TWO-SIDED MESSAGES AND PANDEMIC FLU: PERSUADING THE PUBLIC TO FOLLOW CONTRADICTORY GOVERNMENT DIRECTIVES

by

KAREN M. HILYARD

(Under the Direction of Vicki S. Freimuth)

ABSTRACT

This study investigates effective ways of persuading the public to follow two inherently-contradictory but critical government health directives during a flu pandemic. "Social distancing" asks people to avoid public gatherings and places, including work, school, worship services and sporting events; while a second government directive (referred to here as "public queuing") calls for individuals to go to centralized public distribution centers for medicines and supplies. These inherently-contradictory and potentially-confusing public health directives may undermine the trust and credibility of government and health officials in a pandemic, leading many people to discount risks and disregard recommendations. To more effectively communicate the contradictory directives, this study explored the use of a two-sided message in which the "contradiction" was used as the negative attribute and justification of the contradiction was used as the counterargument. The study comprised two phases: exploratory one-on-one interviews with demographically-diverse individuals (N=19) followed by a 2 x 3, post-test-only experiment with a representative national probability sample (N=443). Qualitative phase investigated knowledge and perceptions about pandemic flu and pandemic policy; it also attempted to better explicate the dimensions of source credibility. Experimental treatment was a fictitious news article with "pre-event" messaging regarding pandemic flu. Treatment conditions included two-sided messages with refutational counterarguments, which have been shown historically to be more persuasive than other types of messages; two-sided messages with supporting arguments only; and one-sided messages. A quasi-control group that read an article about preventing seasonal colds and flu was also included. Independent variables were message order and message sidedness, and dependent variables were perceived source credibility of public health officials and behavioral intention to comply with public health directives in a pandemic.

INDEX WORDS: pandemic, flu, influenza, H5N1, bird flu, avian flu, two-sided messages, contradictory messages, inconsistent messages, social distancing, public queuing, risk, public health, health risk, risk communication, one-on-one interviews, experiment, behavioral intention, source credibility, government directives, Meyer's Credibility Index

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DEDICATION

To Jeff, Vivian and Nathaniel, the best husband and two most precious children in the world: thank you for the many sacrifices that made this possible.

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A number of people have been instrumental in advising, encouraging and supporting me in this endeavor.

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CHAPTER ONE

INTRODUCTION

Avian flu[1] has garnered periodic headlines and perhaps even undeserved media hype over the past few years. However, whether it originates as an "avian" flu strain or mutates from some other source, most scientists do believe that a serious worldwide flu pandemic[2] is not just possible, but highly probable (Morse, Garwin, & Olsiewski, 2006, p. 1676). This study examines how public health officials will communicate key elements of the anticipated response to

[1] The terms *bird* flu, *avian* flu, *pandemic* flu and *H5N1* should be clarified for the purposes of this paper. *Bird* and *avian* are indeed synonymous, however, the referent disease may take several distinct forms. *Avian/bird flu* is sometimes used to describe an influenza confined only to birds, such as, but not limited to, the *H5N1* flu strain that has been detected in Asia, Europe and the Middle East. *Avian/bird flu* is also sometimes used to describe an influenza that is transmitted very rarely from birds to people, as has happened in 332 confirmed human cases of H5N1 around the world. *H5N1*, on the other hand, refers only to one possible strain of influenza that might be found in birds. If this virus were to mutate and become easily transmitted from person to person, its composition would likely change and its name would no longer be H5N1.

Pandemic is correctly used to refer to any widespread outbreak of disease among people, including flu viruses that originate in birds and other animals. The term *pandemic* is technically incorrect when used to describe a widespread outbreak confined to an animal population, which is known as a *panzootic*; however, most media reports use *pandemic* to describe both human and animal epidemics (*epizootics*). Additionally, there is overall confusion among the public about the difference between *pandemic* and *seasonal* flu, as well as the perception among many that a bad cold is "the flu."

At first glance, these distinctions may seem overly pedantic. But the differences are important from a public health perspective in order to clearly express a justified level of risk that neither unduly alarms nor inadequately alerts the public. (See Peter Sandman's discussion of the dangers of linguistic confusion on this issue at http://www.psandman.com/col/poultry.htm).

This dissertation will primarily use *pandemic* to refer to a widespread outbreak of highly-pathogenic flu of any type among humans; however, since the terms *avian/bird* have been widely used in the media, they were also used in some questions for the qualitative portion of this study in order to be more conversational and readily understood by interview participants.

[2] The word "pandemic" can be used as either an adjective or a noun. This dissertation will use the terms "pandemic flu" and "flu pandemic" interchangeably.

pandemic flu and how those messages may affect the general public's compliance with government directives during a pandemic.

A pandemic is generally defined as a widespread outbreak of disease that affects a large proportion of the population. Influenza pandemics are not uncommon, but differ in their magnitude and severity. Three confirmed outbreaks of pandemic flu have happened since 1900; in the worst of these, the 1918-19 Spanish Flu outbreak, 20 to 40% of the world's population may have gotten the disease and experts estimate more than 50 million people died ("Pandemics and Pandemic Threats since 1900,," www.pandemicflu.gov). Unlike deaths in an ordinary flu season, which normally occur disproportionately among infants and the elderly, the 1918 pandemic tended to have the highest mortality rate among otherwise healthy young adults, between the ages of 20 and 40. Because the avian flu virus, H5N1, shows some striking similarities to the 1918 Spanish Flu strain in both evolution and virulence, scientists fear it could be equally as devastating. Researchers estimate a severe flu pandemic with a virulent strain similar to the 1918 variety could sicken more than 30% of the population and kill 2.5% of those who contract it; in the U.S. that means 2.25 million people might die in a pandemic, or 800 times the death toll of the September 11th terrorist attacks.

Given the enormous potential human and economic toll of a future pandemic, agencies such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have identified pandemic preparedness as a top priority. Billions of dollars are being spent worldwide --

$7.1 billion in the U.S. alone -- to prepare for the next flu pandemic (Morse et al., 2006). Much of that money is going to medical research on vaccines and other preventive measures, but significant resources are also being allocated toward community readiness and developing plans to communicate risk to the public before and during a pandemic ("National Strategy for Pandemic Influenza,," www.pandemicflu.gov).

However, part of the federal plan that has been developed for pandemic flu may be problematic to execute because it assumes the public would be willing to follow inherently-contradictory government directives in the event of a pandemic. The first directive, “social distancing,” would ask people to avoid malls, movie theaters and places of worship, even recommending or requiring that individuals stay home from work and school. The second government directive (referred to in this paper as “public queuing”), would call for the distribution of medicines (if available) and vaccines (if they exist) at central, public locations. Food and other supplies also may be distributed in the same way ("HHS Pandemic Influenza Plan, Supplement 6 Vaccine Distribution and Use,,"). So, while people may be told to isolate themselves in a flu pandemic, they also may be asked to stand in line with others for many hours at emergency public health clinics, an inherently-contradictory set of directives.

Individuals often face contradictory public health information, but typically are encouraged to sort through differing messages and accept the most credible and current, rejecting contrary perspectives. Yet in the case of inherently-contradictory directives from a single authority, rather than being encouraged to

accept one idea while rejecting another, individuals are asked to internalize and follow two dissonant concepts – a very different proposition. Inherently-contradictory and potentially-confusing public health directives in a pandemic flu outbreak may undermine the trust and credibility of government and health officials, leading many people to discount risks and disregard recommendations.

Despite extensive research in risk perception, health behavior and communication, as well as the existence of analogous communication challenges elsewhere in public health[3] there are currently no theoretical models covering how decisions are made when a single authority or two equally-credible authorities advise contradictory directives in the name of risk mitigation. This research is envisioned as a first step toward a best-practices model that can assist communication professionals in the dissemination of contradictory information that might otherwise lead to inaction, denial, or other risky and dysfunctional responses. Although this study is specific to messages that might be disseminated before and during a flu pandemic, the same thorny issues are also found elsewhere in health communication and therefore the findings of this research are potentially useful to a broader audience.

[3] Examples of questions raised by inherently-contradictory or inconsistent messages: 1) How do consumers discern between recommendations to include more fish in their diets in order to reduce the risk of heart disease and warnings to limit fish consumption because of dangerous mercury levels (Smith & Sahyoun, 2005)? 2) Which authority is correct about the risks of alcohol use in pregnancy: the British government, which recommends no more than one or two pints of beer once or twice a week for expectant mothers (and even recommends beer as an aid to increasing breast milk supply), or the U.S. and Canadian governments, which stress complete teetotaling both during pregnancy and while trying to conceive (International Center for Alcohol Policies, 1996)? 3) When messages touting the benefits of both abstinence and safe sex are presented in the same education program, how is a teenager to assess the risks and make a decision (Jemmott III, Sweet Jemmott, & Fong, 1998; Tremblay & Ling, 2005)? In all of these cases, either the same authority or two equally-credible authorities may be advising mutually-exclusive behaviors.

In the pages that follow, the author first examines relevant existing literature on the diverse issues clustered around this communication problem: scholarship on risky judgment and decision-making in the public health field; how risk perception impacts the theoretical models of health behavior that often underpin health communication campaigns; message effects theory; as well as relevant work on crisis communication (Chapter Two). Then, following the protocol described in Chapter Three, the study uses both one-on-one interviews (*N*=19), referred to as Phase One, and a 2 x 3 experimental design with a randomized, national sample (*N*=443), referred to as Phase Two to explore how inherently-contradictory directives affect behavioral intention and source credibility. It also examines whether explicit acknowledgment of inconsistencies or the addition of "refutational counterarguments" (William J. McGuire, 1961) affect the impact of contradictory directives. The results of the Phase One interviews are reported in Chapter Four and the Phase Two experiment results in Chapter Five. Finally, Chapter Six presents an analysis of the results and a discussion of their practical implications for public health and risk communicators.

CHAPTER TWO

REVIEW OF THE LITERATURE

The Public and Pandemic Flu

A search of Google Scholar for academic articles including the phrase "pandemic flu" returns about 7,700 citations from 2000-2007, many with attention-getting titles like "Race Against Time" (Fauci, 2005). The academic disciplines range widely, from the usual suspects such as *The Lancet; Journal of Health Communication; Journal of Risk and Uncertainty; Nature;* and *Disaster and Response* to the more unexpected, such as the *Journal of Corporate Accounting and Finance; Tourism Management; Foreign Affairs;* and the *Journal of the American Dietetic Association.* The articles represent an array of epidemiological and bio-science facts, policy-planning logistics, histories of past outbreaks and predictions (and warnings) about a future pandemic. There is a great deal of speculation about how the public might respond in such a crisis, but very little actual information has been gathered about the public's knowledge, perceptions or intended behavior related to a pandemic.

Knowledge and Perceptions of Threat

Some have referred to coverage of avian/bird and pandemic flu as a "media pandemic" (Gainor & Menefee, 2006) and indeed, much attention has been paid to the topic. According to Lexis-Nexis Academic, from January 2000 to December 2007 more than 27,000 articles using the terms "bird flu" or "avian

flu" were published by U.S. newspapers and wire services (see Figure 1.1). While the quantity of coverage is high, it is difficult to assess the quality and effectiveness of any educational messages embedded in the stories. A meta-analysis of surveys by numerous polling organizations from 2000-2006 showed consistent patterns over time among the public: in repeated random samples, roughly two-thirds of Americans are not concerned about pandemic flu, while approximately one-third are moderately to seriously concerned; virtually no one answered "don't know/no opinion." Several polls from 2006 showed that more than 80% of American adults have taken no steps to prepare for a pandemic. In terms of knowledge, about 80% of Americans answer correctly that seasonal flu vaccines will not protect people from pandemic flu (Ho, Brossard, & Scheufele, 2007).

However, the polls may mask some important issues and fail to address others. Most polls jump right into asking the types of questions listed above and do not start by asking people the basic question of whether they are familiar with avian/bird flu. At least one regional poll during the period showed high levels of ignorance among the public: in July 2006 the state of Georgia's Division of Public Health commissioned a poll that found 9% of its citizens had not heard of avian/bird flu (Paek, Hilyard, Freimuth, Barge, & Mindlin, 2008); yet 2006 was the peak of pandemic media coverage thus far, with more than 10,000 newspaper stories in the U.S. Additionally, these polls do not query the public on either knowledge or perception of government policies planned for a pandemic, so it is

unclear what, if anything, Americans know about what might happen and how they might be affected during a pandemic.

Government Policy

Government plans for pandemic influenza are extensive and include numerous contingencies that are beyond the scope of this paper (see for example, *Community Strategy for Pandemic Influenza Mitigation* and *Pandemic Planning Update IV* at www.pandemicflu.gov). However, there are two overriding priorities that are prominent in discussions of pandemic preparedness. The first is mitigating the spread of the disease in the likely event there are no effective vaccines or antiviral medications. Currently, Tamiflu® and Relenza® are two such antivirals used to treat seasonal flu and have been used with limited success against avian flu in Asia. However, it is not known whether they would be effective against a mutated strain of the virus and even if the medication was effective, it is likely supplies would be limited. According to the federal government's pandemic planners, "it is unlikely that [antivirals] would substantially modify the course or effectively contain the spread of an influenza pandemic" ("How would antivirals be used?," 2008). Likewise, a new virus strain would require a new vaccine, which would take months to develop. A second critical element of pandemic planning is dealing with the disruptions of transportation and commerce that many believe would occur if 30% of the workforce were ill, as has been predicted.

Social Distancing

According to estimates by the CDC, it would take six to eight months to develop a vaccine for the new flu strain; to effectively use antivirals, 1.9 million doses would need to be on hand -- more than could be produced in the next five years. Epidemiologists believe "reducing contact rates between infected and uninfected persons will represent one of the few sets of interventions that can be rapidly implemented" in a pandemic (Haber et al., 2007, p. 587).

"Social distancing" to prevent or slow the spread of contagious disease has been shown to be effective in computer simulations models as well as in real world situations such as the SARS outbreak (Ferguson et al., 2006; Glass, Glass, Beyeler, & Min, 2006). In addition to its theoretical and actual successes, social distancing is a policy that sounds like common sense. However, social distancing in a projected pandemic scenario might be a challenging process.

Social distancing is most effective when compliance is at 90%; when compliance drops below 60% it may be relatively ineffective (Rothstein & Talbott, 2007). But instead of asking people to stay away from others for a few days, officials would potentially be asking people in some communities to isolate themselves or members of their families for four to six weeks. The specifics of how people would do that – logistically, financially and emotionally or psychologically – are not part of official policy, and those obstacles make the reality of social distancing a hard sell, even to those who agree the policy makes sense hypothetically.

Under “targeted social distancing,” the least restrictive of the policies proposed by the Centers for Disease Control and Prevention (CDC), “although children and teenagers are restricted to the home, adults and older adults go about their day-to-day routines, except that they avoid children who are not household members” (Glass et al., 2006, p. 1676). Computer models that map social networks have indicated that children and teenagers frequently act as vectors for contagious disease like the flu, hence some researchers believe they are the most important ones to isolate[4] (Glass et al., 2006).

However, according to the U.S. Census Bureau, more than 9.2 million children under 18 live in single-parent households where the parent works; more than 16 million children are in two-parent married couple homes where both parents work (*Families and Living Arrangements: 2006*). With schools and daycares closed, if these working adults were to “go about their day-to-day routines,” that would potentially mean more than 25 million children would remain unsupervised; to care for them, their parents would have a choice between secretly violating the policy by grouping children together with a caregiver or having a family breadwinner stay home with the kids.

That raises the next issue: the financial impact of social distancing. The National Strategy for Pandemic Flu makes no mention of two major obstacles to social distancing: fears about income loss and job security. The government’s advice to the public is to “plan for the possible reduction or loss of income if you

[4]The significance of children and teenagers in spreading flu virus is a subject of some debate among scientists. Computer models vary in their projections of the efficacy of isolating children; however, school closings are a key component of most official pandemic plans.

are unable to work or your place of employment is closed” and to consider working at home ("PandemicFlu.gov," 2006).

Current federal law, including the Americans with Disabilities Act, provides no job protection to individuals who miss work because of illness, quarantine (whether mandatory or voluntary), or to care for a person who is ill or in quarantine. Similarly, there is no federal job protection for parents who must stay home with children when schools or daycares close. Eight states have enacted legislation to protect individuals quarantined by order of the law. These laws protect job security; however, they do not provide income replacement and neither does federal unemployment insurance. Models for protecting jobs and replacing income do exist in other countries, including Canada, China and Singapore, but are not currently under legislative consideration in the U.S. Although laws could be implemented in the event of a pandemic, workers would still be economically vulnerable in the early days of a pandemic (exactly when compliance would be critical to stop the virus), perhaps leading them not to comply with social distancing policies (Rothstein & Talbott, 2007).

A third but not insubstantial impediment to social distancing may be its psychological toll (Rothstein & Talbott, 2007). Not only does it curtail entertainment like trips to the movie theater and the mall, but also worship services, extended family gatherings and other forms of fellowship and solace. Solitary confinement is one of the most severe punishments humans can be subjected to (Haney & Lynch, 1997); “cabin fever” may be casually thrown around as a synonym for boredom, but in geographically isolated areas it is a

real and serious mental disorder (Leipert & Reutter, 2005). Social distancing is a policy that by its nature strips people of support networks, a particularly devastating consequence at a time when society is disrupted and individuals may be dealing with grief, fear and uncertainty. Left with little to do except watch media coverage of the pandemic where pundits may be critical of government policies, individuals may have every reason to question and/or disobey directives for social distancing.

Distributing Resources to the Public

A second challenge for the government and its citizens during a pandemic will be distributing resources to the public. While it is not anticipated that effective vaccines will be available immediately, antiviral medicines are currently being stored throughout the nation in what is termed the Strategic National Stockpile (SNS). In the event of a pandemic, these medicines would be distributed to the public in a tightly controlled fashion. While several distribution systems have been considered, including deliveries to individual homes by the U.S. Postal Service (a so-called "push" method), most planning emphasizes a "pull" method in which citizens come to community-based distribution centers to receive vaccinations or other medications (Hupert, Cuomo, Callahan, Mushlin, & Morse, 2004).

In addition to the large-scale effort to deliver medicines to the masses, pandemic scenarios include projected disruptions to transportation and distribution networks (Skelton, 2006). In a worst-case scenario, with 30% of the population ill and all but essential emergency responders isolated at home,

commerce cannot proceed as normal. Some scholars estimate pandemic flu's impact on the economy could rival that of the Great Depression (Cooper & Coxe, 2005) and cost the U.S. nearly $200 billion (Meltzer, Cox, & Fukuda, 1999). Tools of business efficiency such as just-in-time inventory systems for food and other necessities would mean only limited supplies would be available in any particular community (Nicoll, 2005), and travel restrictions could cripple interstate trucking and air transport, further limiting supplies (Cinti, 2005; Skelton, 2006).

Advice to the public on the federal government's clearinghouse Web site about pandemic flu (www.pandemicflu.gov) clearly anticipates widespread outages and shortages:

> Plan for the possibility that usual services may be disrupted. These could include services provided by hospitals and other health care facilities, banks, stores, restaurants, government offices, and post offices…
>
> Think about how you can rely less on public transportation during a pandemic. For example, store food and other essential supplies so you can make fewer trips to the store….
>
> Stock a supply of water and food. During a pandemic you may not be able to get to a store. Even if you can get to a store, it may be out of supplies. Public waterworks services may also be interrupted…. Store foods that: are nonperishable (will keep for a long time) and don't require refrigeration… are easy to prepare in case you are unable to cook [and] require little or no water, so you can conserve water for drinking…

As witnessed in Hurricane Katrina, getting basic supplies to large groups of people in a crisis is a monumental effort. In a pandemic scenario lasting weeks or months, large numbers of people would potentially need to avail themselves of community supply distribution centers. In its current planning for these centers as places where antivirals or vaccines would be distributed, HHS

recommends an inner area where medications would be administered, and an outer area where crowds would be contained while waiting. For simplicity's sake, in this study the process of waiting for and receiving supplies and medicines is referred to by the shorthand term "public queuing."

Public Awareness of Pandemic Planning Details

According to the U.S Department of Health and Human Services, a cornerstone of planning for community distribution of medicines and supplies is to "educate the public about the general features of a mass prophylaxis response to natural or intentional outbreaks of disease" (Hupert et al., 2004, p. 23) prior to the initiation of the campaign in order to gain public support. Although a great deal of media coverage has taken place on the general topics of avian/bird flu and pandemic flu, virtually no news media have reported details of what average people would be expected to do and what they could expect from the government under the federal pandemic flu response plan. A search of Lexis-Nexis Academic since January 2000 showed fewer than 50 television news transcripts and less than 600 newspaper articles including the three words "pandemic" and "vaccine" and "distribution," all of which would be important to any discussion of the public queuing concept. Instead coverage discussed vaccine production problems and rationing or prioritizing vaccines to certain groups such as medical personnel, but there were no nitty-gritty details of how vaccines would be administered to the public. Similarly, over the same eight year period, "social distancing" was mentioned only 12 times on any U.S. cable or network newscast and fewer than 150 times in major newspapers.

Given the relatively little coverage of the two policies in the press and the absence of any polling data to track either knowledge or perception of the policies, this study sought to gather formative data that could help in the creation of the experimental treatments. Therefore, the following two research questions were explored in the in-depth interviews in Phase One:

> **RQ 1:** What are people's knowledge and attitudes regarding pandemic flu?
>
> **RQ 2:** What kinds of public health directives do people anticipate in the event of a flu pandemic?
>
> **RQ 3:** How do people respond to the two policies of "social distancing" and "public queuing?"

Processing Contradictory Information

The genesis for this study was anecdotal concern from communication practitioners that Americans "would not buy" the two policies of social distancing and public queuing because they contradict each other. Indeed, there is some empirical evidence to support this belief.

There are multiple ways that people react to contradictions: 1) refusing to confront them or denying they exist; 2) discounting both pieces of information; 3) deciding one statement is true and the other is false; or 4) accepting the contradiction and deciding that both contain some elements of truth and attempting to reconcile the two ideas (Peng & Nisbett, 1999). The first of these four possible reactions likely are attempts to avoid cognitive dissonance (Festinger, 1962). The latter dialectical approach is considered by some scholars to be a more sophisticated method of reasoning, that tends to increase with age and experience. However, this ability to see nuances within and

between contradictions may be challenging for the American public (Peng & Nisbett, 1999).

Americans and Europeans tend to react to contradictory information in very different ways than those in other cultures, particularly in Asia, where dialectical thinking, rather than polarization, is the norm. In a series of five empirical studies, Peng and Nisbitt (1999) found that "when two apparently contradictory propositions were presented, Americans polarized their views, and Chinese participants were moderately accepting of both propositions" (p. 741). Americans exhibit strong individualistic and libertarian tendencies, far different than the collectivist, communitarian mindset in Asia and in some European nations (Rothstein, 2004). These cultural differences may become important in the approach to a pandemic in the U.S., given that much of planning is based on the successful control of SARS, not in America but in Asia (Wang et al., 2007).

Cognitive dissonance has been shown to result in the eventual rejection of logically-troubling idea(s) even when doing so is not in the best interest of the individual (Festinger, 1962). In a flu pandemic, if Americans see policies as dissonant rather than dialectical, dissonance theory would seem to point toward non-compliance as the outcome. Thus far, no studies have addressed how to make audiences accept and even embrace such dissonance.

This study is based on the premise that inconsistencies in the two pandemic flu policy directives will be troubling to at least some people. To confirm that premise and to assist in the design of the experimental instrument, the following two research questions were included in the formative phase:

RQ 4: Do individuals perceive contradictions between social distancing and public queuing?

RQ 5: If contradictions are perceived, what is the response?

How Two-Sided Messages Influence Persuasion

Persuasion is one of the most important concepts not only in mass communication, but in the broader field of business and commerce and in interpersonal communication as well. Decades of academic research, as well countless self-help and business advice books have been devoted to the search for better, more effective methods of persuasion. Persuasion in health and risk communication can be even more complex, given that it must also factor in the impact of risk perception, an issue discussed in further detail later in this chapter.

Since the 1940's, research has supported the persuasive effectiveness of "two-sided" messages. A definition for two-sided messages is best begun with a definition of one-sided messages, which are those that support the conclusion of a communicator (Allen, 1991). In contrast, two-sided messages present both the communicator's side of the argument and opposing viewpoints or attributes.

One of the most-referenced examples of a two-sided message comes from the long-running advertising campaign by Avis car rental in the 1960's and 70's. The ads were based around the slogan "We try harder." The gist of the message was, "At Avis, we're only number two – so why go with us? Well, because we're number two, we have to try harder. We can't afford dirty ashtrays, heaters that don't heat, seats that don't adjust or tires that are low..."

Avis admitted a negative attribute (that it was NOT the number one company out there) in order to more effectively present its positive attributes.

Two-sided messages such as this accomplish two things: they build or reinforce the credibility of the communicator (Avis, in this case) and increase positive feelings about the attributes of the product (or key parts of an argument) that the communicator is attempting to promote. Indeed, in the first four years after the campaign was introduced in 1962, Avis saw its market share increase from 11% to 35% ("A History of One of the World's Most Recognized Taglines: "We Try Harder"," 2003).

Empirical Examples of the Effectiveness of Two-Sided Messages

In addition to documented successes in commercial applications, two-sided messages have been explored by academic scholars through numerous frameworks, including the elaboration likelihood model, heuristic-systematic processing and inoculation theory. The two-sided approach has been empirically shown in most cases to establish or reinforce the credibility of the communicator and increase positive feelings about the communicator's argument(s). Additionally, two-sided messages are particularly effective in certain circumstances: persuading an audience that is hostile or skeptical; persuading people with higher socioeconomic status, and in situations in which the persuasive effects must last over time.

Hovland et al. (1953) conducted some of the earliest research on two-sided messages, using an audience of American troops during World War II to test messages about an early end to the war with Japan. Not only did they find the two-sided messages to be more effective in initial persuasion, but found them

to be more effective than other messages over time and found that adding refutational counter-arguments increased this effectiveness.

Some of the earliest tests of two-sided messages in a commercial context came with studies conducted by Faison (1961) that found two-sided messages to be more effective in radio advertising and in personal selling. In fact, the field of personal sales is where two-sided messages truly found a home; salespeople often present two-sided messages to increase their credibility, following any negative they mention with a positive attribute or counter-argument.

Despite their heavy usage in the sales field, two-sided messages were rarely used in the mass media and still remain *relatively* uncommon today, in part because many advertisers fear that saying anything negative will backfire. However, studies in the 70's and 80's showed that negative statements are not necessarily harmful, provided the message is framed with care. The negative attributes must be of less consequence than the positive attributes (for example, it is probably of less consequence that Avis is number two than that they have better customer service) and the attributes must be negatively correlated; e.g. price and quality[5] (Pechmann, 1992; Settle & Golden, 1974). The order of the message may also be important (Crano, 1977; Eisend, 2006); the opposing view or negative attribute should come early in the message.

Throughout the 1970s, studies showed that two-sided comparative ads were more effective than one-sided comparative ads. These early studies looked

[5] For example: "We cost a few pennies more than Brand X, but you'll taste the extra richness in every spoonful" can work because cost and taste are negatively correlated and people usually want less cost and more taste. Whereas this message that presents unrelated attributes does not work: "Sure, we may have fewer package sizes than Brand X, but our richer, creamier taste makes up for it."

at attitude change where people had pre-existing attitudes, but those attitudes brought with them some baggage (i.e., confounding variables). However, subsequent studies applied two-sided messages to new product introductions for such products as cold medicine and beer, where there were no pre-existing attitudes about the brand and found the two-sided comparative appeal could work well there too. Two-sided appeals were found to improve the effectiveness of celebrity endorsements by increasing credibility. They were also found to be very effective in cases where companies needed to overcome a problem such as the recall of a product with a known flaw.

