

**“Who Said What?”**

**Effects of Message Framing and Source Type Toward COVID-19 Vaccinations Intentions  
Among College Students**

by

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**Abstract:**

Since 2020 the world has experienced a change in our everyday lives due to the COVID-19 disease. As the world tries to return to a place of normalcy, the COVID-19 vaccine aims to do that. Considerable research has examined message framing and the role of celebrities in health communication, but there is little research about their effects on COVID-19 and college students. Thus, building on past research this thesis examines the effects of message framing and source type on Instagram with the goal to persuade unvaccinated college students to get the COVID-19 vaccine. To address this gap in the literature, a 2 (message *frame*: loss vs. gain) x 2 (*source type*: CDC vs. celebrity) online experiment was conducted (N =104). The data showed no significant differences between message type (gain vs. loss-frames) and source type (CDC vs. celebrity) in regard to lowering one's vaccine hesitancy, and increasing students' vaccination intentions, attitudes toward the recommended behavior, and social media engagement. However, the supplementary analysis found significant effects for gender. In particular, it was shown that males were more likely to have higher levels of vaccination hesitancy, yet after being exposed to a message advocating for getting the COVID-19 vaccine they reported higher levels of vaccination intentions compared to females.

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## Introduction

Coronavirus, otherwise known as COVID-19, is a respiratory disease that quickly spread around the world (World Health Organization, 2020). At the end of 2019, the disease was discovered in Wuhan, China (Centers for Disease Control and Prevention, 2021). COVID-19 is very contagious as it transmits from person to person and it is highly infectious (World Health Organization, 2020). By the end of 2020, over 105 million people had been infected by COVID-19 in the United States (Pei et al., 2021). According to Our World Data (2022), as of March 2022 937,000 Americans have died from this disease. COVID-19 has left a permanent mark in terms of education, news outlets, remote jobs, how we get our food, but also in the area of health communication. COVID-19 was one of the first disease outbreaks where the internet played such a significant role in the dissemination of information (Finset et al., 2020). Information about the disease could be found at all times and through all mediums of communication (Finset et al., 2020), and in turn made how information is being presented and who is presenting it more important than any prior disease outbreak.

As the disease began to draw the attention of the world, researchers immediately began to research for a vaccine. Overall, vaccines have been an extremely effective health intervention for infectious diseases (Puri et al., 2020). Vaccines have “wiped smallpox off the planet, nearly eradicated the poliovirus, and substantially reduced the occurrence of infectious diseases such as measles, pertussis, and rubella vaccination against disease” (O’Keefe & Nan, 2012). Despite their effectiveness, vaccines have traditionally been emotionally charged and have triggered heated debates (Chou & Budenz, 2020). Specifically, the COVID-19 vaccine has been a controversial topic among Americans. A lot of misinformation is spread about vaccines through anti-vaccine social media pages and this has increased individuals’ vaccine hesitancy (Chou &



Budenz, 2020). Some people believe that the perceived risks of vaccines outweigh their possible benefits. As it has been argued, individuals tend to respond to the perception of a risk instead of the actual risk (Rubin et al., 2009). Also, some individuals tend to believe the false information that is distributed through social media (Chou & Budenz, 2020). The COVID-19 disease and the vaccine quickly became a polarized political issue among many Americans (Macy et al., 2021). For example, political science researchers suggested that some Americans have retreated into party identities since the pandemics' outbreak (Macy et al., 2021) and the reactions of many has stemmed from their political ideology (Imhoff & Lamberty, 2020). Vaccination intentions and behaviors have been also studied in the H1N1 and Human papillomavirus (HPV) context before (Chien, 2011; Gerend and Shepard, 2007) , but this thesis contributes to the literature by focusing on the COVID-19 vaccine.

Social media has not only become a medium to share information with individuals, but it has become a platform for celebrities to connect with fans, companies to reach out to consumers, and news outlets to disseminate information. A study found that 80% of respondents felt comfortable using a mobile app to check on their health and one in 10 use social media to gain health-related information (Hannon, 2021). On Instagram alone, as of March 2022, the World Health Organization has 12 million followers and the Centers for Disease Control and Prevention (CDC) has 2.6 million followers, thus highlighting their salient role in communicating health information. During the COVID-19 outbreak, social media has become a large component of how individuals gain information about the disease and the vaccine (Puri et al., 2020). For instance, the hashtag #coronavirus was the second most used on Twitter in 2020 (Puri et al., 2020)

Even though clinical trials have proven that the vaccine can prevent COVID-19, only 62% of Americans between the ages of 18-24 are fully vaccinated (CDC Covid Data tracker). COVID-19 has caused over 973,000 deaths in the United States alone (Centers for Disease Control and Prevention, 2021). Within this context, this thesis investigates the role of differently framed messages and source types play in order to better understand how to motivate college students to get the COVID-19 vaccine. Briefly, framing refers to how information is framed when presented to individuals (Entman, 1993). How a message is framed may influence how it is perceived by audiences and therefore holds much value (Entman, 1993). There are two types of frames health communication focuses on: gain- and loss- frames. Gain-framed messages focus on what individuals would gain when complying to the advocated behaviors. Loss-framed messages focus on the negative implications that will derive if people fail to adopt the recommended behavior. The framing theory has been utilized in many health communications studies by respectively framing the advantages and disadvantages of sun tanning, getting the HPV vaccine, and breast self-examinations (Bullock & Shulman, 2012, Gerend & Shepard, 2007, Meyerowitz & Chaiken, 1987). Bullock and Shulman (2012) highlighted the need for more research on how gain- and loss-framed messages can impact one's actions and beliefs. Since the disease is still so new, there is a lack of research on framing in the context of messaging of COVID-19 vaccination to college students. Hence, the current thesis will investigate the effectiveness of gain- and loss-framed messages in triggering unvaccinated college students to get the COVID-19 vaccine.

Past research has shown that the source of health information can be instrumental in how individuals perceive the distributed information (Eastin, 2006; Erku et al., 2021; Hancher-Rauch et al., 2019). Erku et al. (2021) conducted a study regarding participants' trust in the sources that

provide information on nicotine vaping products (NVP). These scholars found that participants who trusted NVP organizations were more likely to believe NVPs were less harmful, while participants who trusted a health organization were likely to believe that NVPs were more harmful. It appears that when participants trust the source itself, they are also more inclined to trust the information that this source presents. Similarly, through an online survey Eastin (2006) found that people use the source of a message to determine if the content itself is credible. This is helpful if the source is credible on the topic, but draws concerns on how easy it is to post information online (Eastin, 2006). For instance, studies have shown that different source types may affect message recipients differently (e.g., Chen et al., 2018; De Meulenaer et al., 2018; Kumkale et al., 2010; Phua et al., 2018). According to O’Keefe (2015), truthful information will be relayed by source with high levels of trustworthiness and therefore individuals become less misguided. The beliefs of individuals can mediate the relationship between perceived source trust and source-specific information sharing intentions (Lu et al., 2021). As Lu et al. (2021) found, to persuade individuals to take an action, people weigh the options of the outcome of performing an action before engaging with it. In doing so, individuals attempt to find information on their own from trusted sources.

Although the effects of differently framed messages and celebrities have been studied in various health communication contexts such as in tanning, exercise, or raising awareness and prevention of disease (Bullock & Shullman, 2021; Brown & Basil, 1995; Nan, 2012), there is a lack of understanding about their impact on college students. In a 2021 study, it was found that 80% of college students intended to get the vaccine (Mant et al., 2021). Yet, and as mentioned earlier, only a little more than 50% of individuals between the ages of 18 to 23 have been vaccinated (Centers for Disease Control and Prevention). Given the various sources through

which young individuals receive information on social media, along with the transmissibility of the disease and the lower vaccination rate of younger individuals, in this thesis an experiment was performed where participants were exposed to Instagram posts about getting vaccinated from two sources: the Center for Disease Control and Prevention and a celebrity.

Past research focusing on COVID-19 has also examined how individuals perceive health information when distributed from the CDC (e.g, Anwar et al., 2021; Chesser et al., 2020). Therefore, the CDC was chosen because it is perceived as an authoritative source of health information in the United States, and which assumed an active role since the outbreak of the COVID-19 pandemic.

Celebrities are often used to distribute health information (e.g., Brown & Basil, 1995; Halder, 2021; Phua et al., 2018). When Magic Johnson tested positive for HIV/AIDS, he utilized his platform to promote awareness for the stigmatized disease (Brown & Basil, 1995). Martinez-Berman et al. (2020) found a significantly positive association with anti-vaccination attitudes and celebrity admiration. Halder (2021) found that celebrities are extremely effective in persuasive messaging, and that companies' utilization of them have skyrocketed in the past 10 years. Celebrities were also proven to be effective in young adult's attitudes toward e-cigarettes (Phua et al., 2018). In light of the importance of celebrities in raising awareness about health issues, the second manipulated source type in this thesis was a celebrity that was determined based on a pretest among Auburn University students.

