 2010) as well as Seemiller and Grace (2016). I composed the following birth date ranges: (a) Millennials: born between 1981 and 1994; and (b) Generation Z: born between 1995 and 2010. Using these birth date ranges, I found that 118/303 (38.9%) undergraduate students in my survey (including Bee,

Chris, Eduardo, Frank, and Jim) belonged to the cohort Millennials, while 185/303 (61.1%) students (including Ben, Carlo, Darius, David, Fiona, Grace, Henry, Jane, Kelly, and Sarah) belonged to Generation Z (note: 300 students participated in the main study and 3 students in the pilot study, resulting in a total number of 303 students).

During the survey, I asked undergraduate students at Laketree University to mark on the questionnaire how often they typically use seven pre-selected communication channels to obtain news and other information. The results of the quantitative survey are displayed in Table 6.1.

Table 6.1

Undergraduate Students' Use of Communication Channels

Communication channels	Students' responses				
	Every Day <i>n</i> (%)	4+ Times Per Week <i>n</i> (%)	1-2 Times Per Month <i>n</i> (%)	1-2 Times Per Year <i>n</i> (%)	Never <i>n</i> (%)
Television	48 (16.7)	97 (33.7)	109 (37.8)	11 (3.8)	23 (8.0)
Radio	34 (11.8)	76 (26.4)	105 (36.5)	28 (9.7)	45 (15.6)
E-mail	130 (45.1)	83 (28.8)	40 (13.9)	16 (5.6)	19 (6.6)
Cell phone	203 (70.5)	56 (19.5)	15 (5.2)	3 (1.0)	11 (3.8)
Internet via computer	197 (68.4)	66 (22.9)	19 (6.6)	5 (1.7)	1 (0.4)
Newspaper	10 (3.5)	22 (7.6)	128 (44.4)	76 (26.4)	52 (18.1)
Library	9 (3.1)	25 (8.7)	87 (30.2)	72 (25.0)	95 (33.0)

Note. Percentages for the Likert scales per communication channel were calculated based on $N = 288$. The highest responses in each row are shown in bold.

The data revealed that the preferred communication channels for undergraduate students are as follows (in ranking order): (1) cell phones; (2) Internet via computer; (3) e-mail; (4) newspaper; (5) television; (6) radio; and (7) the library. This showed that students of both generations (i.e., Millennials and Gen-Zers) are well connected with digital communication tools

and benefit from this type of connectivity every day. Students who participated in the interviews explained their preferred choices as follows:

I usually watch the 5 o'clock [on television] and then the national news. Well, actually I watch it Monday through Friday. I want to know what's going on in the community and nationally. I am very scheduled. I commute to school, so I usually listen to NPR [National Public Radio]. Cell phone is important for the Internet use, [while] a computer is less important because my computer crashed last year and I now use my mom's just for the papers I write (Frank, Millennial member).

I drive every day to campus from point A to point B and I listen to NPR a lot. So, radio is there to get news. I check my e-mails [and] have 'Google' on my phone, that's almost like text-messaging. [I have a] cell phone with me and always some sort of computer for Internet access (Chris, Millennial member).

I use the library only when I need to pick up a book. I usually read science fiction. I never go in [the library] to pick up information. Radio is important because if there is no power and you want to hear something, the radio still works (Eduardo, Millennial member).

The way society is shaped now—the college students—that's what we mostly use: e-mail, cell phone, and computer. I don't think we have time and sit down and watch TV or listen to the radio. And [the] library is for studying for class (Sarah, Gen-Z member).

E-mail, cell phone, Internet via computer: 'every day.' I think they are the most common form of communication. Well, for me it's more convenient. I always have my phone and a computer on me. Like you get an e-mail on your phone (Jane, Gen-Z member).

Usually when I see something and get interested, then I want to learn more about it. Then, I 'Google' it and use my computer. Internet is my preferred device for getting information about something. I watch television every day, but most important for me is the Internet and e-mail. I [marked] television there because television is all around campus. I go run every morning and there is television with the news on [in the gymnasium]. When you look at a YouTube video or something like that, they [show] commercials with important news, and CDC with announcements. I am not a big radio person. I only listen to music and not to talk-radio. And [regarding the] newspaper, that is usually online now. And [regarding] the library, I usually use the Internet unless I do a research paper (Fiona, Gen-Z member).

I am on my phone constantly. Multiple times per day. And I am also on the Internet looking for the latest news feeds. The same thing is [true] with the computer. I am always on my laptop and some sort of desktop in the library. I am always on it! There is always a cell phone or a computer close by in this time of age. I very rarely pick up a newspaper. I cannot even tell you when the last time was that I picked up a newspaper. The information in the newspaper is probably good, but I would consider the newspaper itself to be obsolete because of the Internet. I can go on the Internet and search for any kind of

news I want, while the newspaper only gives me a certain selection. The newspaper comes [out] like ones a day, so you have to wait for it. And [regarding] the Internet, you can go on[line] whenever [you want]. And it is constant information. I only go to the library to study and to get material for my classes. But otherwise, I don't go there at all. For me personally, I don't typically watch television for information. I do have a TV, but I don't have cable. So it's unimportant for me (Henry, Gen-Z member).

At first glance, these comments sound like that members of both generations (Millennials and Gen-Zers) are equally well acquainted with modern technology. However, there are a number of differences between these two generations with regards to technology, tech-connection, information access, and identity, among others. I had presented in Table 1.1 (Chapter 1) a short list of characteristics that distinguishes Millennials from Gen-Zers.

When I apply the theory of 'habitus' (Bourdieu, 1990, 2013; Bourdieu & Passeron, 2015) to this phenomenon of a life with high technology, I believe one can say that the modern technology behavior of undergraduate students is essentially a behavioral pattern of Millennials and Gen-Zers, but at different levels: While Millennials are techno-savvy and connected, Gen-Zers prefer smart-tech and are hyper-connected (see Table 1.1). In contrast to these two generations, members of Generation X (born between 1965 and 1980) were still accustomed to typewriters but were in a transition phase to using computers (Seemiller & Grace, 2016). I as a Baby Boomer did not grow up with any of the high-tech devices and multiple digital platforms. Instead, I had to rely on index cards to access books in the library and on the *Current Contents*, which was published weekly in paper form, to search for biomedical research articles. I also need to mention that I wrote my first dissertation in Germany in 1987 on a mechanical travel type writer.

As a member of the Baby Boomer Generation (Born: between 1946 and 1964), I experienced during the interviews with undergraduate students memorable moments in which I

clearly felt our generational differences. I would like to share here a few of these moments. At the beginning of every face-to-face interview, I tested my two digital recorders for functionality.

Below are a few excerpts from the dialogues between students and me:

(a) Interview with Fiona:

Christian: Just a quick test to make sure it [the recorder] still works. Yeah, this one [the first recorder] is already recording. And here is the other one... back-up (!), in case one of them dies.

Fiona: Yeah, that's good.

Christian: Do you see the smile on my face? This thing works! O.K., these [the recorders] are both on. Let's now go over the questionnaire ...

(b) Interview with Frank:

Christian: This is just a quick test to see if it [the recorder] works on March 10.

Frank: My girlfriend has the exact one [recorder].

Christian: Oh, really? This is the second test [for the other recorder] on March 10. O.K. Now ... I guess in my age I have to do everything step-by-step. I am 58.

Frank: Really? I would have guessed in the 40s.

Christian: That would be nice!

(c) Interview with Chris:

Christian: I just look at your age: You are 22 years old. By the way, I am 58 years old—too old!

Chris: You are a wise man!

Christian: I should be, but I don't think I am.

(d) Interview with Bee:

Christian: This is just a quick test for the interview on March 14, 2016, with Bee. That [the recorder] is already counting, that's good! Now, let's test here [the second recorder]. You can probably tell that I am paranoid with these things [digital devices]. If one [device] dies, I hope that the other one works so that I don't lose the information [from the interview].

Bee: Yeah.

Christian: O.K. This one here [the second recorder] is running too.

Bee: Is Bee the most creative name you had so far in your study?

Christian: Yes, absolutely!

(e) Interview with Darius:

Christian: This is a quick test. Interview on March 21, 2016, with Darius.

Darius: Would you like me to come closer so that the recorder can hear me?

Christian: No, I think that's O.K. The recorder will pick up your voice. But thanks!

Darius: O.K.

Christian: Let's go over the questionnaire ...

These dialogues between undergraduate students and me before the discussion of the topic of 'influenza' demonstrated not only my paranoia with digital recording devices and my fear of losing interview information, but also the hesitation to accept my (older) age. I appreciated Frank's comment that I looked younger than I actually am, as well as Chris's comment suggesting that I am a wise man. I am also thankful for Darius' question about his distance to the recorder in regard to the recording quality of his voice. All these comments gave me feelings of being younger and of not being left alone with the digital recording technology in case a problem would have arisen. Luckily for me, both recorders worked fine throughout the

interviews. But, I need to mention that I used a new set of batteries for every recording session—just to minimize the risk of losing battery power during the interviews!

Undergraduate Student Subcultures

Once young adults entered college, they can experiment and accept many identity images, especially those that belong to one or another undergraduate student subculture. Ellett (2010) described subcultures that can develop based on college organization type (e.g., public versus private; 2-year versus 4-year), distance to campus (e.g., commuter versus residential), and class teaching format (e.g., virtual versus on-campus class attendance). Subcultures can also form among international students, first-year students (freshmen), and those that are based on social class (e.g., parents' occupation), among others (Apostal, 1966; Gottlieb & Hodgkins, 1963; Jueckstock & Gallineau, 2009; Magolda & Ebben, 2007; Terenzini & Pascarella, 1977; Warren, 1968; Whittaker, 1968). In short, students' behavior and what they learn in college "is determined by an interaction of individuality and norms common to peer groups" (Whittaker, 1968, para. 1).

In my survey, several undergraduate students emphasized their belonging to certain student subcultures:

Actually, it is my second year at Laketree University. It is my fourth year [in total]. I just averaged it. I transferred here recently (Eduardo, transfer student).

I am from Cameroon (David, international student).

I commute to school (Frank, commuter).

I lived in dorms for two years here at Laketree University (Darius, past dorm-resident).

I am in my first year (Grace, first-year student).

My dad is also kind of in biology. He has a master's degree (Carlo, social class emphasize: father's occupation).

What is common among these students is that they all seek identity and a sense of community, and look for ways to adapt to their new social and academic environment (Adams, Berzonsky, & Keating, 2006; Bowman, 2010). In other words, it is about finding a social space in which undergraduate students can feel comfortable, are given opportunities for position-taking, and can actively participate in the cultural (re-)production of that space (Bourdieu, 1993).

Reacting to Risk

Past Vaccination Behavior

The question whether a certain kind of past behavior is a good predictor for future behavior is of great interest to researchers, especially regarding the forming of attitudes, the development of habits, and the expression of intentions (Corace et al., 2016; Ernsting, Lippke, Schwarzer, & Schneider, 2011; Glasman & Albarracin, 2006; Ouellette & Wood, 1998).

In my survey at Laketree University, I had asked undergraduate students if they received a flu shot last year (i.e., during the 2014-2015 influenza season). As depicted in Table 6.2, the vast majority of undergraduate students at Laketree University remembered whether or not they received a flu shot during the past year (only 10/288, 3.5% students marked 'I don't remember'). The total number of students who received the vaccine (140/288, 48.6%) was almost identical to the number of students who did not (138/288, 47.9%). There was only a slight difference between male students (70/147, 47.6%) and female students (68/141, 48.2%) who refused the vaccine (see Table 6.2). This latter finding of similar vaccination behavior of university students of both sexes was also described by Bednarczyk et al. (2015) who showed that 29% of females and 27% of males reported flu vaccination. However, the self-reported vaccination rates among students in my study were much higher.

Table 6.2

Undergraduate Students' Flu Vaccinations during the 2014-2015 Influenza Season (Stratified by Gender)

Answer	Yes <i>n</i> (%)	No <i>n</i> (%)	I don't remember <i>n</i> (%)	Total
Male	70 (47.6)	70 (47.6)	7 (4.8)	147
Female	70 (49.6)	68 (48.2)	3 (2.2)	141
Total	140 (48.6)	138 (47.9)	10 (3.5)	<i>N</i> = 288

Note. Percentages for gender were calculated based on *n* = 147 for male students and *n* = 141 for female students. Percentages for 'Total' (last row) were calculated based on *N* = 288.

When I compared my data with those researchers obtained from surveys at several other colleges and universities, I was able to show that Laketree University's undergraduate students ranked in 2nd place among selected institutions of higher education (Table 6.3). Although one needs to consider that researchers differed in their selection of student subpopulations (e.g., undergraduate students, graduate students, and/or medical students), my results clearly indicated that the past flu vaccination behavior of Laketree University's undergraduate students was more similar to that of students in medicine and allied sciences than to undergraduate students at other universities.

Table 6.3

Students' Self-Reported Flu Vaccinations at Selected Colleges/Universities

Colleges/ universities	Student population	Number of survey respondents (<i>N</i>)	Flu vaccine uptake	Type of flu vaccine (pre-, in-, or post-2009 flu pandemic)	Ranking (place) by flu vaccine uptake	Comments/ references
University of Birmingham, UK	Medical students	126	49.2%	H1N1pdm09 (in-pandemic)	1st	126 students were offered the vaccine/ Lee et al. (2012)
Laketree University	Undergraduate Students	288	48.6%	Seasonal (post-pandemic)	2nd	Quantitative part of the survey only/ Current study (2015/2016)
University of Notre Dame Australia, Fremantle	Medicine, nursing, and physiotherapy students	438	36.3%	Seasonal (post-pandemic)	3rd	Kelly et al. (2014)
Large public New York State University	Students who visited the University Health Center	593	27.7%	Seasonal (post-pandemic)	4th	Bednarczyk et al. (2015)
California State University, Northridge	Undergraduate students	317	20.6%	Seasonal (post-pandemic)	5th	Benjamin & Bahr (2016)
8 Universities in North Carolina	Undergraduate students	4,090	20%	Seasonal (in-pandemic)	6th	Range: 14%-30% by university; data were collected during the pandemic/ Poehling et al. (2012)
Historically Black Colleges and Universities, Dover, Delaware	African American freshmen	540	17%	H1N1pdm09 (in-pandemic)	7th	Ford et al. (2012)
Vellore Institute of Technology, India	Bio-sciences, biotechnology, and other students	802	12.7%	H1N1pdm09 (post-pandemic)	8th	Data collected in post-pandemic phase/ Suresh et al. (2011)
Brigham Young University, Provo, Utah	Undergraduate students	421	12%	Seasonal (pre-pandemic)	9th	Merrill et al. (2010)
Major university in southwestern United States	Undergraduate and graduate students	483	10%	H1N1pdm09 (in-pandemic)	10th	Mas et al. (2011)

I further analyzed influenza vaccination data from the quantitative part of my survey by year-of-study (Table 6.4). The data showed that past vaccination behavior of all Laketree University's undergraduate students (i.e., freshmen, sophomores, juniors, and seniors) was quite similar. One may speculate that students' exposure to the university environment has somewhat influenced their flu vaccination behavior throughout their tenure as undergraduate students, but other factors may also be responsible for this vaccination behavior. I will come back to this issue later.

Table 6.4

Undergraduate Students' Flu Vaccinations during the 2014-2015 Influenza Season (Stratified by Year of Study)

Year of study \ Answer	Yes n (%)	No n (%)	I don't remember n (%)	Total
1st year	34 (49.3)	34 (49.3)	1 (1.4)	69
2nd year	35 (45.5)	39 (50.6)	3 (3.9)	77
3rd year	28 (45.2)	32 (51.6)	2 (3.2)	62
4th year	31 (51.7)	26 (43.3)	3 (5.0)	60
5th/6th year	11 (57.9)	7 (36.8)	1 (5.3)	19
Other	1 (100)	0 (0)	0 (0)	1
Total	140 (48.6)	138 (47.9)	10 (3.5)	N = 288

Note. Percentages for year-of-study were calculated based on 69 for 1st year students, 77 for 2nd year students, 62 for 3rd year students, 60 for 4th year students, 19 for 5th/6th year students, and 1 for 'other' students. Percentages for 'Total' (last row) were calculated based on $N = 288$.

When I asked students how many flu vaccinations they have received during the past three years (i.e., during influenza seasons 2012-2013 through 2014-2015), the data revealed that 101/288 (35.0%) of students self-reported having received a flu shot every year during these past three flu seasons (Table 6.5). A similar percentage (31.3%) of students marked on the questionnaire that they did not receive any flu shot during the same time period. Furthermore, 55/288 (19.1%) students reported having received at least one flu shot during the three-year period and 42/288 (14.6%) students received two flu shots. Flu vaccination behavior was similar when data were analyzed by year-of-study (Table not shown).

Table 6.5

Number of Influenza Vaccinations among Undergraduate Students during Influenza Seasons 2012-2013 through 2014-2015

Number of flu shots	0	1	2	3	Total <i>n</i>
Gender					
Male	43	30	25	49	147
Female	47	25	17	52	141
Total	90 (31.3%)	55 (19.1%)	42 (14.6%)	101 (35.0%)	<i>N</i> = 288

Note. Percentages for gender were calculated based on $n = 147$ for male students and $n = 141$ for female students. Percentages for 'Total' (last row) were calculated based on $N = 288$.

It was desirable to examine further whether there was an association of flu vaccination behavior and variables other than gender and year-of-study. Based on findings reported in previous chapters, this examination included variables such as memory of the 2009 influenza A(H1N1) pandemic, perceived personal risk of getting the flu, belief in flu vaccine effectiveness,

and worries about flu vaccine side effects, among others. Table 6.6 shows the results of the Chi Square analyses of the relationship between these variables and receipt of the flu vaccination in influenza season 2014-2015.

Table 6.6

Association of Undergraduate Students' Past Vaccination Behavior (2014-2015 Influenza Season) and Selected Variables

Variables	Responses		Statistical significance χ^2 $p < 0.05$
	Yes N = 140/288	No N = 138/288	
Memory of the 2009 influenza A(H1N1) pandemic • Yes (279/288, 96.9%) • No (9/288, 3.1%)	138/140 (98.6%) 2/140 (1.4%)	133/138 (96.4%) 5/138 (3.6%)	$\chi^2 = 1.3636$ $p = 0.242906$
Perceived personal risk of getting the flu • Very high/high risk (34/288, 11.8%) • Some risk (159/288, 55.2%) • Very little/no risk (95/288, 33.0%)	21/140 (15.0%) 83/140 (59.3%) 36/140 (25.7%)	12/138 (8.7%) 69/138 (50.0%) 57/138 (41.3%)	$\chi^2 = 8.477$ $p = 0.014465$
Belief in flu vaccine effectiveness • Always/usually (186/288, 64.6%) • Sometimes (69/288, 23.9%) • Seldom/never (33/288, 11.5%)	126/140 (90.0%) 12/140 (8.6%) 2/140 (1.4%)	54/138 (39.1%) 55/138 (39.9%) 29/138 (21.0%)	$\chi^2 = 79.9029$ $p < 0.00001$
Worries about flu vaccine side effects • Very worried/worried (49/288, 17.0%) • Neutral (43/288, 14.9%) • Little worried/not worried (196/288, 68.1%)	13/140 (9.3%) 19/140 (13.6%) 108/140 (77.1%)	36/138 (26.1%) 23/138 (16.7%) 79/138 (57.2%)	$\chi^2 = 15.6606$ $p = 0.000398$
Familiarity with the concept of influenza • Yes (267/288, 92.7%) • Not sure (21/288, 7.3%) • No (0/288, 0.0%)	131/140 (93.6%) 9/140 (6.4%) 0/140 (0.0%)	126/138 (91.3%) 12/138 (8.7%) 0/138 (0.0%)	$\chi^2 = 0.5115$ $p = 0.474496$
Knowledge about flu protective measures • Very well/well informed (79/288, 27.4%) • Somewhat informed (115/288, 40.0%) • Little/not informed (94/288, 32.6%)	47/140 (33.6%) 56/140 (40.0%) 37/140 (26.4%)	30/138 (21.8%) 54/138 (39.1%) 54/138 (39.1%)	$\chi^2 = 6.9514$ $p = 0.03094$

(Table continues on next page)

Table 6.6 (continued)

Association of Undergraduate Students' Past Vaccination Behavior (2014-2015 Influenza Season) and Selected Variables

Variables	Responses	Flu vaccinations during the 2014-2015 influenza season		Statistical significance
		Yes N = 140/288	No N = 138/288	X^2 $p < 0.05$
Field of study				
• Natural and health-related sciences (63/288, 21.9%)		35/140 (25.0%)	27/138 (19.6%)	$X^2 = 1.4067$ $p = 0.494935$
• Business (107/288, 37.1%)		52/140 (37.1%)	55/138 (39.9%)	
• Engineering (29/288, 10.1%)		13/140 (9.3%)	16/138 (11.6%)	
Residence				
• On-campus (108/288, 37.5%)		59/140 (42.1%)	48/138 (34.8%)	$X^2 = 1.5902$ $p = 0.207295$
• Off-campus (180/288, 62.5%)		81/140 (57.9%)	90/138 (65.2%)	
Generation cohort				
• Gen-Zers (175/288, 60.8%)		85/140 (60.7%)	85/138 (61.6%)	$X^2 = 0.0226$ $p = 0.880372$
• Millennials (113/288, 39.2%)		55/140 (39.3%)	53/138 (38.4%)	
Level of trust in flu information provided by authorities				
• Very high/high (176/288, 61.1%)		98/140 (70.0%)	72/138 (52.2%)	$X^2 = 9.6178$ $p = 0.008157$
• Neutral (90/288, 31.3%)		35/140 (25.0%)	52/138 (37.7%)	
• Very low/low (22/288, 7.6%)		7/140 (5.0%)	14/138 (10.1%)	

Note. Data were computed for students who participated in the quantitative part of the survey. Numbers per variable/responses are presented for male and female students combined, followed by corresponding percentages. Field of study for 'Natural and health-related sciences' included biology, biochemistry, neuroscience, psychology, exercise science, and health promotion, as well as pre-medicine and pre-dentistry. Differences in reported influenza vaccination coverage between variables per categories were calculated using Chi-Square (X^2) tests, with a significance level set at $p < 0.05$. With Bonferroni corrections for multiple comparisons (here 10), statistical significance was declared only when $p < 0.05/10$, or 0.005.