Two-sided messages are not a silver bullet for communicators; there are a couple of situations in which one-sided messages work best, such as when the audience is already in agreement with the position of the communicator, or when the audience is not well-educated. In virtually all other circumstances, however, two-sided messages have been proven superior. Two-sided messages especially work well in the following situations: when the audience is opposed to or skeptical of the communicator, when the audience is of a higher education level, when there is a high overall amount of knowledge about the topic (regardless of education level), when there is a high need for cognition among the audience or when the results need to last a long time (Crowley & Hoyer, 1994).

Theoretical Underpinnings of Two-Sided Messages

A number of theories have been used to explain why two-sided messages are more effective than other types of messages.

First, according to Attribution Theory, two-sided messages work well because people are always looking for a motivation to which they can attribute a message (Crowley & Hoyer, 1994). In commercial advertising, consumers typically attribute one-sided messages to the desire to sell the product, but attribute two-sided messages to the credibility or honesty of the advertiser. As such, the negative side of the message increases the validity attributed to the positive side.

Second, the Discounting Hypothesis posits that attitude is a reaction to content – both content which is there and that which is omitted (Allen, 1991). If a speaker, even one that is perceived as credible, is talking about a controversial issue but fails to acknowledge the existence of the opposing point of view, there is a tendency to "discount" or otherwise ignore whatever the speaker says. On the other hand, if a speaker acknowledges the opposing point of view as legitimate but flawed, and explains logically why his or her view is superior, the speaker is seen as credible and has laid the foundation for a rational basis of discussion and attitude change.

Third, Optimal Arousal Theory states that whatever is novel or pleasingly-different will gain more attention from an audience, provided the level of novelty is not too high (Crowley & Hoyer, 1994). One-sided messages are expected and commonplace, but a two-sided message produces a pleasing sense of novelty that is more engaging to the audience.

Fourth, while not directly related to two-sided messages, the Elaboration Likelihood Model also supports their efficacy. It states that centrally-processed,

rather than peripherally-processed messages will be more effective at persuasion (Cacioppo & Petty, 1984). Since two-sided messages appear to require more scrutiny from the audience than a more simplistic message, chances are they will require more cognition and central processing, and thus be more persuasive.

All Two-sided Messages are Not Created Equal

All of these studies contributed to the overall conclusion that two-sided messages can be more effective than one-sided messages in many cases in which the goal is to win over the audience with an attitude or behavior change.

However, not all two-sided messages are created equal; two-sided messages that only offer supporting arguments, but no counterarguments, are actually less effective than one-sided messages alone (O'Keefe, 1999). The rank order is as follows:

- Most persuasive: Two-sided messages with both supporting and opposition viewpoints, plus refutational counter-arguments
- Not as persuasive: One-sided messages with supporting messages only
- Even less persuasive: Two-sided messages with supporting and opposition viewpoints only

This hierarchy may be seen more clearly using an example. If health educators were creating a message about condom use for an HIV prevention/safer sex campaign (see Table 1), a moderately effective and straightforward one-sided message might be "To prevent HIV, teenagers should use condoms." A two-sided message might present a differing viewpoint such as, "….Some people may be concerned that encouraging condom use encourages teens to have sex," then add the supporting argument, "…But

condom use is still the single most effective way to prevent HIV transmission and that's what we should focus on."

However, while that two-sided message does acknowledge that a downside to condom use could be increased sexual activity – a common objection and one that would be very important to address -- the lack of refutational counterarguments allows the opposing message to linger in the air. On the other hand, adding a refutational counterargument in this case deals something of a *coup de grace* to objections from a hostile audience: "….Of course we want to delay sexual activity among teens, but avoiding the topic of condom use isn't the way to do that. Would you rather have a kid who has sex using condoms or a kid who ends up dead because of HIV?"

The negative attribute presented in this example is "giving kids a license to have sex." Of course a hostile or skeptical audience might be unhappy with that idea, but it is nonetheless a negative that can be discounted and countered as presented in the example. Other "negative" choices might be too strong, such as a negative message that says "Some people may be concerned that condoms can break – it's why condoms aren't 100% effective in preventing pregnancy -- and that telling people they work gives them a false sense of security – but using a condom is still more effective than any other method." This is a somewhat tougher oppositional view for the speaker to then counter because such a statement might give people greater pause as they consider the possibility of condom failure; the only way to counter it would be to emphasize

the low probability of such an event, e.g. "…But that only rarely happens and it is better to have kids using condoms successfully 98% of the time than kids being unprotected 100% of the time." The milder opposing view is probably the better choice in this case.

Indeed, this is the basis of McGuire's classic work on Inoculation Theory; he takes two-sided messages one step further, arguing not just for the importance of preparing the public for particular messages by arming them with support for their beliefs, but also by preparing them for attacks on those beliefs with a "refutational defense" (W. J. McGuire & Papageorgis, 1962, p. 25). Inoculation Theory further posits that this two-sided message framework will make people more resistant to opposing viewpoints in the future.

How Two-Sided Messages Relate to Inoculation Theory

Inoculation Theory (W. J. McGuire & Papageorgis, 1962) uses the metaphor of vaccination to explain how a message can confer resistance on attitudes or behaviors under attack. Inoculation Theory posits that a message will be most effective if, like a polio or flu shot that includes a weak strain of the virus, it mounts a weak attack on a person's beliefs, prompting them to build counter-arguments (antibodies) that will protect them from future attacks on those beliefs, and then is followed by a refutational defense that helps the receiver rehearse their opinions.

This sounds a great deal like two-sided messages, but Inoculation Theory takes the idea several steps further by adding some key characteristics. First, inoculation-based messages are not designed to succeed at initial persuasion,

but rather, to protect or defend attitudes that have already been adopted. In other words, the inoculation message is targeted at an audience that already agrees with the communication. If that were the end goal, then research on message-sidedness tells us that the best approach for this audience is a one-sided message (one of the few circumstances in which one side is better than two.) But, the goal of inoculation is resistance, rather than persuasion, so this technique starts with a two-sided message and then adds to it.

A second difference between inoculation messages and two-sided messages with refutational defenses is that in addition to providing the weak attack, inoculation-based messages provide a warning of the imminent attack, termed a "threat." The combination of the threat and the refutational defense are thought to provide the audience both the motivation and the script to later defend its beliefs.

Gerald Miller (1980) divides persuasion into three types: response-shaping (educational), response-changing (attitude- or behavior-altering), and response-reinforcing (defensive). Simple two-sided messages comprise the first two types, with the more complex type of two-sided message, inoculation, covering the third category.

As mentioned above, inoculation-based messages are tasked with providing resistance, not prompting attitude change, and therefore they work best to protect attitudes that are already in place. They tend to work better in higher involvement situations, being least effective in a low-involvement situation but most effective in a situation where the receiver is moderately involved or

cognitively engaged. The threat must also be sufficiently high for inoculation to work. Factors that can govern the amount of perceived threat in an inoculation message are the socio-demographic characteristics of the receiver, the message content, the context, the recipient's need for cognition, and other variables. Typically, it takes time for inoculation to confer the most resistance; in other words, there should be a delay between the inoculation and the attack. This is analogous to the idea that if you get a flu shot today it will not inoculate you against exposure to the virus tonight – it takes time to work. Another factor is message modality; video tends to confer more immediate resistance whereas print needs more time (Pfau, Holbert, Zubric, Pasha, & Lin, 2000).

Applying Two-Sided Messages to Risk Communication

The communication of risk also has been examined in the context of commercial speech, such as ad campaigns by pharmaceutical companies, as well as in public health and safety campaigns advocating everything from smoking cessation to terrorism threat levels. Several excellent review articles exist on aspects of risk perception and communication (Goldstein, 2005; Marston & King, 2006; Reyna & Farley, 2006; Sjoberg, 2003, etc.) Leaders in the field of risk communication argue for the importance of "pre-crisis communication" (Sandman, 2006, p. 259), and there is no reason to believe it is any less important in anticipation of a crisis such as a flu pandemic.

Before risk communicators can develop effective campaign messages, however, they must understand the public's inherent ability (or inability) to estimate and understand risk, as well as the factors that influence an individual's

ability to make logical choices about avoiding, tolerating or seeking risk. Scientists and risk communicators have historically assumed that the general public cannot understand the nuances of uncertain or variable risks and in many cases have therefore been reluctant to fully explain risks (Goldstein, 2005). However, there is some evidence to suggest greater transparency and explicit acknowledgment of uncertainty would have a positive impact on public trust (L. Frewer, 2004; B. B. Johnson & Slovic, 1995).

The risks involved in the two key pandemic flu policies of social distancing and public queuing are indeed both nuanced and variable; the two behaviors conflict at face value, but become more reasonable if they are explained fully. This study hypothesizes that one way to present such contradictory or inconsistent risk information might utilize two-sided messages. In this case, the "first side" of the message would present the pair of contradictory messages; the "second side" of the message would be the acknowledgement that the two messages may be in conflict with one another, transparently laying contradictions on the table ahead of time, acknowledging them and providing both supporting messages and refutational counterarguments.

McComas and Scherer (1999) wrote that there had been relatively little research done on two-sided messages in risk communication, and a review of the literature in the eight years since shows little has been added. In their study about the safety and quality associated with tap versus bottled water (which administered a survey to the general public as a form of indirect risk communication), McComas and Scherer only peripherally looked at two-sided

messages. They found that "balanced" (i.e. two-sided) messages seemed to be more effective at communicating risks than one-sided messages.

Perceived Credibility of the Communicator

A key determining factor in how people respond to a message is audience perception of the communicator. Mass communication scholarship has frequently addressed the concepts of trust and credibility, and in recent years, significant research has also taken place within risk communication (although risk communication scholars have often worked independently, without much apparent reference to the work that has been done in mass communication.) While not synonymous, credibility and trust have many congruent and interrelated characteristics and indices of the two concepts have been shown to be highly correlated (McComas & Trumbo, 2001b; Sjoberg, 2001). This relationship has often been reflected semantically: many scholars refer to them as a package – like "peanut butter and jelly," "trust and credibility" always seem to go hand-in-hand. This common usage notwithstanding and despite their generally agreed-upon significance, few scholars agree on exactly what the terms mean (Hong, 2006).

Measuring Credibility

Building blocks of credibility are considered to comprise both expertness and trust (Hovland, 1953), although overall findings show trust typically trumps expertness when it comes to the persuasive impact of these perceptions on behavior (Pornpitakpan, 2004). Some risk communication scholars have tested the duo "trust and credibility" and found additional dimensions like *care and*

concern or *dedication and commitment* (Peters, Covello, & McCallum, 1997). Others have found still more dimensions, which they christened with terms like *dynamism* or *competence* (McCroskey & Young, 1981).

This lack of consistency in operationalizing trust and credibility means there is no consensus on how to measure them. Many scales for either credibility, or trust, or both have been developed over the years, but none of them has emerged as the standard. Trust measures have often been very situation-specific; source credibility measures have varied widely. Research has tended to examine the constructs through one of three lenses: by identifying factors, examining functions (for example, credibility as a function of whether the source is providing a benefit or meeting a need of the receiver), or taking a constructivist approach (developing measures that are specific to the receiver's perception of reality in a specific situation.) McComas and Trumbo (2001a; 2003) -- provide several succinct summaries of the evolution of trust and credibility measurement.

Finding a scale for further research, then, necessitates a choice among less-than-perfect and not-very-well-tested contenders. Trust scales seem to have a better track record at validity under replication than credibility scales. One of the most prominent in health communication is the Trust in Physician (TIP) scale, which has been widely used and repeatedly shows high reliability, with Cronbach's α >.80 (Anderson & Dedrick, 1990; Thom, Ribisl, Stewart, Luke, & Physicians, 1999). Successful as TIP has been for measuring trust in doctors, it has not been adaptable across other groups, as evidenced by the need for

scholars to create such scales as Trust in Medical Researchers scale (Mainous, Smith, Geesey, & Tilley, 2006), Trust in Health Insurer scale (Zheng, Hall, Dugan, Kidd, & Levine, 2002) and the Trust in Nurses scale (Wallston, Wallston, & Gore, 1973). Often, these have been replicated in multiple studies, but their questions are too situation-specific to be useful across different populations.

Similarly, many of the credibility scales in the literature are situation-specific and therefore lack ecological validity. Additionally, many of these published scales have been used once but never been replicated. One exception to this is the five-item Meyer's Index for newspaper credibility, a pared-down version of Graziano and McGrath's 12-item index (Meyer, 1988). Like Hovland's work, Meyer's Index identifies trust as subordinate to credibility, along with four other dimensions including fairness, bias, openness and accuracy. Like Graziano and McGrath, Meyer used the scale to measure perceived credibility, but did not explore the resulting implications for behavior or attitude.

A limitation of the Meyer's Index is that its measures appear most closely suited to perceptions of the media and are not necessarily ideal across situations. However, it has been successfully adapted on several occasions, including in a risk communication context (L. J. Frewer, Howard, Hedderley, & Shepherd, 1996; McComas & Trumbo, 2001a). McComas and Trumbo (2001a) measured the credibility of three groups: public health officials, industry and the media. All were sources of information in five different geographic areas where there was some kind of environmental issue of public concern, such as a cluster of brain cancer cases near a factory site. Meyer's Index was used to measure the

perceived credibility of each of the three sources, then gauge the impact of source credibility on perceived risk. The study did not include experimental manipulations and it measured source credibility based on existing or past messages people had received. The authors had no way of knowing for sure what the individual or aggregate content of those messages was. As a result, they did not feel they had enough information to predict the direction of the relationship between credibility and risk perception and therefore conducted a two-tailed test (McComas & Trumbo, 2001a). Additionally, the study did not include behavioral intention as a dependent variable, suggesting an important next step for future scholarship.

The use of the Meyer Index to measure the credibility of public health officials in a risk communication context, combined with its proven reliability under replication, make it one of the best existing scales that could be applied to this study. However, given that there are differing views in the literature about the dimensions of credibility, the researcher has included further explication of the construct as part of this study's Phase One exploratory research:

RQ6: How do individuals weigh the credibility of various sources?

Intention as a Predictor of Behavior

Behavioral intention is a construct used in numerous theories, from the Health Belief Model to the Theory of Planned Behavior/Theory of Reasoned Action to the Stages of Change Model, and has been shown to be a valid construct for predicting behavior when that behavior cannot actually be observed

(I. Ajzen, 1985; Icek Ajzen, 1991; Hagger, Chatzisarantis, & Biddle, 2002; Rosenstock, Strecher, & Becker, 1994).

In their work on the Theory of Planned Behavior and the Theory of Reasoned Action, (I. Ajzen, 1985) Ajzen and Fishbein (1981, 1985) and Ajzen (1995) established that behavioral beliefs, normative beliefs and control beliefs could lead to a behavioral intention that had a high probability of predicting actual behavior. An important point in their research and the many studies that have replicated the concept is that attitude toward the behavior is more important than attitude toward the object. In a marketing context, the analogy might be the difference between the questions “Do you like BMWs?” and “Do you intend to buy a BMW?” The answer to the first question might be an enthusiastic yes, but it is the answer to the second question that actually has predictive validity.

Linking Two-Sided Messages, Credibility and Behavior

Prior to a test by Arora & Arora (2006) of the interaction of source credibility and message sidedness, no such study could be found in a marketing (including health marketing) context. Their experiment used fictitious newsletters about the link between healthy eating and cancer. The high credibility newsletter was purportedly published by a highly-educated physician; the low credibility newsletter came from a produce manager at a local discount grocery store. Message sidedness was depicted in the headline and the body of the newsletter and further indicators of credibility were also embedded within; only one-sided and straightforward two-sided messages were used; two-sided messages with refutational counterarguments were not included. The credibility manipulation

had a strong effect on both dependent variables of source credibility and behavioral intention, whereas the two-sided messages had a significant positive relationship only with source credibility, and not with behavioral intention (Arora & Arora, 2006).

To better understand the relationship of credibility to behavioral intention, one additional research question was included in the qualitative interview phase of the research:

> **RQ 7:** When one source conflicts with another, how likely is someone to follow the advice of a public health official?

Hypotheses Regarding Two-Sided Messages

The literature has shown that two-sided messages enhance the perceived credibility of a communicator and that one-sided messages may detract from it; in turn, levels of perceived credibility are positively correlated with higher rates of behavioral intention to follow the message. However, no empirical evidence exists to confirm that these findings apply to contradictory messages. Inherently-contradictory health and risk communication messages have not been subjected to any rigorous analysis focusing on their contradictions, but the theory of cognitive dissonance would suggest these messages could be more persuasive if they were less dissonant. Therefore, this study proposes bundling the two messages together as a package, so that rather than seeming oppositional or poorly conceived, they are presented as a unit. This bundled contradiction would be made into a "two-sided" message by prominently featuring the acknowledged contradiction as the negative attribute. Refutational counterarguments – that is, criticisms and ways to respond to them, would also

be added as a variation on the two-sided message. The original message, presenting the two conflicting policies without acknowledgement of their contradictory nature, would be the "one-sided" version of the message.

Based on past research, the most effective of the three messages would be the two-sided message with refutational arguments; the least effective would be the two-sided message with only supporting arguments, and the one-sided message would fall in the middle. Hence, hypotheses for the experimental portion of the study include:

> **H1:** One-sided presentation of contradictory messages will decrease perceived credibility of a source.
>
> **H2:** One-sided presentation of contradictory messages will decrease an individual's intention to follow the desired behavior.
>
> **H3:** The use of refutational counter-arguments in a two-sided message will increase perceived credibility of a source.
>
> **H4:** The use of refutational counter-arguments in a two-sided message will increase an individual's intention to follow the desired behavior.
>
> **H5:** Perceived credibility and behavioral intention to comply with directives will be positively correlated.

To validate the overall message effect, a control group[6] was included, leading to one additional hypothesis:

> **H6:** There will be significant differences between the treatment groups and the control group that has heard no messages regarding proposed government policies during a pandemic.

[6] Later in this dissertation, results of the qualitative interviews will be shown to demonstrate a need to alter the material which had been planned for the control group, changing it from a true control to another, albeit qualitatively distinct experimental treatment group. Thereafter, this group will be referred to as the "quasi-control" group.

No direction was hypothesized for this relationship; however, it was believed that a difference would be found if indeed the experimental treatments had an impact on the treatment groups.

Figure 1.1 Articles Published on Pandemic or Avian/Bird Flu, 2000-2007

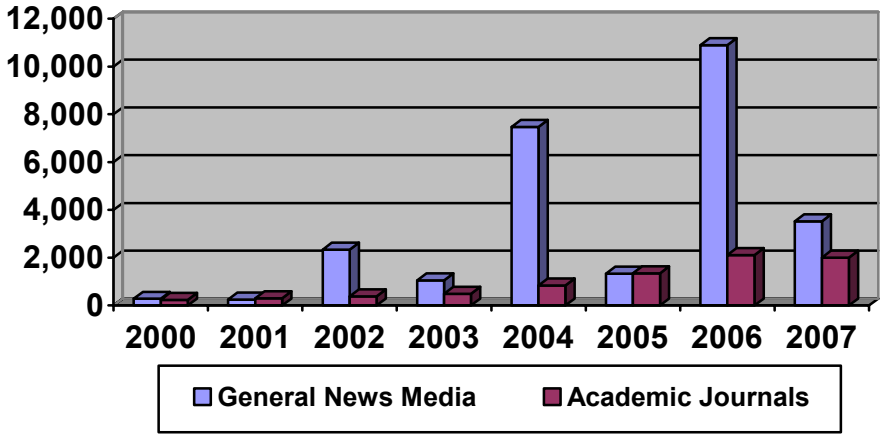

Table 1.1. Hypothetical Two-Sided Message with Contradiction as Negative Attribute

	One-sided (moderately effective)	**Two-sided, supporting only** (least effective)	**Two-sided with refutational defense** (most effective)
Key message	To prevent HIV, teenagers should use condoms	To prevent HIV, teenagers should use condoms	To prevent HIV, teenagers should use condoms
Other side	N/A	Some people may be concerned that encouraging condom use encourages teens to have sex	Some people may be concerned that encouraging condom use encourages teens to have sex
Supporting arguments	Condom use is the single most effective way to prevent HIV transmission	But condom use is still the single most effective way to prevent HIV transmission and that's what we should focus on	But condom use is still the single most effective way to prevent HIV transmission
Refutational arguments	N/A	N/A	Of course we want to delay sexual activity among teens, but avoiding the topic of condom use isn't the way to do that. Would you rather have a kid who has sex using condoms or a kid who ends up dead because of HIV?

CHAPTER THREE

METHODOLOGY

This chapter describes the methodology for each stage of the study: a series of formative, qualitative in-depth interviews, and an experiment with treatments randomly-assigned to a representative, generalizable national sample. Many research questions warrant a mixed methods approach to understand the full depth and breadth of an issue, and indeed, "methodological pluralism… frequently results in superior research" (R. B. Johnson & Onwuegbuzie, 2004, p. 14). Based on the research questions and extant literature (or lack thereof) this study approaches its research questions through both qualitative and quantitative means.

Prior to the beginning of the study, the author had been immersed for more than two years in research on behalf of public health officials in the state of Georgia designed to improve public communication about pandemic flu. This experience, which included both a statewide survey and multiple focus groups, shed light on many facets of public perception regarding infectious disease and emergency preparedness (Paek et al., 2008), but did not directly cover the issues investigated in the current paper. However, interactions with health district risk communicators in the course of the project did reveal their concerns about the public's potential response to contradictory messages in a pandemic, serving as the impetus for the current research. Too often, risk communication messages

are based on anecdotal information that “assume that the communicator knows what people currently know, what they need to learn, what they want to hear, and how they will interpret a message” (Fischhoff, Bostrom, & Quadrel, 1993, p. 184); this research seeks to systematically examine such assumptions in the context of pandemic flu.

Before each stage of research, approval was sought from the University of Georgia Institutional Review Board (IRB), and subsequent changes to the protocols were also approved by the IRB. No participants were subjected to any psychological, social, legal, economic or physical discomfort, stress or harm. No identifying information, such as names or phone numbers, was collected. Participants were apprised of potential benefits they might incur, including learning more about pandemic flu, and how to protect themselves and their familes in the event of a pandemic. They were also informed that the study might possibly help public health officials effectively communicate important information in the future about pandemic flu and other issues. (See Appendix A for consent materials for both phases of research.)

Phase One Method

Given the dearth of information about communicating internally-inconsistent messages and about the public’s perceptions of pandemic flu, some exploratory research was therefore a logical first step in this study as part of the validation process for the experimental treatments. In addition to its main formative purpose answering research questions with direct bearing on the

experiment, a secondary goal of this phase was to add explanatory power to the later results obtained in the quantitative phase.

Both focus groups and one-on-one interviews were considered as viable methods for this study's formative stage, since both methods allow researchers to gather "detailed attitudinal and experiential information" (Powell & Single, 1996, p. 503) from participants. However, given that the experiment in the second phase of the study would be an individual undertaking for respondents, it was important to gauge their individual reactions to the research questions, without the "group effect" that is often a characteristic of focus groups (D. L. Morgan, 1996). Particularly important was getting a sense of how obvious any contradictions might be to individuals, to modulate how explicit the contradictions should be in the experimental treatments. It was also essential to hear from respondents at length about the credibility construct. Fern (1982) found that individual interviews were superior to focus groups in idea generation and "thoughts about a relatively complex concept" (p. 11).

Recruitment of Participants

Nineteen participants were recruited for the interviews, representing a range of socioeconomic and demographic backgrounds. The researcher first started with a demographic breakdown of the state of Georgia (where the interviews were to be conducted), paying particular attention to age, race and education level. A convenience sample was then recruited based on these state demographics, with a slight oversample of African-American and Hispanic participants so that those populations would not be represented by only one or

two individuals. At no point in the research was the sample considered to be generalizable to the population, but it was hoped the interviewees would reflect a variety of opinions and levels of knowledge that could inform the subsequent experiment.

Initially the estimated number of interviews planned was 20; that sample number is based on traditional qualitative protocols that suggest research should continue until “saturation” is reached; that is, when additional interviews no longer result in new information. According to Morgan et al. (2002), after 10 interviews, 85% of new information from interviewees may have been unearthed and after 20 interviews, 95% of new information has typically been identified. However, preliminary data analysis began with the completion of each interview and the researcher felt saturation levels were sufficient after 19 iterations.

The sample was recruited by means of university and community listservs and e-mail forwarding, referrals, and word-of-mouth. Most participants were residents of a racially and economically diverse university town in Northeast Georgia, where some had lived all their lives, although transplants to the region, immigrants from other countries, and visitors to the area were among the sample. The desire for a diverse sample was stated upfront and several volunteers were turned away because too many people with similar demographics had already been interviewed. Participants were paid $25 for up to an hour of their time, although in actuality interviews lasted as little as 40 minutes and as long as an hour and twenty minutes, depending on the participant’s desire to expound on

the issues. The interviews took place over a three-week period in February 2008.

In initial descriptions of the research, prospective recruits were told the interview would cover such things as public health issues, sources of information about health issues, opinions about public health officials, and what they would do in a specific health emergency – that is, the topic of pandemic flu was not mentioned.

If a prospect was interested in participating, a date and time was set up at their convenience. Interviews were conducted at workplaces, coffee shops and at some participants' homes. Two interviewers divided the interviews: the author of this paper and a graduate assistant with experience in both qualitative research and health communication. In accordance with human subjects guidelines, informed consent was obtained. The consent form and briefing did specifically identify pandemic flu as one of the subjects for discussion. All interviews were audio-recorded and demographic information was collected at the end.

Interview Protocol

Interviews were conducted in a semi-structured format using an interview guide and began with a general question about where the participant gets health information. Although structured questions initiated each topic area, conversations were allowed to proceed spontaneously between the interviewer and the participant. From sources of information, the interview progressed to opinions about government health officials, to words that might describe the

factors associated with "credibility." After these topics had been covered, the interview moved on to questions about a hypothetical disease epidemic. For example:

- Let's say there was a serious contagious disease, like tuberculosis, that had been found in your community. Would you support people with the disease being asked to stay at home or to avoid crowds? Would voluntary quarantine be a smart move in terms of preventing disease? Would it be fair to the patients involved?

- In a situation with a contagious disease, how concerned would you be about public health officials knowing what to do to protect you and your family? For example, if the person with the illness worked at your company or went to your child's school…

Following this series of questions, participants were queried on their knowledge about avian flu and/or pandemic flu and their possible responses to such a crisis (see Appendix B for full interview guide). Initially, the pandemic topic was introduced with the following series of questions:

- What have you heard about avian flu, sometimes also called bird flu?

- How concerned would you say you are about avian flu coming to this country, either in birds or in people?

- Avian flu has only infected a few hundred humans so far around the world. But when it has, it has been extremely deadly, killing about half of the people who come down with it. Scientists worry that if it started passing to people quickly it could cause a deadly pandemic… an epidemic that happens around the world. About 90 years ago, a flu pandemic killed between 20 and 50 million people around the world. If you thought avian flu would turn into a pandemic like that, how concerned would you be?

Finally, the policy ideas of social distancing and public queuing were introduced (see below) soliciting general reaction (see below), with subsequent

questions about specific behavioral intention with regard to the policies (again, see Appendix B for complete list of questions).

- Because a flu pandemic could be so serious, the government is already planning for it. In fact, they are spending about $7 billion to stockpile vaccines, prepare the public and plan for handling the crisis. One plan is to ask people to stay home from school and work, and avoid crowded places like malls, churches and movie theaters, maybe for several weeks or months, to prevent spreading the disease. What do you think of that idea, of keeping your distance from other people in the event of a contagious disease pandemic?

- Some officials are concerned that many parts of the economy would be disrupted in a pandemic, making it difficult to get supplies to people – there might be a need to distribute rations of food and other supplies to people if stores are closed. Also, if there was a vaccine or some medicine to help fight off the deadly flu strain, the government might need to get it to people. The government's plan is to get supplies and medicines to people at special temporary health clinics set up in communities. What do you think of that idea?