College-age students have a unique experience with COVID-19 as their social media habits greatly differ from that of their parents (Mant et al., 2021). Thirty-one percent of Instagram's 2 billion active users are aged 18-24, being the second-largest active age group (Social media demographics to inform your brand's strategy in 2022). Since a lot of the

disseminated information occurs through social media (Puri et al., 2020), it is very likely that college students may be exposed to COVID-19-related information through these platforms. Considering the popularity of Instagram among younger audiences, for the purposes of this study Instagram was selected as the platform where the examined sources and messages were manipulated.

In terms of theoretical implications, this thesis advances research in the context of framing and source types in health communication. There are conflicting findings in the framing literature, which depend on the disease type (prevention vs. detection) (Chien, 2011; Meyerowitz & Chaiken, 1987; Nan, 2012). Also, while celebrities are seen as an effective source for influencing others (Brown & Basil, 1995; Chen et al., 2018; Phua et al., 2018; Martinez-Berman et al., 2020), the CDC is an authoritative source for releasing health information. Hence, one of the theoretical contributions of this thesis is to research the effects of these two factors in health communication about COVID-19.

This thesis also has practical implications since it can increase knowledge of social media in health communication for younger audiences. Social media is growing every single day and communication scholars need to ensure how to effectively present health information. Many college students receive health information from social platforms, so it is essential to understand what is the best way to deliver it.

This thesis begins by reviewing past literature on the framing theory, source types, and social media. Next, the research questions and the methodology of the experiment are presented. Finally, the results, discussion, as well as the thesis' theoretical and practical implications are discussed.

## **Literature Review**

The following literature review summarizes past research on framing theory, source type, and social media. The literature situates the following study in the context of the framing theory and source types in regard to the COVID-19 vaccine intentions among college students.

### **Framing**

The framing theory was introduced to the world of communication in 1974 by Erving Goffman. A definition commonly used among scholars to describe this theory is “To frame is to select some aspects of a perceived reality and make them more salient in a communication text in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (Entman, 1993, p.51). In short, framing is the way individuals or companies strategically present information that can possibly change the attitudes or behaviors of recipients. These attitudes or behaviors “become more aligned with framed information” completing the framed effect (Bullock & Shulman, 2021, p. 320). Bullock and Shulman (2021) argue that framing is important because it allows you to target different audiences based on their beliefs. In terms of COVID-19, there are many beliefs regarding the effectiveness, the importance, and the necessity of getting the vaccine, thus researching how different message frames may affect participants’ attitudes is valuable.

There are two types of frames: gain and loss-framed messages. Gain frames provide information to individuals about the benefits that may derive by adopting a certain behavior. An example of a gain-frame message could be: “If you exercise regularly, you will reduce the chance of developing heart disease” (Nan, 2012, p.73). Loss frames highlight the negative outcomes that will occur when individuals fail to comply with the advocated behavior. An example of a loss-framed message is: “if you don’t exercise regularly, you will increase your

chance of developing heart disease” (Nan, 2012, p.73). Gain and loss-framed messages are influential in health communication because of the power that a positive or negative message may have on one’s actions (Tversky & Kahneman, 1981).

Framing originates from the prospect theory of psychology. The prospect theory discusses participants' behavioral intentions based on one’s risk aversion (Tversky & Kahneman, 1979). Tversky & Kahneman (1979) theorize that risky options are more likely to be chosen when using loss frames or when losses are emphasized. Conversely, non-risky options are more likely to be adopted when using a gain-frame or when the benefits of a certain behavior are emphasized.

The framing theory has been a valuable tool in health communication. Von Sikorski and Matthes (2019) describe the importance of framing by its ability to “design persuasive messages to influence an audience to perform desired health-related behaviors” (p.1). One of the first studies of gain and loss frames, used pamphlets about breast self-examinations (Meyerowitz & Chaiken, 1987). This study found that loss frames were more persuasive in getting women to attend appointments. Chien (2011) performed an experiment by examining framing messages regarding the H1N1 flu vaccine, and also found that loss frames were more persuasive than gain frames and educated participants about the vaccine. Kim and Le (2017) investigated the effects of differently framed messages in persuading smokers to quit smoking. These scholars found mixed results since those who had not thought of quitting smoking responded positively to loss-frames, whereas those who wanted to quit smoking responded more positively to gain frames.

In a content analysis of 47 research articles focusing on gain- and loss-frames, Covey (2014) found that the effectiveness of framing has distinct outcomes depending on who the

message recipient is. For example, Kim & Lee (2017) showed that individuals are more likely to respond positively when faced with loss framing but only when their involvement with an issue was low. Lee and Kim found that the more involved individuals are with an issue the more likely it is to react to a loss frame (2017). Rothman and Salovey (1997), based on the prospect theory, found that loss-framed messages are most effective when the action has uncertainty or risk and gain-framed messages are most effective when the action has a certain outcome.

Health communication is divided between advocating health behaviors that perceive no risk such as exercising and actions that perceive risk such as getting a vaccination. More specifically, many studies have focused on behaviors that enhance the prevention of a health issue or increase the likelihood of detection (Shen et al., 2015; Smither et al., 2009). Generally, it is widely accepted that vaccinations can have side effects “such as pain from the injection, a sore arm, and low-grade fever” (Nan, 2012 p.74). Considering the above, Ferguson and Galalgher (2007) suggested that receiving a vaccine can be considered a risky action by some individuals, assuming that loss-framed messages might be more successful.

In the context of vaccination, research has also studied what type of message frame is more successful in urging individuals to get vaccinated. For example, Gerend and Shepard (2007) focused on individuals’ acceptance intentions to get the Human Papillomavirus vaccine (HPV), whereas Nan (2012) examined attitudes toward this vaccine. Gerend and Shepard (2007) found that loss-framed messages led to greater HPV vaccine intentions, but only for participants who had more than one sexual partner and did not engage in safe sex. Nan (2012) also found that the loss frame messages were more likely to result in positive attitudes and behavioral intentions toward the HPV vaccine.



Although framing effects have been examined in diverse health conditions, including urging people to get vaccinated for various diseases, to the best of the author's knowledge, no prior study has investigated the effects of framed messages in the context of COVID-19 and college students.

COVID-19 vaccine messaging can be either loss-framed or gain-framed by providing information on the negative consequences of getting COVID-19 or by providing information on the positive benefits of getting the vaccine and hopefully not contracting COVID-19. Since the beginning of the pandemic, the CDC has employed both gain- and loss-framed messages to educate the public about the dangers of failing to get vaccinated against COVID-19. For instance, in an Instagram post, the CDC highlighted the negative consequences of not receiving the vaccine "adults who were unvaccinated had more than 41 times the risk of COVID-19-associated death" (Centers for Disease Control and Prevention). Yet, in another Instagram post, the CDC highlighted the benefits of getting the vaccine such as "1. Helps protect you from severe illness & death from all known variants, including Omicron 2. Lowers your risk of infection 3. Slows the spread of COVID-19 4. Helps slow the emergence of new variants" (Centers for Disease Control and Prevention, n.d.). How individuals respond to certain messages is essential for health campaigns. Previous studies have focused on how to better communicate to audiences information about COVID-19 (Enicott, 2021; Tam et al., 2020; Thanker, 2021), yet there is limited knowledge about the effects that different types of framed messages have on college students to convince them to get the COVID-19 vaccine. Based on the above literature review about framing effects in health communication, along with the inconclusive results reported in the literature, the following research question is asked:

**RQ1.** What type of message frame (loss vs. gain) is more likely to a) lower vaccine hesitancy, and increase one's b) vaccine intentions, c) attitudes toward recommended behavior, as well d) social media engagement intentions?

### **Source Types in Health Campaigns**

McCroskey and Teven (1999) described source credibility as the relationship between a communicator and a receiver and how the message is perceived. The perception of information is dependent on who presents the information (Kumkale et al., 2010). The source increases the importance of the credibility of the communicator (Kumkale et al., 2010). In health communication, oftentimes different source types are used to distribute information such as the CDC or celebrities.

### **Center for Disease Control and Prevention (CDC)**

The mission of the CDC is to “protect America from health, safety and security threats, both foreign and in the U.S. Whether diseases start at home or abroad, are chronic or acute, curable or preventable, human error or deliberate attack, the CDC fights disease and supports communities and citizens to do the same” (2021 para. 1). The CDC provides the latest information and statistics on various diseases. Likewise, since the beginning of the COVID-19 pandemic, the CDC has constantly tried to inform the public through social media about the latest information on the disease. It should be pointed out that although some people may not always trust it, the CDC still sets a precedent for how health organizations should employ social media. As Sastry and Lovari (2011) stated, the CDC was a “benchmark organization for the use of social media for health”(p. 329). Following the CDC's example, every state now has a social media presence of one government health department (Meadows et al., 2021). Recent research has shown that using social media is an effective way for health organizations to reach

individuals (Meadows et al., 2021). Each day the the CDC posts multiple feed posts to Instagram, Twitter, and Facebook relaying various information to its followers. A content analysis of the CDC's social media during a disease outbreak found three major themes: "organizational competence (i.e., CDC's authority and expert knowledge on Ebola)...extant protocol (i.e., stressing the effectiveness of following established procedures for infection control)...and facts about its transmission" (Dalrymple et al., 2016, p. 452). Since the outbreak of the COVID-19 pandemic, the CDC has diligently used social media to educate the public about the need to wear a mask and get vaccinated, but also to provide facts about how the disease spreads.