The Chi-Square analysis with Bonferroni adjustments revealed that two variables were associated with flu vaccination acceptance (flu season 2014-2015) of undergraduate students at Laketree University. These variables were (a) belief in flu vaccine effectiveness and (b) worries about flu vaccine side effects. All other variables were found to be independent of students' flu vaccination behavior.

I further analyzed data about flu vaccinations that students took every year during the 2012-2013 through 2014-2015 influenza seasons (i.e., students who self-reported having received three flu shots). The results of this analysis are presented in Table 6.7. The data revealed that (a) perceived personal risk of getting the flu, (b) belief in vaccine effectiveness, and (c) level of trust in flu information provided by authorities were associated with flu vaccine acceptance. It appeared that students who took three flu shots every year during the 2012-2013 through 2014-2015 influenza seasons did not worry as much about flu vaccine side effects than those students who self-reported having received a flu shot during the past season (i.e., the 2014-2015 influenza season). Moreover, the level of trust in flu information provided by the authorities seemed to play a role for students who received flu vaccinations every year during the 2012-2013 through 2014-2015 influenza seasons when compared to those who got vaccinated only during the 2014-2015 flu season.

Table 6.7

Association of Undergraduate Students' Past Vaccination Behavior (2012-2013 through 2014-2015 Influenza Seasons) and Selected Variables

Variables	Flu vaccinations every year during the 2012-2013 through 2014-2015 influenza seasons		Statistical significance X^2 $p < 0.05$
	Yes N = 101/288	No N = 90/288	
Memory of the 2009 influenza A(H1N1) pandemic • Yes (279/288, 96.9%) • No (9/288, 3.1%)	96/101 (95.0%) 5/101 (5.0%)	88/90 (97.8%) 2/90 (2.2%)	$X^2 = 1.0034$ $p = 0.316499$
Perceived personal risk of getting the flu • Very high/high risk (34/288, 11.8%) • Some risk (159/288, 55.2%) • Very little/no risk (95/288, 33.0%)	14/101 (13.9%) 64/101 (63.3%) 23/101 (22.8%)	8/90 (8.9%) 36/90 (40.0%) 46/90 (51.1%)	$X^2 = 16.5645$ $p = 0.000253$

(Table continues on next page)

Table 6.7 (continued)

Association of Undergraduate Students' Past Vaccination Behavior (2012-2013 through 2014-2015 Influenza Seasons) and Selected Variables

Variables	Flu vaccinations every year during the 2012-2013 through 2014-2015 influenza seasons		Statistical significance
	Yes N = 101/288	No N = 90/288	χ^2 $p < 0.05$
Belief in flu vaccine effectiveness • Always/usually (186/288, 64.6%) • Sometimes (69/288, 23.9%) • Seldom/never (33/288, 11.5%)	89/101 (88.1%) 8/101 (7.9%) 4/101 (4.0%)	27/90 (30.0%) 38/90 (42.2%) 25/90 (27.8%)	$\chi^2 = 67.5004$ $p < 0.0001$
Worries about flu vaccine side effects • Very worried/worried (49/288, 17.0%) • Neutral (43/288, 14.9%) • Little worried/not worried (196/288, 68.1%)	15/101 (14.8%) 13/101 (12.9%) 73/101 (72.3%)	18/90 (20.0%) 13/90 (14.4%) 59/90 (65.6%)	$\chi^2 = 1.1278$ $p = 0.568983$
Familiarity with the concept of influenza • Yes (267/288, 92.7%) • Not sure (21/288, 7.3%) • No (0/288, 0.0%)	99/101 (98.0%) 2/101 (2.0%) 0/101 (0.0%)	80/90 (88.9%) 10/90 (11.1%) 0/90 (0.0%)	$\chi^2 = 6.7389$ $p = 0.009433$
Knowledge about flu protective measures • Very well/well informed (79/288, 27.4%) • Somewhat informed (115/288, 40.0%) • Little/not informed (94/288, 32.6%)	31/101 (30.7%) 23/101 (22.8%) 47/101 (46.5%)	17/90 (18.9%) 37/90 (41.1%) 36/90 (40.0%)	$\chi^2 = 8.2015$ $p = 0.01656$
Field of study • Natural and health-related sciences (63/288, 21.9%) • Business (107/288, 37.1%) • Engineering (29/288, 10.1%)	30/101 (29.7%) 34/101 (33.7%) 10/101 (9.9%)	20/90 (22.2%) 31/90 (34.4%) 11/90 (12.2%)	$\chi^2 = 1.1361$ $p = 0.566629$
Residence • On-campus (108/288, 37.5%) • Off-campus (180/288, 62.5%)	40/101 (39.6%) 61/101 (60.4%)	34/90 (37.8%) 56/90 (62.2%)	$\chi^2 = 0.0669$ $p = 0.795941$
Generation cohort • GenZers (175/288, 60.8%) • Millennials (113/288, 39.2%)	58/101 (57.4%) 43/101 (42.6%)	55/90 (61.1%) 35/90 (38.9%)	$\chi^2 = 0.2675$ $p = 0.604988$
Level of trust in flu information provided by authorities • Very high/high (176/288, 61.1%) • Neutral (90/288, 31.3%) • Very low/low (22/288, 7.6%)	75/101 (74.2%) 23/101 (22.8%) 3/101 (3.0%)	42/90 (46.7%) 36/90 (40.0%) 12/90 (13.3%)	$\chi^2 = 16.995$ $p = 0.000204$

Note. Data were computed for students who participated in the quantitative part of the survey. Numbers per variable/responses are presented for male and female students combined, followed by corresponding percentages. Field of study for 'Natural and health-related sciences' included biology, biochemistry, neuroscience, psychology, exercise science, and health promotion, as well as pre-medicine and pre-dentistry. Differences in reported influenza vaccination coverage between variables per categories were calculated using Chi-Square (χ^2) tests, with a significance level set at $p < 0.05$. With Bonferroni corrections for multiple comparisons (here 10), statistical significance was declared only when $p < 0.05/10$, or 0.005.

I asked undergraduate students who participated in my survey what their thoughts are about flu vaccination. Below are comments students made during the interviews (those students are identified by their pseudonyms) and comments students wrote on the questionnaire during the anonymous, quantitative part of the survey (those students are identified by gender and year-of-study).

Students who received a flu vaccine.

Love the flu shot (Female student, 4th year).

Big fan of the flu shot, mainly because my mom's a nurse and my dad's a doctor (Female student, 4th year).

I got my flu vaccine at Laketree University this year (Female student, 3rd year).

I opt the flu vaccination through the nasal spray (Female, 2nd year).

I got it a few times. A few seasons. I have not gotten the vaccine and have not gotten the flu, and I have gotten the flu and have gotten the vaccine (Carlos).

I now rely more on my immune system instead of getting the shot (Male student, 3rd year).

Students who abstained from flu vaccination.

I don't think I've ever received a flu shot. I've also never gotten the flu (Female student, 2nd year).

I have gotten the flu twice and it was both of the years I got vaccinated (Male student, 3rd year).

I have not received a shot this year but the only reason for that is [that] I am lazy and hate shots (Male student, 1st year).

The reason I haven't taken the flu shot for the last 3 years is due to my own forgetfulness (Male student, 3rd year).

No needle or spray for me, but I would consider another form of the vaccine (Female student, 2nd year).

I have no problem with vaccines and I think they work. But, I've never had the flu vaccine and never gotten the flu, so I never felt the need to get vaccinated (Female student, 3rd year).

Because I have not gotten a flu shot in many years, I fear that getting one now may make me sick. I never take medications or get shots, at least not regularly (Female student, 3rd year).

These comments of students revealed various different explanations for their past vaccination behavior. While some students gave as reasons for abstaining from vaccination their laziness and forgetfulness, other students simply did not like the shots or the flu vaccine nasal spray. Interesting were also the comments of students who have never experienced the flu and/or who experienced a lack of effectiveness of the influenza vaccine. Reasons for abstaining from flu vaccination like an observed ineffectiveness of the influenza vaccine were also mentioned by students in other surveys (e.g., Lawrence, 2014) as were forgetfulness and laziness (e.g., Hashmi et al., 2016). On the other side, students who got vaccinated during the past year(s) were either enthusiastic about the flu vaccine (“Love the flu shot”) or felt that protection through natural immunization (i.e., through natural infection with the flu virus) would be a better choice for them (“I rely now more on my immune system instead of getting the shot”). The endorsement for uptaking the flu vaccine by a family member who is in the medical field (“my dad’s a doctor”) was also mentioned by students in other surveys (e.g., Ravert et al., 2012).

Influenza Outbreak Behavior

Fischhoff and Kadvany (2011) pointed out that [f]rom a decision-making perspective, people are adequately informed when knowing more would not affect their choices. That test allows assessing whether risk communications have served the practical purpose of letting people make effective risk decisions. The test is somewhat different when applied to the three elements of any decision: facts, values, and options (p. 129).

I had asked undergraduate students at Laketree University a set of questions which were intended to probe for behavior that was influenced by facts (e.g., knowledge of the effectiveness of various flu protection measures), by values (here: What is perceived as beneficial/important by undergraduate students?), and by options (here: What do undergraduate students select most?). I present in Table 6.8 quantitative data that pertained to item 22 on the questionnaire: If you hear a flu outbreak has reached the campus of Laketree University, what would you do?

Table 6.8

Undergraduate Students' Behavior in the Event of an Influenza Outbreak on Campus

Behavior	Students' responses				
	True of me <i>n</i> (%)	Somewhat true of me <i>n</i> (%)	Neutral <i>n</i> (%)	Somewhat untrue of me <i>n</i> (%)	Untrue of me <i>n</i> (%)
I would stay home	33 (11.5)	64 (22.2)	59 (20.5)	55 (19.1)	77 (26.7)
I would try to keep distance from other people	72 (25.0)	100 (34.7)	43 (14.9)	43 (14.9)	30 (10.5)
I would avoid using Laketree University's inter-campus shuttle bus	82 (28.5)	52 (18.1)	54 (18.7)	39 (13.5)	61 (21.2)
I would cover my nose and mouth when sneezing	254 (88.2)	24 (8.4)	7 (2.4)	3 (1.0)	0 (0.0)
I would wash my hands more frequently	246 (85.4)	31 (10.8)	8 (2.7)	1 (0.4)	2 (0.7)
I would increase the use of hand sanitizers	201 (69.8)	49 (17.1)	22 (7.6)	7 (2.4)	9 (3.1)
I would seek flu vaccination	140 (48.6)	67 (23.3)	35 (12.2)	22 (7.6)	24 (8.3)

Note. Data were computed for students who participated in the quantitative part of the survey. Percentages for the Likert scales total were calculated based on $N = 288$. The highest responses in each row are shown in bold.

The results showed that flu vaccination is not the first behavior choice for undergraduate students at Laketree University. Most students (254/288, 88.2%) marked ‘I would cover my nose and mouth when sneezing.’ This was followed by ‘I would wash my hands more frequently’ (246/288, 85.4%) and by ‘I would increase the use of hand sanitizers’ (201/288, 69.8%). Keeping distance to other people and avoiding to use the inter-campus shuttle were less important (100/288, 34.7% and 82/288, 28.5%, respectively). Staying home was chosen by students in last place (77/288, 26.7%). Students who participated in the interviews explained their choices as follows:

If I shook somebody’s hand, it would be probably O.K., but when I saw them sneezing afterwards, then I would wash my hands before I touch anything. It would be a judgment call. Did I just shook hands with someone who is sick? You are better on the side of caution (Eduardo).

If I did get the flu, then I would stay home. Well, if I did have enough energy, I would actually go out and do [things]. But I still do kind of feel like being unfair to other people because then I make them sick (Carlo).

My first instinct is to stay home until I get information about the situation: What is going around? Is the spread of the flu concentrated? I just wait for instructions, but get the instructions from [a source] like the CDC, where people are trained [in outbreak investigations]. So, that would be the first I would do (David).

I feel like that if there is an outbreak going on, you cannot just stay home and hide from it. You have to continue your life (Jane).

In class: I probably would move. No, I would stay there. If I have a lot of classes that day, I may skip one, but still go to the others. If I have a test, I go. {If it is} just an ordinary day, I skip it [but] place a phone call [to the professor] (Ben).

Most of these comments were directed towards a justification why staying at home would not be the option many students would select (e.g., “If I have a test, I go;” Well, if I did have enough energy, I would actually go out and do [things]”). It also seemed important to students to get the facts about the situation (e.g., “Is it concentrated?”). Values such as “You cannot just stay home and hide” and “You have to continue your life” seemed also to play important roles. Taken

together, risk behavior is indeed a multidimensional decision-making process that includes facts, values, and options, exactly as Fischhoff and Kadvany (2011) had pointed out, and as undergraduate students expressed when confronted in this survey with a hypothetical scenario of an influenza outbreak on campus of the university. But, can this behavior be considered rational towards influenza, a highly contagious infectious disease? Douglas and Wildavsky (1983) taught us that

[o]nce the idea is accepted that people select their awareness of certain dangers to conform with a specific way of life, it follows that people who adhere to different forms of social organization are disposed to take (and avoid) different kinds of risk. (p. 9)

Participants in my survey were a group of people who as undergraduate students were part of the social organization of Laketree University and who as young adults were part of the social organization of the general public. Thus, I believe the comments students made to this question on the questionnaire pointed to a conflict between the duty of students to learn by going to class and taking tests and the duty of the students as ‘private persons’ to live their lives and not hide at home despite the fact that there is significant danger in the environment: a hypothetical outbreak of influenza on campus.

An important question that needed to be discussed here is: Why do undergraduate students not regard flu vaccination with higher priority? Perhaps the answer could be found in the fact that students had confronted a severe outbreak of influenza (i.e., the flu pandemic of 2009) when they were in middle/high school. At the time of this pandemic, it was not immediately clear that young adults were at very high risk of infection and associated high morbidity and mortality. Furthermore, a vaccine (i.e., the H1N1pdm09 vaccine) was not available during the first several months of the outbreak. Thus, students were apparently only

taught in school “to take precautions” (see Kelly, Chapter 3) and “Everybody was using it:” hand sanitizers (Chris, Chapter 3). Another reason could be that the benefit of flu vaccination was not clearly explained to students by authoritative bodies, as a comment by Darius indicated (see Chapter 4): “Sometimes it seems like: Vaccinate! Vaccinate! Vaccinate! And then nobody really knows why and how. And that creates hesitation.” A second question I had asked students to probe for behavior was: What would it take for you to start regularly taking flu avoidance measures? The answers students gave on the 5-point Likert scale during the quantitative part of the survey are displayed in Table 6.9.

The most striking observation of these data was that the highest percentages of marked answers were in the ‘Definitely’ and ‘Probably’ columns. This showed that all of the pre-selected reasons for taking regularly flu avoidance measures were relevant for the majority of undergraduate students at Laketree University. When I combined the Likert items ‘Definitely’ and ‘Probably,’ the highest two numbers were computed for ‘When I think I got the flu’ (230/288, 79.8%), closely followed by ‘When I hear other students are sick’ (225/288, 78.1%). Interesting is that mail from Laketree University was considered here a reason despite the fact that the majority of students marked on the questionnaire for a related question ‘moderate interest’ in receiving information about influenza and flu vaccination/protection measures (see Chapter 4). Perhaps a reason for this apparent discrepancy lies in the kind of information distributed by the university. Students mentioned that they are interested in receiving information “in case there would be a severe outbreak” (Darius) and “If it involves the campus” (Frank), although the university was considered “a secondary source” of information about influenza (Jim).

Table 6.9

Reasons for Regularly Taking Flu Avoidance Measures

Reasons	Students' Responses				
	Definitely <i>n</i> (%)	Probably <i>n</i> (%)	Don't know <i>n</i> (%)	Probably not <i>n</i> (%)	Definitely not <i>n</i> (%)
When I think I got the flu	118 (40.9)	112 (38.9)	21 (7.3)	27 (9.4)	10 (3.5)
When I hear other students are sick with the flu	79 (27.4)	146 (50.7)	31 (10.8)	27 (9.4)	5 (1.7)
When a professor talks about the flu in class at the beginning of the flu season	22 (7.6)	91 (31.6)	71 (24.6)	86 (29.9)	18 (6.3)
When people I know from off-campus (family, friends, etc.) suddenly start talking about the flu	45 (15.6)	102 (35.4)	58 (20.2)	70 (24.3)	13 (4.5)
When I get mail about the flu from Laketree University	41 (14.2)	96 (33.3)	46 (16.0)	81 (28.1)	24 (8.4)
When I hear about the flu in the mass media (television, radio, newspaper, Internet, etc.)	65 (22.6)	102 (35.4)	58 (20.1)	45 (15.6)	18 (6.3)

Note. Percentages for the Likert scales total were calculated based on $N = 288$. The highest responses in each row are shown in bold.

Students made comments not only during the interviews (these students are listed by their pseudonyms) but also wrote comments on the questionnaire during the anonymous quantitative part of the survey (these students are listed by gender and year-of-study):

I would take preventative measures if people I know became sick (Male student, 1st year).

I take precaution by the season (Male student, 4th year).

Better safe than sorry! I think it really depends on where you grew up and how your family raised you. I mean there are a lot of different factors. I know people who are really

privileged [and] they are very much encouraged to get the flu vaccination. And maybe a person who is not privileged may not know about it. They don't get the education and information, or take it seriously because of cultural reasons. So, it really depends on the person in the way they were brought up (Bee).

Taking advantage of main stream social media about outbreaks in our area would be very effective. Newspaper/radio probably more effective for older folks (Male student, 3rd year).

The severity of the outbreak would influence the amount of precautions I would take. If maybe 1 in 5 [people] were predicted to get the flu, I would consider skipping class, for example (Male student, 4th year).

[In regard to the professor:] Well, it depends upon how he talks about the flu. So, if he would say 'My wife has the flu,' I mean [I would say] 'I am sorry that your wife is sick.' But, if he would talk about something is going around campus, then I would probably listen more. So, if a professor would come to class and say 'Hey, I just want to let you all know there is a big flu outbreak on campus. I want to give you a heads-up to be ready for it,' I would listen to this a lot more than getting an e-mail. Because e-mails, they send out those all the time. I am getting so many e-mails. But if it is a professor, then I would think it is a big deal. If it would be a normal professor or a guy from the CDC, I would listen as much to both. I would be thinking in the back of my head 'If the school is willing to take the time to have the professor to take a moment and talk to us beyond the normal schedule, it's gonna be something beyond a normal outbreak. If a CDC guy would come to class, then I would think it is really above the top. There is really something going on. Then I would be looking into it and get more information. If he is taking his time out of the day, then it is a warning (Jim).

These comments contained several explanations for undergraduate students' behavior in this survey. First, Bee's idiomatic expression 'Better safe than sorry' is a common phrase people use to indicate that "one should behave carefully, even if it seems difficult or unnecessary, so that you will not have problems later" (Macmillan Dictionary, 2017, para. 1). This phrase essentially points to the phenomenon of the uncertainty of a risk. Bee also mentioned the importance of a cultural component in risk behavior. She mentioned the differences of knowledge about risk which can depend upon the environment in which a person grew up, such as an environment of privilege compared to one of less privilege. Furthermore, the comments "I

take precaution by the season” and “The severity of the outbreak would influence the amount of precautions I would take” can be interpreted as conditional statements (i.e., an if-then logic), which involve a calculation of risk. Fischhoff and Kadvaný (2011, p. 73) mentioned that “people are often forced to ‘construct’ their preferences, inferring what they want in specific situations from the ‘basic’ values that generally guide them in life.” Many questions in my survey were drafted in a way that invited students (or, using Fischhoff and Kadvaný’s word: ‘forced’ students through pre-selected answer choices) to describe their preferences.

Interesting is also the comment by Jim who talked about the role of the professor in students’ reaction to risk. Although the professor was by many students in this survey not considered as an important source of information about influenza (see Chapter 4), it appeared that he/she can play a role in students’ flu protection behavior. This role is that of a person who can point to an imminent risk (here: a hypothetical large influenza outbreak). However, to be accepted in this role appeared to be depending on the way a professor would communicate the risk to students.

Ranking- and Shifting-Risk Behavior

I had mentioned in Chapter 3 that risks come in many different forms and can be examined from various perspectives. What is the same with all kinds of risks is that people or groups of people worry differently about the various risks they encounter. This is what Douglas and Wildavsky (1983) called the personal or group perception of risk, which is also known as the social construct of risk. The main focus of my research project was on influenza, a risk that stems from an infectious agent (a virus) which causes significant morbidity and mortality in human populations. In this section, I report on undergraduate students’ ranking of various risks, including Ebola (i.e., a different viral disease), smoking, texting while driving, and driving

without wearing a seat belt. While the major risk of smoking is the development of lung cancer and death, driving without wearing a seat belt as well as texting while driving can result in severe body injury and potentially death when being in a car accident. Although driving without wearing a seat belt and texting while driving are against the law in most states within in the United States of America and can result in a traffic ticket, this aspect was not the focus of my discussion with students.

I present below undergraduate students' thoughts (as they expressed during the interviews) about the different risks I mentioned above, which revealed students' individual perceptions of risks as well as group perceptions of risks. Furthermore, the comments revealed the reasoning and hypothetical decision-making in situations when risk(s) is/are shifting.

Eduardo:

Tobacco is a guaranteed risk, in the long run. Don't touch it! It's not worth the risk. So I would probably put the flu between the smoking and not buckling up. If you forget to buckle up once, it's o.k. [because] it's not gonna hurt you. But it's still something you don't want to do. So, the flu is between the two. You don't want to get the flu, but it's not life and death. [My ranking order is:] Driving and texting, then smoking, then influenza, and then driving without buckling up.

For Eduardo, texting while driving posed the greatest threat, while influenza ranked relatively low among the four risks. Interesting is his description of the risk of smoking: "Tobacco is a guaranteed risk, in the long run." This showed his knowledge that smoking is a significant risk, one that will harm people over time. Fascinating is his advice: "Don't touch it! It's not worth the risk." This latter idiomatic expression is typically used by people to describe cautionary behavior when considering doing or discussing something (here: smoking). His comment about driving without buckling up (i.e., without wearing a seat belt) showed his reasoning: "If you forget to buckle up once, it's not gonna hurt you." This comment revealed his belief in a behavior that can be described as 'if done only ones, no problem!' Finally, there is his

description of influenza. He explained his low ranking of influenza by the following reason: “it’s not life and death.” This demonstrated that he did not recognize the immediate (short-term) danger influenza can pose to his health as the flu can potentially affect any person anywhere in the world at any time, when there is an influenza outbreak.