After the follow-up questions about behavior, if subjects had not raised the idea of a contradiction, they were asked about it: first, subtly, in the guise of giving advice to a friend who was feeling either uncomfortable or defiant about the directives, for example:

> Even though a flu pandemic might be deadly and much more serious than most disease epidemics we are used to, some people might not listen to government recommendations. They may try to persuade you not to listen either. For example, someone might say that they stay well during flu season every year just by washing their hands often and not standing too close to people, and that is not necessary to stay home from work or church or the grocery store during a pandemic. How would you respond?

They were then given another more direct opportunity to identify any conflict between the two policies:

> What if somebody said… "I don't see the difference between going to pick up my medicines at the health department and going to work. If I can be careful at one place I can be careful at both." In you opinion, are they different?

After the first several interviews, two key concerns emerged: first, while most participants had heard of a disease by the name of bird flu, avian flu or in some cases, pandemic flu, most could recall no information about it. Second, it also became clear that the questions did not convey the potential drama and toll of pandemic flu to participants and their responses reflected a rather blasé attitude toward the severity of a 1918-style pandemic. Additional wording was added to the interview guide to provide basic facts about bird flu and pandemic flu and to paint a more vivid picture of what risk communicators envision as a worst-case scenario. Changes to the interview guide began with the question about a hypothetical disease epidemic, taking out the reference to tuberculosis and emphasizing the contagious and deadly qualities such an epidemic might have. The next several questions were also changed to include more background:

- Let's say there was a serious new disease in your community… a disease that was exotic and very deadly, with no vaccine. Let's say that it could be easily passed from person to person, even just being in the same room with someone. How would you protect yourself and your family?

- I want to tell you a little about bird flu so that you'll have some background to answer the next couple of questions. Bird flu has only infected a few hundred humans so far around the world. But when it has, it has been extremely deadly, killing about half of the people who come down with it. Imagine a disease that kills half of the people who get it… half of your friends, your neighbors, your family. Right now, it only sometimes passes from birds to people. But scientists are worried that virus could *mutate* and suddenly be very easy for one person to pass to

another person. The last time that happened with a disease this dangerous, 50 million people died around the world… what they call a pandemic. If you knew people in your community had a disease like that and that they could give to other people, what would you do to protect yourself and your family?

- The federal government is very worried about a pandemic. If a lot of people in this country started getting that disease, the plan is to shut the country down for a while to keep people away from each other as much as possible, so the disease can't spread. Close schools and daycares. Close public places like movie theaters and malls. Close a lot of stores and some businesses. Tell people not to gather with friends at parties or at church. Tell people to keep sick folks at home and care for them there. A lot of people still might die, but the idea would be to save as many people as possible. It might last a few weeks… or a few months. How do you respond to that idea?

- What problems, if any, would you see with keeping your distance from people during a pandemic? How would people get food, or money or help to take care of people in their family who were sick?

- There might be a need to distribute rations of food and other supplies to people if stores are closed. Also, if there was a vaccine or some medicine to help fight off this deadly disease, the government might need to get it to people. The government's plan is to get supplies and medicines to people at special temporary health clinics set up in communities. Would you take yourself and your family to a place like… the local high school..? What are the reasons for this decision?

These changes were tested with the next four interview subjects and we were found to be more successful at eliciting response and were therefore used for the remainder of the interviews.

Phase One Analysis

Approximately half the interviews were professionally transcribed and half were transcribed by the researcher; all transcripts were then reviewed and compared to the audiotapes for accuracy.

The researcher first read through all the transcripts and color-coded them for emergent themes and recurrent words, phrases or ideas related to the research questions for this phase, maintaining more extensive analytic notes in memo format. A matrix was then produced with these categories, with participant statements organized within the categories for ease of side-by-side comparison. A second matrix was then produced with categories based on the researcher's own groupings of questions in the interview guide and some additional analytic notes were made.

Cell by cell, the matrices were examined with constant comparisons (Glaser, 1965; Goetz & LeCompte, 1981; LeCompte, 2000) across categories, a grounded theory approach that generated some additional themes. In the analysis, the researcher attempted to strike a balance between the typologizing guidance from Lofland and Lofland (1995) and the content analysis trap described by Ezzy (2002), by keeping the categories loose and being receptive to emergent themes. The results of this qualitative analysis are described in Chapter Four.

The primary purpose of this stage of research in the study was treatment validation, rather than the development of grounded theory. Further analysis that seeks to make a stand-alone contribution to the literature is planned, and is described under the heading "Future Research Directions" in Chapter Six.

Phase Two Method

The major research questions for this study seek comparisons that are best explored by an experimental research design. Experiments are commonly

used in social psychology to explore how different stimuli may impact behavioral intention and have been used with some degree of frequency to gauge behavioral response to health communication messages (see for example Gerend & Shepherd, 2007; Millar & Millar, 2000; Salovey & Williams-Piehota, 2004; Steward, Schneider, Pizarro, & Salovey, 2003).

Experimental Design

The experiment followed a post-test-only, 2 x 3 design in which the message type (whether contradictory messages were ignored in a one-sided message, acknowledged in a two-sided message or acknowledged *and* refuted in a two-sided message) was the main effect independent variable. Both to control for any variation created by the order in which the two directives are presented as well as to increase power by reducing the variability of the main effect, the order of presentation (either social distancing first, then public queuing or public queuing first, then social distancing) was used as a blocking variable. Dependent variables were perceived credibility of public health officials and behavioral intention to follow the two directives.

Under a program of the National Science Foundation called Time-Sharing Experiments in the Social Sciences (TESS), the researcher received the opportunity to deploy the experiment online through Knowledge Networks, a private research firm with clients in business, government and academia. According to Knowledge Networks' Web site, it is the only firm that combines "true probability sampling" with the advantages of online research ("Knowledge

Panel Overview," 2008). More details about the Knowledge Networks sample and its recruitment follow later in this chapter.

Participants were randomly assigned to one of six treatment groups and a "quasi" control group. Each of six treatment groups read a fictitious article written to appear as a newspaper story presenting "pre-event messaging" from government health officials on pandemic flu. Because differences between the groups were subtle, the effect size was expected to be small, therefore, the researcher took steps wherever possible in the design of the experiment to increase power, including the addition of a blocking variable and use of the largest sample possible within funding constraints (for details, see later portions of this chapter).

The quasi-control group is referred to as such because although the original intention was to provide no information about pandemic flu in its article, but that changed following results of the qualitative interviews. There was such a lack of knowledge about pandemic flu and its potential severity that basic information had to be provided in order that people might grasp the issue well enough to answer post-test questions about behavioral intention. While the quasi-control group received no information on the two pandemic flu policies, it instead read a general article on preventing colds and flu that began with the same lead as the six other experimental treatments. It is therefore a hybrid of a control and an experimental group, which will be referred to as the quasi-control group. (See Appendix C for all treatments).

After reading the brief articles, participants completed an 18-item questionnaire designed to measure levels of perceived credibility of public health officials and participants' behavioral intention to follow social distancing and public queuing directives. To enhance the researcher's understanding of the responses, several additional explanatory questions were included about awareness of pandemic flu, attitudes toward the contradictions, and if applicable, reasons for anticipated non-compliance with the directives. The TESS funding opportunity allowed for a total of 8,000 "respondent questions" (sample size multiplied by the number of questionnaire items). Because increasing the number of questions had the effect of reducing sample size and therefore power, items were carefully chosen to keep the post-test as short as possible.

Development of Experimental Treatments

Message treatments were presented in a format designed to mimic news articles that might be published in advance of a pandemic. Content included factual information told from the reporter's perspective and quotes from fictitious public health officials at both the local and federal levels. The articles were written by the researcher, who is a media writing instructor and former journalist. The manipulation comprised a small amount of content added to change the one-sided message to a two-sided one, and then a bit more content that added refutational counterarguments to the two-sided message; hence, there was a small variation in the length of the articles. When the order in which the directives were presented was switched, no wording was changed. Following the qualitative phase of the research, minor adjustments were made in the wording,

and the articles were presented to both communication scholars and a small convenience sample (n=5) for feedback. (See Appendix C for complete set of experimental treatments).

Development of Post-Test Questionnaire

This research is designed to measure two concepts: perceived credibility (including trust) and behavioral intention. The post-test questionnaire consisted of 18 questions, divided into four primary areas: measurement of the two independent variables (five questions on credibility and five questions on behavioral intention); cognition of any contradictions between the two policies (three questions); and following brief critical comments by several fictitious pundits, three questions in which participants were given an opportunity to reconsider earlier responses about behavioral intention and perceived credibility. Two additional questions were included for explanatory purposes. Prior to its deployment, the questionnaire was evaluated by several laypersons and scholars for face validity. (See Appendix D for post-test questionnaire.) The questionnaire was presented online, with each question appearing on a new screen; participants could not return to previously answered questions. All demographic information was previously collected by Knowledge Networks.

Measuring the Credibility Construct

The concepts of trust and credibility were carefully considered by the researcher when developing the post-test questionnaire. The extant scholarship on the two constructs led the researcher to several important conclusions that impacted the post-test questionnaire: first, the rejection of the notion that trust

and credibility could serve as proxies for one another. Following Hovland's tradition, the researcher therefore chose to use a credibility index that included trust as one of its dimensions.

This study adapts a previously published scale, the Meyer's Credibility Index, a five-item scale initially developed to measure the credibility of newspapers, but which has been shown to be reliable in measuring the credibility of the media more broadly, as well as credibility of private industry and public health officials in a risk communication context. Responses to Meyer's Index indicate levels of perceived trust, accuracy, fairness, openness and bias and are measured using a seven-point semantic differential scale.

While not perfect, Meyer's Index is both extremely adaptable and reliable. One advantage of Meyer's Index is its simplicity; it required no rewording or adapting for the purposes of this research. It has been replicated multiple times, including its application to public health officials and four other groups by McComas and Trumbo (2001a). In its original test, Meyer found the scale to have a Cronbach's alpha of more than .82; later usage to measure media credibility had a Cronbach's alpha of .92, and McComas and Trumbo (2001a) found the average Cronbach's alpha for their five groups to be above .80. McComas and Trumbo (2001a) also established the scale's population validity, or generalizability across groups, by testing it across five different geographic areas and its ecological validity, or generalizability across situations, by testing it across five different environmental issues and with three different types of sources.

Although Meyer's Index has proven useful to risk communication researchers, it is by no means a definitive measure, as indicated by a review of the scholarship concerning the relationship between trust and credibility. Therefore, the researcher felt a need to better explicate the constructs before accepting the validity of the Meyer's scale on its face.

While trust and credibility may be highly correlated, correlation and congruency are two different things, and it does not mean the two constructs will always mean the same things to the same people. Importantly for this research, not only are trust and credibility different depending on the situation, but they may lead people to different behaviors. For example, a moderately well-off person in a small town may bank with a local community bank because he or she has a high level of trust in that institution, because it is well-established, provides a fair return on savings accounts or CDs, and shows caring and concern for customers. However, if that same person won the lottery and had $40 million dollars to invest tomorrow, credibility, rather than trust, might drive the decision to bank with a larger company, one that has expertise in sophisticated investments or financial planning. Trust might still be a component here, but it is clearly *not* the only factor in credibility. Using the two terms interchangeably would be presumptuous. The Meyer's scale, which measured trust as only one of several factors affecting credibility, implicitly acknowledged these constructs were different.

However, the Meyer's scale did not include some of the dimensions other researchers had identified, such as caring, commitment or dynamism, and it was

important to have some assurance that the Meyer's scale was exhaustive in identifying and measuring all of the factors subsumed in credibility. For that reason, the researcher explored the meanings of these words in the in-depth interviews that preceded the experimental phase of the study and was open to including measures of additional dimensions in the post-test questionnaire. Ultimately, a preliminary analysis revealed a remarkable consistency among respondents that mirrored the dimensions measured by the Meyer's scale, therefore nothing was added to the scale. Meyer's scale was further validated in a risk communication context by McComas and Trumbo (2001a).

While Meyer's Index was the basis of credibility measurement for this research, (L. J. Frewer et al., 1996) also argue in favor of exploratory research to develop situational measurements of trust that reflect the respondents' constructs, rather than the researchers'. To address the issue of construct validity, or how closely the theoretical concept matches reality, exploratory research was embedded in this study, to develop and ensure the appropriately tailored measures of trust and credibility that Frewer, et al. (1996) suggest. During the qualitative phase of the research, the researcher questioned interview participants about perceived meanings of terms such as "bias" and "fairness" in the context of public health credibility, as well as probing for other terms that might need to be included to fully explicate the construct of credibility. A preliminary analysis of the qualitative data supported the components of credibility included in the Meyer's scale and the researcher therefore did not feel additional questions were needed.

Measuring Behavioral Intention

The higher predictive validity of attitude toward a behavior versus attitude toward an object led the researcher to ask participants about behavior rather than opinion; that is, whether they would choose to follow a particular policy directive rather than simply what they thought of the directive.

Borrowing from the early work of Ajzen and Fishbein (1969), which investigated behavioral intention in a choice situation, the study uses a seven-point Likert scale to measure intention to follow either one or both pandemic flu directives.

Based on the results of the qualitative interview phase, a final question was added to the post-test in which participants read three systematically-rotated quotes from fictitious pundits or policy advocates challenging the policy directives by subtly raising their inherent contradictions. Participants were then asked if they would be likely to reconsider their behavioral intention to follow each of the two policy directives and if they would think twice about the credibility of public health officials. These questions were added for several reasons. Some people in the interview sample did not see the contradiction on their own, but it is likely that in an actual pandemic the inconsistency in the policies would be fodder for discussion in the media and the community. The questions would enable one last opportunity to see how these participants might respond. For all participants, it would also give some indication of the strength of their convictions. The exact phrasing of these questions was carefully considered and the “think twice” format was chosen so that people were not put in the situation of saying they had

changed their minds or had somehow been wrong in their initial answers about credibility and behavioral intention.

Additionally, to lend explanatory power to the quantitative results of the post-test, several open-ended questions were included that were not subjected to statistical analysis. Item 15 on the post-test questionnaire was "What do you think the greatest obstacle(s) would be for you in following the government directives mentioned earlier?" Participants were given a list of possible choices and asked to "check all that apply," with an open-ended "other" choice included as well. Participants were also given a chance to comment generally, if they chose to, after the completion of the experiment. These answers are discussed in the results section.

Recruitment of Sample

The experiment was conducted using a national probability-based, representative sample of the U.S. population via Knowledge Networks' KnowledgePanel[SM]. The researcher gained access to this resource through a grant from the National Science Foundation (NSF Grant 0647660, called Time-Sharing Experiments in the Social Sciences (TESS), principal investigators Diana C. Mutz and Matthew Davis).

The national KnowledgePanel[SM] consists of 40,000 participants, with extensive profiling information available for each individual, including demographics, political opinions and behavior, media usage and health. Unlike many online survey providers, the Knowledge Panel includes non-Internet households, which are provided with free web access and hardware in exchange

for participating. The panel was selected using list-assisted random digit dialing, then weighted to correct for any statistical variation between the panel and actual U.S. population. It is from this panel that the experiment's sample (*N*=444 planned, *N*=443 actual) was drawn. Individuals selected from the panel received an e-mail inviting them to take the survey and if they responded, were then randomly assigned to each condition.

According to best practices for quantitative research suggested by Wimmer and Dominick (2003), a minimum of 30 participants is needed in each of the cells or conditions. In this case, to allow for cross-tabulation of demographic differences and allow for error, the researcher requested the maximum sample size possible under the study's NSF grant; hence 56 people per cell were planned for each of the experimental treatment groups and 110 for the quasi-control group (numbers varied slightly, see Chapter Five for details). Using standard calculations of statistical power and conservatively assuming a small effect size and an alpha of .05, a sample of this size would likely ensure the statistical power of the study would be above .80 (Livingston & Cassidy, 2005).

The survey was fielded for two weeks to a group of 730 Knowledge Panel members, garnering 443 responses, for a survey completion rate of 60.9%.[7] According to information provided to the researcher by Knowledge Networks, the cumulative study response rate is calculated using four components: the *recruitment response rate* for the initial random-digit-dialing recruitment of

[7] The AAPOR RR3 response rate for this study was 2.6%, a completion rate based on the number of people originally approached through random digit dialing for recruitment on the Knowledge Panel. The panel recruitment rate was 22.2%. For specific formulas and further information, see the AAPOR Standard Definitions published at www.aapor.org/pdfs/standarddefs_4.pdf.

Knowledge Panel members, based on the AAPOR standard response rate; the *household profile rate*, which is the percentage of recruited households in which an adult has completed the demographic profile; the household retention rate, which is the percentage of households with completed profiles in which an adult remains an active member of the panel; and the *survey response rate*, which is the percentage of completed post-tests in the current research study. The overall cumulative response rate is the average of each of the four components calculated across all panelists sampled for a given survey and then multiplied together.

During the time the survey was fielded, the researcher monitored mainstream media including CNN, *The New York Times*, and *USA Today* for any significant news coverage of "bird flu" or pandemic flu, to be certain that confounding environmental variables were kept to a minimum. Although there was media activity overseas during the two-week period, a survey of Lexis-Nexis showed no articles in the U.S. popular press or transcripts from U.S. news broadcasts related to bird, avian or pandemic flu.

Following the experiment, Knowledge Networks delivered a clean SPSS data set to the researcher, including post-stratification weights and statistical frequencies.

Phase Two Analysis

Statistical analysis of the experiment was conducted using SPSS. Message type was the main independent variable along with a blocking variable

of message order; the dependent variables were credibility of public health officials and behavioral intention to follow the two government directives.

Chapter Four details the results of the interview phase of the study and Chapter Five reports the results of the experimental portion.

CHAPTER FOUR

PHASE ONE RESULTS

Phase One of the research study sought to build a formative basis of knowledge for constructing the treatments and questionnaire to be utilized in the Phase Two experiment. Importantly, it was a window into several relatively unexplored areas: knowledge and opinions related to avian/bird flu and policies to handle a flu pandemic; and trust and credibility of public health officials compared to other sources of information.

Participant Characteristics

The sample (*N*=19) was chosen to mirror the actual population whenever possible, particularly with regard to gender, age, income and educational background, with an oversample of minority populations. Participants were males and females ranging in age from 18 to 70; approximately half the sample comprised minority populations including African-Americans, Hispanics and those who self-identified as "mixed race." Their occupations included such diverse fields as full-time student, school teacher, therapist, custodian, auto mechanic, store clerk, computer programmer, homemaker, and research scientist. Participants will be identified here by pseudonym, age and occupation; see Table 1.2 for a summary of participant descriptions.

Each section below begins with a recapitulation of the research question(s), followed by a thematic overview of participant responses, then

supporting evidence in the form of interview excerpts, and finally, the implications of these formative data for design of the experimental treatments and post-test. Additional interpretation of the findings in included in the discussion section in Chapter Six.

RQ 1: Knowledge and Attitudes Regarding Pandemic Flu

Research Question One asked, "What are people's knowledge and attitudes regarding pandemic flu?" and a number of questions during the interview revealed these answers. The most direct was, "What have you heard about avian flu, sometimes also called bird flu?"

Theme: Superficial Knowledge, at Best

In general, most participants recognized the term "bird flu" but knew little about the disease; those who volunteered information typically had facts wrong. In the initial discussions, several people, while somewhat misinformed, seemed to have genuine concern about the potential severity of a pandemic; a couple of others already held skeptical views; however, the majority did not have enough information to make judgments about possible risks.

Of the 19 participants, only three[8] gave a response that correctly identified what avian/bird flu is and where it has been found.

[8] The results of the in-depth interviews are not intended to be representative of the population as a whole and therefore will be reported qualitatively most of the time. However, because it may be useful to know whether particular opinions were widely held or somewhat singular in this particular sample, the researcher will from time to time report the results quantitatively.

In one near-accurate response, the participant who had attended workplace preparedness training sessions confused the 30% estimated illness rate with a 30% mortality rate, far higher than the 2% actually predicted:

> **Paul, 48, white male, IT executive:** What I'm hearing is the possibility exists and that historically we've gone through cycles and we're probably overdue for a flu bug that we can't control. I've heard… that we should potentially be considering the case where 30% of our workforce dies. How do you protect the organization and manage the infrastructure when one-third of your people are gone?

Some participants saw avian/bird flu mostly as a threat to the food supply:

> **Rosalia, 27, Hispanic female, veterinary student:** I don't think I'm that familiar with it. Basically what I know is it started in Asia and so far it has spread to other European countries, the Middle East and… It's possibly a lot more spread than we think. I don't think it's affected humans the way people think "Oh my God, it's gonna get to me." It also affects the food supply. I think right now the food supply is the biggest problem in learning how badly it would affect the population.

> **Jessica, 34, mixed-race female, law student:** It was in Asia… They were killing all of these chickens to try to quit the spread of if it because I guess it could be transmitted to us if we ate the chickens…I didn't really hear a lot about people dying from it.

> **Catherine, 59, white female, homemaker:** I do know it pertains primarily to the Far East…. I think they recently found a bird or two in Eastern Europe, maybe. I'm not real sure, but I think, I don't know…. Am I worried about our poultry? No, I'm really not. In the same way, mad cow disease. I wasn't really worried about beef.

Several participants appeared embarrassed by their lack of knowledge, with Whitney, a white female 27-year-old costume designer and seamstress, for example, saying things like, "I know I should know this…" The response from the interviewers was to put participants at ease by reassuring them that the question was not a test and that "most people" had answered exactly the same way.

Two participants indicated significant prior interest in the topic of avian/bird flu and a third had been to a preparedness workshop sponsored by his employer. However, even among those who reported the most familiarity with the topic, their knowledge was neither complete nor accurate.

One participant whose strong opinions about the probability of pandemic flu are detailed later in this paper said he and his wife frequently discussed the topic but despite questioning did not volunteer any facts about the disease.

Another participant brought up avian/bird flu early in the interview, in response to questions about sources of general health information before avian/bird flu had been broached by the interviewer: "When they started talking about the bird flu, I read everything there was out there. I wanted to know what it was about." However, later in the interview, it was clear the same participant had some facts confused:

> **Jorge, 53, Hispanic male, e-learning specialist:** It's a very dangerous virus that is transmitted through birds…. It appeared for the first time in some country in another continent. I'm not sure if it was Asia or Africa and that *somehow it got to the United States and they found a few cases where they found birds dead…. I don't know if the virus gets from bird to human.* I understand it is very possible and very dangerous. It's not a disease that affects only the animals. It would be a disaster also, *our cows* and our livestock all dies at once.[9]

Others also believed the disease was already in the United States, but were not too worried:

> **Michael, 25, African-American male, botanist:** I have heard that it is… I don't know. I know it's deadly but *there haven't been many reported cases in the United States.* I don't think it affects me and so I'm not as knowledgeable about it.

[9] Italics represent inaccuracies or lack of awareness in basic facts about avian/bird flu.

Theme: "It's Out of My Hands"

Research Question One also sought to get a sense of people's feelings about avian/bird flu prior to any discussion of proposed pandemic policies, particularly their perceptions of a pandemic's severity, probability and relevance. In many cases, knowledge levels appeared to be so low that people had not formed opinions about the topic. Participants with the strongest opinions tended to feel the problem was in someone else's hands – whether it was simply out of their control as an individual, in God's hands, or being taken care of by public health officials:

Zach, 31, white male, retail sales manager: So, worst case scenario: bird flu is going to come in and it is going to wipe all of us out…. I'm not a doctor, I don't know how to fix it… I don't feel like there are any resources that I as a person in the community can contribute to a cure so it is completely out of my hands, absolutely nothing I can do to prevent it….

Leigh, 26, white female, behavioral therapist: I believe that God has things happen for a reason… God is totally in control and I think that when things happen, it isn't because God didn't know about it. Honestly if it happened I would say…Is this something that is going to affect me because of my lack of a relationship with the Lord?

Margie, 54, white female, special education teacher: It is not something that I think about very much. I rely on health officials to control it as best they can where they find it. I don't lose sleep about it, no.

Implications of RQ 1 for the Experimental Treatments

Important for the creation of the experimental treatments used in the second phase of research, the lack of knowledge and confusion of facts demonstrated in the interviews indicated that no assumptions could be made about what prior knowledge participants would bring to the experiment. The researcher therefore included several key facts in the experimental treatments:

the definition of a pandemic; a simple and non-pedantic explanation of the distinction between bird flu, bird flu passed directly to humans, and human-to-human transmission of a mutated virus; and predicted severity of a future flu pandemic, including possible mortality rates. While the quasi-control group received less information overall, it was given a definition of pandemic and brief information on its potential severity, to have a rudimentary basis of knowledge to answer the post-test questionnaire. This partial information prevented the group from being a true "control" group ultimately, because rather than being *un*informed, they were *under*informed.

Another way in which the one-on-one interviews informed the experiment was gauging the level of involvement participants had in the topic. Responses from people who found the topic of avian/bird flu too boring or irrelevant to have read much about it indicated a need to better engage experiment participants. Therefore, the researcher created the following lead paragraph for all treatment groups, including the quasi-control group:

> It's a disaster experts say could be 800 times deadlier than the September 11th terrorist attacks and would leave no community untouched: pandemic flu.

This paragraph used two techniques often seen in news writing and in persuasive communication: gaining attention with a shocking fact or statistic such as the comparison to 9/11; and emphasizing proximity, by stating that all communities would be affected by a pandemic. The first quote in the experimental treatment sought to explain and underscore the lead:

> "We are not talking here about the run-of-the-mill seasonal flu," said John Lockwood, a spokesman for the CDC. "These preparations are for a very severe form of the flu, like the Spanish

> Flu of 1918 that killed 50 million people around the world. A flu strain like that could kill more than two million Americans in a matter of weeks, so we have to be ready with a plan."

Similarly, the quasi-control treatment, which did not include quotes or information about pandemic flu policies but rather, discussed tips for preventing contagious diseases of all types, included information to support the lead:

> A very severe form of the flu, like the Spanish Flu of 1918 that killed 50 million people around the world, could kill more than two million Americans in a matter of weeks. That's about 800 times the death toll of 9/11, all from a few germs easily passed from person to person.

RQ 2: Anticipated Public Policy During a Pandemic

Research Question Two asked, "What kinds of public health directives do people anticipate in a pandemic?" Prior to broaching the specific issue of pandemic flu, the interview explored the issue hypothetically, asking participants to imagine any type of dangerous disease that might be transmitted through casual contact. The interview then moved into the area of avian/bird flu and flu pandemics specifically, asking people to think about some of the same questions as in the hypothetical, unnamed-disease scenario.

Theme: "Keep Me Informed and Shut Things Down"

Once again, knowledge was very limited as to what plans, if any, the government had in case of a pandemic. Because most people had little information about pandemic flu, they had not imagined scenarios in which action would be required to stop the disease. As a result, rather than testing the extent of their knowledge, this portion of the interview explored participants' gut reactions to the problem and how they would advise the government to react as well as how they would act on an individual level.

On a personal level, people tended to invoke typical infection prevention strategies such as good hygiene, whereas they saw the government's role in divergent ways, ranging from education to enforcement of mandatory quarantine. Once the concept of social distancing was introduced, most were prepared to support it, but they raised concerns about obstacles that "others" might face in complying: getting basic supplies, coping with isolation, paying the bills if forced to remain home from work, and feeling their civil liberties were violated. When public queuing was explained, there was support for the directive coupled with personal concern about the risks of gathering in a public place. The greatest worry was the risk of infection, but some were concerned with potential chaos and violence at distribution centers, others with the possibility of deportation.

Reactions to a Hypothetical Health Emergency. Although this study focuses on pandemic flu policy, its larger questions about public response to contradictory messages transcend any specific disease; additionally, pandemics can involve many other diseases besides influenza. To see the issue of contradictions more clearly without getting bogged down too early in the details of avian/bird flu, the questions therefore started with general public health policy, then moved to policy in a disease emergency, and from there to the specific case of a flu pandemic. Taking into account that people might have different ideas of what they should do as individuals and what the government as an institution should do in the event of a deadly contagious disease epidemic, participants were first asked how they would protect themselves and their families.

Participants typically fell into two camps when considering the hypothetical deadly illness: either they responded with ideas for slightly more stringent infection control than people might typically practice during cold or flu season, or at the other end of the extreme, they imagined the situation as so severe it would disrupt their lives dramatically.