Research has suggested that authoritative sources such as doctors and government health agencies are generally considered trusted sources for providing accurate health information (Dutta-Bergman, 2003). Nevertheless, in recent years this is not necessarily true. For example, individuals with lower health literacy trust media sources (e.g., social media, celebrities) over doctors (Chen et al., 2018). Individuals who are not very knowledgeable about health issues may choose to listen to various sources on social media rather than the CDC.

### **Celebrities**

A great deal of research has highlighted the effectiveness and importance of celebrities in strategic communication (Atkin & Block 1983; Erdogan 1999). Similar to the CDC, celebrities are also a valuable source of health-related information and have been featured in public health campaigns. When Magic Johnson tested positive for HIV/AIDS multiple campaigns were put into place to raise awareness and prevention about this medical condition (Brown & Basil, 1995). For example, Brown and Basil (1995) found that participants who identified with the celebrity

were more likely to follow the recommended health behavior. More recently, this finding was also supported by Phua et al. (2018) who demonstrated that consumers would transfer their attitudes toward a celebrity to the issue the latter is endorsing.

The idea of individuals of higher social status or popularity such as celebrities endorsing a product, company, or a certain issue is not something new. Celebrity endorsements have been recorded since the 19th century (Erdogan, 1999). For example, Queen Victoria was seen on Cadbury Cocoa bars in 1900 (Staff, 2021). As radios and television became more popular in the homes so did the increase in celebrity endorsements (Erdogan, 1999). Today, the purchase intentions of 28% of 18-24-year-olds are influenced by celebrities (Nolsoe, 2020).

Celebrity endorsements are also crucial in health communication and have received widespread attention. Phua et al. (2018) performed an experiment on the effectiveness of celebrity endorsement on Instagram in terms of e-cigarettes and found that celebrity endorsements led to positive attitudes toward e-cigarettes compared to non-celebrity endorsements. The same study also indicated that celebrities showed higher levels of “trustworthiness, expertise, goodwill, and attractiveness” (Phua et al., 2018, p. 550). In 45 sets of data analyzed by Halder (2021), it was also shown that trustworthiness, attractiveness, and celebrity reputation contributed to the favorable perceptions that people have toward celebrities. As Hovland and Weiss (1951) have suggested, someone of trustworthiness was more effective than someone of untrustworthiness.

Although celebrity endorsements are very prominent, there is always a chance of failure. Due to celebrities being humans and not perfect, organizations can get into problematic situations due to a celebrity’s wrongdoings (Erdogan, 1999). These source failures are why, and as Wright (2010) suggested, that source credibility is important especially if the message

recipient does not hold prior attitudes toward the topic. In a study focusing on source credibility, Kumkale et al. (2010) showed that individuals who held different attitudes toward a topic due to prior knowledge would be persuaded differently. Since COVID-19 is a worldwide pandemic, it can be hypothesized that college students may hold differing attitudes toward the pandemic, thus they may be persuaded differently when exposed to information about the need to get vaccinated.

Individuals are more likely to be persuaded by a celebrity when they display wishful identification and relate to them. Individuals who believe they can be like the celebrity, otherwise known as wishful identification, are more likely to positively respond to an endorsement of that celebrity. (Schouten, 2019). The relatability of the source such as his or her values creates a more effective type of source (Schouten, 2019). Individuals who share the same values as the celebrity who is presenting the information are found more effective (Schouten, 2019). Although the concepts that may explain why celebrities are often times persuasive have not been tested in this thesis, a pretest was conducted to select the celebrity that resonates with Auburn University students.

Since the beginning of the pandemic, many celebrities have posted on social media information about getting the COVID-19 vaccine and booster. For example, following Olivia Rodrigo's meeting with President Biden at the White House, she posted on Instagram about the importance of the vaccine. Similarly, Ariana Grande made an Instagram post of her receiving the vaccine. In this post, she included statistics regarding the negative effects of COVID-19. Dolly Parton posted a video of her singing a song while getting vaccinated. Although several high-profile celebrities have posted pro-vaccination messages on social media, there is a lack of knowledge regarding their effectiveness in motivating their followers to get vaccinated for COVID-19. Understanding how the perceptions of a message source affect ones inclination to

get the COVID-19 vaccine is essential to tackle the pandemic. Considering the prominent role that celebrities play in health information dissemination, along with the CDC's role as an authoritative source of health information, the goal of this thesis is to investigate what source type is more relevant to younger audiences. By conducting an online experiment, this thesis tries to examine whether celebrities or the CDC are more likely to trigger unvaccinated college students to receive the vaccine. Therefore, the following research question is proposed:

**RQ2.** What type of source (CDC vs. celebrity) is more likely to a) lower vaccine hesitancy, and increase one's b) vaccine intentions, c) attitudes toward recommended behavior, as well d) social media engagement intentions?

Despite examining the main effects that different message frames and source types may have on the studied dependent variables, this thesis also asks whether there are any interaction effects between these two factors when disseminating to college students information about the COVID-19 vaccine. Thus, the following research question is proposed:

**RQ3.** Are there any interaction effects between source type and message frame?

### **Social Media Usage Among College Students**

Social media is “a group of Internet-based applications built on the ideological and technological foundations of Web 2.0 that allow the creation and exchange of user-generated content” (Kaplan & Haenlein, 2010 p.59). Social media has an interactive dialogue across many media platforms (Baruah, 2012). It is a multi-platform way of connecting with those across the room or across the world. Companies, organizations, and individuals are allowed a voice on the internet to share opinions, facts, or any information they deem fit. Whether a consumer is one of the 2.7 billion users of Facebook or one of the one billion of Instagram or both, a large part of the

world is active on some sort of social media platform (Clement, 2020). From 2008 to 2019, the rise of social media usage went from 5% to 79% in US adults alone (Ortiz-Ospina, 2019). But this rise did not only affect individual consumers, brands and organizations have also seen a rise in social media usage. Compared to traditional marketing tactics such as trade shows or television, social media can almost double the marketing lead (Using social media for business growth, n.d.). Organizations have utilized this tool at the fingertips of individuals to promote their content and attempt to persuade consumers to follow the recommended action.

It is no surprise that interactions between health organizations and consumers have also changed due to social media. Moorhead et al. (2013) performed a content analysis of 98 health communication research articles in regard to social media. These researchers detected six major benefits of social media use in the health communication sector: “(1) increased interactions with others, (2) more available, shared, and tailored information, (3) increased accessibility and widening access to health information, (4) peer/social/emotional support, (5) public health surveillance, and (6) potential to influence health policy” (Moorhead et al., 2013 p.1). Heldman et al. (2013) also found that social media enhances organizations’ reach to diverse audiences. Although there are some disadvantages such as quality and reliability, social media serves as an efficient and effective source of health communication (Moorhead et al., 2013).

In terms of college students, a survey found that 98% of college-aged students are active on social media (Experian, 2020). A study with 519 college students found that Snapchat and Instagram are the top social media platforms used daily (Joly, 2019). Since Snapchat is mostly perceived as a platform to communicate with others rather than to disperse information, in this thesis the manipulated messages appeared as Instagram posts. In a survey, 58% of participants said they became more interested or found out information about an unknown brand on

Instagram (Mulder, 2021). Information in regard to COVID-19 was also largely dispersed via social media outlets, emphasizing the importance of creating informative content (Cinelli et al., 2020). After being suspended since the outset of the pandemic, a study found that when students returned to in-person classes they reported that “most often” and “always” they found health information on the internet and social media (Chesser et al., 2020). In regard to the COVID-19 pandemic, 39% reported receiving information from the internet and 39% reported receiving it from social media (Chesser et al., 2020). Given that younger Americans are active on social media, in conjunction with their low vaccination rate, it is important to understand the most effective way to communicate health information to college students on social media platforms, especially on Instagram. Due to its popularity among college students, Instagram was selected as the platform where the manipulated messages appear.

## **Methodology**

In order to study the proposed research questions, a 2 (*framing*: loss vs. gain) x 2 (*source*: CDC vs. celebrity) between-factor online experiment was conducted (N = 103). A total of four versions of Instagram posts were created by varying the message content and source type.

### **Participants**

For the purpose of this thesis, participants included Auburn University students who participated in an online experiment via Qualtrics (N = 104). The majority of the recruited participants were female (N = 73, 70.19%), while males made up 25.96% of them (N = 27), with four selecting the “prefer not to answer” option for biological sex. Their ages ranged from 18 to 26 years old, while the medium age for participants was 20. Of them, 95.19% were White/Caucasian (N = 99), .96% were African-American (N = 1) and .96% were other (N = 1).



Most of the participants were Republican (N = 78, 75.7%), whereas 12.6% marked Independent for their political affiliation (N =13), 8.7 % (N = 9) chose “Other,” and 2.9% (N=3) identified as Democrats. Finally, in terms of compensation participants were given the opportunity to participate in an Amazon gift card raffle after completing the survey.