Fiona:

I would put influenza on the lower end because when I got the flu, it only lasted 2 or 3 days. You drink some juice and water, salty crackers, and some soup, and you are fine. I never had the flu [for which] I needed to get hospitalized. If I would get hospitalized with the flu, then I would definitely get the flu shot after. Because then I learned my lesson. But with something like buckling up, it is more like an easy thing to do. You don’t need to make an appointment and take time to go to the doctor. And smoking, it’s a choice you make. And if you smoke that is not the smartest thing, but it is your choice, and I chose not to. So, I put that up there with buckling up because that is more like an easy decision. Getting a flu shot and making an appointment is more like a task. And you probably know as a student you are busy and taking out time for something is not easy. And the flu in my age group is not such a big issue in terms of deaths per capita, so that is why I put it lower on the list.

Fiona described her personal experience with influenza. Both her statement “when I got the flu, it only lasted 2 or 3 days” and her reactions to this event “you drink some juice and water, salty crackers, and some soup, and you are fine” showed that influenza is for her not a big deal and the reasons why she gave influenza a low ranking among the risks we had discussed during the interview. However, Fiona’s statement that “If I would get hospitalized with the flu, then I would definitely get the flu shot after” and her reason “Because then I learned my lesson” followed the ‘if-then logic’ and indicated that shifting risk (here: a hypothetical more severe outcome of the disease) would have changed her attitude towards influenza, especially her vaccination behavior: “I would definitely get the flu shot after.” This kind of behavior after a bad (here: hypothetical) experience can be often observed in people’s reasoning and decision-making processes. When I apply the theory of applied phronesis (Crisp in Aristotle, trans. 2014a) to this case scenario, one could ask whether or not this can be considered a wise decision-making by

Fiona. I believe that her reasoning clearly showed an act of deliberation, and this deliberation, as she pointed out, would lead to a change in her behavior to protect her health (in the future).

Revealing were also Fiona's comments about buckling up ("it is more like an easy thing to do") and about smoking ("It's a choice you make"). This is in contrast to her statement about influenza vaccination: "Getting a flu shot and making an appointment is more like a task." It appeared that for Fiona, the time needed to get a flu shot is somewhat in conflict with her academic schedule at Laketree University: "And you probably know as a student you are busy and taking out time for something is not easy." Finally, there is a group perception in her statements when Fiona pointed out that "the flu in my age group is not such a big issue in terms of deaths per capita." This argument may hold true during a mild annual influenza season but not during a severe flu outbreak, as the H1N1 pandemic of 2009 has revealed. Furthermore, as influenza researchers emphasized, influenza is unpredictable because flu virus reassortments can produce at any time influenza virus subtypes that become highly pathogenic for the human population, including for young adults (Fineberg, 2014; Layde et al., 1980; Monto & Webster, 2013; Parrish et al., 2015; Pons et al., 1980; Sobal & Loveland, 1982; Trombetta et al., 2015; Wright et al., 1980).

Jim:

My personal risks would be: (1) Driving while texting; (2) Driving without wearing a seat belt; (3) influenza; and then (4) Ebola – as my personal risks.

[Why is Ebola ranked lowest, at the bottom?] If Ebola is in the vicinity, then it becomes the most dangerous risk. But we look at a personal scenario ... at that moment, it would be at the bottom. And influenza would be at the second from the bottom.

[Is there something different with Ebola in regard to information seeking when compared to influenza?] Yes, there would be a 100% change. If there would be several people on campus with Ebola, I would definitely wear a mask, or I would choose not to show up. I would probably go to my personal doctors and they would say: 'That's something you don't want.' I trust them and they [will] tell me what to do.

Jim also ranked influenza relatively low as a risk among the ones we had discussed during the interview. He emphasized his individual perception of risk by making the statements “My personal risks would be ...” and “we look at a personal scenario.” His comments about Ebola revealed that the distance to the outbreak (“If Ebola is in the vicinity” and “If there would be several people on campus with Ebola”) would make a difference in his behavior. More precisely, he “would definitely wear a mask” or “choose not to show up.” In other words, this shift in the location of a risk from Ebola would cause a significant change in his behavior, which would also include visiting his personal doctors as trusted sources for advice.

Grace:

[How about Ebola?] Ebola is a deadly disease. And flu, what comes to my mind, is a disease that comes and goes. And also with Ebola, you are put in an isolation tent and blocked off.

[If you create a hierarchy of these various risks, where would you place influenza?] I would put influenza last – the lowest risk because of protections I already take against influenza. I may or may not get influenza, and it is not as deadly as Ebola.

Like Jim, Grace reacted strongly to the word ‘Ebola,’ when she stated: “Ebola is a deadly disease.” Interesting is that she described Ebola through the image of an “isolation tent,” in which infected individuals are “blocked off” from the rest of society. This is a powerful image, and it is in stark contrast to her description of influenza as “a disease that comes and goes,” which was the reason for her ranking of influenza in last place. Also, her statement “I may or may not get influenza” is important as it pointed to the chance or likelihood she believed she personally has to contract the flu. This is an example of a risk calculation and shows that we as humans indeed select individual risks (Douglas & Wildavsky, 1983).

Chris:

[Influenza?] It's more on the lower end. But I think it depends on where you are. In the United States, we don't have so many outbreaks because of whatever reason. I feel like it would be a lower risk because it hasn't been that much around me, and there has not been that much information for me to worry about it.

Chris sees influenza similar like Jim. He also ranks influenza as a lower risk ("It's more on the lower end"), and the aspect of distance to the disease outbreak played an important role for him: "It depends on where you are." Chris seemed to justify his low ranking of influenza as a risk through his perceived or observed low frequency of flu outbreaks by making the statement: "it hasn't been that much around me."

Darius:

[Influenza?] I think it depends on how healthy you are. So, I would put influenza on a scale of 1 to 10, with 1 being low risk and 10 being high risk, at about 4.

[What item would you place on top of the scale?] Ebola, if I were in West Africa. Here in Minnesota, I would put it at an 8.

Darius created a scale for the ranking of risks and placed influenza "at about a 4" out of 10, with 10 being high risk. Thus, like other students, he did not perceive influenza as a significant risk. However, Darius emphasized that the risk would depend on the health status of a person. In the discussion about Ebola, he emphasized the importance of the distance to an outbreak when he stated: "Ebola, if I were in West Africa. Here in [our state], I would put it at an 8." Thus, for Darius to make a decision about an infectious disease outbreak depends on where he is when a potential risk would turn into a real situation of acute danger.

Frank:

[How about a larger flu outbreak?] Everything would then shift. Then I need to know everything because I don't want to get it. If there was not an outbreak, then it is not relevant.

[If there would be an Ebola pandemic, would that change your attitude in regard to vaccination?] Yes, it would. And I would then like to learn much more about it – the protective measures and so on. But I was not worrying about Ebola over America. That was never my concern because it happened in Africa and their culture is different from ours. For example, [different] in regard to disposing of bodies. You know, [this is] probably a little more of a third world country problem.

Also Frank pointed in the discussion about Ebola to the distance to the outbreak: “But I was not worrying about Ebola over America. That was never my concern because it happened in Africa.” He also mentioned a cultural behavior of Africans which is different from the behavior of people in America, which is the handling of deceased people's bodies infected with Ebola. To my knowledge, the cultural behavior of Africans is to stay close to deceased family members, while Americans place a stronger emphasis on containing outbreaks by eliminating the threat that family members get infected with a pathogen and then potentially transmit it to other people. It is not clear where Frank got his information about the disposal of Ebola-infected deceased persons in Africa, but I remember the images that were shown on television and were for me powerful reminders that infection control is indeed handled differently in different parts of the globe.

In order to probe for shifting-risk behavior, I discussed with Frank the scenario of a larger influenza outbreak. Interesting is his comment that “Everything would then shift. Then I need to know everything because I don't want to get it.” This revealed his ‘Angst’ (the German word for fear or anxiety) of contracting the disease. He also pointed to the relevance factor of risk by stating: “If there was not an outbreak, then it is not relevant.”

Risk-ranking and shifting-risk behavior are two topics researchers have a great interest in studying. This is because ranking of risks can help identify which risk is relevant to individuals and to groups of people, and it helps deciding which poses the greatest threat (Douglas & Wildavsky, 1983). Studying the behavior of people in situations or hypothetical scenarios when risk(s) is/are shifting can reveal the behavior of priority setting when faced with a change in conditions, such as the appearance of a new risk in addition to existing risks or even a shift among known risks. Douglas and Wildavsky (1983, p. 197) explained that “[s]hifting risks may be more dangerous than tolerating them, both because those who face new risks may be unaccustomed to them and because those who no longer face old ones may become more vulnerable when conditions change.”

I provide in Table 6.10 a summary of students’ comments about influenza by dividing them into subcategories. Students’ answers were used to learn about the reasoning and deliberation processes leading to the expression of intentions what action(s) students would take. Overall, this part of the interview sessions with undergraduate students showed that influenza was perceived as a disease that is not necessarily life-threatening and not much around, and arguments such as those that pointed to the health of their own age group made them rank influenza at the lower end of risks we had discussed.

Table 6.10

Reasons for Low Risk-Ranking of Influenza by Undergraduate Students at Laketree University

<p>Distance from and frequency of the outbreak:</p> <p>It depends on where you are (Chris)</p> <p>I may or may not get influenza (Grace)</p> <p>It hasn't been that much around me (Chris)</p>	<p>Perceived health status and protection behavior:</p> <p>I think it depends on how healthy you are (Darius)</p> <p>Protections I already take against influenza (Grace)</p>
<p>Perceived severity of influenza:</p> <p>It's not life or death (Eduardo)</p> <p>It is not as deadly as Ebola (Grace)</p> <p>When I got the flu, it only lasted 2 or 3 days (Fiona)</p> <p>I never had the flu that I needed to get hospitalized (Fiona)</p> <p>The flu in my age group is not such a big issue in terms of deaths per capita (Fiona)</p>	<p>Time commitment:</p> <p>Getting a flu shot and making an appointment is more like a task. And you probably know as a student you are busy and taking out time for something is not easy (Fiona)</p>

When I mentioned the word ‘Ebola’ to students, it elicited strong emotional and verbal responses (when compared to the other risks), even though Ebola is not a disease people encounter in the United States. Influenza and Ebola share some characteristics such as the transmission of the viruses to people from wild animals. The symptoms in the earlier stages of these two diseases (e.g., onset of fever, muscle pain, and headache) are also similar. However, Ebola is transmitted between people via direct contact with Ebola virus-infected body fluids (blood and secretions) and organs, and is thus not an airborne disease like influenza (Heymann, 2015). It needs to be emphasized that an infectious agent that has the potential to spread via the airborne route can be transmitted between people easily and rapidly, especially in crowded

environments, making it difficult to control. Furthermore, to date, Ebola has not been reported to cause pandemics. The case fatality rate (CFR, i.e., the proportion of cases that are fatal within a specified time [Porta, 2014]) of Ebola is around 50%, with a range between 25%-90% in past outbreaks (World Health Organization, 2017c). The CFR of influenza varies depending on the severity of the annual flu seasons and the sporadically occurring flu pandemics. It has been reported, for example, that the overall CFR for the highly pathogenic avian influenza A(H5N1) was highest with 73% in 2004, 43% in 2005, and 63% by June of 2006 (World Health Organization, 2006). Although the CFR of the Spanish flu was lower with an estimated $> 2.5\%$ (Taubenberger & Morens, 2006), the overall mortality in the human population was greater than that of World War I and World War II combined (Peiris, 2012).

In general, risk assessment is the prerequisite for risk management, and my research data support the idea that influenza risk assessment and risk management is suboptimal for undergraduate students at Laketree University—at least from the perspective of a public health professional. However, the task of analyzing a risk is not easy for any person, and one needs to keep in mind that undergraduate students as young adults just entered the developmental phase of practicing how to deal with various risks. Hence, it is not surprising that this subpopulation of the university looks at a risk from influenza through the eyes of newcomers to risk analysis. Furthermore, the influence of society on students' risk evaluation and risk behavior cannot be underestimated. Douglas and Wildavsky (1983) reminded us that “[r]anking dangers (which is what risk assessment requires) so as to know which ones to address and in what order, demands prior agreement on criteria. There is no mechanical way to produce a ranking” (p. 3).

Needs and Wants

Risks we encounter in our lives threatens things we value, and making wise decisions about them takes several tasks, including accessing chosen information sources, collecting and evaluating selected information, and then deciding what kind of action to take. As Fischhoff and Kadwany (2011) pointed out, risk decisions can sometimes seem so easy that we barely recognize making them. Fiona provided here a good example: “something like buckling up, it is more like an easy thing to do”. But making decisions about other risks, such as influenza, seem to be more difficult. The problem with risk is that it has to do with uncertainty. We don’t really know whether or not a particular risk will affect us. Grace described it as follows when discussing influenza: “I may or may not get influenza.” We also don’t know at what level a risk will affect us. In case of influenza, Eduardo believed that “It’s not life or death.”

Information Needs and Wants

Douglas and Wildavsky (1983) taught us that

“The private person does not isolate the risk elements to address them directly. When he consults, he tries to consult people who understand his situation: this is paramount in his choice of a lawyer or doctor. Only when desperate does he consult the unbiased, technically superior expert. Instead of submerging the risk elements in the larger pattern of social commitments, the medical or legal expert can speak to a narrow issue beyond which professional requirements forbid him to go. (p. 73)

I have shown in my survey that the vast majority of undergraduate students (61.1%) would prefer to consult their personal doctors as a source of information about influenza and flu protection. Carlo provided the reason (see Chapter 4): “a doctor kind of understands the health risks, so they would know what kind of risks *we* have with influenza.”

An issue which remained to be explored in my survey was to find out what information undergraduate students at Laketree University actually need and want in order to make wise decisions about influenza and protection methods. In order to find out, I showed students, who participated in the qualitative part of the survey, three infographics about influenza and asked them what they think was useful information to them and what was missing. I have already discussed in Chapter 4 that two of the three infographics (i.e., No 1 and No. 3), which were developed by the Centers for Disease Control and Prevention, missed their intended target audience of college/university students (Jim: “it doesn’t really relate to me”). For other students, these two infographics provided low information content (Frank: “There is not enough there for me) or contained misleading information (e.g., Bee: “It looks like a music act. ‘Spread the music, not the flu’). In contrast, undergraduate students reacted quite differently to the third infographic (i.e., infographic No. 2). This infographic is displayed in Figure 6.1.

Figure 6.1. Influenza infographic no. 2.

Flu vs. Cold Know the Difference

Symptoms	Flu	Cold
Fever	Usual - 100° F or higher	Rare
Chills	Common	Uncommon
Body or muscle aches	Common – can be severe	Uncommon or mild
Headache	Common – can be severe	Uncommon
Feeling tired and weak	Common – can be severe	Sometimes – usually mild: you don't feel tired
Cough	Common – can last 2-3 weeks	Common – mild to moderate hacking
Sneezing	Sometimes	Common
Runny or stuffy nose	Sometimes	Common
Sore throat	Sometimes	Common
Chest discomfort	Common – can be severe	Sometimes – can be mild to moderate

Prevent the Spread of Flu and Colds


GET A FLU SHOT – Getting a flu shot each year is the best way to slow the spread of flu.

STAY HOME WHEN SICK



CLEAN YOUR HANDS – Wash with soap and water or use hand sanitizer.

COVER YOUR COUGHS AND SNEEZES – Use clean tissues and discard after use.

KEEP SURFACES CLEAN – Make sure to clean all surfaces touched by you and others often, such as countertops, faucets, computer keyboard & mouse, light switches, TV remotes, phones, and handles on doors and cabinets.



www.publichealth.va.gov/InfectionDontPassItOn

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Flu 14 - All

Students commented to this infographic (Figure 6.1) as follows:

This one I like. I love this. This is great! Yes, this is great. Often times you think: Do I have the cold or the flu? Yes, [being able] to distinguish [the two]. So sometimes when you have a cold, you go to class. But when it is the flu, then it can get potentially a lot worse. You might be more inclined to stay back. That's my thought (Ben).

I like this one more because it has information I would read. It's factual and it's quick too. It looks like it's a lot of information in here that is compressed. And I go through symptoms of flu versus a cold. I kind of like facts like that. And if I felt necessary, I would read the bottom. This flyer has a good structure, from the top to the bottom, and you can go through it, step-by-step (Chris).

This would be helpful because there is a lot of important information about the differences of what a cold is and what the flu is. Sometimes I don't know if I have a cold or if I have the flu. It can feel like the flu [but] I have some symptoms the cold has. Yes, this would be very helpful. Usually, all the information you put in about the flu is too much, but I like this one (David).

This one provides good information. This one is more what I am looking for (Eduardo).

This one is much more informational. I like how they have the symptoms listed. The symptoms which are common for the flu and not common for the cold. For me as an analytical person who likes numbers [note: she is studying operations and supply chain management], I like to see data that [tell me] you have the flu or you have the cold. I would stop and read the symptoms. I can get really good information. And for me, checking my symptoms if I have the flu or a cold would be very helpful (Fiona).

This is better. This is pretty good! I like that it has the temperature. This is pretty good! Yes, this is pretty good! I like the information. The length is good. I like the information on it. This would be enough for me to make my own judgements. There are some really good differences there between the flu and a cold. This is fine, I don't need the other stuff. I really like this one. This is good stuff (Frank).

Here I can see what the symptoms are. I can see what the difference is between a cold and the flu, and I know what to look out for. When I look at the symptoms, I may say 'Oh, I got 4 out of 7 of these symptoms ... I may need somebody to look at me.' So, this is actually information I can use. I really like it because it compares the two. I think it's a huge plus. I like information about how you get it and what I can do about it when I got it (Jim).

This one here is nice how they show the difference between the flu and a cold. I think people mix that up sometimes. And they also have a source on here. This is definitely for me. I mean even for me in biology, having a source is everything. That's important, you have a source to verify the information and get more information. If I have a cold, I want to know if this is what I have. I want to verify it. Or, if my friends are sick ... anybody ...

just to know and be able to compare that, and prepare yourself for it if you think it's the flu or just a cold, based on your symptoms. This one would be the most valuable flyer because it has the comparison on it. One can see right here the symptoms and compare them between a cold and the flu. I think this one has most information, right on the flyer. And if one still wants more information, then there is the source [listed] too (Kelly).

I would be interested in learning more about the symptoms, like this one here. This is very good (Bee).

I really like this one here, flyer No. 2. I like that they list the symptoms. And then you can find out if it's a cold or if it's the flu. I think that's pretty helpful. And I like the website, so you know where to go to (Grace).

This one here gives a lot of information, it gives a lot of answers. You may not have to go somewhere else because then you know already. [But,] some kind of contact information. The main thing is to have a website or a phone number (Jane).

I like the flu versus cold because I think it shows that there is a difference. And one is probably more dangerous than the other. I would probably stop and read this one. That is a lot more informative. The one in the middle [i.e., flyer No. 2] is like they try to teach you about learning about yourself (Sarah).

I think it is valuable. When you didn't have the flu since a long time, you think 'oh, that's going to last only a few days.' No, it's more serious than that and this flyer kind of reminds me of that (Carlo).

I like this one the most. This one I like a lot because it has the symptoms. I like that a lot. If you have a cold, then you want to know that's not the flu. Yes, I like that a lot. And it also gives you tips on how to prevent it besides getting the flu shot. It seems like they try to keep you healthy rather than only getting vaccinated. But overall, I would like seeing something like saying 'The flu vaccine helps you prevent getting the flu because it does this ...' (Darius).

These comments by undergraduate students revealed, without exception, that infographic No. 2 was considered most valuable in regard to information about influenza, when directly compared to the other two infographics (No. 1 and No. 3) I had discussed in Chapter 4. I summarized students' needs and wants in Table 6.11, which includes the most important data I collected during the interviews about the topic 'influenza information.

Table 6.11

Influenza Information Needs and Wants of Undergraduate Students at Laketree University

Influenza Information	Needs and wants	Students' Comments
Relevance	<ul style="list-style-type: none"> • Age-related 	<ul style="list-style-type: none"> • Otherwise I feel like it doesn't quite apply to me (Carlo)
Sources	<ul style="list-style-type: none"> • Doctor (most trusted) • Contact information 	<ul style="list-style-type: none"> • He is the expert (Eduardo) • The doctor would have more information and knows how it works (Chris) • A doctor kind of understands the health risks, so they would know what kind of risks <i>we</i> have with influenza (Carlo) • And I like the website (CDC), so you know where to go to [infographic no. 2] (Grace) • The main thing is to have a website or a phone number [infographic no. 2] (Jane)
Contents	<ul style="list-style-type: none"> • Symptoms (especially flu versus cold) • How the flu can be treated • Which preventive measures are available • How to contract the flu 	<ul style="list-style-type: none"> • If I know what the symptoms are, then I can better assess myself (Henry) • If I have it, I want to know how I can treat it (Frank) • I like information about ... what I can do about it when I got it (Jim) • And it also gives you tips on how to prevent it besides getting the flu shot [infographic no. 2] (Darius) • I like information about how you get it (Jim)
Volume	<ul style="list-style-type: none"> • No infoglut • Level of detail 	<ul style="list-style-type: none"> • Usually, all the information you put in about the flu is too much (David) • This would be enough for me to make my own judgements [infographic no. 2] (Frank)
Quality	<ul style="list-style-type: none"> • Facts • Clarity • Educational 	<ul style="list-style-type: none"> • It's factual [infographic no. 2] (Chris) • I think people mix that up sometimes [flu vs. cold; infographic no. 2] (Kelly) • The one in the middle [infographic no. 2] is like they try to teach you about learning about yourself (Sarah) • They try to keep you healthy rather than only getting vaccinated [infographic no. 2] (Darius) • I would like seeing ... 'the flu vaccine helps you prevent getting the flu because it does this ... (Darius)
Reliability	<ul style="list-style-type: none"> • Verifiability 	<ul style="list-style-type: none"> • I want to verify it (Kelly)
Accessibility	<ul style="list-style-type: none"> • Digital high-tech devices 	<ul style="list-style-type: none"> • E-mail, cell-phone, Internet via computer: 'every day' (Jane)
Timing	<ul style="list-style-type: none"> • Instant, real-time • Time factor 	<ul style="list-style-type: none"> • One minute you hear this information and the next it can change (Bee) • Usually, I want to get the quick information (David)
Presentation	<ul style="list-style-type: none"> • Well structured • Compressed • Attention-grabbing 	<ul style="list-style-type: none"> • The flyer [infographic no. 2] has a good structure, from the top to the bottom, and you can go through it, step by step (Chris) • This would be helpful. There is a lot of important information [infographic no. 2] (David) • I would stop and read the symptoms [infographic no. 2] (Fiona) • I look at my e-mails. And when there is something there, like a news feed, then I go online to find out what is going on ... [and] if there would be pictures in the news feed, then I may say 'Let's have a look at it' (Jim)
Reminder	<ul style="list-style-type: none"> • Booster 	<ul style="list-style-type: none"> • When you didn't have the flu since a long time ... this flyer [infographic no. 2] kind of reminds me (Carlo)

Addressing Laketree University

Undergraduate students answering my survey spent a great deal of time studying for a profession they expected to enjoy throughout their professional careers. During this time, they were exposed to the environment of this academic institution for the better part of the day and, perhaps, spent additional hours on campus engaging in various extracurricular activities, such as those of social, philanthropic, or athletic nature. Since Laketree University offers in fall of every influenza season flu vaccinations to students, faculty, and staff, I was interested in finding out whether or not undergraduate students knew that they can get flu shots here. Table 6.12 displays the responses of all students who participated in the quantitative part of the survey.