Catherine, for example, was fairly nonchalant about the risks of a deadly pandemic:

> **Catherine, 59, white female, homemaker:** I would be concerned, but not enough to truly alter my lifestyle. I'd still travel, I'd still do what I do. Would it alter my lifestyle? Not that much, no.

On the other hand, many participants immediately talked about steps they would take to prevent infection:

> **Sharon, 38, African-American female, daycare assistant:** Washing! Doing a lot of cleaning… washing and gloves. Masks! Yeah, I would wear masks.
>
> **Jasmine, 50, African-American female, custodian:** Get that anti bacterial stuff so I'm constantly…I mean, like I said, I'm the type of person, even though I wear gloves, I still don't feel really safe with those gloves so that's why I keep some of the antibacterial… Disinfectant spray stuff quite a bit, too. Hopefully, that will kill some of the germs.
>
> **Maria, 18, Hispanic female, teacher's aide:** I guess eat healthy because you need all the protection that you can get. Just wash your hands a lot and keep clean and cover up any wounds that you have.
>
> **Pedro, 37, Hispanic male, auto mechanic:** I think to cover the mouth and nose. Avoid public places and if we have to go to the supermarket, maybe it will be nighttime… and then keep tracking the sickness and talk with the officials and see what they say that we need to do.
>
> **Rosalia, 27, Hispanic female, veterinary student:** Well, depending on what amount of time I have to prepare, I would

> probably try to find masks, not just surgery masks but real masks. …Once I know how it's spread or how we think it's spread – we may not know – I would just tell them all the precautions they need to do – masks, sanitation, contact with other people. What they eat… I don't know.

Several people said they would make additional efforts to isolate themselves:

> **Lois, 70, white female, homemaker:** Yes, I'd stay away from [my family in order to protect them]. I had pneumonia and I stayed away from the family.
>
> **Elena, 44, Hispanic female, research scientist:** Keep the kids inside the house and listen to all the rules that you'd have to follow.
>
> **Zach, 31, white male, retail sales manager:** Either [sick people] can be quarantined or I'd make an effort to remove my family from the scenario one way or the other.
>
> **Jorge, 53, Hispanic male, e-learning specialist:** I suppose I would leave because how would I be sure? I don't know. But I guess my first reaction would be yeah, because if it is as deadly as you are describing, contagious, I'd leave.
>
> **Jessica, 34, mixed-race female, law student: I**f I needed to stay home, the first thing I'd do is go to the Kroger and buy up some canned goods… I might would leave Georgia, just shut up the house and go somewhere else until it was over….

Still dealing with a hypothetical epidemic or pandemic (not avian/bird flu), participants were asked what they thought the government should do in such a situation. There were a wide variety of answers and some people suggested multiple approaches by the government. Some felt the most important role for government was educational:

> **Michael, 25, African-American male, botanist:** I would expect them to give actionable instructions on what to do, what to look for, how to protect yourself, where to go if indeed you do contract the disease or whatever.
>
> **Jessica, 34, mixed-race female, law student:** I'd expect them to first find a way for us to go on with our lives, kind of like I was

saying, can we wear a mask? To figure out enough about it so that we knew, you know, is it within five feet or is it within ten feet? When I walk into my classroom, is it lingering in the air because someone who had it has been there? Am I exposed to it every time I walk into this classroom regardless if the person who has the disease is in the room or not?

Lois, 70, white female, homemaker: I would expect them to be all over the radios and TV and newspapers.

On the other hand, many people wanted more than just information: they expected swift and decisive action:

Sharon, 38, African-American female, daycare assistant: Oh man… Shut down! (Laughs). That's hard. I would say I'm thinking about shutting the place down.

Michael, 25, African-American male, botanist: Shut down the United States if something like that happened and if there was an epidemic like that, and there weren't any guidelines for me to know who, how, what and what steps I needed to take to safeguard myself…I mean, shut down.

Jorge, 53, Hispanic male, e-learning specialist: They should require [quarantine]. I guess it depends on the degree of the danger. If it is really dangerous and really deadly, they should require it.

Jasmine worried that there was not much the government could do, but then ultimately came back to the idea of quarantine:

Jasmine, 50, African-American female, custodian: Well, if it's airborne, there's nothing really they can do…maybe tell people not to travel but other than that…I don't see anything that they could do in that situation because you can't just put [the city] in a bubble or something to keep it from spreading around.
Interviewer: What would you expect officials to do about a disease like that?
Jasmine: Not let them back in and have everybody that came in contact with that person to be tested.

Perceptions and Behavior in a Pandemic Scenario. When the questions moved from an unknown deadly disease to avian/bird flu, most people had a

similar response for how they would protect themselves and their families if the deadly disease was a flu pandemic. Several appeared to be dumbfounded when contemplating the reality of such an epidemic:

> **Jorge, 53, Hispanic male, e-learning specialist:** You really caught me off guard. That hasn't even crossed my mind.
>
> **Tiffany, 20, African-American female, undergraduate student:** The main thought that comes to mind is that how unaware people are about things like this… We just brush it off and think it could never happen to us… Mentally I don't feel people are ready to deal with something like this. I didn't know any of this stuff that you're telling me, but now it kind of gets me wondering…

For others, thinking in terms of a "real" disease seemed to make a difference, and they cited more stringent precautions for themselves and their families than they had under the hypothetical scenario. Thinking of a specific scenario also enlivened the conversation with regard to how the government should address the issue of pandemic flu, with more people mentioning the idea of quarantine. Rosalia also felt education before a pandemic was essential:

> **Rosalia, 27, Hispanic female, veterinary student:** We shouldn't have to wait till something comes up to educate people. Because when everyone's freaked out no one's gonna absorb anything, no one's gonna do the right thing.

Several people worried about people who might not obey common sense directives to stay away from others, and talked about "doing the right thing" by requiring mandatory quarantine:

> **Paul, 48, white male, IT executive:** [Mandatory quarantine] is a tougher call, but that's where the taking compassion out of the equation and doing the right thing comes in play, and I have to trust the experts on whether that's warranted. But certainly it is not acceptable for individuals to choose to put others at risk.

> **Margie, 54, white female, special education teacher:** I think you could start with voluntary but there's always irresponsible people who have to be coerced into doing the right thing.

In addition to the role of government in protecting people, several participants talked about the responsibility of business or of private individuals not to spread the flu to others:

> **Robbie, 36, white male, film animator:** I think it's the employer's responsibility if the person catches something like that, they should get a paid sick leave.

Several people said they already voluntarily stayed home from work or sent employees home when ill, and they expected the same of people in a pandemic. However, not everyone felt they would be able to choose for themselves whether to stay isolated – one executive stated that he would have no trouble authorizing his employees to stay home, but that his own bosses might not allow him to do the same.

Implications of RQ 2 for the Experimental Treatments

The interview responses for RQ 2 suggested that most people are starting with a clean slate when it comes to knowledge about what "should" be done in a pandemic and what the government's actual plans are. Accordingly, they had not thought much, if at all, about what their own response would be.

The good news from a communication point of view (both in reality and for purposes of the experiment) is that people intuitively saw a need for policies that sounded a lot like social distancing and public queuing. They also appeared to embrace the government as a source of education and information during a crisis.

However, the enormity of a possible pandemic scenario also seemed difficult for some people to grasp. Several were dumbfounded and found it difficult to ponder; others reacted as they might to a disaster such as a hurricane: they would stock up on groceries if they knew ahead of time, and if they thought their state was going to be severely affected, they would leave. Seen through the lens of short-duration, geographically-concentrated emergencies, the longer-term, nationwide or worldwide nature of a severe flu pandemic was a foreign concept. It was clear that the experimental treatments would need to include information about the timing and ubiquity of the crisis in order for participants to understand that government policies in a pandemic might not be just for a day or two or a community or two, but a way of life for weeks or months for the most of the nation.

RQ 3: Reactions to Social Distancing and Public Queuing

An important part of the treatment validation was being certain experiment participants would understand the two policies at issue, so that comprehension would not get in the way of the main effect of noticing and reacting to contradictions between the policies. Therefore Research Question Three, "How do people respond to the two policies of 'social distancing' and 'public queuing?" sought to explain the policies to interview participants and through their responses, determine how to briefly but adequately explain the policies to experiment participants. The researcher also listened for possible obstacles to compliance in these answers, to gauge whether these were a serious threat to intention to comply.

Theme: "I Would Do It, But Other People Might Have Some Problems"

On their own, many people had described policies similar to social distancing as what they believed the government should do in the event of a pandemic. The interviewer then told them the policy was part of the federal plan for pandemic flu, and talked about the kinds of social interactions that might be limited under social distancing (school or daycare attendance, work near others, sporting events, church services, movie screenings, shopping, parties, etc.), and the length of time it might last (a few weeks or perhaps a few months). Many people immediately endorsed the idea and said they would follow it:

> **Sharon, 38, African-American female, daycare assistant:** If that's what it takes, I mean, for safety, to keep everybody you know from catching or getting sick and spreading it, I think that's a great idea.
>
> **Michael, 25, African-American male, botanist:** I would follow all the guidelines. Because they know more than I do.
>
> **Elena, 44, Hispanic female, research scientist:** I would definitely follow what they tell me to do. Because there are things at work that you can't just stop but that would be very difficult but when you put your health in the balance and your family, I think that is the most important, health. And perhaps we would be very depressed because you don't see anybody, that would be very difficult but if you think about health and your family, I think that's the most important thing.

Leigh was one of the few opponents of social distancing. During the discussion of a hypothetical illness, she stated that she favored an individual who was sick staying home to protect others. But she was adamantly opposed to a government policy encouraging the general public to do so:

> **Leigh, 26, white female, behavioral therapist:** I think that it is ignorant. I do think, again, that they scare you. I think they have no idea what is going on and they can't explain it and [they use a

> policy like social distancing to look like they know what they're doing]. I think it is very unhealthy for people to not have…communication with others….The Bible says that fellowship is a necessity and important even though a relationship with the Lord or one to one is too.. and so is going to church and fellowshipping with other people. And so because I feel like it is important to fellowship, I think that you need to have that connection to other people.

She later amended her comment to say that a few days of social distancing would be acceptable but a long period was "ignorant." She added that compliance would be a personal, spiritual issue for her, "Definitely a decision between me and the Lord."

Several people who agreed with the concept of social distancing worried about the logistical realities of shutting down society, even for a short time. They wondered aloud how people would get food and basic supplies and proposed ideas such as "a giant delivery service" or ordering things off the Internet. Most presumed that the government must have a plan in place to provide for people in such a situation.

The questions then turned to obstacles to compliance, including whether it was "fair" or violated individual civil liberties:

> **Margie, 54, white female, special education teacher:** I think fair is nice, fair is not realistic in this world. What's fair? That I go out and give everyone a disease and some of them may be dying from it? Is that fair? So, I don't' think fair matters in this, I think you need to do what is right.

> **Catherine, 59, white female, homemaker:** I think it would be incredibly difficult to say to an elderly person, who's maybe 72 or 73 that goes to church everyday. And you say to this person, well you can't go to church anymore, because that would raise issues with that person. It wouldn't bother me not to go to the mall. But livelihood or church or school, that would kind of – I'd have an issue, that to me would be almost an infringement of my rights.

Catherine brought up the issue of civil liberties numerous times, though always in the context of other people's rights, not her own. She did not seem to object following the policy herself and later said she would encourage her adult children to do the same.

> **Paul, 48, white male, IT executive:** Well, teenagers would be a little anxious and climb up walls, but I can handle it.

> **Margie, 54, white female, special education teacher:** Well, I don't know, I guess you could get bored in your house. Like I said, you have to go to the grocery store, there are things you have to do, you couldn't survive for months without food. I guess commerce would take a big hit, closing the malls down…might finally get the OPEC nations under control because we wouldn't be driving. So, I guess financially it would be a burden to people who have businesses in general…other than that, you can make up school, you can call your friends on the phone, you can watch church on TV, although most of those guys are quacks….(laughs).

Compliance was a major theme. Every participant felt they would be able to comply, but many worried about other people. In some cases, this concern led a few to advocate mandatory quarantine:

> **Lois, 70, white female, homemaker:** Well I think some would listen to it and wouldn't do it. They're just that kind of people. I know people who won't pay attention, but just go and do whatever they want. I don't know that I know anybody like that, but I have heard people make statements like that.

> **Jasmine, 50, African-American female, custodian:** To stay at home, I would. But it would be hard [to enforce] unless [the government] put a watch or something on to make sure they don't [leave their homes].

> **Margie, 54, white female, special education teacher:** I don't know how efficient it would be because there are some people who just don't ever listen to anybody…. If that's what we had to do, as the people of this country to keep the country safe from this epidemic, that would be okay with me. Do I think everybody is going to do it? Oh, no.

However, Sharon did not think compliance would be a problem if accompanied by education:

> **Sharon, 38, African-American female, daycare assistant:** I think…I think they would [stay home] if they know it's a life [threatening situation]… You know it'd be rough. There's people out there they'd be like "well that's not true." You know as far as they believe.

Several people expressed concerns about the economic impact of prolonged social distancing, either for other people or for themselves:

> **Jasmine, 50, African-American female, custodian:** How would people survive? If you're shutting down all of the businesses, then what is the world coming to? I don't see how that could work. … Certain jobs have to be done everyday and if you stop people from doing these certain jobs everyday, there is going to be a problem. And then that probably would really cause other diseases and stuff like that to come up. …If I'm not working making money, how am I going to pay my bills?

> **Sharon, 38, African-American female, daycare assistant:** That would be the thing… not being able to go to work. Money, bills, I mean… how would they pay their bills, how would they be able to put food on the table, to survive.

> **Catherine, 59, white female, homemaker:** You would have people that just couldn't do it because they were not in a financial position, or social, you know. I mean, on paper that looks great and sounds great, but the factors that you'd have to really take into consideration… Are they going to pay my salary for the next month while I don't come into work? And if they don't pay my salary, how do I live?

Theme: "It Doesn't Sound All That Safe, But I'd Go If Had To"

Because many people had worried about the ability of themselves or others to get supplies in the event of a strict social distancing policy, there was an almost palpable sense of relief among some participants when the interviewer told them about government plans to distribute medicines and possibly other

supplies at central distribution centers. For some people, there were dangers in the public queuing idea, but not necessarily dangers of infection. Pedro, a 37-year-old Hispanic male who works as an auto mechanic, described a disaster in California in which people were deported when they came forward for assistance. Zach, a 31-year-old white male who works as a retail store manager feared people bringing automatic weapons to a distribution facility to commandeer supplies. Paul, a 48-year-old white male employed as an IT executive, worried about the "hassle" of long lines and large crowds.

Participants were first asked what they thought of the policy and if they would be comfortable going to a distribution center to pick up medicines or supplies during a pandemic in which they were practicing social distancing, and what precautions they would take, in any. However, some had concerns about the health risk involved in public queuing:

> **Jorge, 53, Hispanic male, e-learning specialist:** I would be very, very hesitant, very reluctant. It depends on the… situation.

Like Jorge, many people reported being reluctant to mingle with others at a supply center, but were resigned to the fact that they might not have a choice if they needed food or medicine in a pandemic. Many people felt they could take adequate precautions, but nevertheless, some worried about their loved ones and would be hesitant to bring them along.

> **Michael, 25, African-American male, botanist:** [I would take] all the precautions that they tell me to take…. I'd try to see if they'd mail [the vaccine] to me. If I had to go, I'd go, take the chance, and get the vaccine. If I'm not going to get [the flu] anyway by staying at home, then I'll just stay at home.

> **Rosalia, 27, Hispanic female, veterinary student:** If I had adequate protection I probably wouldn't care… I would just go. I don't think I would let the entire family go. It should just be one person. It would probably be me.
>
> **Lois, 70, white female, homemaker:** Well, I think you would just do everything you could to take every precaution you need.
>
> **Paul, 48, white male, IT executive:** If I drew the short straw, I'd go to get the food for the day?…I'd feel better about going to a smaller distribution site than a large central one….

Implications of RQ3 for the Experimental Treatments

Once again, it was clear the experimental treatments would need to provide sufficient background knowledge about the policies of social distancing and public queuing for people to grasp the concepts and be able to answer related questions.

It was also evident from the interviews that while most people stated they intended to comply with both policies, they were not without questions and concerns – in other words, the policies seemed to be accepted with reservations. Often these concerns were voiced in the guise of problems that "others" would have with the policies. This raised a tricky issue for the study: would people be honest enough about their own reservations about policies to state their own intended behavior? Including questions about the intended behavior of other people was a possibility, but one that moved the focus away from the impact of two-sided messages on individual decision-making and instead began to enter the theoretical territory of the third person effect and optimistic bias. On the other hand, it was also possible that the focus on "others" was a result of the desire to say what they thought they should say or what the interviewer wanted to hear,

and that the relative anonymity of the experiment might embolden people to be more honest.

Given the exploratory nature of the experiment, it was decided to forge ahead with the questions about individual behavioral intention, but to give people several opportunities to indicate their reservations – by asking them about potential obstacles to compliance and about whether concerns raised by others might give them pause.

RQ 4 and RQ 5: Perception of Contradictions

Once the second policy of public queuing had been introduced and juxtaposed with social distancing, concerns began to surface among some participants, but not all, about the contradiction between two policies. The data in this section therefore corresponds to the following two qualitative phase research questions:

> **RQ4:** Do individuals perceive contradictions between social distancing and public queuing?
>
> **RQ5:** If contradictions are perceived, what is the response?

Theme: "It Doesn't Make Sense, But I Can't Think of Anything Better"

In general, responses bore out the idea that people would find the two policies of social distancing and public queuing contradictory or inconsistent. For some, the logical inconsistency was very troubling; others resigned themselves to it because they could think of no alternative. About half the group felt that while the two policies were technically inconsistent, public queuing was a qualitatively different risk

than congregating for other purposes such as work, school or fellowship, and they therefore envisioned the two policies co-existing successfully.

Several people immediately mentioned the differences in the two policies. Robbie's initial musings below about public queuing encompass many of the interviewee comments[10] and provide a glimpse into his thinking as he processes the idea aloud:

> **Robbie, 36, white male, film animator:** That's such an odd case because, you know, the very fact that people congregating is what can spread the disease, so it seems that instance, maybe there should be some sort of emergency postal system to get medicines. I don't really think you can get the food that way, that would be pretty tough, but medicine is a pretty small, generally is a pretty small bottle and it seems like that…
>
> I mean if the medicine and vaccine were being distributed in that way, I guess I would probably need to. I wouldn't have much of a choice but I don't really see how that…I mean, again, you have a centralized location so that forces many, many people to congregate in one area. It seems almost self defeating although the medicine is necessary, maybe it could be mailed to them. Maybe…
>
> I mean, but to mail it to every person in the city, I don't know how you would…That would be a massive…I don't know, I have never really thought about this kind of thing and the logistics of it. I mean…so what do I think about that, it seems like probably the best alternative there is right now and I think definitely people staying away from nonessential areas where large amounts of people congregating, that is important but I don't really know enough about the logistics of that kind of thing to really have a strong opinion.

Another person who quickly noticed the contradiction was Margie, but she was not especially troubled by it:

[10] Some of the longer comments in this section represent participant responses to multiple questions. Non-substantive interviewer questions, prompts and comments are left out for ease of readability.

Margie, 54, white female, special education teacher: Well, if we all had to go get our food at a central location, we'd all be there together and if the whole thing is to avoid us being together, they need something in place so that there's smaller groups of people at a time. You can't stay at home and not have food so you have to do something about that. If the stores are closed because nobody is at work, you have to get food somewhere so you have to…go to whatever this station they have set up to get it. The only other option would be to hand deliver to everybody, that is ludicrous, that's just not doable logistically. So, I mean, like I said, you can wear a mask and go as seldom as possible, don't take your whole family, unless you have to go for inoculation…

Leigh was very troubled by the logic of combining social distancing and public queuing:

Leigh, 26, white female, behavioral therapist: Well, I think if you first tell people to stay home and then say, "Well, come out and get medicine", are they really going to come out and get medicine? You just pushed and locked them into their house and told them "If you breathe the outside air, you'll die" and so now you want me to breathe it and on my way breathing it, get medicine so I don't die on my way home. I think that's dumb. Again, personally, I'd do think it would be a decision between me and the Lord....

Jasmine agreed that the policy did not make sense:

Jasmine, 50, African-American female, custodian: And see, right there, if they're trying to keep people from being together…how is that solving the problem? Well, that's what I'm saying, if they really don't want anybody interacting, and you're going to shut everything down, then shut everything down. No "going here for a minute" or whatever…and if the government is really that involved in it and if they want you to have medicine or whatever, it looks like they could deliver it or set up some kind of routine, you know, where you wouldn't have a whole bunch there at one time.

The next question asked participants if they felt there was a difference between the risk of going to work to earn a living during a pandemic and the risk of congregating with others at a central distribution point. For those who had already pointed out the inconsistency, it was an opportunity to explore their

perceptions further; for others, it raised the issue of potential contradiction for the first time. When asked whether they saw any problems simultaneously following the two policies, several participants felt public queuing stood to undo the effect of social distancing:

> **Paul, 48, white male, IT executive:** Well, the crowds that would occur, that you were trying to avoid. That would be the big one. We're trying to distance ourselves, trying not to spread the disease, but then you make central locations for people trying to get food, that's where they are all going to be.
>
> **Rosalia, 27, Hispanic female, veterinary student:** What is the purpose of keeping people from going to the movie theater but having them congregate to get medicine?

Some saw a substantial difference in the risks, with public queuing a much lesser danger than other types of contact:

> **Robbie, 36, white male, film animator:** Well, I would almost be in agreement except for the amount of time, I suppose. If it's really efficient, which I kind of don't think it really would be, then you would definitely be spending less time around other people in order to pick up medicine than you would at a full day of work.
>
> **Zach, 31, white male, retail sales manager:** I think everybody coming together for a few moments to get their food and go back home, that's a scenario as opposed to people freely gathering for social interaction just to hang out.
>
> **Margie, 54, white female, special education teacher:** Is it perfect? No, it's not a "hundred percent" policy but when you think about it…like I said, you can't have somebody in a white suit come deliver your groceries and your shots to every house in America, that logistically won't work. [The government wants] you to be isolated as much as possible but a hundred percent is not possible. So, yes, I can see, there are two separate things but I don't see them in conflict.

Ultimately for several participants, their acceptance of the two policies as a package came down to the fact that they could not think of an alternative:

> **Jessica, 34, mixed-race female, law student:** I would…yeah, I guess I can't think of a better way to do it. That's the issue so…yeah, I'd do both because I can't think of a better way.

> **Robbie, 36, white male, film animator:** Um, you know, it's, I guess it's the best they can do with the resources that they have. I mean maybe they could do something better. I don't really know what the limits of technology are as far as systems like the postal system and I don't really know what they are capable of so, it sounds ok but it also sounds kind of '70s or something. It doesn't sound like a 21st century response to that kind of problem. You know what I mean? It sounds more 20th century. It sounds like they could do better.

Leigh strongly believed the government could come up with a better plan, and summed up her position with this:

> **Leigh, 26, white female, behavioral therapist:** Seven billion dollars and that's all they have?

Implications of RQ 4 and RQ 5 for Experimental Treatments

Responses to the portion of the interview regarding contradictions showed that the vast majority of people noted them. This was critical to the validation of the experiment, since it was concern on the part of health risk communicators about inconsistencies in the two policies that first prompted the idea for this study. A dilemma in the development of the experiment was providing enough information about the two policies that both the quasi-control group and the one-sided message group would have an opportunity to notice the contradiction without being "led"; the interview findings suggested that weaving a simple explanation of both policies into the post-test questions would likely be sufficient for people in both the quasi-control group and the one-sided message group to potentially grasp the contradiction.

A second key finding from the interviews is that people had a variety of responses to the perceived contradictions, suggesting that participants in the experiment might exhibit a range of opinions as well.

RQ 6: Consensus on the Credibility Construct

The experiment uses an existing scale, the Meyer's Credibility Index, to measure the dependent variable of source credibility. However, because there is a lack of consensus in the literature about the dimensions of the construct and to better explain results of the post-test credibility questions, interviewees were asked to discuss perceived credibility. Therefore, Research Question Six for the one-on-one interviews was, "How do individuals weigh the credibility of various sources?"

The research question was examined in two ways: directly, by exploring what meaning certain words used in the Meyer's Credibility Index had for interview participants; and indirectly, by finding out which sources people consider most useful and reliable, and perhaps by extension, most credible.

Participants cited many sources of information on health issues and indicated they typically seek multiple sources and assign varying degrees of credibility to them according to the specifics of the situation. Their impressions of public health officials were often colored by past experience and familiarity, in many cases, tended to breed contempt. The value of public health officials as a source clearly related to credibility, and participants discussed credibility very much in the general terms used by Meyer's Index. However, while issues that sounded like the researcher's own definitions of bias and fairness arose in the

wide-ranging discussion of feelings about public health officials, when the actual words were presented to participants, people had about divergent opinions of what “bias” or “fair” meant to them.

Nearly all interview participants distinguished *caring* and *compassion* from *credibility*, indicating no real need to include these concepts in the post-test credibility measure. However, numerous people brought up non-verbal cues to credibility that evoked the concept of *dynamism*.

Theme: Multiple Sources of Information, Varying Levels of Credibility

To gain a complete understanding of the source credibility construct, it was important to understand its context with regard to public health officials. Therefore a portion of the interview dealt with sources of information people typically turn to in the face of an important health issue or crisis, including personal or family health situations and more widespread community health crises. By asking where they would turn for information, it was possible to develop an implicit understanding of what sources they felt were most credible. In the analysis of their comments, particular attention was paid to the order in which they named these sources, as well as to whether the participant named multiple sources entirely without prompting or appeared to include others only as an afterthought or in response to follow-up questions.

Answers ranged across the board, from friends and family, to doctors and other medical professionals, to the Internet and reference books, to the media and official bulletins from the workplace. Most people cited multiple sources of information, but there was no clear majority choice. The largest plurality named

physicians or medical professionals as their most likely source of information, including several people who cited the health department. Some people routinely consulted medical professionals who also happened to be friends or family members.

There were, however, several people who either did not mention doctors at all or indicated that doctors would not be a go-to source for them. Whitney, a 27-year-old costume designer and seamstress, said she would not seek out a doctor herself but might try to find out what friends' doctors were saying. She later explained that she had been uninsured for some time and therefore tried to avoid doctors.

The Internet was a close runner-up to physicians and medical professionals as the primary source of information for people. Like doctors, the Internet appeared in virtually everyone's list, even if not as number one. A few people also mentioned medical books and journals as possible sources.

Friends and family were consistently named as an important source of information for people, following closely on the heels of medical professionals and the Internet. In some cases, participants felt these significant others had wisdom or experience to share; in other cases, they were calling on friends or family to use special skills or tools, such as asking relatives with Internet access to do research for them.

When it came specifically to a health issue that affected the whole community, the Internet and other media were the sources of choice for most people. However, several did mention public health officials as their source of

choice for information about a community-wide health emergency and stated they would call the health department directly, rather than waiting for public health officials to appear in the media.

No matter whether the health issue was personal or public, the clear theme that came across in these responses was that few people utilize just one source of information. The following responses were typical, reeling off a panoply of sources:

> **Margie, 54, white female, special education teacher:** Generally, I go first to my friends, we talk, and kind of share information of what we know. I might Google it, I might get a book and read up on it, and then if I need help I go to the doctor.
>
> **Maria, 18, Hispanic female, teacher's aide:** So far, I've asked my pediatrician, my mom or my grandmother or another mom. [When what my doctor told me] didn't work… I went to the Internet.
>
> **Jasmine, 50, African-American female, custodian:** My private physician. Naturally, my family. And then I have a set of medical books that I had ordered maybe five or ten years ago so I'd try to look it up in there.

Implications of RQ 6 for Experimental Treatments

The results of this portion of the interview answered some questions about utility of Meyer's Index of Credibility, but raised others. The first and most important issue was whether some of the elements of credibility found by other researchers, such as dynamism and caring, should be included to fully explicate the construct.

