WHAT'S REAL ABOUT FAKE NEWS? A LIMITED CAPACITY APPROACH TO STUDYING ONLINE DECEPTION COMPREHENSION IN MEDIA MULTITASKING SITUATIONS

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ABSTRACT

WHAT'S REAL ABOUT FAKE NEWS? A LIMITED CAPACITY APPROACH TO STUDYING ONLINE DECEPTION COMPREHENSION IN MEDIA MULTITASKING SITUATIONS

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Fake news, largely considered a social media problem (Tandoc, Jenkins, & Craft), can lead to misinformed judgments in important, vital areas, such as healthcare and political processes, or to misguided actions related to responses to deceptive information (Fourney, Racz, Ranade, Mobius, & Horvitz, 2017; Tandoc, 2019). The current health circumstances (i.e., COVID-19 Pandemic) require accurate and immediate news to inform the public about the situation, how to proceed as a community, and how to best protect themselves (e.g., helping them answer questions such as: "Should I wear a mask?", "Should I stay home?", or "Will receiving the COVID-19 vaccine cause a miscarriage?"). To date, there has been much misinformation about the spread of COVID-19, how communities should react, and the correct precautions individuals should take in order to stay healthy and safe (Suciu, 2020). Another impeding force is the increased use of mobile devices is changing the way messages are being processed. Of U.S. adults, 77% own a laptop, 58% have a tablet computer, and 91% own a smartphone (Hilton, 2018). Consequently, media usage behaviors, such as multitasking with several devices, have become widespread (Collins, 2008; Jeong & Hwang, 2012). This study examines the effects of media multitasking on falsity detection in an online experiment with a Qualtrics panel of gen pop (N = 186) where half the sample media multitasked while reading both real and fake news posts and the other half were asked to read real and fake news posts. Results indicated that organic media multitasking behaviors, outside of the experimental procedure, such talking to a spouse or

a child or texting on the phone to a friend and media multitasking preferences may be a better indicators of cognitive processing and behavioral intentions in an online media multitasking experiment than manipulating multitasking.

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Chapter 1: Introduction

Leading up to the 2016 U.S. presidential election, the United States was confronted with quite possibly one of the most misinformed political campaigns of our time (Nelson & Taneja, 2018; Tandoc, Thomas, & Bishop, 2021). After a lengthy federal investigation into the 2016 election, it was discovered that election-related misinformation was spread effortlessly, in part, due to outside interference through "Russian hacking and social media campaigns" on platforms such as Facebook (Müller & Schulz, 2019, p. 1). Another more salient example, as of December 2019, is the spread of misinformation during the current COVID-19 (a novel corona-, influenza-like virus) pandemic. Health circumstances require accurate and immediate news to inform the public about the situation, how to proceed as a community, and how to best protect themselves (e.g., helping them answer questions such as: "Should I wear a mask?", "Should I stay home?", or "Will receiving the COVID-19 vaccine cause a miscarriage?"). To date, there has been much misinformation about the spread of COVID-19, how communities should react, and the correct precautions individuals should take in order to stay healthy and safe (Suciu, 2020). Further, due to the exploitation of social media websites, private media companies, such as Facebook, are attempting to actively mitigate the spread of "fake news" during COVID-19 by removing factitious posts (Scott, 2020). Today, *fake news*, defined as information that is presented in the form of real news, but is intended to misinform, mislead, and misguide the reader (Lazer et al., 2018), is a common occurrence on social media (Lazer et al., 2018; Nelson & Taneja, 2018; Tandoc, Lim, & Ling, 2017). This is problematic because access to factual information is vital in the process of shaping informed opinions and making informed decisions. In this regard, fake news occupies an interesting niche between news that is meant to inform in the most accurate and unbiased manner and obtrusive information where the sender (e.g., a political candidate) and

their intent (e.g., to win the presidency) are known. When fake news appears in the form of real news and does not have an explicitly identified sender or intent, the intention could be implicitly present in attempts to make news consumers believe false information and, as a result, form or adjust their attitudes and act upon them (Shu et al., 2019). Fake news, largely considered a social media problem (Tandoc, Jenkins, & Craft), can lead to misinformed judgments in important, vital areas, such as healthcare and political processes, or to misguided actions related to responses to deceptive information (Fourney, Racz, Ranade, Mobius, & Horvitz, 2017; Tandoc, 2019).