Table 6.12

Undergraduate Students' Knowledge of Laketree University's Flu Shot Clinic (Stratified by Gender)

Gender \ Answer	Yes <i>n</i> (%)	No <i>n</i> (%)	Total
Male	123 (83.7)	24 (16.3)	147
Female	120 (85.1)	21 (14.9)	141
Total	243 (84.4)	45 (15.6)	<i>N</i> = 288

Note. Percentages for gender were calculated based on $n = 147$ for male students and $n = 141$ for female students. Percentages for 'Total' (last row) were calculated based on $N = 288$.

It turned out, as shown in Table 6.12, that the vast majority of both male and female undergraduate students knew that this university offers flu vaccinations during the influenza

season. More precisely, 123/147 (83.7%) of males students and 120/141 (85.1%) of female students marked ‘yes’ to this question on the written questionnaire, while 24/147 (16.3%) of male students and 21/141 (14.9%) of female students marked ‘no.’ When I analyzed students’ responses by year-of-study, knowledge of the university’s flu clinic was similar among freshmen, sophomores, juniors, and seniors (Table not shown). I also wanted to find out whether there was an association of students’ knowledge of the flu clinic at Laketree University and their past flu vaccination behavior. The results are displayed in Table 6.13.

Table 6.13

Association of Undergraduate Students’ Past Influenza Vaccination Behavior and Knowledge of Laketree University’s Flu Clinic

Responses Variable	Flu vaccination during the 2014-2015 influenza season		Statistical significance X^2 $p < 0.05$	Flu vaccinations every year during the 2012-2013 through 2014-2015 influenza seasons		Statistical significance X^2 $p < 0.05$
	Yes N = 140/288	No N = 138/288		Yes N = 101/288	No N = 90/288	
Knowledge of Flu Clinic						
• Yes (243/288, 84.4%)	119/140 (85.0%)	115/138 (83.3%)	$X^2 = 0.1449$ $p = 0.703453$	92/101 (91.1%)	70/90 (77.8%)	$X^2 = 6.5483$ $p = 0.010499$
• No (45/288, 15.6%)	21/140 (15.0%)	23/138 (16.7%)		9/101 (8.9%)	20/90 (22.2%)	

Note. Data were computed for students who participated in the quantitative part of the survey. Numbers per variable/responses are presented for male and female students combined, followed by corresponding percentages of students who accepted/refused flu vaccination during the indicated influenza seasons. Differences in reported influenza vaccination coverage between variables per categories were calculated using Chi-Square (X^2) tests, with a significance level set at $p < 0.05$.

The data presented in Table 6.13 revealed that knowledge of Laketree University's Flu Clinic was not a factor for students who received a flu shot during the 2014-2015 influenza season, but it appeared to be important for students who received the flu vaccine every year during influenza seasons 2012-2013 through 2014-2015. Although the reasons for this vaccination behavior remain to be investigated, one may speculate that the tenure of the student at Laketree University and the flu shot campaigns this university conducts every fall have an impact on undergraduate students' vaccination behavior.

Undergraduate students commented during the interviews as follows (note, the 4th-year male student wrote his comment on the questionnaire during the quantitative part of the survey):

I think it is nice to get a little bit more information. I know there is a flu vaccine program at the school. But you have to figure out sometimes where it is and who is administering it. Is it a doctor or a nurse? Usually, I go to my doctor because I trust him more. There [at the campus flu clinic] may be a different doctor or nurse every year (Eduardo).

There are a lot of people here [on campus], so there is a high risk to catch [the flu] here. But, there are also a lot of people who get the vaccination. And here on campus, I am pretty sure they provide the vaccination for free. You know you can get flu vaccination here on the second floor every year, and I think a lot of people actually do that (Bee).

Even though I have the specialists, I would say for us as the Millennial generation, we think we are invincible, so when we see something like that [an e-mail from Laketree University about the flu clinic], we really don't care. It cannot happen to us (Jim).

I don't check my campus mail; I see it as an ineffective use of providing information [about the flu clinic] (Male student, 4th year).

[How about pamphlets about influenza handed out by Laketree University at the beginning of the flu season?] I would look at it. I would read it, but I would probably toss it then. I would not keep a flu pamphlet, I suppose (Grace).

It needs to be noted that the campus health clinic is sending out e-mails to students at the beginning of every influenza season, announcing not only that flu shots are available but also describing the exact locations on campus where members of the university can receive them. Bee described in detail one of those locations where flu shots can be obtained on campus, but she was

not sure if they were available for free. Information provided on Laketree University's website indicated that flu shots are indeed free of charge for students. Eduardo's comment revealed that he was not sure about the location of the flu shot clinic and did not know who is administering the influenza vaccine (a physician or a nurse). Moreover, he did not seem to like the idea that there could be a different person every year who administers the flu shot, a reason why he would prefer to see his personal doctor outside of the university environment.

The comments by Jim and a 4th-year male student (the latter used the empty space on the questionnaire to express his thoughts) showed that the announcement of e-mail campaigns on campus would not be noted because these students apparently don't read e-mails from Laketree University that pertain to the flu. Finally, Grace's comment indicated that flu pamphlets distributed on campus may fail their purpose to inform students about influenza.

So, one may ask what role Laketree University can play in providing information about influenza to undergraduate students? My survey data revealed that this university can take on several roles undergraduate students would most likely appreciate. These roles are summarized in Table 6.14. The information contained in this table lists three campus groups: (a) University Health Clinic representatives, who play a primary role, which is, to provide health care and promote the health and wellbeing of students; (b) the leadership of Laketree University; and (c) members of the faculty body. The latter two groups play secondary roles in that they can serve as messengers supporting the efforts of the health clinic. When these three groups work in concert, I believe they can guide undergraduate students in the decision-making process about influenza and protective measures. After all, undergraduate students as young adults are relative newcomers to making decisions about risks (risk-taking and risk-avoidance), especially risks that are associated with contracting and transmitting influenza viruses on- and off-campus.

Table 6.14

The Role of Laketree University to Inform Undergraduate Students about Influenza

Campus groups	Role	Students' Comments
<p>University Health Clinic representatives</p> <p>• Primary role: Provide health care and promote the health and wellbeing of students</p>	<ul style="list-style-type: none"> • Provide health education by explaining the difference between the flu and a cold • Explain the <i>how</i> and <i>why</i> of flu vaccination • Emphasize the role of the health clinic (i.e., to keep students healthy) • Continue offering flu shots • Re-evaluate e-mail content: <ul style="list-style-type: none"> ○ Age-relevant ○ Avoid information overload ○ Reminder and tips on disease and prevention besides vaccination • Provide contact information (e.g., CDC) • Re-evaluate e-mail presentation style: <ul style="list-style-type: none"> ○ Make it attractive ○ Make it quick to read ○ Make it clear and easy to understand 	<ul style="list-style-type: none"> • They try to teach you learning about yourself (Sarah) • Sometimes it seems like: Vaccinate! Vaccinate! Vaccinate! And then nobody really knows why and how (Darius) • They try to keep you healthy rather than only getting vaccinated (Darius) • I got my flu shot at Laketree University this year! (Female student, 3rd year) • Otherwise I feel like it doesn't quite apply to me (Carlo) • Usually, all the information you put in about the flu is too much (David) • When you didn't have the flu since a long time (Carlo) • I like information about how you get it (Jim) • I want to know how I can treat it (Frank) • The main thing is to have a website or phone number (Jane) • If there would be pictures in the news feed (Jim) • Usually, I want to get the quick information (David) • You can go through it step by step (Chris)
<p>Laketree University leadership</p> <p>• Secondary role: Serve as a messenger</p>	<ul style="list-style-type: none"> • Be <i>the official announcer</i> of influenza outbreaks on campus • Provide real-time information • Find flyers such as 'flu vs. cold,' which contains <i>helpful</i> influenza information and consider placing them on the wall in classrooms 	<ul style="list-style-type: none"> • I trust the school to actually make the decision what the severity of the outbreak is, and to tell us when it is safe (Eduardo) • I would appreciate the university giving early notice of potential outbreaks (Male student, 4th year) • One minute you hear this information and the next it can change (Bee) • This [flyer] would be helpful. There is a lot of important information (David) • I would stop and read the symptoms (Fiona) • In class, because when students go to class, they want to know what that is. Is it part of the course? There is always the expectation that everything that is in class around you, you have to know because it may be on the test (David)
<p>Professors (faculty)</p> <p>• Secondary role: Serve as a messenger</p>	<p>Can serve as a second-line information carrier to inform students about the occurrence of flu outbreaks on campus</p>	<ul style="list-style-type: none"> • It depends on how he talks about the flu ... if he would say 'Hey, I just want to let you all know there is a big flu outbreak on campus. I want to give you a heads-up to be ready for it,' I would listen ... (Jim)

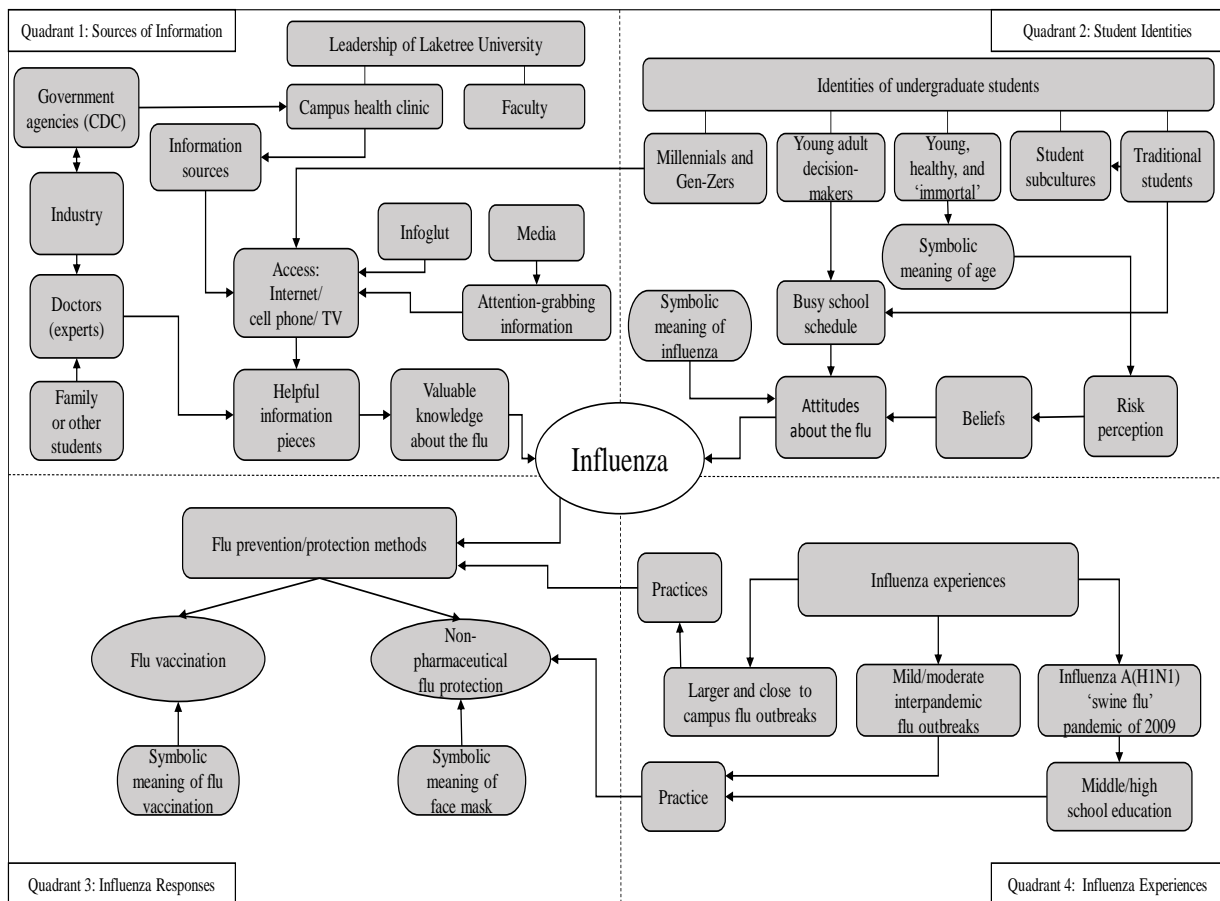
Theoretical Model

The ultimate goal of this mixed-methods, cross-sectional, normative case study was to build a theory about the attitudes and behaviors of undergraduate students towards influenza and vaccination. In order to build this theory, I needed to look at the most telling data I had generated in this research project. This included revisiting the information from the quantitative part of the survey, which formed the framework for this study, as well as revisiting the information from the qualitative part of the study, which revealed through the voices of individual students what they thought about a risk like influenza and how they dealt with this risk in particular situations. The final step of my project was to identify the various connections that existed among the different categories and themes I had described in Chapters 3-6. In the current chapter (Chapter 6), I had already touched upon some of those connections, but in order to get a more comprehensive understanding, I decided to build a theoretical model in form of a concept map. Maxwell (2013) described that concept maps are visualizations of concepts/themes that are typically presented by labelled boxes or circles, and which are meaningfully connected by lines or arrows. Figure 6.2 (see also Appendix F) shows the concept map I have built from the mixed-methods data of this research project. I divided my map into four quadrants (see dotted lines), connected by an oval circle labelled 'Influenza,' which I placed in the center of the concept map. The quadrants are labelled as follows: Quadrant 1: 'Sources of Information;' Quadrant 2: 'Student Identities;' Quadrant 3: 'Influenza Responses;' and Quadrant 4: 'Influenza Experiences.'

In order to interpret undergraduate students' attitudes and behaviors towards influenza and preventative/protective measures (especially flu vaccination), I looked in this research project through four sociological lenses: (a) cultural theory of risk perception; (b) structural constructivism; (c) symbolic interactionism; and (d) applied phronesis. I need to point out here

that I used the latter lens (applied phronesis) only sparingly so far because I felt that it would be most useful in the discussion of items listed in the concept map. Here, the reasoning and decision-making of undergraduate students became most clear. In other words, as Flyvbjerg et al. (2012) emphasized, phronesis concerns values, deliberation about things that are good or bad for people, and action(s) based on judgment and choice.

Figure 6.2. Concept map depicting factors affecting the decision of undergraduate students to deal with the health risk from influenza.



I described in the previous chapters that undergraduate students at Laketree University were exposed to various authoritative powers represented by agencies or institutions, which are either the producers or distributors of information (i.e., information about the risk of influenza and the value of flu protective measures), and/or the makers of protection methods (e.g., flu vaccines, hand sanitizers, and face masks). I showed in the concept map the link between government agencies (e.g., the CDC) and industry on the one side and groups of Laketree University (i.e., the campus health clinic, university leadership, and faculty) on the other side (see Quadrant 1). The information provided by these authoritative entities include influenza warnings and outbreak reports, as well as information about the availability of seasonal flu vaccines and other flu protection methods.

Undergraduate students in my study were dependent on information provided by authoritative powers. My research data revealed that the vast majority of students trusted the information provided by authorities (61.1% had 'high'/'very high' trust in government agencies), and this trust was justified by perceptions of openness, honesty, knowledge, and expertise. There were also concerns such as "the government is always late" (Ben) and "the government is trying to make money" (female student, 4th year). Although students received e-mails from Laketree University at the beginning of every influenza season, my survey revealed that students may not have read flu-associated e-mails ("I probably deleted them all" [Sarah]; "I may skim through it, but not click on it. Honestly, I would just only delete it" [Jim]; and "the newsletter they send out every week: Delete! Delete! Delete!" [Frank]). Although these comments showed that university e-mails containing influenza information may not be very popular among undergraduate students, Darius pointed out during the interview that "they [the university] must know that students look at these e-mails not before the sixth or seventh time." Furthermore, it turned out

that the majority of students (51.8%) in this survey reported having only moderate interest in receiving information from the university about influenza and flu prevention/protection measures. Students such as Jim commented: “I mean in my head I think that any information Laketree University is sending out is secondary information—a secondary source—, and I’d rather hear it directly from the primary source.”

So, I wondered to what extent Laketree University can have an impact on undergraduate students’ knowledge about influenza. Based on students’ answers, I found that the leadership of Laketree University can play an important role in announcing influenza outbreaks on campus (“I would appreciate the university giving early notice of potential outbreaks” [Male student, 4th year]) and, ideally, providing outbreak information that is distributed in real-time (“One minute you hear this information and the next it can change” [Bee]). Although faculty (professors), were considered by students only a moderately important source of information about influenza and flu vaccination (“a professor is not a professional. I mean I am in the business school and [a professor is] not a doctor” [Frank]), I believe faculty can serve as a second-line information carrier to inform students about the occurrence of flu outbreaks on campus. As Jim remarked: “If he would say ‘hey, I just want to let you all know there is a big flu outbreak on campus. I want to give you a heads-up to be ready for it,’ I would listen.”

When I showed undergraduate students an infographic about ‘flu versus cold,’ it became clear that students desire information which explains not only the *how* and *why* of flu vaccination (“Sometimes it seems like: Vaccinate! Vaccinate! Vaccinate! And then nobody really knows why and how” [Darius]), but also aspects of health education (“teach you learning about yourself” [Sarah]), as well as describing the relevance of influenza to their age group (“otherwise I feel like it doesn’t quite apply to me” [Carlo]). Tips on disease and prevention other than

vaccination would also be appreciated (“I like information about how to get it” [Jim] and “how I can treat it” [Frank]), as well as a reminder of flu protection methods, especially in cases “when you didn’t have the flu since a long time” (Carlo). There are also other needs and wants of undergraduate students regarding influenza that can be addressed by the university (especially the health clinic), which I had summarized in Table 6.11.

Because it turned out that e-mails from Laketree University are not always read, students rely more on information they access themselves on cell phones (70.5% of survey respondents used them ‘every day’) and on the Internet via computers (68.4% of students used them ‘every day’). It appeared that these communication/information channels are preferred by undergraduate students because they are most typical for members of Generation Y (‘Millennials’) and Generation Z. Note that I showed that students in my survey were members of these two generations (see box ‘Millennials and Gen-Zers’ in Quadrant 2). In other words, undergraduate students were well acquainted and connected with modern technology. As Jane phrased it, “e-mail, cell phone, Internet via computer: ‘every day.’ I think they are the most common form of communication;” Henry added: “there is always a cell phone or a computer close by in this time of age.” While students indicated that they do react to attention-grabbing information (“if there would be pictures in the news feed” [Jim]), which can be most often found in the mass media (especially on television), undergraduate students are concerned about information overload on the Internet, which is also known as infoglut (see respective boxes in Quadrant 1 of the concept map). In fact, a ‘Google Search’ I conducted on November 1, 2017, showed over 50 million entries for influenza. Carlo remarked “I feel like often times, there is where you get false, I mean you get like correct information but the wrong thing. Like WebMD, type in the symptoms and it spits out 20 different things ... oh, I can have cancer!” Also Ben made here a telling

comment: “Oh, you have a stomach ache and you go to WebMD and your symptoms fit Ebola or something, and then you think you have Ebola!” In short, “it is really easy to get the wrong information from the Internet” (Carlo). Because of infoglut and the risk to access information which may not help students learn and understand the risk of influenza and the benefit of vaccination, undergraduate students expressed that they would like to have contact information. As Jane put it: “The main thing is to have a website or phone number.”

My survey showed that students want information which is age-relevant and quick to read, as well as clear and easy to understand. In other words, undergraduate students look for helpful information about influenza and prevention/protective measures, as I had indicated in the concept map in Quadrant 1 by the box ‘Helpful information pieces.’ This can then lead to ‘Valuable knowledge about the flu’ (see box). I believe that the university can play here a crucial role. I showed that 74.3% [emphasis added] of undergraduate students considered the health clinic of Laketree University an ‘important’/‘very important’ source of information about influenza and flu vaccination (i.e., the health clinic was chosen in second place after the doctor), but it appeared that it is the content, packaging, and communication of flu information that were falling short, and thus perceived by many of these young adults as rather ineffective. Nevertheless, the university health clinic plays a crucial role in that it can help undergraduate students make informed and wise health care decisions.

As I have mentioned above, students’ responses indicated that the doctor (see box in Quadrant 1) is the most valued source for information about the flu (86.8% marked ‘very important’/‘important’ on the written questionnaire). The reasons for choosing the doctor were explained by students as follows: “It’s the expert” (Kelly), “the doctor would have more information and knows how it works” (Chris); and “a doctor kind of understands the health risks,

so they would know what kind of health risks *we* have with influenza” (Carlo). The family (see box) did play some role in providing flu information, but family members were considered a “secondary source” (Chris), and students were unsure about the level of their knowledge (“I can ask them where they get that information from, but I don’t know how much they know. I don’t even know if they have gotten the flu before” [Kelly]). Furthermore, it appeared that undergraduate students at Laketree University did not talk much about the flu on campus because “in college, if somebody is sick, you assume it is a hang-over” (Fiona). Also, talking about influenza is apparently “a downer” (Frank), a “distant topic” (David), “irrelevant right now” (Chris), “just doesn’t come up very much” (Carlo), and “I worry about other things” (Frank). Finally, student colleagues are not considered by the majority of survey participants a significant source of influenza information (only 19.8% marked ‘important’/‘very-important’ on the questionnaire). Three students explained: “Students might not have the correct information. They might have gotten it from sources like Wikipedia” (Henry); “who knows what he told me” (Ben); and “you get more information or better information from a doctor or someone older” (Jane). Because ‘Family or other students’ were not considered sources of ‘Helpful information pieces’ by undergraduate students in this survey, I did not show a direct link between these two boxes in the concept map. But, I did show a connection between the box ‘Doctors’ and the box ‘Helpful information pieces.’