Pervasive comments about non-verbal cues to credibility such as confidence and eye contact sounded a lot like prior operationalizations of dynamism, and the conclusion from these interviews is that dynamism may indeed be an integral part of perceived credibility. However, the non-verbal cues

that lead to dynamism are generally only observable in person or on video. Given that the experimental treatments were print-based, dynamism could not be judged in the same way. Therefore, the conclusion for this study was that dynamism did not need to be included as one of the dimensions of credibility, but that it should indeed be part of any video-based study seeking to measure credibility.

A similar rationale led to the exclusion of caring/compassion as a dimension of credibility in this study. First, although two people indicated that for them caring/compassion was an essential part of the credibility of a message, their criteria for identifying the characteristic were primarily non-verbal cues and gut reactions, which again, did not lend themselves to the print-based experimental treatments. Second, while many people had mentioned the non-verbal dynamism cues, caring/compassion was only brought up unsolicited by a couple of participants; moreover, when questioned, many people specifically disavowed any connection between perceived caring/compassion and the credibility of a message.

In addition to determining whether dimensions needed to be added to Meyer's Index, the interview phase sought people's reactions to the words used for Meyer's five dimensions of credibility: trust, accuracy, openness, fairness and bias. There were some reservations about the vocabulary used in the index: the words *accuracy* and *bias* were not recognized by at least one participant for whom English was not the first language. It is difficult to determine given the small, non-generalizable nature of the interview sample whether this might be a

widespread problem, and if so, how it might affect results. After some consideration, this was dismissed as an immediate concern due to the possibility that a large, representative sample would ameliorate the problem.

Also, two of the words used in the scale appeared to have divergent meanings for participants. In the case of "fair," the two meanings -- "treating all people the same" and "impartial in judgment" were closely related, but not identical. However, "bias" did not garner the same consensus, and in fact, left out meanings the researcher felt might be held by some, such as the use of the word in the context of racial bias. Changing the word was considered, but, ultimately, rejected for two reasons. Number one, there was no single synonym that could capture all of the many possible meanings for "bias." Number two, past uses of Meyer's Index had used "bias" with all it various connotations and it was impossible to narrow those connotations to just one and still claim to be replicating the scale. So while noting this issue for future research directions, the researcher moved forward, albeit with some hesitation, with using the Meyer's Index.

RQ 7: Behavioral Intention to Follow Public Health Advice

As an additional lens through which to examine credibility's influence on behavioral intention, Research Question Seven asked, "When one source conflicts with another, how likely is someone to follow the advice of a public health official?" Therefore, the interview asked people about their likelihood to follow the guidance of public health officials, especially if that advice conflicted with information from other sources.

Theme: Following Advice from Officials, As Long as Other Sources Agree

When initially asked general questions about how they usually felt about the information they received from public health officials, several people felt they would follow almost any official advice:

> **Michael, 25, African-American male, botanist:** At the end of the day, I know that they know more than I do and they wouldn't get on there and tell me to do anything that would be counterproductive to my health so I take them as credible sources, I listen to them and try to follow their guidelines.
>
> **Jorge, 53, Hispanic male, e-learning specialist:** I would believe everything they say. I mean, I trust them highly I would say…. Especially if it was a CDC person or EPA, if they say, "You need to do this" or "Get a flu shot", I would do that. I would believe them.
>
> **Sharon, 38, African-American female, daycare assistant:** I would feel pretty safe. [Public health officials] let me know what's going on and I'd feel kind of at ease…or you know, comfortable.
>
> **Zach, 31, white male, retail sales manager:** [My] basis for trusting the CDC and the Surgeon General is the fact that I'm assuming that they were put in place by respectable people whose reputations are on the line…to put somebody in that role would mean that you trust them.

Most people felt they would follow advice from a medical professional within reason if it made sense to them, and if they could afford it:

> **Pedro, 37, Hispanic male, auto mechanic:** First, my capabilities to do it sometimes. If I have a formal diet but I need to buy certain products but they cost a lot…so first of all if I am able to follow their recommendations is the first step.

Among several people, there was a strong belief that while public health officials might offer advice, they could only speak about what was best for the population as a whole; many participants preferred to follow advice from someone who was familiar with their personal situation:

> **Jasmine, 50, African-American female, custodian:** I'd say it still depends because…the way I feel, nobody is truthful about

> everything. So, it depends on what it is. Well, like the health officials is talking more in general about a wider area. Then if my personal physician is right here close to me, I'd think I'd go by what he said first because to me, he would be closer to the situation instead of somebody like way off.

The value of proximity was a theme for several participants. For Pedro, someone he knew personally might have more influence, although he did not entirely discount the expertise of a public health official:

> **Pedro, 37, Hispanic male, auto mechanic:** …Maybe I could trust the person who is most closest to me. If an official is talking about a general thing but this person is talking about me so maybe I will trust more about the person is…and it is depending on the issue, too, because maybe the official knows a little more about the problem.

Michael said he would tend to follow the advice of his brother, a doctor, over conflicting advice from an official, mostly because of his brother's medical credentials but partly because of the family connection. However, it ultimately seemed to come down to the same issue of proximity that others described:

> **Interviewer:** So, your brother tells you this one thing but then the CDC is on the national news saying something different than what your brother has told you…do you still go with your brother?
> **Michael, 25, African-American male, botanist:** Yes, because the CDC is talking to everybody, my brother is talking to me.

Others said they would verify the guidance first, and importantly, that they would weigh their choices, reject official guidance that did not seem to make sense to them personally and make a decision for themselves if possible. Several participants told stories of personal experiences where they had sought a second opinion and rejected health department advice, but several felt that there was little choice if the government tell you to do something. While many participants spoke in general or hypothetical terms, several recounted past direct

interactions with the local health department that had left them puzzled or unsettled, such as when they contacted the health department and got vague reassurances or advice.

Questions were also raised about the handling of past health emergencies at the federal level. Jessica was one of several participants who brought up the case of the Atlanta man wit tuberculosis who traveled to Europe on his honeymoon in defiance of guidance from health authorities. She was critical of the government's role in the case:

> **Jessica, 34, mixed-race female, law student:** I don't have a lot of trust for the CDC. The Surgeon General I would say I have more trust but the CDC I don't have much trust at all. I watched the whole [tuberculosis story] and read a lot, probably more than most people did about it and it seemed to me like a big cover-up was happening. I didn't feel like they were straight with the way that things actually happened and the media here, in Atlanta, at least or Georgia seemed to try to pretend like this guy hadn't done anything wrong and I don't understand why that was except that his father-in-law was a member of the CDC. So, it was just that whole incident that made me think differently about them.

Participants were specifically asked how they would handle a situation in which two sources of information gave them conflicting advice. Many people said they would try to find a third opinion. Several people who had earlier described themselves as extremely trusting said that if a preponderance of information disagreed with official guidance, it would lead them to doubt public health officials.

Rosalia, herself a physician in training, felt she would take the best of any conflicting health messages and cobble them together:

> **Rosalia, 27, Hispanic female, veterinary student:** I think that you have to take both parts… a little bit of both aspects. Because there's so much we don't know about science that you have to consider the variables. And the possibilities that things are not exactly how it would be… things can change. Viruses, all that stuff. So you gotta take in a little bit of both I guess.

Implications of RQ 7 for the Experimental Treatments

An important step in treatment validation was to sense how much variation there would be in intention to follow the advice of public health officials, and whether given the high levels of perceived credibility that many interviewees expressed, they would be willing to go against the advice of those officials.

Answers to the behavioral intention questions here indicated that some deliberation would take place if there was a reason to question official advice; therefore, it was possible that a contradiction that seemed to defy common sense might erode compliance to some degree. In that sense, the "conflicting source" might be an internal one, based on the participant's own reasoning or recognition of the contradiction between social distancing and public queuing. Earlier in the interview, this internal source did not seem to bother people who recognized the contradiction but said they would comply with the policies nonetheless. However, when asked about conflicting *external* sources, participants had said such sources would potentially lead them to question the advice of public health officials.

To see if *external* conflicting sources would be more powerful than a person's own inner voice, the researcher decided to add comments from three fictitious pundits to the end of the post-test, followed questions asking if the

comments would lead people to think twice about the advice of public health officials or about either the social distancing or public queuing policy.

Table 4.1. Demographic Characteristics of Interview Participants

Pseudonym	Gender	Age	Race	Occupation	Education level
Elena	Female	44	Hispanic	Research scientist	Ph.D.
Lois	Female	70	White	Homemaker	High school
Jasmine	Female	50	African-American	Custodian	High school
Jessica	Female	34	Mixed race	Law student	Bachelor's
Jorge	Male	53	Hispanic	e-Learning Specialist	Masters
Leigh	Female	26	White	Behavioral therapist	Some college
Catherine	Female	59	White	Homemaker	Bachelor's
Margie	Female	54	White	Special education aide	Some college
Maria	Female	18	Hispanic	Teacher's aide	High school
Michael	Male	25	African-American	Botanist	Masters
Paul	Male	48	White	IT executive	Masters
Pedro	Male	37	Hispanic	Auto mechanic	Less than h.s.
Robbie	Male	36	White	Film animator	Bachelor's
Rosalia	Female	27	Hispanic	Veterinary student	Bachelor's
Sharon	Female	38	African-American	Daycare worker	High school
Tiffany	Female	20	African-American	Undergraduate student	Some college
Trent	Male	31	White	Computer programmer	Bachelor's
Whitney	Female	27	White	Costume designer	Bachelor's
Zach	Male	31	White	Retail sales manager	High school

CHAPTER FIVE

PHASE TWO RESULTS

This chapter will report the results of the experimental portion of the study. First, results of the preliminary analysis will be reported, including characteristics of the sample, examination of descriptive statistics, and initial statistical analysis. Second, the step-by-step preparation of data for further analysis will be reported, including reverse coding, factor analyses and the development of dependent variable indices. Third, in the context of the hypotheses for the experimental phase, outcomes will be reported for statistical tests examining differences among experimental condition groups (the independent variable) on measures of the two dependent variables, perceived credibility of public health officials and behavioral intention to comply with government directives in a pandemic.

Finally, while not directly related to the hypotheses of this study, additional data will be provided regarding differences within key demographic groups. Income and education have sometimes been found in past research to impact the effect of message-sidedness and therefore it is important to note if such differences are seen in the current results. Additional demographic variables such as race, age and gender will be examined for exploratory purposes only.

Preliminary Analysis

The research firm, Knowledge Networks, provided the researcher a clean data set already entered into SPSS. First steps were to evaluate the quality of the data and to determine whether sufficient differences existed among groups to warrant further analysis.

Sample Characteristics

A total of 443 respondents participated in the experiment. Participants were randomly assigned to treatments and were divided approximately evenly among the six experimental groups (ranging from n=51 to n=56 participants per cell). To facilitate statistical analysis with equal sample sizes later in the analysis, the quasi-control group contained approximately twice the number (n=116).

The sample was national and randomly drawn from a panel of 40,000 participants initially recruited by random-digit-dialing. It was closely representative of the U.S. population on most measures: 47% were male and 53% female; age was approximately normally distributed in categories ranging from 18-to-24 to 75-plus. Racial distribution comprised white, 78.6%; black, non-Hispanic, 7.9% black; Hispanic, 9%; multi-racial, non-Hispanic, 2%; and "other, non-Hispanic," 2.5%. Distribution among categories for highest year of education completed was less than high school, 12%; high school, 31.4%; some college, 26.5%; and bachelor's degree or higher, 30.5%.

Frequencies and percentages for all of the above demographic characteristics, as well as for income levels and regional distribution, are compared to the U.S. population in Table 5.1.[11]

Initial Review of Variable Descriptives

The researcher inspected frequencies of all variables to identify any patterns in the data. First, as a prerequisite assumption for conducting analyses of variance, examination of the data established that both the seven-point semantic-differential scale used for the five credibility questions and the seven-point Likert scale used for the 12 behavioral intention questions had a sufficient distribution of responses to consider them both to be interval scales.

From this cursory examination it was also clear that participants had tended as a whole to respond positively on questions of both credibility of public health officials and intention to comply with government directives. Responses to open-ended questions included in the post-test for explanatory purposes also stood out. The first was a question about possible obstacles to compliance with government directives; additionally, there were noteworthy responses to the "think twice" items that asked participants to reconsider perceived credibility and behavioral intention after reading criticisms of the policies. These responses will be reported later in this section and discussed at length in Chapter Six.

Omnibus F test

[11] Additional demographic variables including household size, marital status, number of children within various age categories in a household, occupation type, workplace location, home ownership, and Internet service in household were provided by Knowledge Networks but were omitted from analysis.

As a first step to establish the validity of further analysis, an omnibus F test was conducted against responses to items in the post-test. The groups compared were the six experimental treatment groups: three types of message-sidedness and within each of those, messages presented in two different orders, for a total of six groups in all. (There was also one quasi-control group, compared to all groups in a subsequent analysis.) To control for the possibility of group-wide Type I error, a Bonferroni adjustment was made. Of the 17 items where group differences could be evaluated,[12] seven showed significant group differences at the α=.05 level; therefore, further investigation was warranted. See Table 5.2 for the ANOVA summary table.

Preparation of Data

Several steps were needed to prepare the data for meaningful analysis. To make results more clear, items 6 through 12, 14 and 16 through18 were reverse-coded in ascending order from "very unlikely" to "very likely," so that scores on those questions increased as the intensity of likelihood increased, i.e. "higher score equals bigger likelihood." (For example, on the post-test questionnaire, Item 9 asked, "During a flu pandemic, if public health officials told you to go to a public health clinic for medicines or vaccines, how likely would you be to do it?" Participants could choose any of seven "radio buttons" between the words "very likely" and "not at all likely." These raw data were initially scored on an ascending seven-point scale, giving the highest score to the person least likely to comply. Reverse-coding was done to make data more understandable to the reader of the research.) Additionally, item 13 was reverse-coded so that

[12] Open-ended or explanatory-only questions were not included in the ANOVA.

scores corresponded to the increasing intensity of difference on a scale that went from “not at all different” to “very different.”

Development of Dependent Variable Indices

The second step was to create an index for each of the two dependent variables, perceived source credibility and behavioral intention. The response items believed to constitute each of the two variables were first subjected to principal components factor analysis with varimax rotation, then a reliability check was conducted on each.

Credibility index. For perceived source credibility, five questions had been used as a measurement, based on the Meyer’s Credibility Index, an established scale that has been replicated in a risk communication context. To validate the scale and to explore its dimensionality, a principal components analysis with varimax rotation was conducted. According to the Kaiser-Guttman standard, Eigenvalues of 1 or over were included and according to the commonly accepted practice, only factor loadings with absolute values of .4 or more were retained for further analysis. Cases with any missing data were excluded. As expected based on past studies using the scale, only one component was extracted (Eigenvalue 3.71), which explained 74.1% of the variance. The test met the threshold of sampling adequacy according to the Kaiser-Meyer-Olkin test, with KMO=.86 (Kaiser & Rice, 1974)[13] and Bartlett’s test of sphericity was highly significant (p=.000), suggesting the factor analysis was appropriate. Reliability testing of the credibility index indicated a Cronbach’s alpha of .91.

[13] According Kaiser & Rice, any Kaiser-Meyer-Olkin measure of sampling adequacy above .80 is considered “meritorious.”

Behavioral intention indices. To explore the dimensionality of behavioral intention, eight possible items (questions 6 through 12 and 14) from the post-test questionnaire were subjected to principal components analysis with varimax rotation. Two factors emerged with Eigenvalues greater than 1; items 6 through 8 regarding social distancing loaded strongly on the first factor, (Eigenvalue=3.40), which explained 42.5% of the variance and items 9 through 11 regarding public queuing loaded well on the second factor (Eigenvalue=1.27), which explained 15.86% of the variance. Again, sampling adequacy was acceptable (KMO=.79) and Bartlett's test of sphericity was highly significant (p=.000). (See Table 5.3 for results of the factor analysis).

Item 12 loaded weakly on factor one and item 14 did not load at all, therefore, both were rejected, a decision that made logical sense based on the content of the two questions. Item 12 asked about the likelihood of simultaneously practicing social distancing and public queuing, straddling both dimensions and not fitting neatly into either one; item 14 asked about the likelihood of making decisions "on your own" during a pandemic, a qualitatively different sort of behavioral intention than intention to comply with a specific policy directive.

Given the results of the factor analysis, two indices were developed from the dependent variable, behavioral intention: a three-item scale of intention to comply with social distancing and a three-item scale measuring intention to comply with public queuing. Cronbach's alpha for the three-item social distancing scale was .80 and for the three-item public queuing scale was .81.

Method of calculating scales. For both the credibility measure and the two components of behavioral intention, several approaches were possible in creating scales. The most conservative method was to total the scores on each item (ranging from 1 to 7) and average them; the second was to total the scores and use their sum as a score, ranging from 3 to 21 for either of the behavioral intention scales and from 5 to 35 for perceived credibility; the third was to use factor scores calculated by SPSS that took into account not only the absolute score for each item but weighted it according to the relative importance of that item to the overall factor.

The researcher opted to run each statistical test using each of the three indices, and while there were minor differences, each of the options produced the same results in terms of statistical significance. Given that two of the three indexes are new and unproven in terms of reliability, it seemed presumptive to weight the factor loadings in ways that might exaggerate the importance of some items; on the other hand, averaging the scores risked losing precision and nuance in the range of measurements. Therefore, the researcher chose to use summative indices throughout this analysis unless otherwise noted.

Test of Interaction Effect /Analysis of Order Effect

Order of message presentation was included in the study as an independent blocking variable, but was not expected to produce differences between groups. The next step in preparing data for further analysis was to eliminate message order as a factor, if possible, and combine the two order cells

into one under each "message-sidedness" category, reducing the number of treatment groups from six to three (in addition to the quasi-control group).

Two separate tests were conducted to confirm whether message order should be eliminated as a variable. First, a general linear model univariate analysis of variance (ANOVA) was run for each of the three dependent variable indices, perceived credibility, social distancing and public queuing, to check for any interaction effect between the independent variables. There was no significant interaction between order and message for perceived credibility F (1, 425) =.007, p=.931, nor were there significant interaction effects between order and message-sidedness for social distancing F (1, 421)[14] =.431, p=.512 or public queuing F(1, 425)=.003, p=.955. (See Tables 5.4, 5.5, and 5.6 for details).

As a second check of the decision to collapse each message-sidedness group across message order, an independent samples t-test was conducted for each message-sidedness group, looking in turn at the group differences for each dependent variable. No significant differences were found (for results, see Table 5.7), and therefore the number of experimental treatment groups was reduced from six to three in addition to the quasi-control group.

Main Effect Analysis

Once data were prepared for analysis, variables collapsed as indicated, dependent variable scales developed and any interaction effects ruled out, analysis proceeded to examination of the hypotheses. Complex contrasts below followed a simple one-way ANOVA for each of the dependent variable indices.

[14] For the statistical analysis to be as conservative as possible, cases were eliminated from consideration if they had a missing value on even a single response-item. Therefore N is notably reduced for the measure of behavioral intention.

In the one-way ANOVA, statistically significant differences were found between the groups for the dependent variable index for credibility (F(3,422)=11.06, p=.000). Perceived credibility was highest for the quasi-control group (M=26.56, SD=6.26), followed by the one-sided message group with a mean of 22.83 (SD=6.41), then the group that received a two-sided message with refutational counterarguments (M=22.48, SD=6.40), and the two-sided message group with no counterarguments (M=22.25, SD=6.49).

For the behavioral intention indices, results of the one-way ANOVA were significant for public queuing but not social distancing. For social distancing the differences between groups were not significant, F(3, 422)=1.92, p=.126.

For public queuing, F(3, 422)=4.00, p=.008, the lowest degree of behavioral intention was found for the quasi-control group (M=14.23, SD=4.12). The group with the highest degree of intention to comply with social distancing was the two-sided message group with refutational counterarugments (M=15.27, SD=4.09), followed by the two-sided message group with supporting arguments only (M=15.74, SD=3.82). Among the experimental groups, the ANOVA showed the one-sided message group as having the lowest degree of intention to comply, (M=16.04, SD= 4.43). (Results of the three one-way ANOVAs are reported in Table 5.8).

However, the first four hypotheses involved complex contrasts between the groups, and those results are reported in the next sections below.

Hypothesis One: Message-Sidedness and Perceived Credibility

To address the first hypothesis, "The group(s) receiving a one-sided presentation of contradictory messages will exhibit the lowest perceived source credibility," a one-way ANOVA planned contrast was conducted to compare the one-sided group to both two-sided groups. Based on Levene's statistic, homogeneity of variance was assumed[15]. The complex contrast was not significant ($F(1, 422)=375.77$, p=.543). Therefore, the hypothesis that credibility would be lowest among the one-sided group was not supported. (See Table 5.9 for details of the contrast conducted for H1 and H2).

Hypothesis Two: Message-Sidedness and Behavioral Intention

To address the second hypothesis, "The group(s) receiving a one-sided presentation of contradictory messages will exhibit a lower intention to follow the desired behavior," contrast coefficients were used to compare the one-sided group to both two-sided groups. Neither the contrast for social distancing ($F(3, 422)=.25$, p=.62) nor the contrast for public queuing ($F(1,425)=1.59$, p=.21) was significant, therefore the hypothesis was not supported.

Hypothesis Three: Counterarguments and Perceived Credibility

To address the third hypothesis, "The group(s) receiving two-sided messages with refutational counter-arguments will exhibit greatest perceived source credibility," contrast coefficients were used to compare the one-sided group and two-sided group without refutational counterarguments to the two-sided group that received refutational counterarguments. Based on Levene's

[15] For all results in this analysis where it was applicable, homogeneity of variance was assumed based on Levene's statistic.

statistic, homogeneity of variance was assumed. The complex contrast was not significant ($F(3, 425)=.006$, $p=.94$) and the hypothesis was not supported. Details of this contrast, which apply to both H3 and H4, can be found in Table 5.10.

Hypothesis Four: Counterarguments and Behavioral Intention

To address the fourth hypothesis, "The group(s) receiving two-sided messages with refutational counter-arguments will exhibit greatest intention to follow the desired behavior," contrast coefficients were used to compare the one-sided group and the two-sided group without refutational counterarguments to the two-sided group with refutational counterarguments. The contrast between the group that received the two-sided message with refutational counter-arguments with the other two experimental treatment groups was not significant for either social distancing ($F(1, 193)=.27$, $p=.61$) or for public queuing ($F(1, 422)=1.19$, $p=.28$). Therefore the hypothesis that refutational counterarguments would be associated with a higher degree of behavioral intention was not supported.

Hypothesis Five: Correlation Between Credibility and Behavioral Intention

For Hypothesis Five, "Perceived credibility and behavioral intention to comply with directives will be positively correlated," a Pearson's correlation was calculated between the credibility index and the two behavioral intention indices. All three correlations were significant at the .01 level, therefore the hypothesis was supported. The strongest correlation, .45, was between the two behavioral intention factors, social distancing and public queuing. Social distancing

intention was almost as strongly correlated with perceived source credibility (.44). The weakest of the three dependent variable correlations (though still significant) was the link between credibility and public queuing at .26. (See Table 5.11).

Although the planned contrasts were not significant, the earlier ANOVA indicated significance did exist somewhere between groups, suggesting the need to run *post hoc* tests. The first of these was already planned to test Hypothesis Six below; others are detailed in the section that follows.

Hypothesis Six: Knowledge and Behavioral Intention

To investigate the final hypothesis, "There will be significant differences between the treatment groups and the quasi-control group that has heard no messages regarding proposed government policies during a pandemic," Dunnett's test (1955) was performed to identify differences between the quasi-control group and the experimental treatment groups. Dunnett's test found statistically significant differences between the quasi-control group and all three message-sidedness groups for perceived credibility. The quasi-control group was statistically significantly less likely to follow social distancing directives than the two-sided group *without* refutational arguments but there were no significant difference between the quasi-control group and the other two groups. The quasi-control group was statistically significantly less likely to follow public queuing directives than either of the two-sided message groups. (See Table 5.12 for details).

Post hoc Comparisons

To ascertain whether there were additional significant differences other that those between the quasi-control group and other groups, both Tukey's HSD and Scheffe's test were conducted *post hoc*. The only statistically significant group differences were between the quasi-control group and treatment groups; findings of significance mirrored those for Dunnett's with the exception of the two pairwise comparisons: the two-sided group without counterarguments, which had been significantly different than the quasi-control group on the both behavioral intention indices according to Dunnett's test was not shown to be significant by Tukey's HSD or Scheffe's. However, since Dunnett's was a planned comparison, its significance findings (reported in Table 5.12) will be retained for discussion.

Additionally, to determine whether the independent blocking variable of message order may have reduced the effect size, the researcher returned to the original seven groups (prior to collapsing them into message-sidedness groups) and conducted the complex contrasts for Hypotheses 1, 2, 3 and 4 again. No statistically significant effects were found.

Additional Analyses

Several items were included on the post-test questionnaire primarily for explanatory value rather than in direct response to either hypotheses or research questions and the results of these questions follow below. Additionally, differences between groups according to key demographic variables are briefly reported at the end of this section.

Questions 12, 13, 14 and 15

Question 12 asked participants, “Assume you are in a flu pandemic and have gone to a public place to wait with other people for supplies or medicines. How likely would you be to also follow directives to stay home at all times and away from others?” There were no significant mean differences between the groups (F (3,427)=.13, p=.94). Table 5.13 shows the ANOVA summary table for Questions 12, 13 and 14.

Question 13 asked participants, “When it comes to your safety during a flu pandemic, how different is going to work from going to a place like the local high school gym to get supplies?” The mean answer for this question was 4.04, just slightly on the side of the two behaviors being different, rather than similar. A one-way ANOVA showed significant differences among groups on this question (F (3, 430)= 3.15, p=.025). The two-sided group *without* counterarguments saw the two behaviors as most different, followed by the two-sided group with refutational counterarguments, the one-sided message group and the quasi-control group.

Question 14 asked participants how likely they would be to make their own decisions during a flu pandemic. There were no significant differences among the groups (F(3, 430) = 1.40, p=.24). (See Table 5.13 for details).

Question 15 asked respondents about potential obstacles to compliance with social distancing and public queuing during a pandemic, allowing them to “check all that apply” for a variety of choices and to select “other,” which enabled

them to write-in obstacles not supplied on the list. Following are the percentages of people who checked each choice: financial reasons (42%); policies contradict each other (39.3%); none of the above (17.4%); policies not in my best interest (13.3%); other (9.3%); would not want supplies from the government (7%); not concerned about pandemic (6.5%); would not want medicines from the government (6.1%); refused (1.6%).

Of the 9.3% who wrote in comments for "other," responses are shown below, loosely grouped by the researcher according to type of obstacle:

Trust in government

- After 8 years of Bush, I don't trust this government
- Return of Naziism [sic] in the guise of government big daddy control
- Cant [sic] trust some of our leaders
- Don't trust our government officials at this time.

Conditions or risks at distribution centers

- Would not like to go to paces [sic] where a lot of people are congregating!
- Must somehow plan phased access to encougage [sic] small crowds.
- Concern over chaos at distribution centers
- Would go with hepa filter mask
- Public places full of people waiting for meds or supplies is [sic] a dangerous place during a pandemic
- Contagion at center
- Rick [sic] of getting the flu
- Risk of exposure in a designated area.
- I would not want to be around a lot of sick people
- Getting sick from someone going for supplies at a central location.
- Gathering of people to get supplies and medical help.
- There is a higher risk of being infected
- Getting enough masks and rubber gloves
- Don't believe public would follow directions at public distro [sic] site, so I'd be at risk for someone else's stupidity.
- It's like driving - I'm not afraid of the govt [sic] roads, I'm afraid of idiot drivers.
- Central location idea is idiotic more dangerous than just letting people naturally go shopping--fewer people in one place at a time in the grocery

store, at least. No way they could "control" what THOUSANDS (that's what they said they were looking for a place to hold) of people are doing as they mill around waiting for supplies. Completely idiotic. Who the heck is running this show at the CDC anyway? I've had friends at the CDC that aren't this stupid.