Hence, fake news dissemination can possibly have an impact on the ability to discern real from deceptive information, comprehension, counterarguing, and behavioral intentions (Persily, 2017). With this in mind, it is pivotal for citizens and consumers, who are likely to be social media users, to quickly discern false information and assess it critically—that is, with a certain level of skepticism and by generating counterarguments—before making decisions based upon such information. A number of factors associated with distraction, such as multiple screen device use, may prevent in-depth critical assessment of mediated messages, including fake news, leading to their higher level of acceptance and believability. One of these factors is media multitasking.

The increased use of mobile devices is changing the way messages are being processed. Of U.S. adults, 77% own a laptop, 58% have a tablet computer, and 91% own a smartphone (Hilton, 2018). Consequently, media usage behaviors, such as multitasking with several devices, have become widespread (Collins, 2008; Jeong & Hwang, 2012). Media multitasking is defined in this work as the use of (or exposure to) two or more media sources or devices simultaneously

during a specific time period (Lang & Chrzan, 2015; Jeong & Hwang, 2012; Kononova, Joo, & Yuan, 2016).

Media multitasking, especially when using the newest information and communication technologies (ICTs), is distinct when compared with other forms of multitasking that do not involve media (e.g., cooking and paying bills at the same time) because of specific characteristics of new media and technologies, a big part of which constitute mobile media. The newest forms of mobile media are unique because of portability, accessibility, and the increased immediacy of feedback and consequential instant rewards that mobile media use provides (e.g., Schrock, 2015). These characteristics make new forms of mobile media and devices (e.g., smartphones, laptops, and tablet computers) omnipresent, making interference in peoples' lives more likely. Thus, multitasking with new media has become a rapidly growing media use behavior trend within the last 30 years (Collins, 2008; Edwards & Shin 2017). Further, the current generation of college students, known as Generation Z (Gen Z; Beall, 2017), is the generation that (a) has grown up with unlimited access to media both through devices and by location, and (b) is the first generation that has been constantly engaged in multitasking with media (Lee et al., 2012).

In addition, the millennial generation that preceded Gen Z, while not as extreme in terms of technology use, has had similar exposure and access to media. Today, 90% of millennials have at least a smartphone, while 64% own both a smartphone and a tablet (Vogels, 2019). While Gen Z and the millennial generation (alternatively Gen Zers and millennials) differ in some ways, such as the use of privacy settings on electronic devices and in electronic applications (Taylor & Keeter, 2010), both generations embrace media use to a similar extent (Vogels, 2019). Access at any time and in any location plays a large role in what makes media

multitasking distinct from multitasking situations that do not involve media and ICTs. While access itself does not seem problematic, in more recent years, researchers have found that media multitasking has negative cognitive effects, e.g., decreased ability to counterargue, and positive persuasive effects, e.g., increased positive attitudes toward the message (Gilbert et al., 1993; Kupor & Tormala, 2015).

Jeong and Hwang (2012) conducted a meta-analysis to understand the effects of media multitasking on cognitive and affective processing, based on a review of 49 studies. The authors confirmed the negative effect of media multitasking on cognition. However, they noted a lack of evidence to explore the effects of multitasking on emotional message processing and attitudes. Among few studies that found such effect, Jeong and Hwang (2012) concluded that the effect of media multitasking was mostly favorable, suggesting that participants enjoyed multitasking, despite it hindering their memory for and performance on some tasks.

Fake news is an emerging concept and has yet to be studied in the context of media multitasking. The primary goal of this dissertation project is to understand how individuals in media multitasking environments, which are ubiquitous, process fake news information cognitively and affectively, and in what ways they react to it. Overall, media multitasking is found to decrease cognitive effects and increase positive effects of persuasion (Armstrong & Chung, 2000; Armstrong et al., 1991; Brasel & Gips, 2011). However, existing evidence largely derives from studies in which messages were used as a simple stimulus tool and, thus, were assumed to be truthful. For example, some previous studies have explored the processing of the following types of messages: a story about "a major breakthrough in a 13-year-long murder investigation" (Van Cauwenberge at al., 2014, p. 103) and an article about "freedom of expression" (Jeong & Hwang, 2012, p. 576). Although some research has been done with stimuli

specifically modified for study purposes (e.g., Kononova, Joo, & Yuan, 2016 intentionally modified information about the flu on a health website), exploring online deception in the context of media multitasking has been limited.