My research showed that undergraduate students in my survey had many different identities (see respective boxes in Quadrant 2 of the concept map). First, I described undergraduate students as traditional students whose primary responsibility was to go to class and to pass tests. To phrase it in more general terms, traditional students consider the university education as their primary responsibility. I visualized in the concept map this characteristic by an

arrow to the box labelled 'Busy school schedule.' Second, I showed that undergraduate students belonged to one or another student subculture (e.g., first-year students: "I am in my first year" [Grace]; or international students: "I am from Cameroon" [David]); or commuter students: "I commute to school" [Frank]). Third, and as I had mentioned earlier, undergraduate students in my survey turned out to be members of young generations (see the box 'Millennials and Gen-Zers') who were well equipped with high-tech devices and preferred to use them for accessing information. Sarah described it this way: "The way society is shaped now, the college students, that's what we mostly use: e-mail, cell phone, and computer. I don't think we have time and sit down and watch TV or listen to the radio." Fourth, undergraduate students are typically young by age (in my survey: mean age was 20.2 years; median age was 23.5 years). Fifth, undergraduate students in my study were young adults who have just only recently entered the developmental phase of evaluating and reacting to various types of risks (here: the risk from influenza). In short, they were newcomers to risk decision-making (see the box 'Young adult decision makers' in Quadrant 2 of the concept map). Thus, the activity to make a judgement about an infectious disease like influenza can be considered an *extracurricular activity* for students, which appeared to be in conflict with their busy school schedule.

Undergraduate students emphasized their young age multiple times during the survey. I was able to show that age had symbolic meanings for students. Phrases such as "Personally, I am young and I am active" (Fiona) and "I am also very healthy" (Sarah), as well as a group perception of 'immortality' ("We think we are immortal and can't die" [Ben]) pointed to their belief in their excellent health status, which influenced their personal risk perception of the flu. I demonstrated that also influenza had symbolic meanings to students. For example, 39.6% of undergraduate students used the words 'sickness' or 'illness,' or 'being sick' to describe what

influenza meant to them. While some students described influenza by a name (e.g., swine flu or bird flu), other students mentioned symptoms (e.g., chills, runny nose) or feelings (e.g., not fun and scary), among many others. Grace described ‘sick’ as follows: “You feel emotionally sick as well as you look physically sick.” Perhaps one of the most striking observations was that undergraduate students associated influenza with risk groups other than their own: “I think babies are always sick, old people are always sick, young children are always sick” (Ben); and “youth and health go together, and old age and illness go together” (Darius). This most likely influenced undergraduate students’ perception of influenza as a risk to their health and was seen as a reason why students positioned this highly contagious disease at the lower end of various risks discussed during the interviews (smoking; texting while driving; driving without wearing a seatbelt; Ebola; and influenza).

Risk perception impacts how people develop their belief system about risks, and ultimately form attitudes about a topic (here: influenza and vaccination/other protective measures). Based on the data from my survey, the young age of undergraduate students should be considered an important driver for the decision-making about influenza. I depicted this line of thought by connecting five items in Quadrant 2 of the concept map: (a) ‘Young, healthy, and ‘immortal’;’ (b) ‘Symbolic meaning of age;’ (c) ‘Risk perception;’ (d) ‘Beliefs;’ and (d) ‘Attitudes about the flu.’ I suggest here that students’ attitudes, which were also formed by the ‘Symbolic meaning of influenza’ (see oval circle in the map), were trigger points for students’ reactions to influenza and subsequent decisions about what kind of prevention/protection measures to take. I showed this link through arrows connecting the ‘Attitudes about the flu’ box in Quadrant 2 to the box ‘Flu vaccination/protection methods’ in Quadrant 3.

It turned out that both ‘flu vaccination’ and ‘face mask’ had also symbolic meanings for undergraduate students at Laketree University, for which I placed additional two oval circles in Quadrant 3 of the concept map. More specifically, flu vaccination was visualized by most students through images such as ‘shots’ and ‘flu shots’ (39.2% of students’ responses), while the mask elicited feelings like “it would be strange wearing a mask” (Fiona); “it just would feel awkward all day” (Eduardo); and “it would be like [in] China or something” (Ben). I suggested that students’ assigned meanings to these words (i.e., ‘flu vaccination’ and wearing a ‘mask’) most likely impacted their choice and use of these prevention/protection methods. My suggestion was supported by the fact that 74.0% of students indicated that they would not wear a mask in the event of a flu outbreak on campus. Furthermore, participating in influenza vaccination was considered time-consuming and in conflict with the busy school schedule. For example, Fiona mentioned: “Getting a flu shot and making an appointment is more like a task ... as a student you are busy and taking out time for something is not easy.”

I showed that 92.7% of undergraduate students reported familiarity with the concept of influenza, and the responses were similar (by the distribution of individual percentages) between freshmen, sophomores, juniors, and seniors. It needs to be reiterated that this survey was not aimed at asking specific knowledge questions about influenza such as virus reassortment mechanisms, transmission routes, or incubation periods. But, the survey revealed that the vast majority of students (96.9%) remembered the H1N1 influenza pandemic of 2009, which occurred during the time they were in middle/high school (see respective boxes in Quadrant 4). It appeared that a great deal of students’ attitudes and knowledge about influenza stemmed from the memories of that global outbreak. Some students commented: “But it was like in a joking manner. But it was also a serious thing that was going on when people got the influenza virus”

(Chris); “they talked about it. It was a big deal. It was because students were getting it and teachers told us to take precautions” (Kelly). Yet, my survey data revealed that less than 30% of students felt they were ‘well’/‘very-well’ informed about protective measures against influenza. When I asked students during the interview if they know what the best flu protection method is, Sarah answered “I do not.” Interesting was then the finding that the majority of students (55.2%) in this survey reported believing that they have ‘some risk’ of getting the flu. Grace commented: “I feel myself always at some risk, but not at high risk at all. Because you already do quite a bit of protection against the flu.” While most students (68.1%) marked on the questionnaire that they had ‘little’/‘no’ worries about getting sick from the flu vaccine (Sarah remarked: “Not worried because of psychological [reasons]. The more you worry, the more you attract it”), less than 50% of students reported having chosen influenza vaccination during the 2014-2015 flu season, and the number of flu shots received during the three influenza seasons from 2012-2013 through 2014-2015 was rather inconsistent. Darius commented: “I guess I was surprised why I had only one flu shot in the last three years. But that’s all.” Surprising was then the finding that 64.6% of undergraduate students in this survey marked on the questionnaire that they believed the flu vaccine is ‘always’/‘usually’ effective. Yet, 47.9% of undergraduate students in this survey reported that they abstained from flu vaccination during the 2014-2015 influenza season.

I discussed in this dissertation undergraduate students’ experiences with practicing flu protection other than vaccination. I mentioned that the H1N1pdm09 vaccine was not available during the first several months of the 2009 H1N1 pandemic when many people had seriously falling sick or died. The unavailability of this vaccine during the first phase of the outbreak in conjunction with students’ instruction by middle/high school teachers to use products such as hand sanitizers (“the teachers are very informative about it. They pretty much pounded it into our

heads with the swine flu” [Sarah”) was seen as a form of conditioning of students’ behavior to primarily use non-pharmaceutical flu protection methods. The finding that a large percentage of students (42.0%) were against mandatory influenza vaccination in this survey (“Don’t tell me I should get a flu shot“ [Ben]); “I think people have freedom of choice” [Chris]) let me conclude that undergraduate students at this university were more interested in non-pharmaceutical flu protection methods and were more accustomed to use them than flu vaccination. In other words, influenza vaccination would not necessarily be their first choice of prevention/protection during a typical (mild/moderate) seasonal influenza outbreak. I depicted this line of thought by connecting the boxes ‘Middle/high school education’ and ‘Mild/moderate interpandemic flu outbreaks’ to the box ‘Practice’ (see Quadrant 3), which I then connected to the box ‘Non-pharmaceutical flu protection’ in Quadrant 4.

There is one final box in the concept map, which I need to discuss here. This box is labelled ‘Large and close to campus flu outbreaks’ (see Quadrant 4). Data from my survey showed that in the event of such an influenza outbreak, the behavior of undergraduate students would drastically change. As Frank stated: “Everything would then shift. Then I need to know everything because then I don’t want to get it.” Data from the quantitative part of the survey showed that all information pieces about influenza (see Table 4.3) were considered by the majority of undergraduate students as either ‘very important’ or ‘important’ in the event of an influenza outbreak on campus. Furthermore, the health clinic at Laketree University would then play a more crucial role for students. Eduardo remarked: “I trust the school to actually make the decision what the severity of the outbreak is, and to tell us when it is safe.”

Moreover, in the event of an outbreak on campus of Laketree University, undergraduate students’ behavior would include the following priorities: 88.2% of students would cover nose

and mouth when sneezing, 85.4% would wash their hands more frequently, and 69.8% of students would increase the use of hand sanitizers. As I had discussed earlier in this chapter, flu vaccination was not selected by students with a percentage higher than 48.6%. Again, this showed that non-pharmaceutical interventions would be preferred by the majority of undergraduate students. Yet, flu vaccination is still considered a factor by some students in the event of a larger and close to campus outbreak (“But if the bird flu or something would come around, then I would get vaccinated” [Fiona]). I depicted this line of thought by connecting the respective boxes in Quadrant 3 to the box ‘Flu prevention/protection methods’ in Quadrant 4, which includes both ‘Flu vaccination’ and ‘Non-pharmaceutical flu protection’ (see oval circles).

Most of the comments students made during the interviews were directed towards explaining why staying at home would not be an option: “You cannot just stay home and hide from it. You have to continue your life” (Jane) and “If I have a test, I go” (Ben). These two comments, again, supported the idea that undergraduate students would behave during a flu outbreak situation in a manner which fits the behavior of traditional students who have a busy school schedule and take their responsibility to learn for their professional careers seriously. Finally, the two most important reasons for students to start regularly taking flu avoidance measures were found to be: (a) When students hear that other students are sick with the flu (50.7% of respondents), and (b) when a student thinks he or she got the flu (40.9% of respondents). This showed that the sickness of students during a flu outbreak should be considered important triggers for undergraduate students at Laketree University to adopt flu avoidance behaviors on a more regular basis.

Crisp (in Aristotle, trans. 2014a) pointed out that Aristotle's theory of phronesis relates to the virtue of

getting it right within particular spheres of human life. Virtue of character rests partly on the development of dispositions towards virtuous action through habituation. This habituation will be guided by, for example, one's parents or teachers. But the virtuous person is able to get it right in each sphere without guidance from others, and his capacity to do that is what centrally constitutes practical wisdom. (p. xxiv)

My survey revealed that undergraduate students at Laketree University did receive guidance from other people. These people appeared to be primarily middle/high school teachers who informed students about the health risk from the pandemic H1N1 swine flu virus, which caused significant morbidity and mortality in human populations, and which affected especially the younger population segments (see Table 1). Based on the comments students made during the survey interviews, teachers taught students to be cautious and take protection, which apparently focused primarily on non-pharmaceutical interventions, such as cough etiquette, washing hands more frequently, and using hand sanitizers. This guidance seemed to have influenced students' behavior in that they got used to choosing non-pharmaceutical flu protection methods when they entered college (i.e., the habituation). However, my survey also showed that almost half of undergraduate students in my survey did choose flu vaccination. So, I had to ask where this guidance came from and why almost the other half of students did not adopt a habit to vaccinate during the 2014-2015 flu season and/or some previous seasons as well? I believe that the habituation of flu vaccination was not fully developed yet in all undergraduate students. There could be several reason that would explain this phenomenon: First, the imprinting of students in middle/high school to get accustomed to non-pharmaceutical flu protection could

have been so strong that it overshadowed attempts by authorities to convince undergraduate students that flu vaccination is considered the best protection methods against this highly contagious disease. Second, undergraduate students felt that they have other things to worry about, especially their professional education at Laketree University.

Third, undergraduate students expressed that they did not perceive influenza as a significant risk to their health because of reasons such as their young age and associated good health. This perception of low vulnerability and low susceptibility to influenza virus infection can be defined as an *optimism bias*, which is an underestimation of risk leading to an unrealistic optimism in risk perception when making judgements about comparative risks (Weinstein, 1984; Weinstein et al., 2007). It is indeed a bias because I had pointed out numerous times in this dissertation that influenza is a dangerous disease which can affect people in any age group and in any setting anywhere in the world at any time, especially in crowded environments such as a university campus. Fourth, habits form when a person uses a particular behavior more often; otherwise, the behavior would be abandoned. This may explain why many students in my survey chose not to receive the flu vaccine during all of the three influenza seasons from 2012-2013 through 2014-2015.

Fifth, the guidance Laketree University provided to undergraduate students appeared to be suboptimal. I had explained potential shortcomings of the university and made suggestions for improvements in the section ‘needs and wants’ (see also Table 6.11 and Table 6.14). Thus, the guidance by this university did most likely not stimulate sufficiently the “development of dispositions towards virtuous action through habituation” with regards to influenza vaccination (Crisp, in Aristotle, trans. 2014a, p. xxiv). Six, Aristotle’s thought that the virtuous person needs to get it right without guidance from others, implies that he/she had been properly guided in the

past and that the capacity to use practical wisdom to act wisely is fully developed. As I had discussed earlier, this is not the case in these young adults because they are relative newcomers to risk evaluation and risk decision-making. So, does that mean that undergraduate students need to be considered as non-virtuous persons who did not apply practical wisdom before acting? I believe that undergraduate students focused exactly on what they were supposed to focus on, which is to go to class, learn, and pass tests in order to graduate from this university and leave with an education they hopefully can enjoy throughout their lives. But, when it comes to influenza, many of these young adults still need (and want) further guidance.

As I had discussed earlier, dealing with risks is a tricky thing, and wise decisions do not come easy. This is true not only for young people like undergraduate students but also for older people. In fact, I had mentioned in the Introduction section that influenza vaccination rates among American adults are generally low, and in fact, they are well below the target of 70% coverage for adults aged 18 years and older, which is the *Healthy People 2020* goal (Centers for Disease Control and Prevention, 2016c; United States Department of Health and Human Services, 2014).

In regard to Aristotle's thoughts about applied wisdom, I need to point out that he did not specifically look at phronesis from the perspective of health. He stated:

We may grasp what practical wisdom is by considering the sort of people we describe as practically wise. It seems to be characteristic of the practically wise person to deliberate nobly about what is good and beneficial for himself, not in particular respects, such as what conduces to health or strength, but what about what conduces to living well as a whole.

An indication for this is the fact that we call people practically wise in some particular respect whenever they calculate well to promote some good end that lies outside the ambit of a skill; so, where living well as a whole is concerned, the person capable of deliberation will also be practically wise (Aristotle, trans. 2014a, p.107 [Bk. VI, 1140a-1140b]).

My study focused on an issue of personal and public health. I was aware of the limitations of using Aristotle's theory, and that I had to adapt it to my research topic (see Table 1.3). However, health significantly contributes to living well, and we face today a world which is quite different than the one Aristotle experienced. As I had outlined in the Introduction of this dissertation, we are faced today with an unprecedented population growth (7.3 billion in mid-2015 [United Nations, 2015]), significant crowding in communities (Florida, 2009), an enormous level of global interconnectedness (World Tourism Organization, 2016; World Trade Organization, 2016), and an increasing risk to our health from emerging and re-emerging infectious diseases. Influenza is only one of the many infectious health risks we face today.

Going to college and becoming an undergraduate student as a young adult involves many changes. It is a time for significant personal development, for finding out what is needed to live well, and for envisioning what the future might hold. Last, but not least, it is a time for learning how to lead oneself, especially in difficult situations such as those that require risk assessment. Aristotle (trans. 2014b) emphasized that

“it is not thought that a young man can come to be possessed of Practical Wisdom: now the reason is, that this Wisdom has for its object particular facts, which come to be known from experience, which a young man has not because it is produced only by length of time” (p. 70; Bk. VI, 1142a-1142b).

I present below some final excerpts from discussions with undergraduate students, which I believe demonstrated how they as young adults began practicing phronesis during the interviews:

(a) Interview with David:

In case someone would say there was a flu [outbreak], the first thing I would do is [to find out] what the flu [is all] about. I am at the beginner level, so I don't have information. I go to the Internet. If someone said 'oh, I have the flu,' and I think this person is infected, then I would call my doctor. So then, I can make an appointment. So, if I have the flu, it depends on how serious it is. It is about the information. [For example,] if someone says, this flu is caused by the HIV virus or something, I would think 'that's not right!' Or, if someone would say that [it] is something else. I call the doctor if I feel someone around me has [the flu] because then there is the likelihood that I may have it. Then I would call [the doctor] to make sure [and] make an appointment, just to make sure I don't have it.

(b) Interview with Fiona:

I have not gotten a flu shot since middle school. I definitely remember when I got sick in one year, and then I think about it in the next year when I get sick again. But there is not much I change because I had the same prevention methods when I had the flu. Some years I get the flu and some years I don't. If I would be already in a doctor's office and [he/she] would suggest [I should get a flu shot on] that day, then I would get it. But, if it would be something I would need to make a separate appointment for or take time out of my schedule to get a flu shot, then I would not get it that year. I know we have flu shots on campus, and if a friend would tell me she gets the flu shot, then, maybe, I would go

with her and do the same. In the past, I remember when I got the flu shot, I had a little fever the next day. It was not like the full flu, but it was like a little bit of sniffing and the fever. I would only get a flu shot if it is recommended or when it is very prevalent in my age group that year. When they gave out the H1N1 vaccine [during the 2009 influenza pandemic], I did not get one because I was not in the high risk field and it was not very prevalent in [our state]. But if the bird flu or something would come around [and] I would be hospitalized for [it], then I would get vaccinated.

Summary

I presented in this sixth chapter the final set of data I had generated in this dissertation research project. More specifically, I described the various communication channels undergraduate students at Laketree University preferred for obtaining general-type information. I showed that students used primarily high-tech electronic devices such as cell phones and computers to access on-line information. These findings were not surprising because students in my survey belonged to two generations (Generation Y [‘Millennials’] and Generation Z [‘Gen-Zers’]), and people of these generations are not only accustomed to using these modern devices but are also well connected via the World Wide Web to search for any kind of information they desire. However, on-line information has its pitfalls because of an information overload (infoglut) which can lead to misinformation and thus to confusion by the Internet user (here: the undergraduate students). When searching for information about an issue such as influenza, false or misleading, or badly drafted information can do more harm than help, and can threaten the intention of public health professionals to optimally inform students about their risk from influenza and the benefits of preventative/protective measures (especially vaccination).

Students in my survey expressed that they would like to have a web address and a phone number to lead them to information they can trust.

I also showed in this chapter that undergraduate students belonged to various subcultures (e.g., commuters and international students). Furthermore, I examined the past vaccination behavior of undergraduate students and showed that about half of the students in my survey reported having received the flu vaccine during the 2014-2015 flu season. However, it turned out that their acceptance of flu vaccinations in the prior years was rather sporadic. I conducted a Chi-Square analysis in which I examined students' past vaccination behavior in association to various variables including students' memory of the 2009 influenza H1N1 pandemic, belief in flu vaccine effectiveness, worries about flu vaccine side effects, and field of study, to name a few. I found a statistically significant association of students' flu vaccinations for the 2014-2015 influenza season to variables such as belief in flu vaccine effectiveness and worries about flu vaccine side effects, while for the 2012-2013 through 2014-2015 influenza seasons (i.e., for students' who self-reported having received three flu shots) to variables such as perceived personal risk of getting the flu, belief in flu vaccine effectiveness, and the level of trust in flu vaccination provided by authorities. Furthermore, I compared the flu vaccination behavior of undergraduate students at Laketree University with the behavior of students in other surveys and found that respondents in my study were more similar (in regard to self-reported flu vaccinations) to medical students than to other students (e.g., graduate students). A reason for this similarity could be the preference of many students to seek advice about influenza from their personal doctors.

I then turned my attention to undergraduate students' behavior in influenza outbreak situations, which revealed that the majority of students preferred using non-pharmaceutical

interventions (e.g., cough etiquette and washing hands more frequently). I also reported that the majority of students would regularly take flu avoidance measures when they think they themselves contracted the flu or hear that other students were sick with this infectious disease. I offered undergraduate students, who participated in the interviews, an exercise in which I asked them to rank various risks (smoking; texting while driving; driving without wearing a seat belt; Ebola; and influenza). It turned out that students ranked influenza at the lower end among these risks, and I mentioned that students' 'age' symbolism, which means, students' expressions of their young age and associated fitness and good health (i.e., a perceived lower susceptibility to infection) most likely played a role in the ranking of influenza. However, if risk(s) would shift (e.g., a significant influenza outbreak on campus of Laketree University would occur), students expressed that they would seek protection, which would primarily include the use of non-pharmaceutical interventions, but flu vaccination would then also be considered.

In another section of this chapter, I identified numerous needs and wants of undergraduate students in regard to the topic 'influenza.' For example, I showed students during the interviews three infographics about influenza and vaccination. I had discussed two of these infographics in Chapter 4 and reported that students felt that they lacked helpful information. A third infographic, which showed the difference in symptoms between the flu and the common cold, was discussed in Chapter 6. It was during the discussion of this latter infographic that it became clear that undergraduate students would prefer information about influenza that is age-relevant, attention-grabbing, well-structured, easy to understand, and educational, among others. I summarized all information needs and wants of undergraduate students at Laketree University in form of a table (see Table 6.11) and also made several suggestions what the university could do to better inform students about this highly contagious disease (see Table

6.14). Finally, I demonstrated that most students knew that this university offered flu vaccination on campus, which I found out was offered to students free of charge.

I concluded this sixth chapter by selecting the most telling data from this mixed-methods investigation for the development of a theoretical model. I presented this model in form of a concept map (see Figure 6.2). I described the meaning of the individual boxes/circles in the map and explained why I connected them through arrows and lines in the way they were displayed. In short, I discussed how the data from this study fit together.