Concerns about vaccines

- I'm allergic to the flu vacciene [sic]
- Can I trust the flu shot maybe it would make things worse
- Would not want to be forced to take a vaccine
- We get so many medicines from China and we are dying

Job duties

- Health care professional I would be taking care of all those sick people
- Work- I am a public safety officer
- My work is medical related
- Work in healthcare
- Concern about work responsibility

Job loss

- You either report to eork [sic] or get fired
- Loss of job

Logistical barriers

- Don't have several weeks of supplies or water on hand
- Regular everyday medications
- many people have no transportation
- The care and safty [sic] of our pets
- If my mother was ill and needed me - she lives in another town an hour and a half from me

Individual decision

- My situation would determine my actions
- As a doctor, I would rely on my own knowledge about risks and about modes of transmission of pathogen in question.

Miscellaneous obstacles

- Worship and prayer needed
- 1 MILE. [sic]

- Live in the heart of new york city and it is impossible to avoid a lot of people no mattter [sic] what you do.
- Constraints on trying to live a normal life

"Think Twice" Questions

Just before the end of the post-test questionnaire, participants read three systematically-rotated quotes from fictitious pundits criticizing the social distancing and public queuing directives. Participants were then asked whether the new information caused them to "think twice" or reconsider either of the directives or their feelings about the recommendations of public health officials. All groups were at least somewhat likely to reconsider their previous opinions: mean responses for each question, ranging from 1= "not at all likely" to 7= "very likely" were as follows: likelihood to reconsider social distancing (4.71), likelihood to reconsider public queuing (4.29), likelihood to reconsider recommendations from public health officials (4.88).

To examine these results regarding message resiliency further, a "think twice" scale was developed: first, items 16, 17 and 18 were reverse-coded so that increasing scores indicated increasing message resiliency (i.e. less likelihood to think twice); second, the reliability of the scale was tested and found to have a marginally acceptable Cronbach's alpha of .62. Paired comparisons were conducted between each of the dependent variable indices and the think-twice question that related to it (e.g. the index measuring source credibility was compared to the question asking whether a person would be likely to question the credibility of public health officials after hearing criticism of the pandemic flu policies). Results showed that all groups were statistically significantly likely to

experience doubts on each measure after reading comments from fictitious pundits. A closer examination comparing the means of each averaged dependent variable index to the mean of the corresponding think-twice question revealed a statistically significant likelihood to reconsider behavioral intention for both social distancing and public queuing; comparisons of the credibility index to the think-twice question about credibility were not significant. (Results are reported in Table 5.14).

Differences Among Demographic Groups

Finally, while not a focus of this study's hypotheses or research questions, education and income levels have been a factor in some past studies of message-sidedness, therefore, it was important to know if there were differences in the dependent variables based on these demographic characteristics. Additionally, in consideration of future research directions and explanatory value, comparisons were made between the dependent variables indices of three other key demographic variable groups: gender, race, and age.

An independent samples t-test was conducted for gender differences in the two dependent variable indices, and a one-way ANOVA was conducted for race, age, income and education. No significant differences were found among gender, race, income or education groups; however, there were statistically significant differences between age groups for the perceived credibility index. Perceived credibility increased roughly as age increased. Table 5.15 summarizes the results of the one-way ANOVA for age.

End of Survey Comments

In addition to the instruments prepared for particular studies, Knowledge Networks routinely includes an opportunity after the completion of a study for participants to comment on the survey topic. In the interest of space, this information is presented in the Appendix, but will be drawn in as relevant to the discussion in the next chapter.

Table 5.1. Sample Characteristics Compared to U.S. Population

	Sample Frequency	Sample Percentage*	U.S. Population Percentage*
TOTAL	443	100%	100%
Gender			
Male	208	47%	49.2%
Female	235	53%	50.8%
Age			
18 to 24 years	32	7.2%	13.2%
25 to 34 years	65	14.7%	17.7%
35 to 44 years	69	15.6%	19.5%
45 to 54 years	108	24.4%	19.2%
55 to 64 years	89	20.1%	14.1%
65 to 74 years	52	11.7%	8.4%
75+	28	6.3%	8.1%
Race			
White, non-Hispanic	348	78.6%	66.2%
African-American	35	7.9%	12.6%
Other	11	2.5%	5.4%
Hispanic	40	9%	14.8%
Two or more races	9	2%	2%
Education			
Less than high school	53	12%	16.18%
High school diploma	139	31.4%	30.69%
Some college	116	26.2%	28.56%
Bachelor's degree +	135	30.5%	24.58%
Household income			
Less than $10,000	21	4.7%	8%
$10,000-$24,999	71	16%	11.4%
$25,000-$49,999	116	26.1%	26%
$50,000-$74,999	101	22.8%	19%
$75,000-$99,999	62	14%	11.8%
$100,000-$149,999	46	10.4%	10.9%
$150,000 +	26	5.9%	7%
Regional distribution			
Northeast	86	19.4%	18.3%
South	168	37.9%	36.4%
Midwest	97	21.9%	22.2%
West	92	20.8%	23.2%

Based on a U.S. population of 299,398,485. Source: U.S. Census Bureau 2006 American Community Survey, available at http://factfinder.census.gov/jsp/saff/SAFFInfo.jsp?_pageId=sp1_acs&_submenuId=
*Percentages may not total 100% due to rounding error.

Table 5.2. Omnibus F Test for All Scored Post-Test Items

Items from post-test		*df*	*SS*	*MS*	*F*
Q1: Please mark the number between the pair of words that best describes your feelings about information from public health officials: Cannot be trusted/can be trusted	Between Groups	6	49.43	8.24	3.77*
	Within Groups	428	936.43	2.19	
Q2: is inaccurate/is accurate	Between Groups	6	60.62	10.10	4.79*
	Within Groups	425	895.69	2.11	
Q3: is unfair/is fair	Between Groups	6	39.66	6.61	2.98*
	Within Groups	424	941.75	2.22	
Q4: does not tell the whole story/tells the whole story	Between Groups	6	82.10	13.68	5.20*
	Within Groups	425	1118.53	2.63	
Q5: is biased/is unbiased	Between Groups	6	52.99	8.83	3.99*
	Within Groups	423	936.47	2.21	
Q6: In a contagious and deadly flu pandemic, health officials might tell you to stay home and avoid crowded public places like malls, movie theaters and places of worship. How likely would you be to follow their directive?	Between Groups	6	8.24	1.37	.72
	Within Groups	427	819.40	1.92	
Q7: If health officials told you to stay home from work for several weeks during a flu pandemic, how likely would you be to do it?	Between Groups	6	19.77	3.30	.16
	Within Groups	436	916.29	3.57	
Q8: If you care for children under the age of 18, and health officials told you to keep them home from school or daycare for several weeks during a flu pandemic, how likely would you be to do it?	Between Groups	6	7.16	1.19	.76
	Within Groups	422	663.42	1.57	
Q9: During a flu pandemic, if health officials told you to go to a public health clinic for medicines or vaccines, how likely would you be to do it?	Between Groups	6	9.22	1.54	.64
	Within Groups	427	1024.77	2.40	

Q10: During a flu pandemic, if health officials told you to go to a clinic or other public gathering place to wait for food, bottled water or other necessities, how likely would you be to do it?	Between Groups	6	30.83	5.14	2.12*
	Within Groups	425	1030.14	2.42	
Q11: If health officials told you to go to a centralized health clinic or supply center like the local high school, how likely would you be to go?	Between Groups	6	82.14	13.69	4.70*
	Within Groups	424	1235.60	2.91	
Q12: How likely would you be to also follow directives to stay home at all times and away from others?	Between Groups	6	1.10	.18	.09
	Within Groups	424	882.60	2.08	
Q13: When it comes to your safety during a flu pandemic, how different is going to work from going to a place like the local high school gym to get supplies?	Between Groups	6	50.83	8.47	1.97
	Within Groups	427	1841.33	4.31	
Q14: In the event of a flu pandemic, how likely would you be to make your own decisions about what is safe?	Between Groups	6	12.86	2.14	1.18
	Within Groups	427	774.98	1.82	
Q16[16]: How likely would you be to reconsider staying home from work and isolated from others if directed by the government?	Between Groups	6	44.62	7.44	2.40
	Within Groups	426	1321.873	3.103	
Q17: How likely would you be to reconsider going to a community supply distribution center if directed by the government?	Between Groups	6	13.57	2.26	.71
	Within Groups	427	1359.43	3.18	
Q18: How likely would you be to "think twice" about recommendations from public health officials?	Between Groups	6	18.51	3.09	1.27
	Within Groups	424	1032.72	2.44	

*p< .05 following the Bonferroni adjustment

[16] Note: Question 15 is not included in this analysis because it was "check all that apply" item that included open-ended responses and could not be accurately analyzed with an ANOVA.

Table 5.3. Factor Loadings of Varimax-Rotated Principal Components Analysis

Post-test Questionnaire Item	Component		
	1	2	3
Q1: Please mark the number between the pair of words that best describes your feelings about information from public health officials: Can't be trusted _|_|_|_|_|_|_ Can be trusted	.90		
Q2: Please mark the number between the pair of words that best describes your feelings about information from public health officials: Is inaccurate _|_|_|_|_|_|_ Is accurate	.92		
Q3: Please mark the number between the pair of words that best describes your feelings about information from public health officials: Is unfair _|_|_|_|_|_|_ Is fair	.88		
Q4: Please mark the number between the pair of words that best describes your feelings about information from public health officials: Doesn't tell the whole story _|_|_|_|_|_|_ Tells the whole story	.80		
Q5: Please mark the number between the pair of words that best describes your feelings about information from public health officials: Is biased _|_|_|_|_|_|_ Is unbiased	.82		
Q6: In a contagious and deadly flu pandemic, health officials might tell you to stay home and avoid crowded public places like malls, movie theaters and places of worship. How likely would you be to follow their directive? Very unlikely _|_|_|_|_|_|_ Very likely		.81	
Q7: If health officials told you to stay home from work for several weeks during a flu pandemic, how likely would you be to do it? Very unlikely _|_|_|_|_|_|_ Very likely		.57	
Q8: If you care for children under the age of 18, and health officials told you to keep them home from school or daycare for several weeks during a flu pandemic, how likely would you be to do it? Very unlikely _|_|_|_|_|_|_ Very likely		.80	
Q9: During a flu pandemic, if health officials told you to go to a public health clinic for medicines or vaccines, how likely would you be to do it? Very unlikely _|_|_|_|_|_|_ Very likely			.75
Q10: During a flu pandemic, if health officials told you to go to a clinic or other public gathering place to wait for food, bottled water or other necessities, how likely would you be to do it? Very unlikely _|_|_|_|_|_|_ Very likely			.80
Q11: Assume you are in a pandemic and you are keeping yourself isolated at home to avoid getting yourself or others sick. If health officials told you to go to a centralized health clinic or supply center like the local high school, how likely would you be to go? Very unlikely _|_|_|_|_|_|_ Very likely			.78
Q12: Assume you are in a flu pandemic and have gone to a public place to wait with other people for supplies or medicines. How likely would you be to also follow directives to stay home at all times and away from others? Very unlikely _|_|_|_|_|_|_ Very likely		.71	
Q13: When it comes to your safety during a flu pandemic, how different is going to work from going to a place like the local high school gym to get supplies? Not at all different _|_|_|_|_|_|_ Very different			.45
Q14: In the event of a flu pandemic, how likely would you be to make your own decisions about what is safe? Very unlikely _|_|_|_|_|_|_ Very likely			

Table 5.4. Univariate Analysis of Variance for Interaction Effects of Message Order and Message Sidedness on Perceived Source Credibility

Independent Variables	*df*	*MS*	*F*	Sig.
Intercept	1	220103.28	5375.38	.00
Message order	1	2.09	.05	.82
Message sidedness	1	14.99	.37	.55
Order * sidedness	1	.30	.007	.93
Error	421	40.95		
Corrected Total	425			

Table 5.5. Univariate Analysis of Variance (ANOVA) for Interaction Effect Between Message sidedness and Message Order on Intention to Comply with Social Distancing

Independent Variable	*df*	*MS*	*F*	Sig.
Corrected Model	4	18.51	1.92	.11
Message order	1	25.72	2.66	.10
Message-sidedness	1	2.97	.31	.58
Order * sidedness	1	4.17	.43	.51
Error	421	9.67		
Total	426			
Corrected Total	425			

Table 5.6. Univariate Analysis of Variance (ANOVA) for Interaction Effect of Message Order and Message-Sidedness on Intention to Comply with Public Queuing

Independent variable	*df*	*MS*	*F*	Sig.
Corrected model	4	51.28	3.02	.02
Message order	1	5.58	.33	.57
Message sidedness	1	26.41	1.55	.21
Order * sidedness	1	.05	.003	.96
Error	421	17.01		
Total	426			
Corrected Total	425			

Table 5.7 Independent Samples T-Test of Perceived Credibility and Behavioral Intention Differences Between Groups According to Message Order

	Social distancing first		Public queuing first			
Dependent variable index	*M*	*SD*	*M*	*SD*	*df*	*T*
Perceived source credibility	22.44	6.78	22.60	6.02	314	-.23*
Social distancing intention	16.48	3.25	16.99	3.05	315	-1.46**
Public queuing intention	15.82	4.17	15.54	4.07	314	.61***

*p=.82; **p=.14; ***p=.54

Table 5.8. One-Way Analyses of Variance for Impact of Message-Sidedness on Three Dependent Variable Indices

	df	*SS*	*MS*	*F*
Perceived credibility				
Between groups	3	1355.13	451.71	11.06*
Within groups	422	17237.78	40.85	
Social distancing				
Between groups	3	55.70	18.58	1.92**
Within groups	422	4088.12	9.69	
Public queuing				
Between groups	3	204.03	68.01	4.01***
Within groups	422	7162.30	16.97	

*p=.000; **p=.126; ***p=.008

Table 5.9. Planned Contrast Between One-Sided Message Group and Both Two-Sided Groups

		One-Sided	Two-Sided				
			No counter-arguments	Counter-arguments			
Indices					*F*	Contrast *t* value	η^2
Perceived Credibility	*M*	22.83	22.25	22.48	11.06	.62	.07
	SD	6.41	6.49	6.40			
	N	105	106	105			
Social Distancing	*M*	16.61	16.98	16.60	1.92	-.50	.04
	SD	3.62	2.71	3.09			
	N	107	107	103			
Public Queuing	*M*	15.27	15.74	16.04	4.01	-1.26	.03
	SD	409.33	3.82	4.43			
	N	105	106	105			

Equal variances assumed based on Levene's test.

Table 5.10. Planned Contrast of Two-Sided Group with Refutational Counter-arguments Against One-Sided and Two-Sided No-Counterargument Group

		One-Sided	Two-Sided				
			No counter-arguments	Counter-arguments			
Indices					*F*	Contrast *t* value	η^2
Perceived Credibility	*M*	22.83	22.25	22.48	11.06	-.08	.07
	SD	6.41	6.49	6.40			
	N	105	106	105			
Social Distancing	*M*	16.62	16.98	16.60	1.20	-.52	.04
	SD	3.62	2.71	3.09			
	N	107	107	103			
Public Queuing	*M*	15.27	15.74	16.04	4.01	1.09	.03
	SD	409.33	3.82	4.43			
	N	105	106	105			

Assumes equal variances

Table 5.11. Correlations Between Dependent Variable Indices

	Perceived Credibility	Social Distancing	Public Queuing	*M*	*SD*
Credibility	1.00	.40**	.26**	23.56	6.61
Social Distancing	.40**	1.00	.40**	16.82	3.92
Public Queuing	.26**	.40**	1.00	15.31	4.16

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.12. Dunnett's Test for Differences Between Control and Treatment Groups

Dependent variable index	Treatment mean		Control mean		Difference
Perceived source credibility					
One-sided message	22.83	-	26.56	=	-3.74*
Two-sided supportive	22.25	-	26.56	=	-4.32*
Two-sided refutational	22.48	-	26.56	=	-4.09*
Social distancing					
One-sided message	16.61	-	15.98	=	.63
Two-sided supportive	16.98	-	15.98	=	1.00*
Two-sided refutational	16.60	-	15.98	=	.620
Public queuing					
One-sided message	15.27	-	14.23	=	1.04
Two-sided supportive	15.74	-	14.23	=	1.51*
Two-sided refutational	16.04	-	14.23	=	1.81*

*significant at the p<.05 level

Table 5.13. One-Way Analyses of Variance for Questions 12, 13 and 14

	df	*SS*	*MS*	*F*
Question 12				
Between Groups	3	.83	.28	.13
Within Groups	427	882.87	2.07	
Question 13				
Between Groups	3	40.74	13.58	3.15*
Within Groups	430	1851.42	4.31	
Question 14				
Between Groups	3	7.60	2.53	1.40
Within Groups	430	780.24	1.82	

*p=.025

Table 5.14. Resiliency of Dependent Variable Indices

	Averaged DV Index		Think Twice Question			
	M	*SD*	*M*	*SD*	*df*	*T*
Perceived credibility	4.71	1.33	4.87	1.56	422	-.59*
Social distancing intention	5.40	1.02	4.29	1.79	424	12.29**
Public queuing intention	5.09	1.39	4.89	1.56	421	2.00***

*p=.113; **p=.000; ***p=.05

Table 5.15. Differences in Perceived Source Credibility Between Age Groups

	M	*SD*	*MS*	*SS*	*df*	*F*
Between groups			155.80	934.76	6	3.70*
Within groups			42.14	17658.15	419	
Total	23.56	6.61		18592.91	425	
Age categories						
18 to 24	19.67	8.23				
25 to 34	23.49	5.38				
35 to 44	23.27	6.45				
45 to 54	23.44	6.32				
55 to 64	23.59	6.66				
65 to 75	24.40	7.04				
75 +	27.65	5.73				

*p<.05

Table 5.16 Summary of Research Findings

Research Questions & Hypotheses	Findings	Results
RQ1: What are people's knowledge and attitudes regarding pandemic flu?	Superficial knowledge; Lack of control	Included information at a very basic level in experiment
RQ2: What kinds of public health directives do people anticipate in the event of a flu pandemic?	Government education and a shutdown of society; responses similar to other emergencies	Emphasized severity and duration of pandemic in experiment
RQ3: How do people respond to the two policies of "social distancing" and "public queuing?"	Compliance for selves but not others; cognizance of some obstacles	Focus on individuals and not "others" but provide opportunities for concern to be voiced
RQ4: Do individuals perceive contradictions between social distancing and public queuing?	Contradictions were perceived	Did not need to over-emphasize contradictions
RQ5: If contradictions are perceived, what is the response?	Responses varied, but contradictions were often not troubling	Experiment participants likely to exhibit a range of reactions
RQ6: What are the commonly understood meanings of the components of Meyer's Credibility Index (trust, accuracy, openness, fairness and bias) and do they fully explicate the construct?	Meyer's not perfect; Additional dimensions of credibility may exist, but are challenging to represent in print	Meyer's Index sufficient for this experiment
RQ7: When one source conflicts with another, how likely is someone to follow the advice of a public health official?	Many sources of information are weighed and differing sources could erode compliance	Added "external" sources of information to test resiliency of intention
H1: One-sided presentation of contradictory messages will decrease perceived credibility of a source.	Not supported	$F(1, 422)=375.77$, $p<.54$
H2: One-sided presentation of contradictory messages will decrease an individual's intention to follow the desired behavior.	Not supported	SD: $F(3, 422)=.25$, $p<.62$ PQ: $F(1,425)=1.59$, $p<.21$
H3: The use of refutational counter-arguments in a two-sided message will increase perceived credibility of a source.	Not supported	$F(3, 425)=.006$, $p<.94$
H4: The use of refutational counter-arguments in a two-sided message will increase an individual's intention to follow the desired behavior.	Not supported	SD: $F(1, 193)=.27$, $p<.61$ PQ: $F(1, 422)=1.19$, $p<.28$
H5: Perceived credibility and behavioral intention to comply with directives will be positively correlated.	Supported	Correlations ($p<.01$): SD & PQ =.45, SD & Credibility= .44 PQ & Credibility=.26
H6: There will be significant differences between the treatment groups and the control group that has heard no messages regarding proposed government policies during a pandemic.	Supported	Significant differences: ▪ Credibility: Between all groups and the control ▪ SD: Between the control and the two-sided supportive message

	▪ PQ: Between the control and both two-sided groups

CHAPTER SIX

DISCUSSION OF FINDINGS AND FUTURE RESEARCH

Given the enormous potential human and economic toll of a future flu pandemic, public health agencies across the world have identified pandemic preparedness as a top priority. Worst-case scenarios for the United States that envision a pandemic as severe as the 1918 Spanish flu estimate 30% of the work force would be ill and more than two million people could die.

The U.S. has spent more than $7 billion on pandemic planning, but two core policies of the federal plan may be problematic to execute because they assume the public would be willing to follow inherently-contradictory government directives in the event of a pandemic. The first directive, “social distancing,” would ask people to avoid malls, movie theaters and places of worship, even recommending or requiring that individuals stay home from work and school. The second government directive (referred to in this paper as “public queuing”), would call for the distribution of medicines, vaccines and basic supplies at central locations in each community. So, while people may be told to isolate themselves in a flu pandemic, they also may be asked to stand in line with others for many hours at emergency public health clinics, an inherently-contradictory set of directives.

Some health risk communicators believe these inherently-contradictory and potentially-confusing public health directives in a pandemic flu outbreak may

undermine the trust and credibility of government and health officials, leading many people to discount risks and disregard recommendations. However, despite a great deal of speculation about how the public might respond in such a crisis, very little actual information has been gathered about the public's knowledge, perceptions or intended behavior related to a pandemic.

This study sought to explore the most effective ways to communicate social distancing and public queuing in order to maximize compliance with the policies. The study involved two phases: first, a series of in-depth interviews to help create and refine experimental treatments for the second phase, which was an experiment, in turn, that compared three different methods of communicating the pandemic flu policies.

The premise of the experiment was that two-sided messages with refutational counterarguments have been shown historically to be more persuasive than other types of messages. Therefore, it was posited that a two-sided model in which the "contradiction" was used as the negative attribute and justification of the contradiction was used as the counterargument might be effective. This study focused on contradictory messages related to pandemic flu, but there are also such inconsistent messages in other areas of health risk communication, such as recommendations regarding fish consumption or alcohol use, that could potentially be addressed by its findings.

According to past research, two-sided refutational messages would be most persuasive, followed by one-sided messages; two-sided messages with supporting arguments only (*without* refutational counterarguments) would be the

least persuasive. Past research also suggested that perceived source credibility would be an important gateway to persuasion. Source credibility of public health officials and behavioral intention to comply with public health directives were, therefore, the dependent variables used to assess the persuasiveness of the three message-sidedness types.

Experimental treatments were fictitious news articles; the first six presented the pandemic flu policies and varied in either order or message-sidedness; a seventh group, the "quasi-control" group, received an article with some basic definitions of pandemic flu but no information on the policies. Participants were randomly assigned to one of seven treatments.

Discussion of Results

The message-sidedness hierarchy seen in the past was not supported in this research, and therefore four of the hypotheses that were dependent on this continuum of persuasiveness were not supported. Given that this experiment was highly exploratory and that few studies have been done regarding either contradictory messages or pandemic flu, these results are disappointing but perhaps not surprising. However, several interesting trends in the data did emerge that are worthy of discussion.

Perceived Source Credibility and Two-Sided Messages

As expected, perceived source credibility was significantly positively correlated with behavioral intention, and yet, as evidenced by the comparison of the quasi-control group to the treatment groups, something about the experimental treatments in which the policies were presented appears to have

diminished credibility. If it was the policies themselves, this finding suggests theoretical implications for the impact of contradictory messages, and practical implications for compliance if indeed contradictions – whether acknowledged and defended or not -- are a credibility-killer.

First, it is worth examining the overall results related to source credibility. The groups were remarkably consistent in their answers on the perceived credibility index, with both of the two-sided message groups scoring lower on perceived credibility questions than the one-sided message group – despite past research showing that two-sided messages typically increase source credibility.

It is possible that in this case, acknowledgment of the contradiction was simply not seen as evidence of a source's credibility on the issue; perhaps rather than either increasing credibility or having a neutral effect, the contradiction may have lowered it. Perhaps the negative attribute (the contradiction), which past studies have shown needs to be "negative, but not too negative," was too strong, or too damaging to the credibility of the source.

Comparing both of the two-sided message groups, refutational counterarguments seemed to boost credibility slightly (though not statistically significantly), indicating that once the contradiction was acknowledged, explaining the reasons for may have helped ameliorate some of the contradiction's impact on credibility. This issue is worth further investigation to determine if indeed two-sided messages are ineffective in situations where contradictions are present.

The credibility index also produced the only significant difference along demographic lines; perceived credibility of public health officials appeared for the most part to increase with age. Anecdotally, many people do associate trust in government (or “the establishment”) more so with older people than with young adults. However, recent events may also have had an impact on the credibility of public health officials among the young. For some, the most salient memory of a disaster may be Hurricane Katrina, where government officials at all levels failed to protect public health and safety. Indeed, some of the open-ended end-of-survey comments brought up this issue:

- I hope the [sic] my husband and I would never be in a situation where we had to rely on the government for help. I would only use the government medicine in a dire emergency. Unfortunately many people less fortunate probably would have to rely on it and heaven help them. Remember Katrina!!!

- Would you like to live in one of the "SAFE" FEMA trailers? Do you think these people can do a better job with the flu than they can with a hurricaine? [sic] They took three to eight weeks to do something that they have done before, the flu will run it's [sic] course by the time FEMA and CDC deside [sic] what needs to be done and where to do it!!

- Katrina, That says it all about what the government can do for us if there was a problem!!!!!

For others, their clearest recollection of a contagious disease in the news might be the young man with extremely-drug-resistant tuberculosis who left the country on his honeymoon in spite of admonitions not to travel. Interview participant Jessica, a 34-year-old law student, saw CDC and other public health officials as villains in that story. Lower perceived credibility of public health officials may be a stage that younger people pass through and outgrow, or it may

be a result of recent bad publicity that public health communicators must find a way to overcome. As one experiment participant commented in open-ended remarks:

- I don,t [sic] trust the government now. I sure as hell would not trust them in a national emergency especially with their track record as of late.

Criticisms of the Bush administration figured prominently in some of the anti-government comments made both in the end-of-survey comments and for Question 15's open-ended "other" response about obstacles to compliance;

- This whole article portends enormous trust in a government now headed by officials who have repeatedly tried to deceive the populace for the goal of personal financial gain and corporate rape of the average American.
- After 8 years of Bush, I don't trust this government
- Don't trust our government officials at this time.

Some people may see public health officials as part of the administration, and in a presidential election in which exit polls show many young voters gravitating away from the Republican party, politics as much as anything else may be hurting the credibility of public health officials among younger people.

However, it is worth noting that despite the significance of age with regard to perceived source credibility, there was not a corresponding significant difference among age categories for behavioral compliance.

Given the link between perceived source credibility and behavioral intention, public health agencies need to investigate the possibility of decreased "brand" credibility in the wake of current events, and perhaps focus some of their preparedness resources on image restoration.

Measurement of Source Credibility

Results of the experiment indicate the Meyer's Credibility index performed consistently compared to past studies -- a single component scale with high reliability. In the context of what was possible for this experiment, it appeared to fully explicate the construct of credibility, however, some of the responses in the one-on-one interviews seemed to indicate that non-verbal cues, perhaps related to the concept of "dynamism," could also be important. The experiment did not set out to test the importance of these non-verbal signals in influencing credibility, but the findings do indicate a need for practitioners to be aware of the importance of not just substance, but style, in delivering health risk messages. Researchers should also be cognizant of the non-verbal dimension; in a digital media age in which many messages are received via television or streaming video, measuring credibility with non-visual stimuli may not always be sufficient.