## **Procedure**

Participants were recruited via email, in classrooms, and through word-of-mouth. Before collecting data, this study received approval from Auburn University’s Institutional Review Board (IRB). The experiment was sent out to participants via Qualtrics, an online survey tool that is often used in communications research. Only participants who were at least 18 years old and provided their consent were able to participate in the study. Since this thesis focused on examining what message frames and source types may influence unvaccinated college students to receive the COVID-19 vaccine, a screener question asked participants’ vaccination status. Those who had received at least one dose were prompted to the end of the survey while those who did not continued to the survey. Next, eligible participants were randomly exposed to one of the four Instagram posts. The manipulated social media posts included various posts from Instagram with different frames (loss vs. gain) and sources (CDC vs. celebrity) for each post. To increase the likelihood that participants would read the stimulus material, a timer was added and were able to proceed to the survey only after spending at least 15 seconds on the stimulus material. Next, participants were asked a series of questions regarding their vaccine hesitancy, vaccine intentions, attitudes toward the recommended behavior, and social media engagement. Finally, demographic questions such as age, race, and political affiliation were asked. The survey took approximately 10 minutes to complete.

## Stimulus Material

### Message frames

**Loss-framed messages.** Following a process similar to prior studies (e.g. Gerend & Shepard, 2007; Updegraff & Rothman, 2013), the loss-framed message discussed the negative health implications of not getting the COVID-19 vaccine. In particular, the loss-framed Instagram post read: “1) NOT getting the vaccine can increase your risk of contracting the virus and spreading it to others. 2) If you decide NOT to get the vaccine you have to wear a mask when shopping at many stores. 3) NOT getting the vaccine requires to get tested all the time if you want to attend a concert or fly.”

**Gain-framed messages.** On the contrary, the gain-framed message also followed a process in line with what prior studies have reported (Gerend & Shepard, 2007; Updegraff & Rothman, 2013), by highlighting the benefits of getting the COVID-19 vaccine. More specifically, the gain-framed message stated: “1) getting the vaccine can help you reduce your risk of contracting the virus and limiting the spread of the virus. 2) If you decide to get the vaccine you can shop at some stores without wearing a mask. 3) If you get vaccinated you can attend events and fly without getting tested all the time.”

To check whether the frame manipulations were successful, in the second pretest participants (n = 35) were randomly presented with two messages, one gain- and one loss-framed. After spending at least 15-seconds on the message by including a timer within the survey, participants were asked on a 7-point Likert scale if the message was negative or positive (1 = mostly negative, 7 = mostly positive). Borrowed from past research (Riet et al., 2008), participants were also asked on a 7-point Likert scale if the message emphasized the advantages

of receiving the vaccine or the disadvantages of not receiving it (1 = disadvantages, 7 = advantages).

To ensure information accuracy, the information that was included in all four of the Instagram posts about vaccination was adapted from information found on the official the CDC website. The specific survey items used in the pretest can be found in Appendix B.

### **Source Type**

A total of four messages that presented information about the COVID-19 vaccine were created.

**CDC.** Similar to prior studies, the source type was manipulated by creating Instagram posts that originated from either the CDC or a celebrity (Kosenko et al., 2018; Lee, 2019; Phua et al., 2018; Phua et al., 2020). As mentioned earlier, the CDC is a public health agency in the United States that aims to protect the public against health threats. Since the outbreak of the COVID-19 pandemic, the CDC has played a vital role in educating Americans about COVID-19 and how to protect themselves from contracting the disease. Given its relevance to the examined topic, CDC was selected as one of the two manipulated source types.

**Celebrity.** To determine what celebrities are more likely to resonate with Auburn University students, a pretest (n = 43) was conducted. The celebrities included in the pretest included the top six sports personalities- Megan Rapinoe, Venus Williams, Simone Biles, Cam Newton, Tom Brady, and Lebron James (three females and three males)- as ranked by YouGovAmerica's *The Most Popular Contemporary Sports Personalities (2021)*. YouGovAmerica is a research data and opinion company that conducts polls on various issues. Since not all students may be sports fans, and to increase the generalizability of the stimulus sampling, the top six artist celebrities were also included in the pretest. Based on Billboard's Top

100 artists, Ariana Grande, Olivia Rodrigo, Billie Eilish, Post Malone, Bruno Mars, and Luke Combs (three females and three males) were selected (Billboard, 2022). All celebrities were from the United States to increase the likelihood that study participants were familiar with them.

For each celebrity, participants were asked to rate their familiarity on a 7-point Likert scale (1= not at all, 7= extremely familiar). Next, participants were also asked to report their attitudes toward them (good/bad, like/dislike, pleasant/unpleasant, favorable/unfavorable) also on a 7-point Likert scale derived from past research (Thomas & Fowler, 2015). Based on the pretest results, participants reported that they were more familiar with and had more positive attitudes toward Simone Biles (Table 1). Simone Biles is the most decorated women's gymnast, winning four gold, one silver, and two bronze Olympic medals and 25 Worlds medals (USA Gymnastics: Simone Biles, n.d.). Biles competed in her first international competition in 2013 and quickly went on to her first Olympics in 2016 (USA Gymnastics: Simone Biles). As Brown & Basil (1995) suggested, celebrities are most effective when participants identify closely with them. Thus, based on the pretest results Simone Biles was the selected celebrity for the main experiment. The survey items used in the pretest can be found in Appendix A.

## **Variables**

### **Vaccine Hesitancy**

Vaccine hesitancy was measured using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Borrowed from past research (El-Elimat, et al., 2021), the items used in this scale asked if the COVID-19 vaccine is safe for most people, if the COVID-19 vaccine is effective, and if it's never too late to get the COVID-19 vaccine (Cronbach's  $\alpha = .86$ ). See Appendix C for all items used in the used measures.

### **Vaccine Intentions**

Vaccine intentions were measured using a 7-point Likert scale (1 = extremely unlikely, 7 = extremely likely). In particular, this scale measured the extent to which participants were unlikely or likely to get the COVID-19 vaccine “sometime soon,” to get the COVID-19 vaccine “today,” and to get the COVID-19 vaccine “in the future.” This scale was derived from Rothman et al., 1999 (Cronbach’s  $\alpha = .84$ ).

### **Attitudes toward the Recommended Behavior**

Attitudes toward the recommended behavior were measured with a 7-point Likert scale. The scale asked whether getting the COVID-19 vaccine is: bad/good; foolish/wise; unfavorable/favorable; negative/positive; undesirable/desirable; unnecessary/necessary; detrimental/beneficial. This scale was derived from Dillard and Shen, 2005 (Cronbach’s  $\alpha = .98$ ).

### **Social Media engagement**

Participants’ social media engagement intentions were measured with a 7-point Likert scale (1 = very unlikely, 7 = very likely), by asking them how unlikely or likely they were to like, share, or comment on the Instagram post they were exposed to. This scale was borrowed from DiStaso et al., 2015 (Cronbach’s  $\alpha = .87$ ).

## **Results**

The following section presents results from the two pretests and the online experiment. As mentioned earlier, the first pretest was launched to identify the celebrity with whom Auburn University students are the most familiar and have the most favorable attitudes. A second pretest was launched to examine whether the manipulation of the framed messages (loss vs. gain) was successful.

## Pretest 1- Celebrity

Descriptive statistics were run to identify the celebrity who resonates the most with Auburn University students. The pretest data showed that participants were more familiar ( $M = 5.71$ ,  $SD = 1.60$ ) with Olympic gymnast Simone Biles than the other celebrities. The results also showed that students had the most positive attitudes toward Simone Biles ( $M = 5.97$ ,  $SD = 1.36$ ) (Table 1). In light of the above, Simone Biles was selected as the celebrity adopted in the experiment.

*Table 1 – Familiarity and Attitudes toward the Celebrities*

Celebrity	Familiarity		Attitudes	
	M	SD	M	SD
Megan Rapinoe	2.83	2.24	3.89	1.49
Venus Williams	4.54	2.28	5.29	1.65
Simone Biles	5.71	1.60	5.97	1.36
Cam Newton	5.63	1.59	5.59	1.39
Tom Brady	5.37	1.86	4.69	1.80
Lebron James	5.26	1.84	5.03	1.42
Ariana Grande	5.54	1.20	5.35	1.61
Olivia Rodrigo	5.40	1.67	5.04	1.63
Billie Eilish	5.40	1.44	5.01	1.81
Post Malone	5.54	1.36	5.49	1.24
Bruno Mars	5.46	1.38	5.43	1.58
Luke Combs	4.83	2.09	5.52	1.66

## **Pretest 2 - Framed message**

Two independent-samples t-tests were run to check the effectiveness of the framed condition manipulation. The independent variables consisted of the two types of frames: loss vs gain. In terms of the first item that was used to check the framing manipulation, the results showed that the gain-framed message was perceived by participants as highlighting the advantages of getting the COVID-19 vaccine ( $M_{gain} = 6.64$ ,  $SD = .84$ ) and the loss-framed message discussed the disadvantages from failing to get vaccinated ( $M_{loss} = 3.00$ ,  $SD = 2.29$ ), ( $t(20.98) = -6.08$ ,  $p < .001$ ). Likewise, with the second item participants also correctly identified what the focus of the Instagram post was (loss vs. gain), since those in the gain-framed condition ( $M_{gain} = 6.29$ ,  $SD = 1.38$ ) perceived it as highlighting the benefits of vaccinations, whereas those in the loss-frame condition ( $M_{loss} = 2.71$ ,  $SD = 2.47$ ) responded that the message focused on the negative implications that may result from failing to get vaccinated ( $t(25.89) = -5.09$ ,  $p < .001$ ). The pretest showed that the framing manipulation worked as expected.