For the interpretation of the set of data discussed in Chapter 6, I revisited Douglas and Wildavsky's (1983) cultural theory of risk perception as well as the concepts of 'field' and 'habitus,' which are part of Bourdieu's (e.g., 1990, 1993, 1998) theory of structural constructivism. I decided to use here also the theory of phronesis (Aristotle, trans. 2014a, trans. 2014b) because it helped me understand what wise decisions-making can mean for undergraduate students when faced with a conflict between school responsibilities (i.e., learning for a professional career) and dealing with a health threat like influenza.

CHAPTER SEVEN:
CONCLUSIONS AND RECOMMENDATIONS

Background

Influenza is a highly contagious infectious disease which is caused by a virus that has its primary reservoir in wild aquatic birds. It is a zoonotic and airborne virus with the potential to circulate among various animal hosts, including birds, pigs, horses, dogs, cats, and seals (Chambers, Dubovi, & Donis, 2013). Human infections are primarily acquired through direct contact with infected animals (e.g., in chicken or pig farms) or contaminated environments. Efficient transmission of these viruses between people can take place when sufficient flu virus adaptations have occurred and genetic reassortments promote such an event (Jernigan & Cox, 2013). Lipsitch and Smith (2013) pointed out that

[t]he antigenic variation of influenza viruses is the reason why the viruses can reinfect humans multiple times during their lifetimes, why vaccinating both humans and birds against avian H5 influenza virus is difficult, and what necessitates the enormous worldwide effort to track the evolution of influenza viruses so as to repeatedly update the strains in the influenza virus vaccines to track the latest variants. (p. 441)

Transmission of influenza viruses between people occurs through multiple routes, including large droplet, droplet-nuclei particles of respirable size, and contact (Bridges et al., 2013). Once the viruses entered the body through the nose or throat, respiratory tract infections can occur with symptoms such as fever, sore throat, cough, headache, myalgia, coryza, and prostration (Heymann, 2015). Influenza virus infections in humans can lead to mild or severe annual epidemics and to sporadically occurring pandemics of major proportions. The Spanish flu is an example of the most severe influenza pandemic on record, which occurred in 1918-1919 and killed an estimated 50 to 100 million people globally (Centers for Disease Control and

Prevention, 2016d). The latest influenza pandemic occurred in 2009 and became known as the H1N1 pandemic or swine flu. In both of these pandemics, the highest mortality was observed in healthy people younger than 65 years of age (Centers for Disease Control and Prevention, 2016d). My study was conducted in the post-2009 influenza pandemic era. More specifically, I placed the time for the field research between December 2015 and March 2016, which, as it turned out, included the peak time of the flu epidemic of that winter season.

My background as a biomedical researcher and university faculty with interests in infectious diseases, epidemiology, vaccinology, and international health, as well as policy development and strategic management stimulated me to select a dissertation research topic about influenza in human populations. More precisely, I set out to conduct a mixed-methods (quantitative-qualitative), cross-sectional, normative case study to investigate the attitudes and behaviors of undergraduate students towards influenza and vaccination. This topic was viable for a dissertation research project because my literature review had revealed that (a) influenza is a topic of great interest to researchers, especially since the H1N1 swine flu pandemic of 2009 when a significant jump in influenza-related research publications occurred; (b) investigations about the attitudes and behaviors of undergraduate students towards influenza and vaccination was found to be still in its infancy because young adults were not included in the high risk groups for influenza susceptibility prior to the 2009 H1N1 pandemic; (c) flu vaccination rates in university student populations were found to be generally low despite the fact that universities conduct influenza vaccination campaigns at the beginning of the flu season; and (d) flu outbreaks with varying severity occur every year at institutions of higher education, which are particularly prone to efficient and sustained transmissions of airborne pathogens like influenza viruses

because of crowding of students in classrooms, in dormitories, and at social events on (and off) campus.

My investigation was designed as a social science study. Hence, I analyzed my research data by looking through the lenses of four theories drawn from sociology. These theoretical lenses included (a) the cultural theory of risk perception; (b) structural constructivism; (c) symbolic interactionism; and (d) applied phronesis. The analysis of the research data from both the quantitative and qualitative parts of the study, in which I had invited a total of 303 undergraduate students (three of these students had participated in the pilot study), allowed me to develop a theoretical model. I had presented this model in form of a concept map, which visualized and meaningfully connected the concepts/themes that had emerged through a 3-step qualitative coding procedure of the data generated in this research project.

Core Findings

At the beginning of this research study, I proposed to find answers to four main questions that pertained to the overarching topic ‘risk perception and risk response behavior,’ using influenza as an example of a risk and the use of methods of prevention/protection (especially vaccination) as a possible response behavior. I will repeat below each of the four research questions followed by short summative answers:

- How do undergraduate students perceive influenza as a risk in light of risk information communicated by authoritative bodies?

In this survey, I described students as the end-receivers of information about influenza provided by various authoritative powers, including the vaccine industry, the Centers for Disease Control and Prevention, health care providers, and Laketree University. I found that most students trusted the government as being knowledgeable and trustworthy in providing influenza

information. The majority of undergraduate students reported being familiar with the concept influenza, and most of them remembered the H1N1 pandemic of 2009. But, despite the fact that these students were trained in middle/high school in flu protective measures (which apparently focused primarily on non-pharmaceutical interventions such as cough etiquette and hand hygiene), the majority of them felt they were only somewhat informed about influenza. Most students marked on the written questionnaire that they perceived the flu as a moderate risk to their health. But, when I had asked students during the interviews to compare the flu to other risks (texting while driving, driving without wearing a seatbelt, smoking, and Ebola), they ranked influenza at the lower end of these risks.

- Where do undergraduate students seek advice and educational information about influenza and methods of flu protection?

Over 60% of students preferred their personal doctor (they called the ‘expert’) as the main source of trusted information on influenza. The campus health clinic, the Internet, and family seemed also important to them, but to a lesser degree. Based on the fact that a physician is not available to students without making an appointment, searching the Internet for information was reported by students as a daily task which is typical for young people who, as I found out, belonged to Generation Y (‘Millennials’) and Generation Z (‘Gen-Zers’). However, students were concerned about finding the right information online. I showed that students seek educational information, which can be easily accessed and understood, and which needs to be provided in real time and up to date. It turned out that information about influenza, sent via e-mails by Laketree University, was not always read by students, and I made suggestions for how the content and format of this type of information can be improved.

- What attitudes do undergraduate students hold towards influenza and vaccination?

Students assigned various symbolic meanings to words such as ‘influenza’ (e.g., a sickness or being sick) and ‘flu vaccination’ (e.g., a shot or prevention/protection). The coding of data revealed that two additional words had also symbolic meanings. These words are ‘age’ (students emphasized their fitness and health, and even perceived immortality) and ‘mask’ (which elicited feelings of uncertainty and awkwardness). The young age of students in association with their perceived good health status were described as reasons why influenza was seen by the majority of students not as a significant risk to their health. 58.3% of students believed that the flu vaccine is effective, but self-reported flu vaccination was less than 50% for the 2014-2015 flu season, and rather inconsistent in prior seasons. Students expressed concerns about flu vaccine side effects as well as a lack of effectiveness in some influenza seasons. Most students in this survey were against mandatory flu vaccination, with some students arguing that it would infringe on their right of freedom of choice. I found that flu vaccination was not necessarily undergraduate students’ first choice as a response to influenza, most likely because they were primarily trained during middle/high school years in the use of non-pharmaceutical interventions and were, at that time, not included by authorities in the high risk groups for influenza susceptibility.

- When and why do undergraduate students engage in risk response behavior?

Students reported that they would engage in risk response behavior in case there would be a large influenza outbreak close to or on campus of Laketree University. More specifically, they would take action if they would hear other students are sick with the flu or think they themselves contracted the flu, or hear about the outbreak from people off-campus or in the mass media. In such a scenario, students want to receive many pieces of information (e.g., treatment

options and preventative measures) that would help them to deal with this risk. Furthermore, information provided by the university (especially information about the severity of the outbreak and a message when it is safe to be on campus) would then be on their lists of needs and wants. Staying home was considered by most students the least likely response to an influenza outbreak, and a reason for this behavior was seen in students' dedication to higher education and associated busy school schedule. Finally, flu vaccination was not considered by undergraduate students at Laketree University as one of the first three choices to respond to an outbreak. Again, the primary reason for this was seen in the developed habits from middle/high school to prefer protection methods such as covering nose and mouth when sneezing, washing hands more frequently, and increasing the use of hand sanitizers.

Limitations and Suggestions

There are a number of limitations in this social science investigation that needed to be discussed. First, the design of the research project as a cross-sectional study had the limitation that undergraduate students were studied only at one point in time and within a relatively short time period. Although cross-sectional surveys have many advantages, as I had described in the Research Methodology section of Chapter 2, data from a longitudinally study (e.g., a prospective cohort [follow-up] study) could provide an even deeper insight into the topic. I believe the results from my cross-sectional study can be used as a good proxy for such investigations as it provides practical initial clues about an undergraduate student population.

Second, there is a risk that the use of a convenience sampling method provides a limitation of a survey study because of a possibility that the sample is heavily skewed towards one or the other demographic categories. However, it turned out that in my survey the samples for most of the demographic categories represented their respective categories of the total

undergraduate population. Since calculations for ethnicity, place of origin, and religious affiliation did not fall within the required confidence interval ranges, the research findings for these categories were not representative and must thus be considered a limitation of this study.

Third, my literature research about college/university students' attitudes and behaviors towards influenza and vaccination had revealed that different types of student subpopulations (e.g., undergraduate students, graduate students, medical students, and/or students in allied health sciences) were studied by other investigators. The lack of having more publications specifically about undergraduate students in this research area made it difficult for me to fully compare my findings to other studies. Furthermore, my investigation focused on a single university setting (i.e., Laketree University), and it was thus not possible to make direct comparisons to university campuses of similar make-ups.

Fourth, to my knowledge, none of the social science theories I used for the interpretation of my research data have been used before by other investigators who studied this topic. Thus, there is the limitation to compare my social science data directly to those of other investigators. Furthermore, in hindsight, I believe that if I would have used only a single theory for interpreting a complex issue such as influenza and vaccination, I would not have been able to provide the kind of comprehensive description of undergraduate students' attitudes and behaviors towards influenza and vaccination. In my opinion, it would be desirable to have more public health researchers engage in qualitative or mixed-methods research approaches and using theories for the interpretation of data that are derived from sociology.

Recommendations for Influenza Research, Preparedness, and Response

There are several avenues for future research about undergraduate students and for improving policies that are aimed at increasing flu vaccination in this subpopulation. I describe

below my specific recommendations by addressing the various authoritative entities I had identified as participants in influenza research, preparedness, and response.

First, learning about undergraduate students' attitudes and behaviors towards influenza and vaccination depends on research in this field. As I had mentioned earlier, this type of research is still in its infancy and more data are needed to decipher the multidimensional dynamics of undergraduate students' interactions with authoritative powers, which have an impact of students' perceptions of risks such as influenza. I encourage social science researchers with an interest in public health to generate more data about this subpopulation at institutions of higher education. As McQueen (2002, para. 4) pointed out, "sociology has not been the key social science discipline in public health. That position has gone to psychology, where the emphasis on individual behavior resonates more with a biomedical model." I believe we should make sociology a more prominent discipline in public health.

Second, industry leaders are responsible for making flu vaccines. I have shown that interactions between the government and the vaccine industry can be tricky at times, especially when the pressure is high during influenza outbreaks and the public depends on the development, manufacture, and distribution of an effective and safe vaccine in a timely manner. Sufficient funding by government for influenza research is as important as is the creation of information about flu vaccines that clearly describes why and how young adults can benefit from this vaccination.

Third, public health professionals have many responsibilities. These include, for example, health promotion through prevention and intervention of health problems. Low influenza vaccination rates in the community is considered an undesirable outcome as it impacts herd immunity, can lead to higher morbidity and mortality, and subsequently puts a higher burden on

the public health system not only financially in terms of health care costs, but also through losses in economic productivity. In my opinion, strategic planning and implementation of influenza vaccination programs should have a stronger focus on younger generations, which were represented in my study by undergraduate students. I believe it is here crucial to better explain to students the risk influenza poses to their health and to emphasize the *best* protection method (i.e., flu vaccination). This does not mean that the role of non-pharmaceutical interventions should be deemphasized as these methods of protection are quite important, especially before a flu vaccine becomes available. Thus, public health professionals need to explain to young adults that other preventative/protective interventions should be used in concert with flu vaccination.

Fourth, universities have a major impact on the implementation of vaccine policies. As I had mentioned before, the Centers for Disease Control and Prevention (2010b) suggested that institutions of higher education should tailor influenza guidelines as they see fit best their own unique circumstances on campus. My survey revealed several needs and wants of undergraduate students in regard to flu information (see Table 6.11), and I had summarized in Table 6.14 what can be done by Laketree University (especially the health clinic) to better inform undergraduate students about influenza and vaccination. In my opinion, an emphasis should be placed here on efforts to educate students as early as possible, which means, when they enter college. This, in turn, can lead to the creation of a culture of flu vaccine acceptance among undergraduate students that could be carried over when they become graduate students and/or enter the workforce. Finally, I encourage researchers to study the operation of university health clinics with a particular focus on their organization and management (including staffing), as well as care, wellness, and information services provided. Knowledge about the utilization of these clinics by undergraduate students prior to, during, and after flu seasons could provide additional

clues about students' attitudes and behaviors towards infectious diseases such as influenza and methods of prevention/protection.

Concluding Remarks

The present dissertation research project was concerned with studying undergraduate students' attitudes and behaviors towards influenza and vaccination. My hope is that the concepts and theories I developed here will be helpful to other influenza researchers and policy makers, as well as to those who are in charge of implementing policies. Hayden (2014) mentioned that

[t]heories and models help us understand why people behave the way they do. They are based on concepts and take into account the many factors influencing health behavior. They enable us to focus on these factors from three different levels: intrapersonal [the individual level], interpersonal [influenced by other people], and community [social systems: communities, organizations, institutions, and public policies]. In addition to providing an explanation for behavior, theories and models provide direction and justification for health education and health promotion planning activities (pp. 9-10).

I sincerely hope that the voices of undergraduate students, who so freely gave me their time to participate in my survey despite their busy school schedule, will be heard by the people who are in charge of making decisions about influenza education. After all, good health education depends not only on what professionals feel is important but also on knowing what the needs and wants are of those they want to educate.

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APPENDICES

APPENDIX A**LAKETREE UNIVERSITY^a**

Dear Laketree University Undergraduate Student,

I invite you to take this short survey about influenza (also known as “the flu”). Your feedback is important because it helps to understand what students think and do about influenza.

Your participation in this research study, which has been approved as a dissertation research project by the Institutional Review Board (IRB) of the University of St. Thomas (IRB # 833932-1), is voluntary and you can stop at any time or opt out of individual questions. If you wish to withdraw entirely from this study, please clearly tell me that you want to stop the survey. Data collected about you will then not be used for analysis.

Note: Please do not write your name on this survey!

Section A: Demographics

(1) What is your gender? *(Please mark only one answer)*

- Male¹
- Female²
- Other (please specify)³: _____

(2) What year in your undergraduate program are you currently enrolled in at the University of St. Thomas? *(Please mark only one answer)*

- First year¹
- Second year²
- Third year³
- Fourth year⁴
- Fifth/sixth year⁵
- Other, not listed (please specify)⁶: _____

Note. ^aLaketree University is a pseudonym used throughout the questionnaire for identity protection of the university at which the survey was conducted.

- (3) What is your current major? *(Please specify and print your answer in the box below)*

- (4) Where do you reside? *(Please mark only one answer)*

- In a dormitory (on-campus)¹
 I live off-campus (please specify; e.g., with parents, apartment, etc.)²:

- (5) Where are you from? *(Please mark only one answer)*

- Minnesota¹
 Some other U.S. state²: _____
 Another country (please specify)³: _____

- (6) How old are you? *(Please print your age in the box below)*

- (7) What is your ethnic background? *(Please mark only one answer)*

- American Indian or Alaska Native¹
 Asian²
 Black or African American³
 Hispanic⁴
 Native Hawaiian or other Pacific Islander⁵
 Non-Hispanic White⁶
 Multiracial or Other⁷

- (8) What is your religious affiliation? *(Please mark only one answer)*

- Buddhist¹
 Catholic²
 Christian³
 Islamic⁴
 Jewish⁵
 Other affiliation (please specify)⁶: _____
 None⁷

Section B: Attitudes and Opinions

- (9) Are you familiar with the concept of influenza (a.k.a. “the flu”)? *(Please mark only one answer)*
- Yes, I know what it means¹
 - I have heard of it, but I am not exactly sure what it means²
 - No, I don’t know what it means³

- (10) Do you remember the influenza (“swine flu”) pandemic of 2009? *(Please mark only one answer)*
- Yes¹
 - No²

- (11) What comes to your mind when you hear the words “influenza” and “flu vaccination?” *(Please limit entry to 1 or 2 words per box)*

“Influenza”	“Flu Vaccination”

- (12) As concerns the annual seasonal influenza, how would you assess your personal risk of getting the flu? *(Please circle the appropriate number)*

1	2	3	4	5
Very high risk	High risk	Some risk	Very little risk	No risk

- (13) To what extent are you informed about the various protective measures that could be taken if a flu outbreak would occur? *(Please circle the appropriate number)*

1	2	3	4	5
Very well informed	Well informed	Somewhat informed	Little informed	Not informed at all

- (14) In the event of a flu outbreak on campus of Laketree University, how important is it to you to receive the following pieces of information? *(For each item, please assign a rating in accordance with your judgment)*

	Very important	Important	Moderately important	Not very important	Unimportant
What the symptoms of the flu are	1	2	3	4	5
How the flu spreads	1	2	3	4	5
The severity of the flu outbreak	1	2	3	4	5
How long the flu outbreak will last	1	2	3	4	5
My risk of catching the flu	1	2	3	4	5
How I can find out if I have the flu	1	2	3	4	5
If I can potentially transmit the flu to other people	1	2	3	4	5
How the flu can be treated	1	2	3	4	5
Which preventive measures against the flu are available to me	1	2	3	4	5
What the best protection method is	1	2	3	4	5
Where I can get information about the flu and protection methods	1	2	3	4	5

- (15) What is your level of trust in the information about influenza provided by the authorities (e.g., government agencies)? *(Please circle the appropriate number)*

1	2	3	4	5
Very high	High	Neutral	Low	Very low

- (16) If Laketree University would provide you with information about influenza and flu prevention/protection measures, would that interest you? *(Please circle the appropriate number)*

1	2	3	4	5
Very high interest	High interest	Moderate interest	Little interest	No interest

- (17) Do you think flu vaccination is effective? *(Please circle the appropriate number)*

1	2	3	4	5
Always	Usually	Sometimes	Seldom	Never

- (18) Do you worry about getting sick from the influenza vaccine? *(Please circle the appropriate number)*

1	2	3	4	5
Very worried	Worried	Neutral	Little worried	Not worried

- (19) To what extent do you agree or disagree with the following statement:
"Flu vaccination should be mandatory." *(Please circle the appropriate number)*

1	2	3	4	5
Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Section C. Behaviors and Actions

- (20) How often do you use the following communication channels to obtain news and other information? *(For each item, please circle the appropriate number)*

	Every day	4+ times per week	1-2 times per month	1-2 times per year	Never
Television	1	2	3	4	5
Radio	1	2	3	4	5
E-mail	1	2	3	4	5
Cell phone	1	2	3	4	5
Internet via computer	1	2	3	4	5
Newspaper	1	2	3	4	5
Library	1	2	3	4	5

- (21) If you want to learn more about influenza and flu vaccination, how important are the following sources of information to you? *(For each item, please circle the appropriate number)*

	Very important	Important	Moderately important	Not very important	Unimportant
Ask other students	1	2	3	4	5
Ask a professor at the Laketree University	1	2	3	4	5
Contact Laketree University's Health Clinic	1	2	3	4	5
Ask my doctor	1	2	3	4	5
Ask my family	1	2	3	4	5
Watch television	1	2	3	4	5
Search the internet via a computer	1	2	3	4	5
Read the newspaper	1	2	3	4	5
Listen to the radio	1	2	3	4	5

- (22) If you hear a flu outbreak has reached the campus of Laketree University, what would you do?
 (For each item, please circle the appropriate number)

	True of me	Somewhat true of me	Neutral	Somewhat untrue of me	Untrue of me
I would stay home	1	2	3	4	5
I would come to class but wear a face mask for protection	1	2	3	4	5
I would try to keep distance from other people	1	2	3	4	5
I would avoid using Laketree University's inter-campus shuttle bus	1	2	3	4	5
I would cover my nose and mouth when sneezing	1	2	3	4	5
I would wash my hands more frequently	1	2	3	4	5
I would increase the use of hand sanitizers	1	2	3	4	5
I would seek flu vaccination	1	2	3	4	5

(23) Did you receive a flu shot last year? *(Please mark only one answer)*

- Yes¹
- No²
- I don't remember³

(24) How many flu shots have you received in the last 3 years? *(Please print the number in the box below)*

(25) Would your cultural/religious beliefs inhibit you from seeking vaccination? *(Please mark only one answer)*

- Yes¹
- No²
- I am not sure³

(26) Do you know if Laketree University offers flu vaccinations? *(Please mark only one answer)*

- Yes¹
- No²

(27) If you hear that other students at Laketree University got the flu shot, would that influence your behavior to seek flu vaccination too? *(Please mark only one answer)*

- Yes¹
- No²
- I am not sure³

- (28) What would it take for you to start regularly taking flu avoidance measures?
 (For each item, please circle the appropriate number)

	Definitely	Probably	Don't know	Probably not	Definitely not
When I think I got the flu	1	2	3	4	5
When I hear other students are sick with the flu	1	2	3	4	5
When a professor talks about the flu in class at the beginning of the flu season	1	2	3	4	5
When people I know from off-campus (family, friends, etc.) suddenly start talking about the flu	1	2	3	4	5
When I get mail about the flu from Laketree University	1	2	3	4	5
When I hear about the flu in the mass media (television, radio, newspaper, Internet, etc.)	1	2	3	4	5

If you would like to elaborate on any of the topics covered in this questionnaire, please use the space below *(Please print your comments)*

This is the end of the survey. Thank you for your participation. Please return the completed survey to Christian T. Stadtlander, the doctoral researcher who has given you this questionnaire.