The Difference Between Behavioral Intention and Actual Behavior

Behavioral intention measures in this case were divided into two indices: social distancing and public queuing. While the two indices were statistically reliable and on their face asked valid questions, there are some questions regarding the validity of self-reported responses that raise important issues for scholars of risk communication and for practitioners.

Based on the two indices of behavioral intention, all message groups were favorably inclined to comply with government directives. This mirrored the trend noted in the Phase One interviews in which people tended to say they would comply with directives even while they worried about other people *not* complying.

Similar results had been seen in an earlier telephone poll (Paek et al., 2008), but given the difference in methodology, there was the possibility that the tendency for people to answer more candidly in a relatively anonymous online survey might produce different results.

The big question, then, given results such as these, is whether people are telling the truth and if they would indeed comply with government directives in a pandemic. Theoretically, communication scholars are aware of the distortion that results from such phenomena as the third person effect, self-serving bias and optimistic bias. People often overestimate their own abilities and good behavior and see other people as less capable, more careless or more susceptible to negative influences. However, disaster sociologists have also shown that in reality the public tends generally to be law-abiding and rational in emergencies, so perhaps people *are* correctly estimating their level of compliance with directives in a disaster.

But many health risk communicators see pandemic flu as a qualitatively different sort of crisis – more severe, more prolonged and more widespread than other disasters. People may intend to follow government directives, but as a crisis stretches on for weeks, it may be difficult to maintain levels of initial compliance.

That qualitative difference between a flu pandemic and other disasters that are geographically-concentrated, less-deadly or more fleeting may make it very difficult for people to reasonably estimate their behavior. Several observations from the Phase One qualitative interviews may be relevant here.

Participants had very little prior knowledge of avian/bird flu and even less awareness of what government policies might be enacted during a pandemic. When a severe pandemic scenario was described to them (including the ease of transmissibility, lack of vaccines and medicines, the potential illness and death rates, and the proposed policies of social distancing and public queuing) it was difficult for some to grasp the enormity of the crisis – in fact several were left momentarily speechless. The more they processed the information aloud, the more vivid the crisis seemed to become to them (indeed, engagement grew as the discussion moved from a generic disease to a flu pandemic, and even more as policies and their challenges were discussed.)

It is reasonable to expect that for many of the experiment participants there was similar shock or surprise. The unexpected nature of the scenario and short time frame of the experiment could mean the ramifications of the various policies may not have been fully examined and deliberated by participants. Under the circumstances, it is not surprising that most people – who in familiar types of disasters would likely follow directions from authorities -- would say “yes, of course” to questions about whether they would follow directives described as protecting them from a pandemic. As will be discussed later in this section, when given a chance to reconsider, many showed evidence of hesitation to embrace the policies.

Self-Determination Versus Compliance

When public health officials lose sleep over pandemic preparedness, it is sometimes because of such sentiments as those reflected in Question 14

(*M*=5.60), in which people indicated they would be more likely than not to make their "own decisions" during a pandemic. Indeed, this likelihood was the third highest score for all groups of any question on the post-test questionnaire. Like some of the remarks by Phase One interview participants, several end-of-survey comments echoed this idea:

- It would depend on the situation at that time. Each situation is very different. Sometimes the best decision is the one we make ourselves.
- The circumstances would dictate how I would make my decisions at the time.
- The situation will occur sooner or later but it depends a lot of how where and what will happen how I will make my decisions.
- Peoples [sic] comments make sense, our rich leaders take care of themselves so i being me would do what i want i cant afford to do nothing [sic]

And yet, these declarations of autonomous decision-making conflict with similarly strong intentions to follow the government's directives in a pandemic, demonstrating the tension inherent in being a law-abiding citizen or person-in-need (in this case, of medicines and food supplies) in a culture that celebrates individualism, personal autonomy and self-reliance.

Earlier surveys have indicated strong support for many government policies during a pandemic, such as quarantine and closing borders, and the post-test responses in this study reflect that same tendency to comply with the law. Given the hypothetical nature of a flu pandemic, it is difficult to know if this behavioral intention is based on reality; it may also be that directives in a pandemic, while never identified to participants in this study as mandatory, may be seen as different than, for example, directives to include more fish in your diet,

an example of a contradictory message for which there may be less across-the-board support. There is, after all, no criminal penalty associated with either failing to eat fish two to three times a week as recommended or accidentally buying the farmed salmon (higher in toxins) instead of the wild-caught. Therefore, while the hypotheses in this study were not supported for one- and two-sided messages regarding a pandemic, those results may not necessarily be generalized to all contradictory health risk messages.

One limitation of the experiment may have been asking participants only about their own behavioral intentions, and not giving them an opportunity to talk about what "others" might do. Another possibility might have been to solicit their feelings about the policies themselves and not their intention to comply with them, although Ajzen and Fishbein's work showed that attitude about an object (or in this case, policy) is not as good an indicator of behavior as answers to questions about behavioral intention.

Obstacles to Compliance

This study evolved out of the concerns of risk communication practitioners who worried that the public would immediately question the contradictory nature of the social distancing and public queuing policies and therefore not follow them. No conclusions can be drawn from this work about the causal relationship between the contradictions and behavioral intention, but several things are clear: 39.8% of participants said the contradictory nature of the policy would be a potential obstacle to their compliance; 46.8% of respondents felt that going to work during a pandemic wasn't different than going to a distribution center,

implying that they would be as likely to do one (going to work, a violation of directives as presented) as the other (going to a distribution center).

Additionally, the results of the study show that although most people intended to comply with most policies, that support is fragile. After reading criticisms of the policies by fictitious pundits (and it is easy to imagine many such pundits inundating the airwaves in the event of a pandemic), 59.4% said they would be likely to reconsider their support for social distancing; 49.9% said they would reconsider their support for public queuing. A *post hoc* paired samples t-test comparing the earlier scores on each behavioral intention measure to the corresponding think-twice question also showed a statistically significant tendency to rethink compliance after hearing criticism of the policy. While this single-item measure cannot be considered a robust measure of the fragility of earlier behavioral intentions, it highlights a potential problem for risk communicators: resiliency of the message. Message-sidedness had no impact on the likelihood people would "think twice" about policy directives; across treatment groups and quasi-control group alike, the "pundits" shook people's confidence in public health policy.

It is not a stretch for risk communicators to be concerned about vacillating public compliance in a pandemic, and it brings the discussion full-circle back to perceived source credibility. Based on the Phase One interviews, people appear to routinely seek outside, alternative opinions and make "personal decisions" about health behavior. This study did not compare the credibility of pundits and public health officials, so there is no way of knowing which source would win out

and an investigation of how people process multiple information sources is beyond the scope of this research. But the constellation of the Internet, friends, family, private physicians, and media that interview participants said they consult on health matters does imply that there is some deliberation occurring, whether it is weighing one source against another or seeking corroboration of a particular source's information. This "marketplace" of sources suggests that differing values may be attached to each source, and that relative credibility could be an important factor. The tendency to supplement the advice of medical professionals could also be a reflection of changes brought on by the healthcare system, in which getting a "second opinion" from a doctor may be difficult or impossible on certain insurance policies. Hence, the traditional practice of gathering information from multiple sources *within* the medical field may have shifted to sources *outside* the medical field. This habit may be hard to break, even in an emergency situation like a pandemic.

A limitation of this study is the inability to explore these issues further within the current data. The "think twice" measures were added for explanatory value only, but in many ways they raise more questions than they answer, and unfortunately the single-item measure for each dependent variable is not sufficient to draw any real conclusions.

Quasi-Control Group as Most Significant Indicator

Whereas past research on two-sided messages suggested that the highest level of perceived source credibility would be among the group that received a two-sided message with refutational counterarguments and that the

one-sided message group would indicate the lowest perceived credibility levels, almost exactly the opposite happened. Even more interesting was the place where the most dramatic difference in perceived credibility could be seen: the quasi-control group, which had the highest levels of all.

These results suggest that the more people heard about the inherent contradiction between the policies of social distancing and public queuing, the more their estimation of the credibility of public health officials fell. While the other groups read treatment articles about pandemic flu policies, the quasi-control group read an article that consisted mostly of advice from public health officials on preventing colds and flu. They were not entirely uninformed about the meaning of a *pandemic*; because of the widespread ignorance found in the one-on-one interviews, the lead of the quasi-control article gave them enough information to answer later questions, i.e. to know what a pandemic was and that it could be severe, but no details were provided to them about pandemic policy. Their article began as follows:

> It's a disaster experts say could be 800 times deadlier than the September 11th terrorist attacks and would leave no community untouched: pandemic flu.
>
> Every year in the United States about 200,000 people are hospitalized and 36,000 die from the flu or its complications according to the Centers for Disease Control and Prevention (CDC). But a pandemic, or widespread epidemic that affects many communities at the same time, could be much worse. A very severe form of the flu, like the Spanish Flu of 1918 that killed 50 million people around the world, could kill more than two million Americans in a matter of weeks. That's about 800 times the death toll of 9/11, all from a few germs easily passed from person to person.

> Whether it is a pandemic or simply seasonal flu, public health officials say it makes sense to take certain precautions. Here are ten ways you can stay healthy:

All groups answered questions about perceived credibility of public health officials before they were asked anything about compliance with pandemic policy, thus the quasi-control group was responding to credibility questions without being influenced by feelings about the policies. It is possible that their perceptions of credibility were boosted by the quasi-control article they read, however, the cold-and-flu advice was so familiar and common-sense that it is doubtful it made much of a difference. It is reasonable, then, to assume that the perceived source credibility scores of the quasi-control group were fairly representative of general prior opinion about public health officials.

However, where the opinions of the quasi-control group become even more interesting relates to behavioral intention. Despite having the highest scores for perceived credibility, the quasi-control group had the lowest scores for both social distancing and public queuing. This flies in the face of the statistically significant correlation overall between credibility and the two behavioral intention indices in this study and the correlations found between source credibility and behavioral intention found in previous research.

From a practitioner's perspective, what this finding may indicate is the importance of knowledge. While it cannot be extrapolated to the participants in the experiment, the one-on-one interviews indicated education about pandemics was woefully non-existent. In the experiment, the quasi-control group was given less information than the other experimental groups about pandemic flu and the

reasons why social distancing or public queuing might be in its best interest. In this case it appears source credibility could not trump audience ignorance as an influence on behavioral intention. Such results may underscore the importance of education and "pre-event messaging" as a precursor to compliance with policies; if the general public is unfamiliar with what they will be called upon to do during a pandemic, they may be more resistant to following government directives.

The interview results for the questions about avian and pandemic flu knowledge beg the question of whether a previous poll showing that 91% of respondents were familiar with avian/bird flu is meaningful, since merely recognizing the term may not be evidence of real knowledge. Furthermore, it raises doubts about the accuracy of knowledge tests about the topic that show roughly half of people answering each question correctly; it is possible that their "right" or "wrong" answers merely reflect guesses. Tests of recognition such as a poll with multiple choice answers typically have higher scores than tests of pure recall, but there is also more possibility of random guessing in such situations, which could indeed provide a score of 50% (Singh, Rothschild, & Churchill, 1988).

Impact of Contradictions

Another possible explanation for differences between the quasi-control group and the other groups are the experimental treatments. Even though it did not have the hypothesized effect on the treatment groups, the treatment may still have affected them in ways that were not predicted. Since it is reasonable to

expect the same range of preconceived notions about public health officials throughout the random sample, then we may infer that perhaps coming into the experiment the treatment groups had higher notions of perceived source credibility and that something about the experimental treatments diminished that perceived source credibility. While there may be many reasons for this, it is possible that the contradictory message is a culprit and that no variation in message-sidedness could have overcome it.

Based on several open-ended comments, there is no doubt the contradictions were troubling to some participants in the experiment:

- Thank goodness this was ficticious [sic] the only thing that happened was i got too confused as to what to do you cant stay home and go into public at the same time

- Well, I'm relieved the article was fictitious. I HOPE that means they aren't really considering putting this policy in place; it's ludicrous. It would be safer to go to work and everybody there take reasonable precautions than to go wait for supplies with hundreds of other people doing who knows what with who knows what kind of exposure.

- Central location idea is idiotic more dangerous than just letting people naturally go shopping--fewer people in one place at a time in the grocery store, at least. No way they could "control" what THOUSANDS (that's what they said they were looking for a place to hold) of people are doing as they mill around waiting for supplies. Completely idiotic. Who the heck is running this show at the CDC anyway? I've had friends at the CDC that aren't this stupid.

The contradiction did not prevent people from indicating compliance with both social distancing and public queuing. But in an actual pandemic, an open question for risk communicators is how even a minority of voices repeatedly calling the policies “ludicrous” or “idiotic” might potentially erode compliance.

Conclusions

Considering the meaning of this study, it is instructive to look back at the words of Baruch Fischoff, quoted in Chapter Two, when he said that too often, risk communication messages are based on anecdotal information that "assumes that the communicator knows what people currently know, what they need to learn, what they want to hear, and how they will interpret a message" (Fischhoff et al., 1993, p. 184).

Anecdotally, health risk communicators have been concerned about how people will interpret contradictory messages, especially regarding the pandemic flu policies examined in this study. They have assumed that people will be troubled by the contradictions, leading to non-compliance with government directives in a pandemic.

The findings of this study may suggest otherwise. People are not unaware of the contradictions, but many of them, as seen in the one-on-one interviews, may be resigned to the inconsistency. Many of them, as seen across the experimental groups, may intend to follow policies whether or not they believe they are logical or wise. If the views expressed by participants can be believed, risk communicators may not need to fear the contradictions in and of themselves. However, the larger question of accurately discerning behavioral intention and how intentions may change or evaporate under stress – particularly related to risk and disaster -- is one that also deserves scholarly attention.

An issue that is bypassed by examining the contradictions too closely is the question of what people know and what they need to learn. Focusing on the

contradictory nature of policies such as these overlooks the fact that many people do not have adequate knowledge of pandemics or bird/avian flu to begin with. As Fischoff's words imply, this may be an oversight that arises from conventional wisdom, but is not based on fact. Seven billion dollars have been allocated toward pandemic preparedness and for the last several years, risk communicators have been inundated with the topic. Surely by now, it must seem to many of them, everyone knows about pandemic flu. If, as the scores of the control group indicate, lack of knowledge would mean lower compliance in a pandemic, then assumptions about "what people know and what they need to learn" need to be re-evaluated so that public education can begin at a much more basic level.

Some communicators may have been so stymied by the idea of overcoming objections to contradictory policies for which there were no proposed alternatives that it may have been difficult to think about "what people want to hear." Results of both phases indicate several things may be important for people to hear before and during a pandemic: they want to know that the government has considered many different alternatives before settling on social distancing and public queuing – many of them want to be able to suggest their ideas and have input. Others want to understand how their financial security would be provided for – how for example, a policy like social distancing could work for someone with no sick leave or savings. Others may need to know the details of policies so they could plan in advance for things they consider necessary such as religious worship or social interactions. Some of these

questions fall under the aegis of education, but others are policy questions that have yet to be resolved. The "things people want to hear" deserve more than anecdotal consideration; they deserve research and attention not only from risk communicators but also from policymakers. Given projected timetables for how a pandemic might unfold, these are not issues that can wait until the event happens – they must be addressed now.

A vacuum currently exists related to what people know and what they want to hear about pandemic preparedness, and it is easy to imagine dissenting voices filling that void in the event of an emergency. Addressing policy questions and gaps now would take away potential ammunition from some of those critics, but pre-event education and information would also likely be effective. While two-sided messages with refutational arguments did not make a difference between groups in this research, there is still some investigation to be done on how, if at all, messages could inoculate people so they are less likely to have second thoughts about complying with pandemic policies.

Limitations

Like most research studies, this project has many limitations. First, the issue of pandemic flu, while currently of prime interest to public health officials, is a complex, unfamiliar issue to the public. The potential severity and emotional toll of a pandemic scenario and the relative lack of individual efficacy to prevent a pandemic may have confounded the investigation of two-sided messages and contradictions. In other words, because a flu pandemic is so unlike any other health risk, responses to pandemic messages and policies may be unlike

responses to more mundane health risks. Other contradictory messages such as those surrounding fish consumption may be better choices for future research.

Second, the apparent lack of knowledge about pandemic flu and the need to explain the topic enough for all experiment participants to complete the post-test meant that there was not a true control group, only a cursory knowledge group. In retrospect, the decision to give this group tips about general cold and flu prevention may have unduly influenced their opinions about public health officials. Likewise, neither do they represent the completely uninformed public, since they were given some information about pandemic flu, just none about government policy during a pandemic.

Third, the grant by Time-Sharing Experiments in the Social Sciences (TESS) understandably limited the number of questions permitted on the post-test questionnaire[17] and therefore, in the interest of space, no manipulation check was included. Additionally, a cap on the sample size limited the ability of the researcher to increase power by including more participants.

Fourth, although the post-test questionnaire was reviewed by several scholars and similar questions were tested on participants in the qualitative interview stage and subsequently refined, no formalized pilot of the post-test was conducted.

Fifth, the differences in the treatment groups were subtle ones, and hence, the effect size was expected to be small. The researcher took several steps to

[17] The TESS grant provided 8,000 "respondent questions" to the researcher, meaning the sample size multiplied by the number of items in the post-test could not exceed 8,000. Therefore there was a trade-off between the number of items that could be included on the post-test and the number of participants. Eight-thousand respondent questions, divided by 18 items, equaled 444 possible participants in the experiment; the final sample was *N*=443.

increase power, including making the sample size as large as possible and including a blocking variable to reduce the variability of the main effect. However, this may have rendered the effect size too small to be statistically significant.

At the same time, the study included a number of steps designed to ensure a high degree of reliability and validity. Reliability of the sample was addressed in several ways: the qualitative sample (*N*=19) was chosen to reflect, where possible, the actual population. Minorities were oversampled so that no group would be represented by a single individual; however, one limitation is that only one person in the qualitative sample had less than a high school education. The sample for the experimental portion (*N*=443) was taken from a representative, national panel of 40,000 recruited through random digit dialing and interview participants were randomly assigned to experimental treatments. Although the experiment was deployed online, non-Internet households are included in the panel by the provision of a Web TV appliance in exchange for their participation.

Significant evidence was shown to support construct validity. Both laypersons and expert scholars reviewed all materials, and it was then discussed in approximately 19 hours of interviews in the qualitative interview phase of the study. Content-related evidence was addressed through the use of an existing credibility scale with high reliability; it was also aided by the accepted practice of measuring behavior that cannot be observed by asking about behavioral intention. Factor analysis of the dependent variables further validated that they

measured what they were intended to measure and the relatively high Cronbach's alpha for each resulting index showed moderate to high internal reliability.

Further evidence of construct validity was addressed in several ways: first, by using existing measures, and second, by eliciting feedback about the dimensions of each measure from the participants in the qualitative interviews. A limitation of the study is the unknown extent to which some of the terms used in Meyer's Index may have divergent meanings for people. Additionally, the nature of the experimental design did not include a way to measure dynamism, which may be a component of credibility that is not adequately measured by Meyer's Index.

Future Research Directions

The researcher plans additional analysis of the qualitative portion of this study to mine it for further insights and grounded theory, since it may be one of the first "conversations" with members of the public about pandemic flu.

There are a number of additional research directions that could be useful to both scholars and practitioners.

First, in terms of constructs, if dynamism is part of the credibility construct when visual cues are present (in-person or on video), then it may be useful to explore ways of injecting dynamism into print and online media, as well, to increase overall perceived credibility.

Second, the construct of behavioral intention deserves special consideration in risk and particularly emergency situations. Can people really

anticipate, pre-event, what their behavior would be during an emergency event? Is behavioral intention a good predictor of behavior in an emergency? How well do high levels of intended compliance persevere under stress and changing circumstances? Emergencies are high-involvement situations in which people would theoretically exhibit more systematic processing than in low-involvement, non-emergency situations; yet when time or resources are limited, as they often are in emergencies, theory indicates heuristic processing might take over. More work needs to be done in this area to ensure that data from surveys and experiments related to behavioral intention and emergency risk are, in fact, valid.

In this study, both credibility and compliance appeared to be under threat when people were exposed to negative opinions and asked whether they had second thoughts. This implies that resilience of opinion and intention under attack may be an important issue in risk communication. One way to continue exploring this further might be in a pre-test/post-test experiment in which several "focus groups" could be organized, with confederates playing the role of naysayers and critics, to get a sense of how exposure to opposing opinions might sway people's convictions, so communicators could more effectively inoculate them. "Resiliency of message" is an issue that should be examined by both scholars and practitioners.

If the current experiment were replicated in the future, the researcher would include several modifications to remove possible confounding variables. First, to more clearly see the effects, if any, of two-sided messages on processing of contradictions, a more mundane, less-threatening topic than

pandemic flu should be examined. Second, a cynicism scale could be added as a pre-manipulation measure that could serve as a covariate in the data.

While two-sided messages may not be an effective way to handle contradictions about pandemic flu, the issue of contradictions is one that should continue to be explored. Theoretic frameworks such as prospect theory and heuristic-systematic processing may offer alternative ways of examining the issue; grounded theory, developed from qualitative work and used to inform future surveys and experiments, may be another.

Expanding theoretical knowledge about the impact of contradictions and the most effective ways of communicating inherently-inconsistent messages has application throughout the field of health risk communication. But while a deeper understanding of these issues could be quite useful in creating future messages about fish or alcohol consumption, there is an urgency associated with the life-and-death scenario of a severe flu pandemic that demands that the immediate attention of scholars. Managing the impact of contradictory messages in public health emergencies truly demonstrates a critical intersection of theory and practice.

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Appendix A

Consent Forms

INTERVIEW CONSENT FORM

I, _____, agree to participate in a research study titled "Public Health and Pandemic Flu" conducted by Karen Hilyard from the Grady College of Journalism and Mass Communication at the University of Georgia (706-308-5522) under the direction of Dr. Vicki Freimuth, Grady College of Journalism and Mass Communication, University of Georgia (542-0586). I understand that my participation is voluntary. I can refuse to participate or stop taking part without giving any reason, and without penalty. I can ask to have all of the information about me returned to me, removed from the research records, or destroyed.

The reason for this study is to better understand the way the public receives important information about public health threats such as pandemic flu. If I volunteer to take part in this study, I will be asked to do the following things:

1) Answer questions about my feelings about public health officials, the issue of pandemic flu and what I would do in a pandemic. The discussion will last 30-60 minutes.

2) Someone from the study may call me to clarify my information or follow-up to get additional information if I consent. I am under no obligation to consent to further interviews, however.

The benefits for me are that I may learn more about the issue of pandemic flu and how to protect myself and my family in the event of a pandemic. The researcher also hopes to learn more about how public health officials can effectively communicate important information about pandemic flu and other issues.

No risk is expected.

I will receive $25 for completing the interview. I understand that in order to process the payment for my participation, the researcher needs to collect my name, mailing address, and social security number on a separate payment form. This completed form will be sent to the Grady College of Mass Communication business office and then to the UGA Business Office. The researcher has been informed that these offices will keep my information private, but I understand they may have to release my name and the amount of compensation paid to me to the IRS, if ever asked. The researcher connected with this study will protect my private information and will keep this confidential by storing in a secured location. However, I understand the researcher is not responsible once my name, social security number, and mailing address leave her office for processing of my payment.

The interview will be audio-taped and transcribed by the researcher and only the researcher will have access to the tapes, which she will store in a secure location in her home. Any identifying information about me will be removed from the transcripts and the tapes will be destroyed no later than May 31, 2009. The researcher may use some quotations or verbatim response in her published work from the interview but will not attribute these to me, either by reporting these anonymously or by using pseudonyms.

No individually-identifiable information about me, or provided by me during the research, will be shared with others without my written permission.

The investigator will answer any further questions about the research, now or during the course of the project.
The investigator will answer any further questions about the research, now or during the course of the project.

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

_____	_____ _____
Name of Researcher	**Signature** **Date**

Telephone: _____
Email: _____

_____	_____
Name of Participant	**Signature** **Date**

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix B

Phase One Interview Guide

Thank you meeting with me today. As I mentioned when we first spoke, I am a researcher with the University of Georgia trying to better understand what public health officials can do to help people in public health emergencies. I am going to ask you some questions about where you get information about health and how you feel about different sources of information, as well as what you would do in the event of a specific kind of health emergency.

I want to be sure I get everything you have to say, and I am not as fast as I should be taking notes, so I'd like to tape our conversation if you don't mind. That way I won't miss anything! The tape is for research purposes only and after I get your words down on paper I will destroy it. If at any point you'd like me to stop the tape or would like to end the interview, please let me know. If you have any questions after we talk today, I will give you my contact information as well the professor I work with and a contact at the research review board at UGA.

I would like to hear your honest opinions, whatever they are. I'm going to be asking you a lot of questions, and I'll be asking "why?" a lot. It is important that you be absolutely honest and open, even if what you have to say may be negative or different from what you think other people might say. Every opinion is really important, so don't worry about how it sounds – just say it.

If that sounds okay, then I'd like to ask you to sign a form that gives consent for us to talk. [consent form -- see attachment].

I would like to start today by asking about ways you get information about health issues and what you think about that information.

1. When you learn that you or your family has an important health problem and maybe you have to make some choices about what kind of treatment to get or how to handle the problem… how do you usually respond?

2. If you needed to get information about a health issue, where would you turn? (If they don't have any idea, can prompt with such choices as friends, family doctor, health department, the Internet, etc.)

3. If it is a health issue that involves not just you or your family, but other people in the community – like an outbreak of measles or the flu -- where would you go for information?

4. What do you think about the advice and information you get from public health officials?
Think about federal health officials for a moment…such as from the CDC or the Surgeon General. What are your impressions of them? Do you consider them experts? How trustworthy are they? How about local public health officials, like those from your county?

5. Sometimes in a disaster or emergency… health officials like the county health department or Surgeon General might be on television telling us about the situation… what to do… what the government is going. What do you usually think about them and what they have to say?

6. I want to change the subject a little now to talk about the way you might think about people who give health advice… and I want to talk about words people use to describe them. Sometimes people will talk about whether a health professional is "credible." When you hear that word, what does it mean to you, if anything? What characteristics does a health professional need to show to tell you what they have to say is "credible"?

7. How can you tell if they are "*accurate"*?

8. Thinking about government health officials now, like you might see on TV… How can you tell if they are being "*open"* with you?

9. What would make you think a health official was "*biased*"? If I said to you that a health professional is "biased," what does that mean to you?

10. Sometimes people may be concerned about government health officials being "fair." What would tell you that a person was being fair or not fair?

11. How would you know whether a health official is "caring" or "compassionate"? What if you don't think they are – how does it change your response to what they have to say?

12. Talking about any kind of health professional now…(doctors, nurses, local or national public health officials)… how do you decide whether to follow their advice?

13. You mentioned (…) as an important source of health information for you. If they said one thing, but public health officials told you something totally different, what would you do?

14. Changing subject just a little, I would like to talk about contagious diseases. When I say something is "contagious," what does that word mean to you?

15. How about "infectious"? Same thing as contagious?

16. Let's say there was a serious new disease in your community… a disease that was exotic and very deadly, with no vaccine. Let's say that it could be easily passed from person to person, even just being in the same room with someone. How would you protect yourself and your family?

17. What would you expect officials to do about a disease like that? In a situation with a contagious disease, would public health officials know what to do to protect you and your family? For example, if the person with the illness worked at your company or went to your child's school…

16. Would you support people with the disease being asked to stay at home or to avoid crowds? How could the community be sure they would do that? (If they need a prompt

here, you could ask if people should do it on their own and whether the government should step in.)

17. How would these decisions or policies affect the patients?

18. What have you heard about avian flu, sometimes also called bird flu?

19. I want to tell you a little about bird flu so that you'll have some background to answer the next could of questions. Bird flu has only infected a few hundred humans so far around the world. But when it has, it has been extremely deadly, killing about half of the people who come down with it. Imagine a disease that kills half of the people who get it… half of your friends, your neighbors, your family. Right now, it only sometimes passes from birds to people. But scientists are worried that virus could *mutate* and suddenly be very easy for one person to pass to another person. The last time that happened with a disease this dangerous, 50 million people died around the world… what they call a pandemic. If you knew people in your community had a disease like that and that they could give to other people, what would you do to protect yourself and your family?