## **Main Experiment Results**

The following section presents the findings of the manipulation checks as well as those of the research questions that were posed in the main experiment. An independent-samples t-test and chi-square tests were run to check whether participants in the main experiment correctly perceived the manipulations. A multivariate analysis (MANOVA) and a series of analyses of variance (ANOVA) were run to test the effects of the independent variables on the study's four dependent variables: vaccine hesitancy, vaccine intentions, attitudes toward the recommended behavior, and social media engagement intentions.

Before running the statistical analysis, skewness and kurtosis were tested for all scales in accordance with Kline (2011). Kline (2011) suggests that skewness and kurtosis cannot be greater than |3| and |5|, respectively. No violations of these assumptions were detected. In order to identify any univariate outliers, z-scores were also tested and no violations were found, in line with Tabachnick and Fidell's (2007) recommendation that any data with a z-score higher than |3.29| is considered an outlier.

### **Main Experiment Manipulation Check: Message frame**

In terms of the framing manipulation in the main experiment, the first independent-samples t-test showed that the gain-framed message contained positive information about COVID-19 ( $M_{gain} = 5.20$ ,  $SD = 1.58$ ) and the loss-framed message contained negative message ( $M_{loss} = 3.23$ ,  $SD = 1.86$ ), ( $t(100.44) = -5.84$ ,  $p < .001$ ). The second independent-samples t-test results also showed that the gain-framed message highlighted the advantages of getting vaccinated ( $M_{gain} = 6.04$ ,  $SD = 1.47$ ), while the loss-framed message focused on the disadvantages associated with failing to get vaccinated ( $M_{loss} = 2.58$ ,  $SD = 2.04$ ), ( $t(94.54) = -9.93$ ,  $p < .001$ ). Thus, the framing manipulation was successful.

### **Main Experiment Manipulation Check: Source type**

A chi-square test was run to ensure that participants correctly identified who the source was in the Instagram post they received. In the CDC condition, 91.1% of participants correctly answered that the Centers for Disease Control and Prevention (CDC) was the source of the Instagram post they were exposed to, whereas 95.8% of participants in the celebrity condition correctly identified Simone Biles as the source of this post ( $\chi^2(1, N = 104) = 78.11$ ,  $V^* = .87$ ,  $p < .001$ ). The manipulation of the source type was successful.



### Research Question 1

The first research question asked about the relationship between the different framed messages (loss vs. gain) and one's vaccine hesitancy, vaccine intentions, attitudes toward the recommended behavior, and social media engagement intentions when exposed to information about getting the COVID-19 vaccine. The MANOVA test did not show any significant results between the gain or loss-framed messages on any of the dependent variables regarding participants' COVID-19 vaccination intentions (Wilk's  $\Lambda = .96$ ,  $F(4, 97) = 1.03$ ,  $p = .39$ ,  $\eta^2 = .04$ ).

Table 2 – Message Frames

Measure	Gain		Loss		F(1,100)	$\eta^2$
	M	SE	M	SE		
Vaccine Hesitancy	4.04	.23	3.70	.23	1.12	.01
Vaccine Intentions	2.45	.23	2.52	.22	.05	.00
Social Media Engagement	2.34	.22	2.21	.22	.19	.00
Attitudes Toward Behavior	3.92	.25	3.77	.24	.18	.00

### Research Question 2

The second research question asked whether the source type (CDC vs. celebrity) will influence one's vaccine hesitancy perceptions as well as his/her vaccine intentions, attitudes toward the recommended behavior, and social media engagement intentions. To answer this question, a MANOVA was run with source as the independent variable and the study's four

outcome variables. The analysis found no significant results between the CDC and Simone Biles on any of the dependent variables regarding participants' COVID-19 vaccination intentions (Wilk's  $\Lambda = .96$ ,  $F(4, 97) = 1.02$ ,  $p = .40$ ,  $\eta^2 = .04$ ). Table 2 reports the means and standard errors for the two source types, the CDC and Simone Biles.

*Table 3 – Source type*

Measure	CDC		Celebrity		F(1, 100)	$\eta^2$
	M	SE	M	SE		
Vaccine Hesitancy	3.99	.23	3.76	.23	.50	.01
Vaccine Intentions	2.66	.22	2.31	.23	1.17	.01
Social Media Engagement	2.24	.22	2.31	.22	.04	.00
Attitudes Toward Behavior	3.98	.24	3.71	.25	.59	.01

### Research Question 3

The third research question asked if there are any interaction effects between the source type and the message frame. A MANOVA was run with all the study's independent variables (source type, frame) and dependent variables (vaccine hesitancy, vaccine intentions, attitudes toward the recommended behavior, and social media engagement intentions). The data showed no significant interaction effects between message frame and source type on any of the dependent variables regarding one's COVID-19 vaccination intentions (Wilk's  $\Lambda = .98$ ,  $F(4, 97) = .47$ ,  $p = .76$ ,  $\eta^2 = .02$ ). See Table 4.

Table 4– Message frame and source type interaction

Measure	Loss-Simone Biles		Loss-CDC		Gain-Simone Biles		Gain-CDC	
	M	SE	M	SE	M	SE	M	SE
Vaccine Hesitancy	3.57	.32	3.85	.32	3.96	.34	4.14	.32
Vaccine Intentions	2.32	.32	2.72	.32	2.31	.33	2.59	.32
Social Media Engagement	2.35	.31	2.06	.31	2.26	.32	2.42	.31
Attitudes Toward Recommended Behavior	2.32	.32	2.72	.32	2.31	.32	2.59	.32

### Supplementary Analysis

Although no significant findings were detected in relation to the asked research questions, it is noteworthy to point out that participants’ demographic information did produce some interesting findings. In particular, a series of analysis of variance (ANOVA) were conducted with gender as the independent variable and the study’s four dependent variables, respectively: vaccine hesitancy, vaccine intentions, attitudes toward the recommended behavior, and social media engagement intentions. The results found that males displayed higher levels of hesitancy in terms of getting vaccinated than females ( $F(2, 101) = 4.75, p < .01, \text{partial } \eta^2 = .09$ ) (Table 5). Interestingly, it was also found that males were also more likely to get vaccinated when directly asked about their intentions to do so ( $F(2, 101) = 4.78, p < .01, \text{partial } \eta^2 = .09$ ). No significant effects were found for gender on social media engagement ( $F(2, 101) = .62, p = .54, \text{partial } \eta^2 = .01$ ); neither for gender on one’s attitudes toward the

behavior ( $F(2, 101) = .38, p = .38, \text{partial } \eta^2 = .02$ ). See Table 5. In sum, it appears that gender may influence how college students perceive information about getting vaccinated for COVID-19.

*Table 5 – Vaccine hesitancy, vaccine intentions, social media engagement, and attitudes toward behavior by gender*

Measure	Male		Female		Prefer not to say		F(2, 101)	$\eta^2$
	M	SD	M	SE	M	SE		
Vaccine Hesitancy	4.63	.30	3.57	.18	4.42 <sup>a</sup>	.79	4.75	.09
Vaccine Intentions	3.14	.30	2.19	.18	3.58 <sup>a</sup>	.77	4.78	.09
Social Media Engagement	2.35	.30	2.21	.19	3.08	.79	.54	.01
Attitudes Toward Recommended Behavior	4.25	.34	3.70	.21	3.86	.89	.99	.02

*Note:* Bonferroni post-hoc comparisons within rows. Means with no lower case subscript in common differ at  $p < .05$ .

## Discussion

The purpose of this study was to gain a deeper understanding of source credibility and message framing in regard to the COVID-19 vaccine in college students. Previous research in health communication has focused on the effectiveness of sources or message frames individually. However, due to the recent COVID-19 pandemic, there are no studies that have simultaneously examined these two factors in this context. Below I review the findings of each

research question and compare them with that of previous studies. Then, I discuss the thesis' theoretical and practical implications. Limitations and directions for future research are also provided.

The first research question considered the relationship between vaccine hesitancy, vaccine intentions, attitudes toward recommended behavior, and social media engagement in regard to the two message frames, gain and loss. The data found no significant difference between these two framed messages. As mentioned in the literature review, studies have found contradictory findings about framed messages. Kim & Lee (2017) found that gain-frames are more effective when participants have high involvement, and Covey (2014) found that gain-frame messages are most effective when the behavior has a certain specific outcome. Although not statistically significant, the means of the framed messages (loss vs. gain) suggest that college students may be more likely to show lower vaccine hesitancy, as well as display more positive attitudes toward getting the vaccine and interact with social media when exposed to a gain-framed message. On the other hand loss-frames were more effective in increasing vaccine intentions. The effectiveness of loss-frames was partially supported in previous research (Kim and Le, 2017; Meyerowitz & Chaiken, 1987; Tversky & Kahneman, 1979). The gain-framed message was most effective for vaccine hesitancy, vaccine intentions, and attitudes toward the behavior. The means in this thesis indicated that the gain- and loss-framed messages affected differently the examined dependent variables, hence this finding confirms previous studies in framing communication that have also found contradictory results.