Thank you again and have a wonderful day!

APPENDIX B

General Discussion Guide for the Semi-Structured Interview

1. Housekeeping Issues

- I will welcome undergraduate students to the interview and briefly reiterate the goals and content of the research study.
- I will review the consent form with students including the confidentiality agreement, the use of pseudonyms for study participants, and the rationale behind the audio-recording of the interview. After I have answered all questions students may have, I will proceed with the signing of the form.

2. Brief Introduction

In the interview, I like to find out more about what undergraduate students think about influenza as part of an assortment of behaviors that might contain some element of risk. I like to discuss the topic of risk perception and behavior in a broader sense by asking questions about other potential risks such as smoking or driving while talking on the phone. I then like to explore the reasons why students may or may not consider the flu as a risk to their health. Furthermore, I like to include in the discussions particular health risk protective actions, especially vaccination against influenza. Below are examples of questions I like to ask students during the interview:


- Thank you for completing the written questionnaire. I now want to explore the topic of risk a bit further. I noticed that you use your cell phone a lot – you circled “Every day” (Question 20). Do you use your phone also while driving? ... Can you say more about that?
- How about smoking? Do you smoke? ... Please tell me more about it?
- I noticed that you assessed your personal risk of getting the flu as “very little risk” (Question 12). Can you say more about that?
- How would you compare your response to the possibility of getting the flu to smoking or using your cell phone while driving? ... Can you tell me more about that?
- I noticed that you took the flu shot within the last 3 years (Questions 23 and 24). Do you plan to or did you get the flu shot this season (i.e., the 2015-2016 influenza season)?

3. Wrapping it all up

- I will ask students to reflect back to the interview questions and answers (What surprised you?).
- I will ask students what, if anything, they have taken from the survey and the subsequent interview (What did you learn? What was missing?)
- I will thank students for their participation.

APPENDIX C

Influenza (“Flu”) Infographic No. 1




Reason enough to get
VACCINATED!

Even healthy people can get the flu, and it can be serious.
Everyone 6 months and older should get a flu vaccine. This means you.
This season, protect yourself—and those around you—by getting a flu vaccine.

<http://www.flu.gov> • 1-800-CDC-INFO

Get the facts.
Get vaccinated.



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

0223302-08

Note. This flyer/poster is from the Centers for Disease Control and Prevention. It is labeled “Reason Enough to Get VACCINATED!” July 27, 2012; Flyer (192 KB, PDF, 11” x 8 1/2”). Retrieved from http://www.cdc.gov/flu/pdf/freeresources/young/flu_ad_24-64_sneezing_woman-508.pdf

Influenza (“Flu”) Infographic No. 2

Flu vs. Cold

Know the Difference

Symptoms	Flu	Cold
Fever	Usual - 100° F or higher	Rare
Chills	Common	Uncommon
Body or muscle aches	Common – can be severe	Uncommon or mild
Headache	Common – can be severe	Uncommon
Feeling tired and weak	Common – can be severe	Sometimes – usually mild: you don't feel tired
Cough	Common – can last 2-3 weeks	Common – mild to moderate hacking
Sneezing	Sometimes	Common
Runny or stuffy nose	Sometimes	Common
Sore throat	Sometimes	Common
Chest discomfort	Common – can be severe	Sometimes – can be mild to moderate

Prevent the Spread of Flu and Colds


GET A FLU SHOT – Getting a flu shot each year is the best way to slow the spread of flu.

STAY HOME WHEN SICK



CLEAN YOUR HANDS – Wash with soap and water or use hand sanitizer.

COVER YOUR COUGHS AND SNEEZES – Use clean tissues and discard after use.

KEEP SURFACES CLEAN – Make sure to clean all surfaces touched by you and others often, such as countertops, faucets, computer keyboard & mouse, light switches, TV remotes, phones, and handles on doors and cabinets.



www.publichealth.va.gov/InfectionDontPassItOn

U.S. Department of Veterans Affairs
Public Health Administration
Office of Health Affairs
FH 14 - All

Note. This flyer/poster is from the United States Department of Veterans Affairs. It is labeled “Flu 14 – Flu vs. Cold” (238 KB, PDF, 8.5” x 11”). Retrieved from <http://www.publichealth.va.gov/docs/flu/fs14-flu-factsheet.pdf#>

Influenza (“Flu”) Infographic No. 3



Spread Music. Not Flu.

Even healthy people can get the flu, and it can be serious. Everyone 6 months and older should get a flu vaccine.
This means you. This season, protect yourself—and those around you—by getting a flu vaccine.

 U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Note. This flyer/poster is from the Centers for Disease Control and Prevention. It is labeled “Spread Music, Not Flu;” December 12, 2014; Poster (2.2 MB, PDF, 17” x 11”). Retrieved from <http://www.cdc.gov/flu/pdf/freeresources/young/spread-music-17x11.pdf>

APPENDIX D**IRB Tracking #: 833932-1**University of St. Thomas
Minnesota**Institutional Review Board
Grants and Research Office****Application for Initial Review**

The University has assured federal regulatory agencies that the institution will review all research studies that meet the federal definition for human subjects research. The Institutional Review Board (IRB) ensures the safety and wellbeing of research study participants and determines whether a research study is ethical. All studies that meet the federal definition for human subjects research must obtain IRB approval **prior to any contact with participants**. Contact with any human subjects may not begin until you receive notification of approval from the IRB. Please read through directions carefully and provide specific, detailed answers.

You are encouraged to contact the IRB office at (651) 962-6035 or Sarah Muenster-Blakley, director of the Institutional Review Board, at muen0526@stthomas.edu with questions at any time.

A. GENERAL PROJECT INFORMATION

1. Level of Review

For more information on levels of review, please contact the IRB office.

Exempt **X Expedited** **Full**

2. Are you submitting an exempt or expedited application for review as a classroom protocol?

Instructors may submit one application for review that covers most human subjects research assigned to undergraduate or graduate students in the same course. There are exclusions; contact the IRB for more detail. Do not check if you are an investigator planning to conduct research in a classroom.

Yes **X No**

**3. Estimated Project Completion Date
November 2016****4. Project Title****A Mixed-Methods Normative Case Study of University Students' Attitudes and Behaviors towards Influenza and Vaccination in the Post-2009 Influenza A(H1N1) Pandemic Era****5. Principal Investigator Research Category**

Graduate Student Research

If you selected *other*, please specify:

6. Principal Investigator

Name: Christian T. K.-H. Stadlander

Status Type: Graduate Student

If you selected *other*, please specify:

Department or School: School of Education; Department of Leadership, Policy and Administration

Phone (please include area code): 651-578-3427

Email Address: stad0077@stthomas.edu or ctkstadtlander@msn.com

7. Co-Investigator(s)

Include a separate sheet with additional co-investigators if necessary and include it in your IRBNet project package. All co-investigator and advisor contact information must be included in the Application for Initial Review.

Name:

Status Type: Click to Select

If you selected *other*, please specify:

Department or School:

Phone (please include area code):

Email Address:

Name:

Status Type: Click to Select

If you selected *other*, please specify:

Department or School:

Phone (please include area code):

Email Address:

8. Research Advisor(s) Undergraduate and Graduate Students Only

Include a separate sheet with additional research advisors if necessary and include it in your IRBNet project package. All co-investigator and advisor contact information must be included in the Application for Initial Review.

Name: Donald R. LaMagdeleine, Ph.D.

Status Type: Faculty

If you selected *other*, please specify:

Department or School: School of Education; Department of Leadership, Policy and Administration

Phone (please include area code): 651-962-4893

Email Address: drlamagdelei@stthomas.edu

Name:

Status Type: Click to Select

If you selected *other*, please specify:

Department or School:

Phone (please include area code):

Email Address:

9. Research Project Funding

No Funding

If you selected *other*, please specify:

B. RESEARCH SUMMARY AND METHODOLOGY

1. Abstract/Research Summary *Describe your research study in clear language so a person who is unfamiliar with your field of study will understand your proposal. Please avoid jargon and provide definitions for study-specific terms.*

a. In one or two paragraphs (500 words or less), describe the purpose of your research. Indicate how it fits in with previous research in the same field and why it is important.

The purpose of this dissertation research study is to get an understanding of what undergraduate students at LAKETREE UNIVERSITY^a think about influenza (a.k.a. "the flu"), a highly contagious viral respiratory disease, and what they would do for prevention/protection during the annual flu season (here: the 2015-2016 influenza season). To phrase it differently, this study is about exploring how traditional-age LAKETREE UNIVERSITY students understand risk, and its relationship to how they interpret a number of actions to minimize flu effects; not least getting a flu shot. There are studies that have been conducted about the attitudes and behaviors of university students in regard to influenza and vaccination. However, other investigators used primarily quantitative approaches to analyze their survey data and did not attempt to use a mixed-methods approach and view the topic through sociological lenses and theory. Using theories from the social sciences (e.g., the theory of symbolic interactionism or the cultural theory of risk perception) could shed significantly more light on the various barriers students may have to inform themselves about risks such as influenza, and make decisions about preventive/protective measures such as vaccination. The proposed research is essentially a social science study about an important international infectious disease and public health topic, which places university students in the spot light of an examination about the interface between student life and science in society – an approach which is - to my knowledge - novel.

Influenza poses a major threat to public health as flu viruses can be easily transmitted from person-to-person via flu-infected respiratory droplets that get into the air when coughing, sneezing, or talking. Even asymptomatic, yet infected, persons contribute to influenza transmission. The disease can spread easily, rapidly, and extensively through populations, particularly in crowded environments such as a university setting. The risk of contracting and transmitting flu viruses is high at a university because of the close and ongoing contacts of students in classrooms and dormitories on-campus as well as in student housing off-campus, and because of social contacts of students with family, friends, and other members of the general public. It is the crowding and participation in mass events, travel during school breaks, and commencement of school term that can have a strong effect on the transmission of influenza in the student community and beyond. One can imagine that an academic institution can easily become a center of a major influenza outbreak. Studying university students' attitudes and behaviors towards influenza and vaccination is important in general, but perhaps even more important a few years after a major flu outbreak (here: the 2009 influenza H1N1 pandemic) when media coverage has subsided and flu vaccination remains voluntary and well below the target of 70% coverage for adults aged 18 years and older (which includes the age

group of undergraduate students), which is the 'Healthy People 2020' goal set by the United States Department of Health and Human Services in 2014.

b. Provide a one or two paragraph (500 words or less) literature review to show existing information in your field of study that supports your research project.

Studies dealing with the attitudes and behaviors of university students in regard to influenza and vaccination can be grouped chronologically in three main categories: Studies conducted before, during, and after the 2009 influenza H1N1 pandemic. Research conducted prior to the pandemic focused primarily on the elderly and on health care workers. To my knowledge, there are only three studies in which flu vaccination of students was a topic. Researchers focused on flu vaccination effectiveness against influenza-like illnesses, the influence of parental education level on the carry-over to students regarding influenza and flu vaccination knowledge, and the impact of various vaccination strategies including pre- and in-season vaccination. It needs to be mentioned that prior to the pandemic (healthy) adults, which include undergraduate students, were not included in the World Health Organization's (WHO) recommendation for annual influenza vaccination. These recommendations changed during the H1N1 pandemic of 2009 when it became clear that an age shift towards young healthy adults (in regard to influenza susceptibility) had occurred. The WHO recommended to extend flu vaccination to adults aged older than 15 years and younger than 65 years. This recommendation is still in effect today.

Most articles about influenza and university students stem from studies that were conducted during the 2009 H1N1 pandemic. The reasons for this increase in publications about university students include the fact that the highest mortality from influenza H1N1 was observed in young adults, that university settings can be indeed hot spots for influenza transmission, and that university students' uptake of the 2009-2010 seasonal flu vaccine and the 2009 H1N1 pandemic vaccine was low, on some campuses barely above 10%. Although investigators looked at various parameters, such as the knowledge of students about influenza/vaccination and health practices, there are significant discrepancies in research findings. There are variations in the knowledge of students about influenza and vaccination (e.g., the level and accuracy of knowledge such as modes of influenza virus transmission, symptoms and severity of the flu, pandemic vs. epidemic, preventive measures, and the priority groups for receiving flu vaccine). There are also variations in perceived influenza susceptibility (e.g., individual vs. public health threat; vaccine benefit vs. side effects and efficacy), and in flu vaccination coverage. Finally, researchers revealed differences in health information practices (digital vs. interpersonal communication), and in the acceptance of advice (e.g., from individuals vs. groups). The reasons for these differences remain largely unknown. Researchers continued studying university students after the 2009 H1N1 pandemic. Data indicate that for the most part students' attitudes and behaviors towards influenza and vaccination have not changed; the underlying reasons for this remain unknown. But, what is known and not disputed among researchers is the fact that flu vaccination coverage is low in student populations, and that the vast majority of surveyed students do not have sufficient knowledge about influenza and the benefits of flu vaccination. This provides the main justification to continue studying university student populations. Exploring the issue more from a social science perspective, as I propose, could provide valuable information.

Note. ^aLAKETREE UNIVERSITY is a pseudonym used throughout this IRB document for identity protection of the university at which the survey was planned to be conducted.

c. Provide your research question(s).

Central question:

What are the attitudes and behaviors of university students towards influenza and vaccination?

Subquestions:

(1) How do undergraduate students perceive influenza as a risk?

(2) Are undergraduate students aware of influenza prevention strategies and treatment options available to them?

(3) What sources of educational material about influenza and treatment/prevention do undergraduate students access and prefer, and how do they interpret the material?

(4) What is the threshold of action when undergraduate students engage in seeking knowledge about risks in general and influenza in particular, and at what point do they decide to use protection from risks?

d. Provide your research hypotheses, if applicable.

N/A

e. Describe the method(s) you will use to address your research question(s).

This dissertation research project is a mixed-methods (quantitative-qualitative) case study, in which a self-administered paper-and-pencil questionnaire, face-to-face interviews, and a discussion of influenza flyers/posters are included.

2. Is this study a continuation of a preliminary study?

Yes No

If yes, are there any preliminary results that will be used in this study?

Yes No

If yes, please explain.

Research data from a pilot study conducted in the doctoral course EDLD 905-01 "Analysis of Qualitative Data" (Instructor: Dr. Deborah S. DeMeester) will be included in the dissertation research project. I took this course in Summer of 2014 and the assigned IRB number for this pilot study was A11-205-01.

3. Will you analyze existing data, such as education records, medical records, specimens, or other data?

Yes No

If yes, please explain the source and type of the data and how and where you will access it.

Who has custody of the data (who is the person who must provide permission for you to access the data)?

C. PARTICIPANT INFORMATION

1. Target Participant Population and Participant Eligibility

a. Describe the population you plan to deliberately target for your research. *For example, University of St. Thomas undergraduate students taking psychology courses.*

LAKETREE UNIVERSITY undergraduate students

b. State why you selected this population for your research study.

The reason for studying undergraduate students is based on the fact that these students are considered traditional students who are more similar to undergraduates found at other universities, and who have served as the research focus in virtually all the research in this area.

c. Describe eligibility requirements for participants. That is, what criteria must participants meet to be included in the study?

The criteria are:

(1) Students must be 18 years of age or older.

(2) Students must be currently enrolled in an undergraduate program at LAKETREE UNIVERSITY.

2. How many participants do you plan to recruit?

300

3. Vulnerable Populations *Requires full review*

Please check the appropriate box(es) for any vulnerable populations that you plan to deliberately target for recruitment as participants in your research. The following populations are determined 'vulnerable' by federal regulation:

- Children (minors—under the age of 18)
- Pregnant women
- Prisoners (any individual involuntarily confined or detained in a penal institution)
- Adults lacking capacity to consent and/or adults with diminished capacity to consent including, but not limited to, those with acute medical conditions, psychiatric disorders, neurologic disorders, developmental disorders, and behavioral disorders
- Economically disadvantaged persons (any individual determined as low-income by the Department of Health and Human Services Poverty Guidelines)
- Educationally disadvantaged persons (any individual who requires special services or assistance to enable them to succeed in educational activities or an individual who has lacked access to normal education rights and services)

4. Other Populations

Please check the appropriate box(es) for any special (non-vulnerable) populations that you plan to deliberately target for recruitment as participants in your research.

- Elderly/aged persons (individuals age 65 or older)
- Hospital or clinic patients (in- or out-patient)
- Non-English speaking persons
- Students (age 18 or older)
- UST employees

Other (Please describe):

5. Will all participants be at least 18 years of age?

Yes No (*Requires full review*)

6. If recruiting children (persons under the age of 18) to participate in your study, please indicate the specific age range of the anticipated participants:

_____ years old to _____ years old

7. Demographic Population

a. If you are purposefully excluding women or minorities in your study, explain why. If you are not purposefully excluding women or minorities, provide a statement that indicates this.

I will not exclude women or minorities in my study.

b. Will gender, race, and ethnicity of your participants be proportionate to the general population?

Yes No

If not, state what demographic you anticipate your participant population to be representative of. *For example, if you are recruiting only UST students, indicate that the participant demographics will be representative of the population at UST.*

In this research project, I will only study LAKETREE UNIVERSITY undergraduate students, but not in an attempt to reach statistical representativeness; rather, the purpose of this study is to better understand how these students interpret issues such as risk/protection using the example of influenza/vaccination.

8. Existing Relationships

Do you, the investigator, have any existing relationships with potential participants or organizations?

Yes No

If yes, please explain:

I am a doctoral student at the University of St. Thomas.

9. Conflicts of Interest

a. Identify any conflicts of interest in this study. A conflict of interest is any circumstance that could result in undue influence or coercion. For example, the potential for coercion exists if research participants are also students, employees, colleagues, or subordinates of the investigator. Research participants are also students (here: undergraduate students) at the University of St. Thomas.

b. If a conflict of interest exists, provide a management plan to eliminate or minimize undue influence or coercion.

I intend to minimize undue influence or coercion by not putting any pressure on undergraduate students to participate in the dissertation research project, neither through words, gestures, or any other means. I will point out that students' participation in the study is entirely voluntary, and that their decision to whether or not participate will not affect their current or future relations with LAKETREE UNIVERSITY.

10. Expectations of Participants

Provide detailed information to describe expectations of participants.

a. What will each participant be asked to do?

I will ask undergraduate students to fill out a short written, paper-and-pencil, self-administered questionnaire containing 28 questions, which will take approximately 10-15 minutes to complete. For the quantitative part of the study, approximately 288-290 students will be asked to only complete the survey questionnaire, which will be kept anonymously. For the qualitative part of the study, approximately 10-12 undergraduate students will be asked to complete the same questionnaire and then participate in a face-to-face interview, which is planned to take approximately 30-60 minutes. The identity of these 10-12 students will be known to me. During the interview, I will discuss the answers these 10-12 students provided on the questionnaire and explore further the attitudes and behaviors of undergraduate students in regard to their perceptions of risk in general and influenza-risk in particular, as well as their attitudes towards risk mediation with a particular focus on vaccination practices. During this conversation, I will show each of the 10-12 students 3 flyers/posters containing various information about influenza and vaccination. I obtained these flyers/posters from reputable Internet websites, including the websites of the Centers for Disease Control and Prevention (www.cdc.gov) and the Department of Veterans Affairs (www.publichealth.va.gov). I will ask these students what they think about the information provided on these flyers/posters and will ask them to indicate what information is most useful to them and what is missing.

b. What is the total time commitment of each participant?

The total time commitment of each undergraduate student to complete the written survey questionnaire is approximately 10-15 minutes. The total time commitment of each undergraduate student who participates in the interview is approximately 30-60 minutes.

c. Where will the study take place?

The study will take place at LAKETREE UNIVERSITY (NORTH and SOUTH campuses).

d. Indicate whether you will follow up with participants at any point and how you will determine whether or not follow up is necessary.

In this survey research project, information will be collected from study participants only at one point in time. Thus, follow-ups with study participants are not planned.

D. RISKS AND BENEFITS TO PARTICIPANTS

1. Risks to Participants

a. Consider any potential risks to participants in your study. Read through each listed risk carefully, consider the risk in terms of your study, and check each risk involved in the study, even if it seems like minimal risk:

- Possible violation of privacy of subjects
Privacy is having control over the extent, timing, and circumstances of sharing oneself (physically, behaviorally, or intellectually). For example, some potential participants may view certain recruitment methods as a violation of their privacy. Check if there is any possibility invasion of privacy above what would be reasonably expected by participants.
- Possibility of confidentiality of data breach

Confidentiality is the treatment of information that an individual has disclosed in a relationship of trust and with the expectation that it will not be divulged to others in ways that are inconsistent with the understanding of the original disclosure (the informed consent) without permission. For example, data collected from participants should be secured in a manner that maintains confidentiality. Check if a data breach may cause additional risks or harms to the subjects.

- Possible emotional distress
- Recalling traumatic or distressing events
- Social or economic risk
Check if employability or reputation of any participant are at risk.
- Physical harm
Including minor pain, physical discomfort, or possibility of injury.
- Use of deception as part of experimental method
If your research design uses deception, complete the debriefing statement in the Use of Deception section (D.3) of this form.
- Any probing for personal or sensitive information in surveys or interviews
- Participation in measurement scales that may lead a participant to self-diagnose any symptom or disorder
- A sense of mental fatigue or embarrassment
- Manipulation of psychological or social variables such as sensory deprivation, social isolation, or psychological stresses
- Risks associated with allergies, phobias, or environmental sensitivities
For example, would this study harm someone who is allergic to peanuts or who is frightened by heights?
- Other (please be specific):
- None of the above

b. Describe each risk that you checked as it relates to your study. Include all potential risks, not just those listed above.

c. Describe the precautions and safeguards you will use to minimize each risk. Please be specific.

2. Potential Coercion

Participation in research must be voluntary. Coercion can occur if a participant feels they must participate or cannot withdraw for any reason. Identify any source of coercion and indicate how you will eliminate or minimize undue influence or coercion on participants.

Like myself, study participants are ALSO students at A UNIVERSITY. I will eliminate or minimize undue influence or coercion on participants by not putting any pressure on them to participate in the dissertation research project, neither through words, gestures, or any other means. I will point out to students that their participation in the study is entirely voluntary, that they can stop the survey at any time or opt out of answering individual questions in both the written survey and the interview, and that their decision whether or not to participate in the study will not affect their relations with LAKETREE UNIVERSITY.