20. The federal government is very worried about a pandemic. If a lot of people in this country started getting that disease, the plan is to shut the country down for a while to keep people away from each other as much as possible, so the disease can't spread. Close schools and daycares. Close public places like movie theaters and malls. Close a lot of stores and some businesses. Tell people not to gather with friends at parties or at church. Tell people to keep sick folks at home and care for them there. A lot of people still might die, but the idea would be to save as many people as possible. It might last a few weeks… or a few months. How do you respond to that idea?

21. What problems, if any, would you see with keeping your distance from people during a pandemic? How would people get food, or money or help to take care of people in their family who were sick?

22. There might be a need to distribute rations of food and other supplies to people if stores are closed. Also, if there was a vaccine or some medicine to help fight off this deadly disease, the government might need to get it to people. The government's plan is to get supplies and medicines to people at special temporary health clinics set up in communities. Would you take yourself and your family to a place like… the local high school..? What are the reasons for this decision?

23. What precautions would you take?

24. Do you think the government has the best interest of people like you in mind when it comes to these two polices… isolating yourself most of the time, but going to a public place to get medicines or supplies? Would you do both?

25. Some people might say they that during a flu pandemic they would be afraid to go to a clinic to get medicine or vaccine, even if the government told them to, because they might get infected while they are there. If somebody had a choice, what would you tell them to do?

26. Even though a flu pandemic might be deadly and much more serious than most disease epidemics we are used to, some people might not listen to government recommendations. They may try to persuade you not to listen either. For example, someone might say that they stay well during flu season every year just by washing their hands often and not standing too close to people, and that is not necessary to stay home from work or church or the grocery store during a pandemic. How would you respond?

27. What if somebody said… "I don't see the difference between going to pick up my medicines at the health department and going to work. If I can be careful at one place I can be careful at both." In you opinion, are they different?

28. Overall… what do you think about the government plans I just told you about?

29. Now I'd like to get some information about you…

a. What is your age?

b. What is the last grade of school or year of education you completed?

c. What race do you consider yourself?

d. Which of the following categories best represents your income:
   i. Less than $25,000
   ii. $25,000 or more but less than $50,000
   iii. $50,000 or more but less than $75,000
   iv. $75,000 or more but less than $100,000
   v. $100,000 or more

Thank you for your time.

I am going to be talking with people all over the state about their opinions on these same issues – how worried they are about emergencies like pandemic flu, how to prepare and who to trust. What you've told me today will help me develop questions to ask an even larger group of people about how they would handle an emergency. Based on those answers, officials may develop public health education campaigns so people can be safer, healthier and more prepared. By being here today, you've helped toward make people safer and healthier – thank you again. Do you have any questions?

Here is some contact information for you if you think of questions after today…. You may also wish to visit this website, www.pandemicflu.gov for more information.

Appendix C

Experimental Treatments and Control Article

One-Sided Message with social distancing first, then public queuing

It's a disaster experts say could be 800 times deadlier than the September 11th terrorist attacks and would leave no community untouched: pandemic flu.

As part of a $7 billion effort to be ready for the worst, public health officials today announced the details of a pandemic flu preparedness plan, developed over the last two years by experts at the Centers for Disease Control and Prevention (CDC) and the Federal Emergency Management Agency (FEMA). The plan would be put into effect in the event of an influenza *pandemic*, or serious, widespread epidemic affecting many communities at the same time.

Similar influenza viruses that were passed from animals to humans in Asia in recent years have killed nearly half of those people infected. So far, those deadly viruses have not spread easily between people, but scientists fear they could mutate and sweep across the world.

"We are not talking here about the run-of-the-mill seasonal flu," said John Lockwood, a spokesman for the CDC. "These preparations are for a very severe form of the flu, like the Spanish Flu of 1918 that killed 50 million people around the world. A flu strain like that could kill more than two million Americans in a matter of weeks, so we have to be ready with a plan."

At the centerpiece of the new federal plan is a policy called "social distancing," in which people would be asked to stay home from work, school, stores, places of worship and all other gathering places for up to six weeks, or until the worst of the pandemic was over. Staying away from others during a pandemic is critical, say officials, because the virus is transmitted not only by handshakes and doorknobs but by droplets in the air.

"We know it will place a heavy emotional and financial strain on the public to stay away from others during a pandemic, but if it is critically important that people follow this advice. Staying home during a pandemic is a life-and-death decision," said Lockwood.

A second key part of the federal plan is a method to distribute medicines, vaccines and other supplies such as groceries. People would be asked to come to a central place in each community, such as a public health clinic, high school gymnasium or convention center to receive supplies. Distribution centers would be staffed by trained local public health officials.

"While we do not want people to leave their homes for any other reason in a pandemic, we will need to ask them to come to us to receive medications the government has stockpiled. Also, many people will no doubt need to receive food and basic necessities this way."

No local distribution facility has been designated yet, according to Mary Louise Shewmaker, spokesperson for the County Health Department.

“We are trying to pinpoint the best place right now,” said Shewmaker. “We need a place that can hold several thousand people, has adequate parking and is protected from bad weather.”

In the mean time, officials encourage the public to prepare by storing at least three weeks of non-perishable food, including a gallon of water per day per person.

One-sided message with public queuing first, then social distancing

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At the centerpiece of the new federal plan is a policy called "social distancing," in which people would be asked to stay home from work, school, stores, places of worship and all other gathering places for up to six weeks, or until the worst of the pandemic was over. Staying away from others during a pandemic is critical, say officials, because the virus is transmitted not only by handshakes and doorknobs but by droplets in the air.

"We know it will place a heavy emotional and financial strain on the public to stay away from others during a pandemic, but if it is critically important that people follow this advice. Staying home during a pandemic is a life-and-death decision," said Lockwood.

A second key part of the federal plan is a method to distribute medicines, vaccines and other supplies such as groceries. People would be asked to come to a central place in each community, such as a public health clinic, high school gymnasium or convention center to receive supplies. Distribution centers would be staffed by trained local public health officials.

"While we do not want people to leave their homes for any other reason in a pandemic, we will need to ask them to come to us to receive medications the government has stockpiled. Also, many people will no doubt need to receive food and basic necessities this way."

"Although it may seem contradictory for people to come to a public distribution center when we are asking them stay away from other gathering places such as work, school or church, this is the best way for us to get medicines and critical supplies to people quickly."

No local distribution facility has been designated yet, according to Mary Louise Shewmaker, spokesperson for the County Health Department.

“We are trying to pinpoint the best place right now,” said Shewmaker. “We need a place that can hold several thousand people, has adequate parking and is protected from bad weather.”

In the mean time, officials encourage the public to prepare by storing at least three weeks of non-perishable food, including a gallon of water per day per person.

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The CDC's Lockwood says taking a few weeks away from all interaction from others is an important part of the plan.

"Daily life is an incubator for germs. It means touching hundreds of door knobs, sharing public restrooms, elevators and public transportation and indirect contact with thousands of people. Wearing gloves and masks may not be enough to protect you, because you cannot be sure everyone else is taking the same precautions. Even in a killer pandemic people may get sloppy or forgetful. Stopping that kind of interaction with others for a few weeks can stop the virus in its tracks and could potentially save millions of lives."

However, Lockwood said experts who have studied the successful management of other epidemics believe carefully orchestrated public distribution of supplies can occur without spreading the disease.

"We believe a single visit to a public clinic for supplies or vaccinations could be tightly monitored with very little direct contact and minimal sharing of germs. Public health officials could take extreme precautions and members of the public could be mindful for that brief period of not touching things unnecessarily and keeping a physical distance from others."

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Control article

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Every year in the United States about 200,000 people are hospitalized and 36,000 die from the flu or its complications according to the Centers for Disease Control and Prevention (CDC). But a pandemic, or widespread epidemic that affects many communities at the same time, could be much worse. A very severe form of the flu, like the Spanish Flu of 1918 that killed 50 million people around the world, could kill more than two million Americans in a matter of weeks. That's about 800 times the death toll of 9/11, all from a few germs easily passed from person to person.

Whether it is a pandemic or simply seasonal flu, public health officials say it makes sense to take certain precautions. Here are ten ways you can stay healthy:

1) **Wash your hands.** A study by the Naval Health Research Center showed that washing your hands five times a day can cut respiratory diseases like colds, flu and bronchitis by 45 percent.
2) **Think about all the people who didn't wash *their* hands.** After washing your hands in a public restroom, use a paper towel to turn off the faucet and another paper towel to open the door.
3) **Carry a bottle of hand sanitizer.** Cold and flu germs can live for hours on objects like doorknobs, soft drink and ATM machines or fountain pens. Sanitize your hands frequently, especially before and after eating or touching your face.
4) **Cover coughs with your sleeve, not your hand.** Hands transmit other people's germs to you and your germs to others.
5) **Use your knuckle, not your fingertip, to rub you eyes.** Fingertips carry more germs and the eye is a major entry point for germs. The average person rubs their nose, eyes or face 20-50 times a day.
6) **Get a flu shot.** A flu shot may not help if there is a pandemic, but it is your best defense against seasonal flu.
7) **Avoid crowds during cold and flu season.** Take a flight of stairs instead of crowding into the elevator or walk a few blocks instead of taking the bus.
8) **Don't ask your doctor for an antibiotic.** Antibiotics don't work on viruses like the cold and flu and can kill off healthy bacteria that help your immune system. Besides, a doctor's waiting room is a likely spot to catch a cold from someone else who is sneezing and coughing. Rest at home and drink plenty of fluids instead.
9) **Stock up on supplies to get you through an illness.** Keep pain relievers, throat lozenges and chicken soup on hand in the winter months. Prepare for possible isolation during a pandemic by stocking several weeks of non-perishable groceries in your pantry.
10) **In the event of an actual pandemic, listen to the advice of public health officials.** Scientists who study contagious epidemics will advise the public how to avoid getting sick.

Appendix D

Post-Test Questionnaire

Q1-Q5. Considering what you know from the article you just read, please mark the number between the pair of words that best describes your feelings about information from public health officials

Can't be trusted	1	2	3	4	5	6	7	Can be trusted
Is inaccurate	1	2	3	4	5	6	7	Is accurate
Is unfair	1	2	3	4	5	6	7	Is fair
Doesn't tell the whole story	1	2	3	4	5	6	7	Tells the whole story
Is biased	1	2	3	4	5	6	7	Is unbiased

Sometimes in history, flu viruses have mutated and killed many people, including healthy young adults. An epidemic that spreads around the world and kills many people is called a pandemic. Please answer the following questions about what you would do in a flu pandemic if the virus is easy to catch and very deadly.

Behavioral Intention

Q6. In a contagious and deadly flu pandemic, health officials might tell you to stay home and avoid crowded public places like malls, movie theaters and places of worship. How likely would you be to follow their directive?

Likely 1 2 3 4 5 6 7 Unlikely

Q7. If health officials told you to stay home from work for several weeks during a flu pandemic, how likely would you be to do it?

Likely 1 2 3 4 5 6 7 Unlikely

Q8. If you care for children under the age of 18, and health officials told you to keep them home from school or daycare for several weeks during a flu pandemic, how likely would you be to do it?

Likely 1 2 3 4 5 6 7 Unlikely

Do not care for children under 18 **[CHECKBOX: SP]**

During a flu pandemic, it is possible that business and transportation networks would be disrupted. The government might need to distribute food and medicine at central public locations.

Q9. During a flu pandemic, if health officials told you to go to a public health clinic for medicines or vaccines, how likely would you be to do it?

Likely 1 2 3 4 5 6 7 Unlikely

Q10. During a flu pandemic, if health officials told you to go to a clinic or other public gathering place to wait for food, bottled water or other necessities, how likely would you be to do it?
Likely 1 2 3 4 5 6 7 Unlikely

Q11. Assume you are in a pandemic and you are keeping yourself isolated at home to avoid getting yourself or others sick. If health officials told you to go to a centralized health clinic or supply center like the local high school, how likely would you be to go?
Likely 1 2 3 4 5 6 7 Unlikely

Q12. Assume you are in a flu pandemic and have gone to a public place to wait with other people for supplies or medicines. How likely would you be to also follow directives to stay home at all times and away from others?
Likely 1 2 3 4 5 6 7 Unlikely

Q13. When it comes to your safety during a flu pandemic, how different is going to work from going to a place like the local high school gym to get supplies?
Very different 1 2 3 4 5 6 7 Not at all different

Q14. In the event of a flu pandemic, how likely would you be to make your own decisions about what is safe?
Likely 1 2 3 4 5 6 7 Unlikely

Q15. In a deadly pandemic, what do you think the greatest obstacle(s) would be for you in following the government directives mentioned earlier?

Financial reasons 1
Not concerned about the risk of a flu pandemic 2
Policies contradict each other 3
Believe the policies are not in my best interest 4
Would not want supplies from the government 5
Would not want medicines from the government 6
Other_____ 7
None of the above **[SP]** 8

Please read the following comments from people regarding public health policy during a pandemic. Three questions will follow.

[RANDOMIZE THE ORDER THAT COMMENT1, COMMENT2 AND COMMENT3 ARE SHOWN]

Comment 1

"On the one hand you are telling people to leave their jobs, take their kids out of school and hole-up at home so they do not spread this deadly disease. At the same time you are telling them to wait in line for food and medicine with hundreds of others, who might not have symptoms yet but could already be contagious. It doesn't make sense. It won't stop the spread of disease and it will create enormous financial hardship and emotional stress for people.

Donald Bakersfield
Citizen's Healthcare Watch, non-partisan policy group

Comment 2

"Who is going to be able to stay home and be safe under this plan? Wealthy Americans who can live off their money in the bank and food in the pantry. Working people will still have to go to work to pay the bills and buy the groceries. If you can take precautions to go these distribution centers to pick up food and medicine, then you can take precautions to go to work, within reason."

Suzanne DiMarco
Working Parent magazine

Comment 3

"If the government is saying this kind of flu is so dangerous two million people could die within a few weeks, then why would anybody risk going to a crowded place to get food or medicine? The people who do that would be risking their lives. If the government wants us to stay home, they better figure out a way to get the food to us."

Reginald Carey
Political Columnist

Q16. Consider whether the statements you just read would make you "think twice" before doing the following things during a pandemic:

How likely would you be to reconsider staying home from work and isolated from others if directed by the government?
Likely 1 2 3 4 5 6 7 Unlikely

Q17. How likely would you be to reconsider going to a community supply distribution center if directed by the government?
Likely 1 2 3 4 5 6 7 Unlikely

Q18. How likely would you be to "think twice" about recommendations from public health officials?
Likely 1 2 3 4 5 6 7 Unlikely

APPENDIX E

OPTIONAL END-OF-EXPERIMENT COMMENTS

- My mother lived through the flu epidemic 1917/1918, and from the things she told us,people had to work together and help each other. While the town in which she lived did much to help, common sense had to prevail. I think that same attitude would have to be important in event of a similar situation today or in the future. We can all take precautions to ward off problems, listen to the powers that may be,but it would come down to a personal decision.
- Next time you have a fictitious news article, make sure that you state it upfront. If I was a panicky person I would've been near states of high anxiety due to family with severe flu at the current moment.
- It really made me think, about going out for food and medicine is the same as going out to work. If or when it happens people need to be prepared with a plan.
- While a pandemic is possible, I think most current discussion is designed to frighten people rather than help them.
- talking about things most of us know nothing about.not sure of information you presented. what is the point?
- There would be a better way by having people line up in cars, or by alphabet, in smaller groups so only small numbers are in contact. It is horrible to see someone suffocate and die from resp/flu and it already happens. We will NOT have enough resources to care for them and will be deciding life and death anyway. This just one more method of triage
- No one knows for sure how they will react to such a crisis. It is hard to determine exactly how you might react.
- scary
- If people are kept isolated, doesn't the effectiveness of this in stopping a virus depend on how long a virus can live on surfaces? People could go back to work in two weeks and still be faced with germs on surfaces. There really wasn't enough information in this study to make an informed decision about these issues.
- The government, as usual, is contradicting itself. The flu vaccines also have not worked for the past few years, so why would it work in a pandemic?
- They should distribute supplies like they distribute hurricane supplies. Find a large parking lot, let people drive thru, stay in their cars, receive supplies through window or in the trunk and have as little human contact as possible.
- The situation will occur sooner or later but it depends a lot of how where and what will happen how I will make my decisions.
- I hopeit never happens
- i hope the government comes up with a more realistic solution
- I think the government would be the best to let the country know what is going on if there were to be an epidemic.

- I work in healthcare and most likely during a pandemic WILL be at work and working with many people and being exposed to others with symptoms. I could not in good conscience..."stay at home."
- Well, I'm relieved the article was fictitious. I HOPE that means they aren't really considering putting this policy in place; it's ludicrous. It would be safer to go to work and everybody there take reasonable precautions than to go wait for supplies with hundreds of other people doing who knows what with who knows what kind of exposure.
- Please note that I concluded there was risk on the basis of the fictitious article, before I read the opposing points. I understand the difficult balance attempted here, but time phasing access to sites will be important. Also, if the government is going to "direct" anything, it had better have 1) a tight plan, 2) backed by strong legislation passed NOW so people can get used to it, and 3) plenty of law enforcement or military resources that start training very soon.
- I'm glad someone is studying this - I hope that we have a good plan in place soon.
- I think this topic is very important and interesting. I pray God not to get here in United States a pandemic.
- Should have n95 masks at home and emergency food that does not require reconstitution with water
- The circumstances would dictate how I would make my decisions at the time.
- I believe a pandemic is likely, and that government estimates are conservative, I am almost 65 and will probably not survive such an event, however a certain number of people will survive for various reasons. The biggest threat will come from public panic, which will cause more casualties than the disease.
- Receiving the instructions to stay home and then be instructed to go out and wait with others for supplies, etc. does seem contradictive, however, I feel given that people would be on their top guard at the time, that it would be a lower risk than going to a job especially if their job requires interaction with the public.
- good survey, really made you think
- I have not seen nor heard of any alternative for those of us who area allergic to ingredients in the flu serums and therefore not able to take the injections. What would folks like us do when we couldn't accept the treatment available for a flu pandemic?
- Public health is concerned about improving health of citizens and do an excellent job.
- I guess we will have to wait and see what happens and the do our best to stay away from germs and people, and se thgat we have the supplies we need. But with earthquake and other things, not many people have propper food, water and medical aupplies on hand- in case. ... M
- We are retired, live in the country and have two freezers full of food. We could live here for "months" without going anywhere. Going to a shelter for supplies would be the LAST THING we would want to do when we are to stay away from crowds!
- I am 77 years old and have a freezer and storage cupboard I could live from for quite some time. I do not work, so would likely stay away from people.

- it sounds like something the goverment would do..half the problems we have are because of them...
- Very thought provocking..It's going to happen....
- Topic was presented welll.
- the nation would have to put a freeze on everyones bills and the national guard would have to go door to door to drop off suppiies or to the voting areas and have these sects pick up supplies this would help localize these viruses.
- A difficult topic, with many conflicting opinions of what would be best. I hope we never have to find out. Maybe more education about how viruses are spread could help.
- scarey
- this one was a little disturbing to wonder if this will happen in the future and also to think how much control the government would have over us. Wonder if this would be a true epidemic or a way to see if the government could make something up to control us.
- I CONTRACTED THE FLU IN JAN. I AM CONVINCED I CONTRACTED IT AS A RESULT OF A FLIGHT I TOOK IN WHICH I CONTRACTED GERMS FROM OTHERS ON THE AIRCRAFT.
- This is a no win.
- We are social and need each other for survival.
- That's why these viruses have such an easy time spreading.
- I'm retired and would not have to miss work if public health officials recommended staying away from work. I also have limited contact with other people and probably have a two weeks supply of provisions so I wouldn't have to go out.
- This whole article portends enormous trust in a government now headed by officials who have repeatedly tried to deceive the populace for the goal of personal financial gain and corporate rape of the average American.
- In the event of a pandemic, I would more likely trust organizations similar to the Red Cross, whose purpose is protection of the average person during calamity. It would not be possible for the government to deliver food to every person. []
- This is a disconnect from the average American who knows that close connectivity to human relationships is their ultimate saving of their human experience, not any technology. [
- Dispassionate responses of practicality prove the inane disrespect of a government for its people.
- Disrespect and lack of dignity, treating people as a herd of unintelligent beings, without personal values that play into the equation is where this type of governmental thought patterns fail us all.
- I live in the ruralest of rural areas on a farm. Aside from the milk man we might not see anyone for days as it is. We grow much of our own food and can not afford doctors. Germs can come to use without even going anywhere . They can be airborne.
- As I said in one question. Living in new manhatan makes these questions almost meaningless. There is no way to avoid people no matter what you do. There is no room to store food and water for three weeks unless you live in

what would be a huge apartment in new york. In my neighborhood a studio goes for$3500 a month so not many live in huge apartments.

- Education is the key. The recommendations listed at the beginning of this survey were great. Most adults who contract infectious diseases are victims of their own carelessness.
- after reading all the info I would have to think real hard about what I would do.Maybe I need to stock up on food suplies for a couple of weeks and rotate them.But I agree with the articles that say going to a crowded center for suplies would be no different than going to work.Why not wear a mask to protect your self if you have to go anywhere.
- We may not have a choice, in terms of going to work or needing food/supplies.
- I do think during a pandemic people should be able to decide whats safe for them but I personally would not go to a crowed place for meds or food, the gov. would need to figure out a way to get these items to people such as delivery like mail.
- this issue is very scarey to think about
- there would seem to be many ways to prevent large crowds when dealing with med's and food. Also there is no perfect answer to the issue.
- If we had to go to a central distribution place, could be it be distributed from a window or some way that I could remain out of doors and lessen the possibilities of contagion? A drive through window could be a better possibility, because I could remain in a car and be better isolated from others.
- I trust the experts at CDC to take the utmost precautions to prevent people from getting the flu at distribution center to get food and medicines.
- I am retired and would think twice about going to a place where hundreds of people were vying for water and food.
- I hope the my husband and I would never be in a situation where we had to rely on the government for help. I would only use the government medicine in a dire emergency. Unfortunately many people less fortunate probably would have to rely on it and heaven help them. Remember Katrina!!!
- very scary topic
- I won't be surprised when it happens. I'll try to be ready.
- I think the govt. is messed up people just run to get the flu shot and they have no idea that it has lead and alluminim god knows what else i think it is population control.
- I always keep sevreral weeks of food any way, watter is no problem just boil what water is available. it would be too late for a vacine to work, I WOULD JUST STAY AT HOME and watch the news.
- I and my family are against being forced by the government to recieve vaccines.
- the topic was stupid
- this is a subject that we would all hope never came to be but something we would need to get valuable information on if it did occur. sometimes these agencies can put a real scare into people unnecessarily
- reading those articles I believe them. what good would it do if you go to a school to get supplies. It would not work either way. If a flu epidemic happens I quess like takes it course and if it was wide spread their is not much we could

not about it. You cannot isolate yourself from the world. Life is life and I quess what is meant to be will be with something like this. Lets hope it doesn't happen. I do not worry much about that stuff.

- Health officials need to be more pro-active in avoiding pandemics BEFORE they happen, not after.
- for the moment, i actually believed the story. stranger things have happened. familys should talk about emergencies, of war, and life situations, so as to control panic, and make sound decisions, as a family.
- I think there are a lot of valid points here. I just don't see how many Americans could afford to stay home that long. Unless the government suspends bills, mortgages, etc., there is just no way.
- peoples comments make sense , our rich leaders take care of themselves so i being me would do what i want i cant afford to do nothing
- Everything mentioned in the begining of this survey, is what I have done for years. I can't remember the last cold or flu I've had.
- It would depend on the situation at that time. Each situation is very different. Sometimes the best decision is the one we make ourselves.
- pepole will fallow instructions for medicines.
- may be for food.
- not going to work is very hard.
- This has to be more carefully thought out with the help of doctors and scientists. There has to be a better way to do this.
- wow!!!!!!
- very interesting something to really cosider n think about.. ty
- We have due to an increasing population,a need for structured planning. Our local elected officials should have more regard for contingency plans.
- While this might be ficticious there seem to be significant contradictions in what the Government would tell people to do. This might create a greater problem or even panic amonng the populus. [sic]
- people have t work your plan would not employers will make sure of it
- Its a very scary subject to think about; a tough situation with tough choice to be made by all, I think that is one thing we can all agree on.
- Very confusing info. Has to be thought through more carefully.
- I will e-mail Hilyard at UGA on precausions when going out during a pandemic!
- This sounds like a bureauacratic nightmare, something that would be on the Sci-Fi Channel!!!!!!!!!!!!1
- the only fear i have is of the government and their lies. the flu of 1918 alot of deaths were caused by their trial vaccinations on innocent people; these are things they don't tell you.
- Gov instructions could be problematic based on statements on safety after 9-11
- of course, I would like to have as much notice as I could to consider all possibilities and to be able to store food in the event there would be a pandemic flu.
- I work in a health care facility and would probable be required to go to work.

- This was a very thought provoking survey. Regarding medications, I would hope the Postal Services would continue to deliver them to recipients homes as many do now... especially for seniors and disabled.
- interesting but not too boring or to redundant muchas gracias y que Dios los bendiga
- you made me thnk!! [sic]
- great survey - good luck!
- We live in Florida, and have see [sic] how chaotic it is to go to a central location to get supplies. Although it may be necessary in your scenario, it is far from ideal. People wait for hour, and exposure to disease (in your scenario) is too great. Maybe if there were multiple, instead of major central locations, in each town, it could work better - in the event people need meds or supplies (in your scenario).
- thank goodness this was ficticious the only thing that happened was i got too confused as to what to do you cant stay home and go into public at the same time
- If people are really needed to go to public location for food/water/med.'s they should be given masks/gloves/santitizing items at entrance to parking lots w/o a car
- If the scenerio [sic] were true, then i would also assume that there were precautions athe the distribution centers to prevent the virus spread as much as possible. A system for handling items b bothe giver and recipient to kill bacteria, masks etc for brething and goggles etc for airborne droplets.
- There weren't any suggestions for individuals to wear protective masks while going to "government" sources for medications/immunizations.
- I think it would be extremely hard for most people to stay at home and not go to work . They might risk losing their jobs. It would be easier for me since my husband is retired and drawing social security but I think that ina situation this serious I would be scared enough to heed thier warnings and follow thier instrutions and pray for the plan to work. A job won't be any good if you die. Another job would be easier to get if you were still alive and healthy.
- If you have to go to distribution areas,you can always wear a mask over your mouth. I would also wear gloves.
- Pandemic threats are real. I trust scientists and epidemiologists, but have some concerns about government policies.
- I think there is a real possiblity [sic] of such an event. My father had the spanish flu in 1918 and survived.
- The only way I or any employee would be able to not go to work would be for the geoverment to step in and force the shut down of a work place.
- It was obvious to me that this article was written to be contradictory. The truth is if my only option of getting food and/or medicine is through a central meeting place, I would have no choice than to do it. The alternative of staying home would have the same result … death by starvation!
- This topic really gives people something to think about.
- Would you like to live in one of the "SAFE" FEMA trailers? Do you think these people can do a better job with the flu than they can with a hurricaine? They

took three to eight weeks to do something that they have done before, the flu will run it's course by the time FEMA and CDC deside what needs to be done and where to do it!!

- interesting
- that is something to think about and it woul be something you or i would have to use your own judgement to keep your family safe
- I don,t [sic] trust the government now. I sure as hell would not trust them in a national emergency especially with their track record as of late.
- should be more public awareness for hygiene and taking better care of ones [sic] self
- if your [sic] sick stay away from others
- i pray that never hapens [sic] to us
- Preventive actions could be taken if necessary to go to a community site. I would continue working if my job was maintaining life for others (utilities, medical facility, human or public service)

Katrina, That says it all about what the government can do for us if there was a problem!!!!!