The second research question considered the relationship between vaccine hesitancy, vaccine intentions, attitudes toward recommended behavior, and social media engagement in regard to two sources, the CDC and Simone Biles. The data found no significant differences

between them. Previous research has highlighted not only the importance of celebrities in advertising and strategic communication (Atkin & Block 1983; Erdogan 1999) but also in health communication (Brown & Basil, 1995, Kumkale et al., 2010, Nan, 2012, Phua et al., 2018). Although not statistically significant, an inspection of the means indicated that college students are more likely to show lower vaccine hesitancy, increased vaccine intentions, and attitudes toward the behavior when they read information deriving from the CDC, whereas they are more likely to interact with social media when reading the Simone Biles stimuli. Based on the data, it appears that different source types have different effects when it comes to motivating college students to get the COVID-19 vaccines. Information coming from the CDC may be more likely to urge one to take action on the advocated health behavior, whereas information coming from a celebrity may influence this person's attitudes toward the health behavior. Consequently, the results of this study, although not statistically significant, suggest that unlike to what past studies have suggested (e.g., Brown & Basil, 1995; Phua et al., 2018), celebrities are not necessarily more effective when it comes to influencing the public about a health behavior.

On the other hand, the means of this study confirmed what other scholars have reported about the relationship between information coming from a celebrity and one's engagement with social media. For example, studies found the source of a post is one of the most important aspects of social media engagement (Gilbert et al., 2013; Giakoumaki & Krepapa, 2020; Hu et al., 2014). Giakoumaki and Krepapa (2020) performed a study solely looking at source factors on Instagram. All other social media aspects were kept consistent except three sources (user, brand, and influencer). Although not significant, these scholars study found that there was a positive brand engagement toward influencers. Kim and Kim (2020) also found that fans have a

higher likelihood to engage with a celebrity on social media due to the connection they have with the celebrity.

As mentioned in the literature review, celebrities are often times persuasive sources of information. Schouten (2019) found that although celebrities seem to be more effective, their persuasiveness can be enhanced when participants report wishful identification with the celebrity. Briefly, wishful identification is when an individual desires to be another person (Schouten, 2019). Although wishful identification was not measured in the study, and regardless the positive attitudes they displayed toward Simone Biles, it appears that participants did not identify with her. Perhaps, the results would have been different if participants had identified with Simone Biles. Since wishful identification was not measured, future studies should further examine its role in the context of COVID-19 vaccine.

The third research question considered the interaction effects of the source and message framing. The data found no significant interaction between the two factors, but these results could have occurred for various reasons. A potential reason for the lack of significance may be attributed to the small sample size. Only 104 participants reported to be unvaccinated and completed the survey. Also, since this research focused on COVID-19, studies have shown that there are many preconceived notions (Macy et al., 2021). The reactions of the individuals toward the disease may stem from their political ideologies (Imhoff & Lamberty, 2020). Studies showed that Republicans tend to have negative attitudes toward the COVID-19 vaccine (Fridman et al., 2021). Since a majority of participants were Republicans, if they had preconceived negative attitudes toward COVID-19 those attitudes may not have changed regardless of the message or source. However, it should be mentioned that participants' attitudes toward COVID-19 were not measured before they were exposed to the stimulus material, thus it cannot be argued that this is

the reason for the lack of significant findings. However, the fact that the majority of them identified as Republicans may confirm what other scholars have argued about one's COVID-19 vaccination intentions and his/her political affiliation (e.g., Fridman et al., 2021).

The results did, however, find that students' gender played an important role in terms of their behavioral intentions to get vaccinated. As found, males were more likely to show higher levels of hesitancy in terms of getting vaccinated than females. Nevertheless, males were also more likely to get vaccinated when directly asked about their intentions. In a study on gender as a determinant of dental behavior, Sakki et al. (1998) found that women were significantly more likely to brush their teeth. Zintel et al. (2022) conducted a content analysis and 57% of the 46 studies that were analyzed found that men were more likely to get vaccinated against the COVID-19 than women. Based on the reviewed studies, the finding that one's gender may affect how this person perceives health information about the COVID-19 vaccine should not come as a surprise. Instead, the findings confirm what Zintel et al. (2022) reported in their study that males may be more inclined to get vaccinated.

### **Theoretical Implications and Practical Applications**

As mentioned in the literature review, there are many health communication studies that have analyzed framed messages and source types. Although there was a significant amount of research on source types, specifically with celebrities, as well as framed messages, very little research has examined both factors together. For instance, Grewel et al. (1994) considered these two factors in the context of perceived risk that consumers face in consumer behavior, but to the best of the author's knowledge, no prior research has examined source types and message frames in urging unvaccinated college students to get the COVID-19 vaccine. Since no prior studies have examined these two variables simultaneously, this thesis contributes to the literature by



examining source type and message frames in the context of a global pandemic. Although previous research has found that celebrities are seen as highly persuasive sources (Brown & Basi, 1995; Halder, 2021; Phua et al., 2018), the data of this thesis did not confirm what these studies have reported.

Schouten (2019) used celebrities and influencers and curated stimuli on who was the best fit for a product. They created stimuli where ‘fit celebrities’ were promoting fitness products (Schouten, 2019). Studies have found that when the source’s expertise coincides with the behavior in which they are endorsing it may increase the message recipients’ behavioral intentions (Schouten, 2019; Till & Busler 2000). It could be argued that the celebrity in this thesis may not have played a prominent role due to her poor fit as a source of health information about COVID-19. Although college students had positive attitudes and were familiar with Simone, whether she was a good fit to the recommended behavior was not measured.

Practically speaking, how to successfully distribute health information on social media is an ever-growing field of study. Social media is becoming larger by the day and companies and organizations are going to continue to brand, promote, and present information on various platforms. As a result, it is necessary for communication scholars to understand how individuals are persuaded on social media platforms. For example, the participants in this study still reported higher social media engagement intentions when the post came from Simone Biles than the CDC, a finding that supports previous research on the importance of celebrities in strategic communication. Rather than utilizing a health organization platform, individuals are more likely to like, comment, and share if the content comes from someone to who they can relate. Perhaps, the CDC should use celebrities in its public health campaigns since younger audiences tend to interact more with content that comes from them.

In terms of gender, this creates an aspect of social media for the CDC to focus on. Since males are more likely to get vaccinated when the information comes from the CDC, then the CDC could focus more on how to more effectively target females on social media as well. In a study conducted about information processing among genders, Meyers-Levy and Maheswaran, (1991) found that females processing “often entails substantial, detailed elaboration of message content, sometimes resulting in females' heightened sensitivity to the particulars of message claims” (p. 68). The way females process information means the CDC could create social media messages focusing on vaccine intentions with specific information about the vaccine in order for females to elaborate more on the message and hopefully increase their willingness to receive the vaccine. In one of the CDC’s most recent Instagram posts regarding the disease, the caption stated “As of March 28, 2022, 255.3 million people, or about 76.9% of the U.S. population, have received at least one dose of a #COVID19 vaccine. Of those, 217.4 million, or about 65.5%, are fully vaccinated. More than 97.3 million people have received a booster dose. COVID-19 vaccines are safe, effective, and free. Find a COVID-19 vaccine or booster near you” with a graphic of gain-framed statistics (Centers for Disease Control and Prevention, 2022). If the CDC continues to deliver detailed information similar to the post described above, it may increase the vaccine intentions of women given their preference for detailed-oriented information.

This research also creates a course of action of framed messages. Results showed that the gain-framed message was not only more effective to lower one’s vaccine hesitancy, but also to increase participants’ vaccine intentions and attitudes toward the behavior while the loss-framed message was more effective for social media engagement. To trigger individuals to get vaccinated, the CDC should continue to frame captions with the benefits associated with receiving the vaccine rather than focusing on the disadvantages of not getting the vaccine. On the

other hand, loss-framed messages may increase one's social media engagement intentions. If the CDC aims to engage individuals on social media (like, comment, and share), then the organization should utilize a loss-framed message on social media.

The findings of this thesis highlight that celebrities may not be always the best source to disseminate health information. There are now other sources besides celebrities and organizations. Over the past few years, influencers have gained prominence in terms of influencing individuals, especially younger ones, to adopt a certain attitude or behavior.

In advertising, research has shown that influencers can be successful in promoting a company or a company's products on its social media platforms (Veirman et al., 2017). Influencers are effective because they position themselves as experts (Pilgrim & Bohnet-Joschko, 2019) and because they share personal experiences about a product or services this makes them more relatable and approachable (Schouten et al., 2019). Since this thesis did not find any significant findings about the role of celebrities, future studies should consider examining how influencers can be incorporated in public health campaigns to educate the public about a medical condition or disease.

### **Limitations and Future Research**

There are several limitations that should be mentioned. First, although this thesis investigated the effects of varying sources and messages frames, no significant findings were detected, Perhaps, the study's small sample size and the lack of diversity of the participants, who were primarily females, could explain the lack of any significant results.