3. Use of Deception *Only complete this section if your research design utilizes deception.*

If this study is designed to use deception as part of the experimental method, include a debriefing statement and explain the debriefing procedure that will be followed once the study is complete or if a participant withdraws from the study. This statement must explain your study in truth and detail, discussing what elements of the study were changed or left out on purpose and why. All participants must be given another opportunity to withdraw from the study upon debriefing.

4. Benefits to Participants

a. List any direct benefits to research participants. If there are no direct benefits, please state "None." *Please note that benefits to society, such as adding to existing knowledge, are not a benefit to participants. Direct payments or other forms of remuneration offered to potential subjects as an incentive or reward for participation should not be considered a benefit to be gained from research. Direct benefits are most often medical benefits for participants receiving specialized treatment as part of a research study.*

None

b. Will the participants receive direct payments or other forms of remuneration as an incentive or reward for participation?

Yes No

If yes, describe these payments, incentives, or rewards. Describe the procedure for giving these to participants. At what point in the study will payment be given? *Please note that payments and rewards cannot be held until the study is completed or only provided when a participant completes the study. Plan to provide any payments or remuneration if a participant withdraws at any point in the study.*

Each study participant will receive a BiC Round Stic Ball Pen to use for filling out the written survey questionnaire. In addition, students who participate in the interview will receive a SanDisk "Cruzer U" 16 giga bytes USB Flash Drive. These incentives will be given to each study participant at the beginning of the survey. Students can keep the pen and USB Flash Drives even if they decide to withdraw at any point from the study.

E. RECRUITMENT

1. Recruitment of Participants

*Please note that if subjects are recruited through an agency or institution other than the University of St. Thomas, you must submit written documentation of permission from each agency or institution you wish to recruit through. Written permission must be in the form of a **signed letter on agency letterhead** with enough information to demonstrate that the agency or institution understands your research project and grants permission for you to work with and recruit through their organization.*

a. Identify where participants will be recruited. Use organization or location names and include city, state, and country. *For example, if you are recruiting at UST, include University of St. Thomas, St. Paul, MN, United States.*

LAKETREE UNIVERSITY, MIDWESTERN LOCATION, United States.

b. Identify how you will recruit participants and indicate whether you will recruit using flyers, advertisements, social media, phone calls, email, or other forms of contact. *All recruitment materials, such as flyers and advertisements, must be uploaded to IRBNet and approved by the IRB prior to use.*

For this dissertation research study, I will randomly select undergraduate students while walking on the TWIN campuses of LAKETREE UNIVERSITY (locations include student gathering places, LAKETREE UNIVERSITY buildings, hall ways, cafeterias, etc.). I will ask ANY undergraduate student I pass if he/she would be interested in participating in a survey about students' attitudes and behaviors towards influenza and vaccination.

I will not use any other recruitment methods or materials, such as snail- and e-mail, or phone invitations, or flyers/advertisements. The only method to recruit study participants is through face-to-face invitation.

2. Will you use existing records in order to recruit?

Yes **X** No

If yes, where are the records located?

If yes, describe the type of records you will access.

If yes, provide the name of the person giving permission for you to access existing records. You must submit written documentation of permission from each agency or institution through which you will obtain records.

3. Recruitment Script

a. Provide a recruitment script you will use as you contact potential participants. What will you say to potential participants to describe the study and ask whether they would like to participate? Include any information that you think is necessary for an individual to make an informed decision about whether or not to continue with the recruitment process. *Please note that the recruitment communication is not informed consent.*

Provide an email or telephone script that includes the following:

- 1) Information about your study;
- 2) Why the individual you are contacting is eligible as a potential participant;
- 3) What the risks and benefits (if any) of participation are; and
- 4) The expectations of subjects if they decide to participate.

I will say the following to potential study participants:

(1) "Hi, my name is Christian Stadlander and I am a student at the University of St. Thomas (I will show the student my UST ID card which I inserted into a clearview Collegiate I.D. Card Dispenser attached to a UST neckband and, in addition, a large name tag in a plastic cover (4" x 3") also attached to a UST neck band). I am enrolled in a doctoral program in education and was wondering if I can interest you in participating in a survey study I am conducting as part of my dissertation research project. I attempt in this study to find out what undergraduate students at LAKETREE UNIVERSITY think about influenza - commonly known as "the flu" - and how they perceive its risk to their health, what and how students access information material about influenza, and what their attitudes and behaviors are towards vaccination. Would you be interested in participating in this study?"

(2) I will ask potential participants if they are at least 18 years of age and are currently enrolled in an undergraduate program at LAKETREE UNIVERSITY, which are the two criteria for eligibility to participate in the study.

(3) Given the type and location of the research study (i.e., a written and interview survey conducted within a university environment), it is unlikely that there are any risks to study participants. The TWO CAMPUSES of LAKETREE UNIVERSITY are considered safe study environments. Furthermore, there are no negative academic consequences expected for students participating in this study. The responses given by students will not affect their grades on exams. Finally, whether or not students respond to questions and the kind of answers they

give on the questionnaire and during the interview will not be shared with anyone outside of the research team.

(4) I will tell students that the survey consists of two components: (a) A written, paper-and-pencil, self-administered questionnaire containing a total of 28 questions, which completion will take approximately 10-15 minutes; and (b) an interview in which the answers to the survey questions will be discussed in light of risk perception and risk mediation; and (c) a discussion of 3 influenza/vaccination flyers/posters. I will tell students that completion of (a), (b), and (c) together will take approximately 30-60 minutes. I will invite students to participate either in the anonymous 10-15-minute questionnaire survey only (i.e., 'Option 1') or in the non-anonymous 30-60 minutes questionnaire-interview-flyers/posters survey (i.e., 'Option 2'). In case students show an interest in participating in the study, I will let them decide if they want to participate in filling out the survey questionnaire only (Option1) or if they want to participate in the interview (Option 2). Once I have completed all of the proposed 10-12 interviews, then Option 2 will no longer exist. From then on, I will invite students to only participate in the written survey (Option 1) up to a point when I have collected the survey data from all of the proposed 288-290 students who agreed to participate in this segment of the survey.

Based on my experience from the pilot study, students who will choose Option 1 can take the written survey immediately at the same location where I invited them. Students who will choose Option 2 can select a quiet place (e.g., an empty room, a table in the back of the cafeteria, or a sitting area in a building with little or no traffic). The importance is to find a place where students can feel comfortable and where audio recordings can be made without interference from background noise. In case a student wants to take the survey at a later time, a meeting on campus can be arranged.

b. Provide a script you will use to follow-up with participants, if applicable. As I had mentioned above, there is no follow-up with study participants planned in this research project. All survey data will be collected only at one point in time.

4. Costs to Participate

Will there be any costs participants must cover if they choose to participate in the study?

Yes No

If yes, describe what those costs are.

F. CONFIDENTIALITY OF DATA

1. Identifying Information

a. Will personal identifiers be collected? *Personal identifiers include names, initials, postal or home address, email address, phone numbers, birth date, social security numbers, demographic information, photographs or videos of participants, etc.*

Yes No

If yes, describe what identifying information will be collected.

The names of the 10-12 students participating in 'Option 2' of the survey, and basic demographic information (see questionnaire) will be collected.

b. Why is it necessary for these identifiers to be collected and maintained?

The names need to be collected for signing the Consent Form. The basic demographic information is collected to compare survey data across multiple demographics of study participants.

c. Will identifiers be coded by the investigator? *Coding means that the original identifying information of the participant is replaced with a code, often a letter or number system, the researcher uses.*

Yes No

If yes, explain how identifiers will be coded.

The original identifying information of the 10-12 students participating in 'Option 2' of the survey will be coded by using pseudonyms for their names and surveys.

If coded, how will identifiers be kept separate from data that could link the code to the identifier?

The identifying information will be kept in a file separate from the interview documents and stored in my office at my private residence.

If no, explain why identifiers will not be coded.

2. Data Formats

In what formats will data be created? Check all that apply.

- Consent forms
- Audio recordings (*requires consent form statement*)
- Surveys, digital format
- Surveys, paper format
- Notes, paper format
- Notes saved on a computer
- Transcripts
- Photographs, digital format (*requires special permission from participant via the Photography and Video Recording Permission Form*)
- Photographs, paper format (*requires special permission from participant via the Photography and Video Recording Permission Form*)
- Video recordings (*requires special permission from participant via the Photography and Video Recording Permission Form*)
- Other:

3. Data Access

Indicate who will have access to the specific types of data you checked above.

No one except me will have access to the specific types of data checked above. However, I will discuss data trends, but not primary data, with Dr. Donald R. LaMagdeleine - my research advisor (Dissertation Committee Chair).

4. Data Transcription

Will information from audio-recorded interviews or other data be transcribed?

Yes No

If yes, explain who will transcribe data and whether the audio recordings will be deleted upon transcription. If the transcriber is not a project investigator, complete the **Transcriber Confidentiality Agreement** and include it with this application.

I will transcribe the data myself. Audio recordings will be kept for the duration of the dissertation research project to allow the possibility to re-listen to the spoken words of study participants in case questions arise during data analysis of the transcripts. All audio recordings will be deleted after completion of the dissertation research project.

5. Data Storage

Give the specific location where you will store all forms of data that you checked above. If data formats will be kept in different places, indicate this (i.e. digital files kept on a computer and paper files kept in a filing cabinet). Specify if passwords, codes, or locks will be used and provide the location for storage. If you will be traveling while conducting research, say how you will maintain confidentiality while traveling and at your home or office.

Completed paper files (i.e., files students have filled out) and audio recordings (i.e., recordings from the interviews using Sony digital recorders ICD-BX132 and ICD-PX333) will be kept in my briefcase until safely transported in my car to my private residence. These paper files and recordings will be kept in a filing cabinet in the office at my private residence. Digital files (generated from the paper files; and those transferred from the audio recorders) will then be kept on my personal password-protected computer in the office at my private residence. In addition, non-identifying information will be kept on my UST password-protected student account of the network storage at the University of St. Thomas.

6. Data Retention

Federal regulations require that consent forms and any significant new findings shared with research participants be retained for a minimum of three years after completion of the research study. Any records that are kept indefinitely must be de-identified. **Photography and Video-Recording Permission forms** should be retained for as long as you will keep the photographs and videos collected. *If you plan to de-identify your research data, please specify how you will do so and maintain data anonymity in the Identifying Information section.*

Provide an estimated date when you will destroy each type of data marked in the Data Formats section.

To comply with federal regulations, consent forms will be kept for a minimum of three years after completion of the research study. After completion of the dissertation project, which includes subsequent publication of research findings in scientific journals, all non-identifying data will be transferred to USB drives and stored indefinitely in a safe deposit box I rented at U.S. Bank. Files stored on my office computer and on the network storage at the University of St. Thomas will then be deleted.

G. INFORMED CONSENT AND ASSENT PROCESS *Exempt review applicants who are not required to obtain consent may skip this section—please proceed to Additional Forms*

Please read carefully:

Informed consent is an ongoing discussion between the investigator and participant(s). Simply giving a participant the consent form is not informed consent. Prior to asking the participant(s) to sign the consent form, the investigator is responsible for having a conversation with each

participant individually (or in groups in approved settings) to discuss the required elements of informed consent. Required elements can be found on the IRB website. Participants must have the option to skip interview questions, surveys, or tests and to withdraw from the study at any time. *In the case of electronic surveys, the consent form is often a cover sheet or the first page of the survey which clearly informs the participant that continuing with the survey means they consent to participating in the study.*

CONSENT WITH ADULT PARTICIPANTS AND LEGALLY AUTHORIZED REPRESENTATIVES

1. Consent Discussion

State at what point you and participants will have a conversation about informed consent.
I will have a conversation with study participants before the survey.

2. Informed Consent Script

Include the script you will use to have an informed consent discussion with participants. The script should summarize information provided in the consent form, including but not limited to:

- 1) What the study is about;
- 2) Why the participant is eligible for participation;
- 3) How many participants will take part in the study;
- 4) Risks and benefits of participation;
- 5) How risks will be managed;
- 6) How you will preserve confidentiality of data; and
- 7) Steps a participant should take if they choose to withdraw from the study.

If your participants are under the age of 18, please write this script for parent or guardian consent. Please be aware of language used in your script; it is important to use appropriate language for your target population (for example, avoid jargon specific to your discipline). A full list of informed consent requirements is available on the IRB website.

I will communicate with the study participants as follows:

(1) "I appreciate your time. The research project is about students' attitudes and behaviors towards influenza and vaccination. I would like to find out what undergraduate students think about influenza and how they perceive its risk. I would also like to find out what educational material about influenza and vaccination students access and prefer, and how they interpret the material. Finally, I am interested in finding out what actions students take to minimize risk through prevention/protection, such as vaccination."

(2) "You are eligible for participation in this research study because you are at least 18 years of age and are currently enrolled in an undergraduate program at LAKETREE UNIVERSITY."

(3) "The total number of study participants is 300, whereby approximately 288-290 students will be invited to participate in the anonymous 10-15-minutes, paper-and-pencil questionnaire survey, and approximately 10-12 students will be invited to participate in the non-anonymous 30-60 minutes questionnaire-interview-flyers/posters survey."

(4) "It is unlikely that you are at any risks during the conduct of this study. The TWO CAMPUSES of LAKETREE UNIVERSITY are considered safe environments. Furthermore, there are no negative academic consequences expected for you as a student when participating in this study. The responses you give will not affect your grades on exams. Also, the kind of answers you give on the questionnaire and during the interview will not be shared with anyone outside of the research team."

(5) "Since it is unlikely that there are any risks to you when participating in this study, a management of risks is unnecessary."

(6) "Your identity and the data I will collect during this study will remain confidential. The survey application has been reviewed by the Institutional Review Board (IRB) of the University of St. Thomas, and the application has been approved. No one except me as the doctoral researcher will

have access to the specific data I will collect, and Dr. Donald R. LaMagdeleine (my dissertation advisor and committee chair) will discuss with me data trends but not primary data. I will use a pseudonym for your actual name to disguise your identity in this study."

(7) "You can withdraw from this study at any time. If you wish to withdraw, please clearly tell me that you want to stop the survey, using the contact information I provided. Data collected about you will then not be used for analysis."

3. Informed Consent Questions for Participants

Investigators should ask participants open-ended questions upon ending the informed consent discussion. The participants' answers to these questions will help the investigator assess whether the participant truly understands the research project, risks, the voluntary nature of the study, and what they will be expected to do.

Please provide 3-4 questions to ask participants (e.g. What should you do if you wish to withdraw from this study? What are the risks if you choose to participate? How will these risks be managed?) These questions should not be yes-no questions; rather, they should require participants to answer in full sentences so that you can more adequately gauge their understanding of the study.

(1) "What do you understand to be the risks associated with this study?"

(2) "What is your understanding of confidentiality?" "How will your data be kept confidential?"

(3) "What should you do if you wish to withdraw from this research study?"

ASSENT WITH CHILDREN *Complete only if targeted participant population includes persons under the age of 18.*

Please read carefully:

Under state law, participants under 18 years of age cannot consent to participate. Once you have received parent or guardian consent for child participation, the investigator must also have a discussion about the study with each minor participant. In this discussion, the investigator is asking minor participants whether they agree to participate in the study, after their parents or guardians have given their permission for their child to participate. The agreement of the minor participant is called assent.

4. Informed Assent Script

Include the script you will use to have an informed assent discussion with child participants. The script must summarize information provided in the assent form. *Please be aware of language used in your script; it is important to use appropriate language for the population.*

5. Informed Assent Questions for Children

Investigators must ask child participants open-ended questions upon ending the informed assent discussion. The participants' answers to these questions will help the investigator assess whether the child truly understands the research project, risks, the voluntary nature of the study, and what they will be expected to do.

Please provide 3-4 questions to ask child participants in an appropriate language level (e.g. What should you do if you do not want to answer my questions?) These questions cannot be yes-no questions; rather, they must require participants to answer in full sentences so that you can more adequately gauge their understanding of the study. *Please be aware of the language used in your questions; it is important to use appropriate language for your population.*

H. ADDITIONAL FORMS

If required, include the following forms in your IRBNet project package. Applications missing forms will not be reviewed until all necessary forms have been uploaded to IRBNet. If you need assistance to determine which consent form is right for your project, please contact the IRB office. Check which forms will be included in your project package:

1. Consent Forms—*Required*

- General consent form, *required for most studies that do not involve children or adults who cannot consent*
- Parent or guardian consent form, *if children are participants*
- Child assent form, *if children are participants*

2. Surveys/Questions/Instruments—*Required*

Upload a copy of all surveys, questionnaires, interview questions, or other research instruments that will be used in the study.

- Surveys, if applicable
- Interview Questions, if applicable
- Other research instruments used (e.g. psychological measurements, questionnaires, etc.), if applicable

3. Confidentiality Agreements

- Research Assistant Confidentiality Agreement, if applicable
- Transcriber Confidentiality Agreement, if applicable

4. Other Permissions

- Photography and Video Recording Permission form, if applicable
- Organization, agency, or institution letters of permission to obtain existing data or recruit through the institution, if applicable

I. SIGNATURES

Thank you for completing the Application for Initial Review. Once you have completed this application, upload all necessary application forms to your IRBNet project package. It is important to review all application materials for clarity, consistency, and grammar prior to signing and submitting the package. Project review will not be initiated until all electronic signatures are received on IRBNet.

Electronic signatures can be added to your IRBNet project package by clicking “Sign this Package.” By electronically signing the IRBNet project package, you confirm that:

- The information provided in this application is true and accurate.
- All contact with human subjects will not be initiated until final approval has been granted by the IRB.
- All investigators and research advisors agree to contact the IRB within 24 hours of becoming aware of any adverse events or problems associated with this research project.

- All consent forms and records required by the IRB will be retained for a minimum of three years upon completion of the study.
- The investigator agrees to contact the IRB and seek approval prior to any amendments to this research proposal, including changes in procedures.

The following electronic signatures are required for new project submissions:

Principal Investigator

All co-investigators

All research advisors

APPENDIX E**CONSENT FORM
UNIVERSITY OF ST. THOMAS**

A Mixed-Methods Normative Case Study of
University Students' Attitudes and Behaviors Towards Influenza and Vaccination in the
Post-2009 Influenza A(H1N1) Pandemic Era

IRB # 833932-1

I am conducting a survey as a dissertation research project about influenza (a.k.a. “the flu”) risk perception, access and choice of influenza educational material, and behaviors towards vaccination. I invite you to participate in this research project. This study has been approved for human subject participation by the University of St. Thomas Institutional Review Board (IRB).

You were selected as a possible participant in this study because you are at least 18 years of age and a student currently enrolled in an undergraduate program at LAKETREE UNIVERSITY^a.

Please carefully read this form and ask any questions you may have before agreeing to be a participant in this study.

This research study is being conducted by: Christian T. K.-H. Stadlander (doctoral researcher) under the guidance of Donald R. LaMagdeleine, Ph.D. (research advisor and Dissertation Committee Chair), College of Education, Leadership and Counseling, Department of Leadership, Policy and Administration.

Background Information:

The purpose of this study is to determine the attitudes and behaviors of undergraduate students at LAKETREE UNIVERSITY towards influenza and vaccination (and other measures of protection). More specifically, this study is about risk perception in general and influenza risk perception in particular, access and choice of risk educational material, and behaviors/actions towards protective measures, particularly vaccination.

Note. ^aLaketree University is a pseudonym used throughout the consent form for identity protection of the university at which the survey was conducted.

Procedures:

If you agree to be in this study, I will ask you to do the following things: (a) To fill out a short written, self-administered questionnaire, which will take approximately 10-15 minutes to complete and (b) to participate in a subsequent interview, which is planned to take approximately 30-60 minutes. During this interview, I will discuss with you the answers of the influenza questionnaire and explore further issues related to your attitudes and behaviors towards influenza and vaccination. During this conversation I will show you 3 so-called “information flyers/posters” containing various information about influenza and vaccination. I will ask you which one(s), if any, you would consider to be useful to you. With your permission, I will digitally record our conversation for ease and correctness of later data analysis.

Risks and Benefits of Being in the Study:

There are no direct benefits for you of being in this survey study, which involves a maximum of 300 undergraduate students. The TWO CAMPUSES of LAKETREE UNIVERSITY are considered safe study environments. It is not expected that you as a study participant will be exposed to any risks during the conduct of this study. If you feel, however, that you might be at some sort of risk at any time during this study, please inform me, Dr. Donald R. LaMagdeleine, and/or the IRB immediately so that we can decide if or how we should proceed with this project.

Compensation:

There will be no financial compensation for the participants in this study.

Confidentiality:

The records of this study will be kept confidential. In any sort of report I publish, I will not include information that will make it possible to identify you in any way. The types of records I will create include field notes and audio digital recordings, transcripts of these field observations and recordings for analysis, and computer data records. The information contained in each of these records will be stored in my office located at my private residence in Woodbury, Minnesota. Only I will have access to the complete set of data. In addition, Dr. Donald R. LaMagdeleine (my research advisor and Dissertation Committee Chair) at the University of St. Thomas will have access to the data, but only to data trends and not to the primary data. After completion of the dissertation, which is expected to be in 2017, and subsequent publication of the research results in scientific journals, data which could identify you as a study participant will be deleted. However, in order to comply with federal regulations, this consent form will be kept for a minimum of 3 years after completion of the research study.

Voluntary Nature of the Study:

Your participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your current or future relations with LAKETREE UNIVERSITY. If you decide to participate, you are free to withdraw at any time up to and until the completion of this project. You are also free to skip any questions I may ask you on the written (self-administered) survey questionnaire and/or during the interview. Should you decide to withdraw from this study, please clearly tell me that you want to stop the survey (see Contacts and Questions section below). Data collected about you will then not be used for analysis.

Contacts and Questions

My name is Christian T. K.-H. Stadtlander. You may ask any questions you have now. If you have questions later, you may contact me by phone at 651-578-3427 or by e-mail at stad0077@stthomas.edu. You may also contact my dissertation advisor, Dr. Donald R. LaMagdeleine, by phone at 651-962-4893 or by e-mail at drlamagdelei@stthomas.edu. The University of St. Thomas Institutional Review Board (IRB) can be reached at 651-962-6035 with any questions or concerns you may have.

You will be given a copy of this Consent Form to keep for your records.

Statement of Consent:

I have read the above information. My questions have been answered to my satisfaction. I consent to participate in the study. I am at least 18 years of age. I have agreed that the interview will be recorded.

Signature of Study Participant

Date

Print Name of Study Participant

Signature of Researcher

Date

Print Name of Researcher

APPENDIX F

Concept Map