Second, the sample size was small. Finding participants was an arduous task because they had to be unvaccinated to be eligible to participate. It should be pointed out that a total of 692

students initially agreed to participate in the survey and provided their consent. Of them, 589 reported that they had received at least one dose of the COVID-19 vaccine, and thus they were directed to the end of the study. As reported earlier, only 104 participants indicated that they were not vaccinated at the time of the study, thus resulting in a small sample size. In addition, Auburn University requires any employee of the University to be fully vaccinated as of January 18th, 2022 (Covid-19 resource center, n.d.), thus excluding many students who work for the university and limiting the pool of potential available participants. Given the difference in the means between the four experimental conditions, although not statistically significant, a larger sample size could have provided more insights in terms of what type of sources or messages may lead unvaccinated students to get vaccinated. Another limitation includes the little diversity among the study participants. All participants were recruited from Auburn University in Alabama, and this reflects participants' attitudes toward vaccination only in a specific geographic region. Moreover, 95% of participants were White/Caucasian, which is another limitation since the findings mostly represent a specific race. Some other demographic characteristics that may have skewed the data include gender, since 70.19% of participants were female, as well as political affiliation since 75.96% of participants reported that they were Republicans. Thus, the current data cannot be generalizable to the general U.S. population.

Another possible limitation is that participants in this study were college students, representing attitudes and behaviors of teens and young adults. In future studies, the sample size could be expanded by using Amazon's Mechanical Turk (MTurk). MTurk is an online database for researchers to recruit participants (Follmer et al., 2017). Follmer et al. (2017) stated that MTurk is significantly more diverse than traditional means of sampling. If the sample size was

more diverse in terms of age, race, sex, and political affiliation, there could have produced more diverse and insightful findings.

Studying actual behavior change in terms of persuasiveness is another important factor that needs to be considered in future studies. Many studies measure participants' behavioral intentions (e.g., Bullock & Shulman, 2012, Gerend & Shepard, 2007, Meyerowitz & Chaiken, 1987), yet only a few studies follow-up and examine if the advocated behavior in the study was actually implemented after participating in an experiment or survey. Post behavior implementation usually can be done with post-exposure surveys or interviews to measure the success or failure of certain stimuli. Hence, given the nature of the health issue (getting the COVID-19 vaccine), future scholars who engage in a similar line of research can conduct follow-up studies to determine whether the manipulated source or message in their study can trigger people to get vaccinated.

As mentioned in the literature review, Kumkale et al. (2010) argued that one's prior attitudes can affect this person's perceptions of source credibility. If participants have a prior attitude toward the source those attitudes will continue to impact their judgment regardless of the stimuli (Kumkale et al., 2010). Since attitudes were not taken before and after, this study is limited to if prior attitudes were measured. For future research, attitudes could be measured before a stimulus is presented, after, and then compare one's pre- and post-stimulus reactions.

### **Conclusion**

In conclusion, persuasion is an ever-growing area of research for health communication scholars. Traditionally, source types and framed messages are very important components of the persuasion process. As Kumkale et al. (2010) stated, the two most impactful aspects of persuasion are the content of the message and the source. Adding to the current literature, this

study investigated different sources and messages and their effects on college students' COVID-19 vaccination intentions.

Although there have been many studies examining different source types such as celebrities and authoritarian sources such as the CDC, but also differently framed messages, no past study in health communication has studied these factors together. Although there were no significant results, this thesis can lay the foundation for future research regarding the effects of these two factors. With a larger sample size and a more diverse pool of participants, research in this area could pave the way for health organizations and agencies to design more effective educational material on social media to convince target audiences to engage with a certain health behavior.

Regarding practical implications, this research can shed some light about what source type may be perceived as more credible when presenting the information. Although not statistically significant, the means in the data suggested that the CDC is possibly a more effective source to lower one's vaccine hesitancy and increase vaccination intentions. On the other hand, a celebrity, such as Simone Biles, may be more successful when it comes to increasing one's social media engagement with a health-related post. It can be assumed that participants might not see Simone Biles as a credible health information source and, thus, may trust her less than a public health organization such as the the CDC. The low credibility of Biles also supports what the means in this thesis showed- that individuals are more likely to interact with celebrities than a health organization. The low credibility of Biles is important if organizations contemplate using a celebrity or an influencer who may be perceived as a good fit with the recommended behavior.

The study did find some significant results in relation to gender and vaccine hesitancy and vaccine intentions. Results showed that men were more likely to be hesitant toward vaccines,

yet they displayed higher intentions to receive the vaccine after reading the presented message. These findings may be contradictory, but more research needs to be done to understand if these results holds true in other health contexts and why they may be the case.

The current thesis has many limitations, however, it is also a call for further research in the context of vaccinations associated with a pandemic. Social media is not going away, therefore, this thesis suggests that future researchers should continue work toward understanding how these two factors (source/ message frame) work on social media when they involve the distribution of health information.

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### **Appendix A: Pretest #1**

On a scale from 1 to 7, with 1 = not at all familiar and 5 = extremely familiar, please rate your familiarity with the following celebrities:

1. Luke Combs
2. Ariana Grande
3. Bruno Mars
4. Olivia Rodrigo
5. Post Malone
6. Billie Elish
7. Megan Rapino
8. Cam Newton
9. Venus Williams
10. Tom Brady
11. Simone Biles
12. Lebron James

Please rate your attitudes toward the celebrity:

Bad/good

Dislike/like

Unpleasant/ pleasant

Unfavorable/ favorable

## Appendix B: Pretest #2

**Welcome to the study. First, please read an article about a health issue at your normal speed. While reading the article, the "next button" will appear after 15 seconds before you are able to move to the next page. Then, answer some questions related to the message. Thank you for your participation.**

Failing to get the COVID-19 vaccine can have NEGATIVE implications for your health and your loved ones! There are many risks of NOT getting the vaccine including:

- ① NOT getting the vaccine can increase your risk of contracting the virus and spreading it to others
- ② If you decide NOT to get the vaccine you have to wear a mask when shopping at many stores
- ③ NOT getting the vaccine requires to get tested all the time if you want to attend an event or fly

Thank you to everyone who has done their part to end this pandemic!!

Getting the COVID-19 vaccine is the BEST thing you can do for your health and your loved ones! There are many benefits from getting the vaccine including:

- ① Getting the vaccine can help you reduce your risk of contracting the virus and limiting the spread of the virus
- ② If you decide to get the vaccine you can shop at some stores without wearing a mask
- ③ If you get vaccinated you can attend events and fly without getting tested all the time

Thank you to everyone who has done their part to end this pandemic!!

The information in the message I just read was:

(1 = Mostly negative, 7 = mostly positive)

Did the message emphasize the disadvantages from failing to get vaccinated against COVID-19 or the advantages associated with getting vaccinated against COVID-19?

(- 3 = Disadvantages, + 3 = Advantages)

## **Appendix C: Experiment Instrument Online Survey**

Have you received the COVID-19 vaccine?

- A. No
- B. Yes, the full vaccine or at least one shot

### **Manipulation check questions**

#### **Celebrity vs. non-celebrity manipulation check**

Please choose the answer that best represents the message you read:

The message I just read featured...

- \_\_\_\_\_ the Centers for Disease Control and Prevention (CDC)
- \_\_\_\_\_ a Celebrity

#### **Framing manipulation**

The information in the message I just read was:

(1 = Mostly negative, 7 = mostly positive)

Did the message emphasize the disadvantages from failing to get vaccinated against COVID-19 or the advantages associated with getting vaccinated against COVID-19?

(- 3 = Disadvantages, + 3 = Advantages)

Riet, J. V. T., Ruiter, R. A., Werrij, M. Q., & De Vries, H. (2008). The influence of self-efficacy on the effects of framed health messages. *European Journal of Social Psychology*, 38(5), 800-809.

### **Main questionnaire**

*All below questions will be asked in conjunction with stimulus material provided after the first pre-test is conducted.*

**Vaccine Hesitancy/Attitudes (El-Elimat T, AbuAlSamen MM, Almomani BA, Al-Sawalha NA, Alali FQ (2021):**

Below are a number of statements regarding attitudes toward the COVID-19 vaccine. Please read each one and indicate to what extent you agree or disagree with each statement after reading the **message** of the Instagram post.

1. The COVID-19 vaccine is safe for most people
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
2. The COVID-19 vaccine is effective
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
3. It's never too late to get the COVID-19 vaccine
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree

**Vaccine Intentions (Rothman et al.,1999)**

1. How likely would you be to get the COVID-19 vaccine sometime soon?
  - a. 1:Extremely unlikely-7:extremely likely
2. If you were faced with the decision of whether to get the COVID-19 vaccine today, how likely is it that you would choose to get the vaccine?
  - a. 1:Extremely unlikely-7:extremely likely
3. How likely would you be to get the COVID-19 vaccine in the future?
  - a. 1:Extremely unlikely-7:extremely likely

Below are a number of statements regarding social media engagement. Please read each one and indicate the likelihood with each statement after reading the **social media engagement** of the Instagram post.

**Attitudes toward recommended behavior/ Issue attitudes (Dillard & Shen, 2005)**

The behavior advocated in the message [to get the COVID-19 vaccine)] is...

bad/good;

foolish/wise;

unfavorable/favorable;

negative/positive;  
undesirable/desirable;  
unnecessary/necessary;  
detrimental/beneficial

### **Social Media Engagement (DiStaso et al., 2015)**

Please rate your agreement with the following statements. How likely are you to...  
1 represents “Very Unlikely” and 7 represents “Very Likely.”

1. “Like” this message on Instagram.
2. “Share” this message on Instagram.
3. “Comment” on this message on Instagram..

### **Attitudes toward the celebrity (Tran et al., 2019)**

1. Please rate your attitudes toward the celebrity:
  - a. Bad/good
  - b. Dislike/like
  - c. Unpleasant/ pleasant
  - d. Unfavorable/ favorable

Familiarity with Simone Biles (Thomas, V. L., & Fowler, K. (2015). More Isn't Always Better: Exploring the Influence of Familiarity When Using Multiple Celebrity Endorsers. *Journal of Promotion Management*, 21(2), 208-223.)

1. How familiar are you with Simone Biles?
  - a. 1:Extremely unlikely-7:extremely likely

Familiarity with CDC (Thomas, V. L., & Fowler, K. (2015). More Isn't Always Better: Exploring the Influence of Familiarity When Using Multiple Celebrity Endorsers. *Journal of Promotion Management*, 21(2), 208-223.)

1. How familiar are you with CDC?
  - a. 1:Extremely unlikely-7:extremely likely
2. Please rate your attitudes toward the the CDC: **(Tran et al., 2019)**
  - a. Bad/good
  - b. Dislike/like
  - c. Unpleasant/ pleasant
  - d. Unfavorable/ favorable

### **Demographic information**

*Please answer the following questions to the best of your ability.*

1. Please indicate your gender
  - a. Male
  - b. Female
  - c. Non-binary gender
  - d. Prefer not to answer
  
2. What is your **age**? (Please enter in numbers). For example, if you are 20-years old, enter the number 20 in the box below.
  
3. What **race** group do you belong to?
  - a. African-American
  - b. Asian/Asian-American
  - c. White/Caucasian
  - d. Hispanic/Latino/a
  - e. Native Hawaiian
  - f. Other
  - g. Prefer not to answer
  
4. Please indicate your highest level of education
  - a. Less than High School
  - b. High School / GED
  - d. Some college
  - 2-year college degree
  - 4-year college degree
  - Master's degree
  - Doctoral degree
  - Professional degree (MD, JD)
  
5. What is your political affiliation?
  - a. Republican
  - b. Democrat
  - c. Independent
  - d. Other

## Appendix D: Stimulus Material

### Gain Frame: CDC

 cdcgov · Follow



♥ ◻ ◻ ◻

Liked by Instagram and 61,320 others

**cdcgov** Getting the COVID-19 vaccine is the BEST thing you can do for your health and your loved ones! There are many benefits from getting the vaccine including:

- 1 Getting the vaccine can help you reduce your risk of contracting the virus and limiting the spread of the virus
- 2 If you decide to get the vaccine you can shop at some stores without wearing a mask
- 3 If you get vaccinated you can attend events and fly without getting tested all the time

Thank you to everyone who has done their part to end this pandemic!!

#COVID19 #vaccine

View all 160 comment

### Loss Frame: CDC

 cdcgov · Follow



♥ ◻ ◻ ◻

Liked by Instagram and 61,320 others

**cdcgov** Failing to get the COVID-19 vaccine can have NEGATIVE implications for your health and your loved ones! There are many risks of NOT getting the vaccine including:

- 1 NOT getting the vaccine can increase your risk of contracting the virus and spreading it to others
- 2 If you decide NOT to get the vaccine you have to wear a mask when shopping at many stores
- 3 NOT getting the vaccine requires to get tested all the time if you want to attend an event or fly

Thank you to everyone who has done their part to end this pandemic!!

#COVID19 #vaccine

View all 160 comment



## Gain Frame: Simone Biles



simonebiles · Follow



Liked by Instagram and 61,320 others

**simonebiles** Getting the COVID-19 vaccine is the BEST thing you can do for your health and your loved ones! There are many benefits from getting the vaccine including:

- 1 Getting the vaccine can help you reduce your risk of contracting the virus and limiting the spread of the virus
- 2 If you decide to get the vaccine you can shop at some stores without wearing a mask
- 3 If you get vaccinated you can attend events and fly without getting tested all the time

Thank you to everyone who has done their part to end this pandemic!!

#COVID19 #vaccine

[View all 160 comment](#)

## Loss Frame: Simone Biles



simonebiles · Follow



Liked by Instagram and 61,320 others

**simonebiles** Failing to get the COVID-19 vaccine can have NEGATIVE implications for your health and your loved ones! There are many risks of NOT getting the vaccine including:

- 1 NOT getting the vaccine can increase your risk of contracting the virus and spreading it to others
- 2 If you decide NOT to get the vaccine you have to wear a mask when shopping at many stores
- 3 NOT getting the vaccine requires to get tested all the time if you want to attend an event or fly

Thank you to everyone who has done their part to end this pandemic!!

#COVID19 #vaccine

[View all 160 comment](#)

## Appendix E: Recruitment Letter

Dear prospective participant,

You are invited to participate in a study “Message Factors and Source Credibility” which examines the role of health messages that are posted on Instagram to inform the public about important health issues. This study is being conducted by Kacie Hines, M.A. student and Michail Vafeiadis, Ph.D. of Auburn University. Study questions may be directed to Kacie Hines at [kmh0087@auburn.edu](mailto:kmh0087@auburn.edu) or Dr. Michail Vafeiadis, at [mzv0042@auburn.edu](mailto:mzv0042@auburn.edu).

You were selected as a possible participant because you are an Auburn University student.

Participants will be asked to complete questions regarding different stimuli. The online Qualtrics survey should take 20 minutes or less. Your participation in this survey is completely voluntary. You may end your participation at any time by closing the browser. Your survey responses will remain anonymous and no individual data about you will be reported.

As a thank you for your participation, at the end of the initial survey will be a link to a separate survey, where you have the option to enter your name and email address to participate in a random drawing to win one of four \$25 Amazon gift cards.

If you participate in this study, you cannot expect to receive any direct benefits, although your participation may enable the generation of knowledge about message factors and source credibility. There are no costs to you.

Proceeding with this online survey indicates that you consent to participate in this study. To begin the survey, please go to this website:

[https://auburn.qualtrics.com/jfe/form/SV\\_d9WxC4IDzV9MqY6](https://auburn.qualtrics.com/jfe/form/SV_d9WxC4IDzV9MqY6)

With any research study there is always a potential risk, such as feeling uncomfortable. Benefits include the opportunity to and increase our understanding of message framing and source credibility on Instagram. There are no costs for participants of this study.

Questions about your rights as a study participant should be directed to the Auburn University Office of Research Compliance at (334) 844-5966 or [irbadmin@auburn.edu](mailto:irbadmin@auburn.edu).

Thank you for being willing to share your insights and participate in this important research.

## Appendix F: Consent Form

SCHOOL OF  
COMMUNICATION  
AND JOURNALISM



AUBURN UNIVERSITY

COLLEGE OF LIBERAL ARTS

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

### INFORMATION LETTER For a Research Study entitled “Message Factors and Source Credibility”

**You are invited to participate in a research study** that examines the role of health messages that are posted on Instagram to inform the public about important health issues. The study is being conducted by Kacie Hines, graduate teaching assistant in the Auburn University School of Communication and Journalism. You were selected as a possible participant because you are an Auburn University student.

**What will be involved if you participate?** If you decide to participate in this research study, you will be asked to answer questions about your attitudes and feelings toward the health messages that you just read. Your time commitment for questions about your attitudes will be approximately 10 minutes, your time commitment for questions about your feelings will be approximately 10 minutes, and your total time commitment will be approximately 20 minutes. Questions will not include any identifying information and will be securely stored.

**Are there any risks or discomforts?** The risks associated with participating in this study are a potential loss of confidentiality. To minimize these risks, we will remove all identifying information from stored data.

**Are there any benefits to yourself or others?** If you participate in this study, you cannot expect to receive any direct benefits, although your participation may enable the generation of knowledge about message factors and source credibility.

**Will you receive compensation for participating?** You will have the opportunity to participate in a random drawing of approximately 200 participants to win one of four \$25 Amazon gift card. Once all participants finish the study random winners will be chosen and an emails will be sent to those who won.

**Are there any costs?** There are no costs to you.

**If you change your mind about participating,** you can withdraw at any time during the survey. Your participation is completely voluntary. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or the School of Communication and Journalism

**Your privacy will be protected.** Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be presented at a professional meeting or published in an academic journal.

**If you have questions about this study,** contact Kacie Hines at kmh0087@auburn.edu or Dr. Michail Vafeiadis at [mzv0042@auburn.edu](mailto:mzv0042@auburn.edu).

**If you have questions about your rights as a research participant,** you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at [IRBadmin@auburn.edu](mailto:IRBadmin@auburn.edu).

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.



Principal Investigator

Date 02/01/2022



Principal Advisor

Date 02/01/2022

**The Auburn University Institutional Review Board has approved this document for use from January 28, 2022 to April 22, 2022 Protocol #22-029 EX 2201, Hines**