Processing falsity is a two-step process where an individual (a) identifies deception, and (b) reacts to it cognitively, affectively, and behaviorally. In exploring and understanding the impact of fake news posts, I will be using the term *deceptiveness* to mean the potential of a message to deceive consumers (Richards, 1986). Importantly, the term refers to the potential of deception, not the actual deception. Fake news posts fall into this potential because they have the intent to deceive, but have not yet accomplished deception until the consumer has believed a news post and acted in regard to it.

It is important to note that identification of falsity and source/message credibility judgments become very important in measuring the cognitive and emotional processing of deceptive messages, as well as the behaviors and behavioral intentions they elicit. For example, Munzel (2016) examined how to improve consumers' ability to detect fake online reviews. Results of Munzel's (2016) study showed that reviewers' identification information, such as their name, played a key role in consumers' ability to determine whether the review was falsified. Another study (Teven, 2008) examined the relationship between perceived credibility and perceived deceptiveness of presidential candidates in the 2008 U.S. presidential election. Teven (2008) found that an increase in perceived credibility was related to a decrease in perceived falsity of a candidate. These studies (Munzel, 2016; Teven, 2008) demonstrate the importance of credibility cues in ones' ability to detect fake information.

Based on the previous literature on media multitasking's effects on cognitive message processing, it is thought by researchers that the ability to process fake news should decrease in

media multitasking environments when compared with non-media multitasking (multitasking that does not involve electronic media) and monotasking environments. At the same time, the ability to identify information as false should also decrease, thus increasing the chances that fake news messages will be encoded and stored. This dissertation explores media multitasking's effects on both falsity detection and information processing. If an online news reader detects a fake story, they will not proceed with reading it, protecting themselves from misinformation. However, if deception detection fails, the online news reader may proceed with reading the fake post, which may increase the chances of deceptive information spreading. Given prior evidence on the positive effects of persuasion when multitasking with media (Jeong & Hwang, 2012; Kononova, Joo, & Yuan, 2016), if defenses against deception are weakened by media multitasking, fake news arguments will be more likely to be accepted by online news readers.

With this study, I intend to fill the current gap in the media multitasking and deception detection literature by focusing on how media multitasking affects deception detection, fake news cognitive and emotional processing, and the viral behavior intentions that can result. In doing so, the results from the current study will help uncover the impact of media multitasking on fake news detections, comprehension, counterarguing, perceived credibility, and viral behavioral intentions; and how arousal and valence impact these cognitive resources. In this study, I also aim to better understanding of the role of media multitasking preferences (i.e., How does having a high verses low preference toward media multitasking impact cognitive resources?). Further, this study seeks to contribute more knowledge in regard to deceptiveness and how media multitasking affects an individual's ability to be deceived.

The present study applies the limited capacity model of motivated mediated message processing, a theoretical framework that largely explains human capacity limitations with regards

to information processing (Lang, 2000, 2006), especially in multitasking environments (Jeong & Hwang, 2012; Srivastava, 2010) and dual-processing models, such as the Elaborated Likelihood Model (Petty & Cacioppo, 1986) and the Heuristic-Systematic Model (Chaiken, 1999). Applying these theoretical frameworks, the current dissertation will explore peoples' ability to process deceptive information—presented in the form of fake news posts—while multitasking with media. Specifically, this dissertation aims to examine how media multitasking impacts (a) detection of deceptive information presented in the form of fake news online (detection of deception in news posts); (b) perceived credibility of fake news versus real news story posts; (c) comprehension of fake news versus real news story posts, measured with argument listing; (d) counterarguing, or generating arguments that are counter to those presented in fake news versus real news story posts; (e) recognition of fake news versus real news story posts, sources, and content; (f) attitudes toward fake news versus real news posts; and (g) intention to like, comment, and share fake news versus real news posts on social media.

The literature review (Chapters 2, 3, and 4) presents empirical evidence in three key areas: (a) online deception and fake news (Chapter 2), (b) media multitasking and detecting deception (Chapter 3), and (c) human limited capacity to process information and reliance on dual (controlled and automatic) ways of processing (Chapter 4). Hypotheses are stated and research questions are asked in Chapter 5. Chapter 6 is devoted to the description of the proposed experimental study's methods. Chapter 7 describes the results that the present dissertation project produced. Chapter 8 discusses the results using the applied theoretical perspectives on humans' limited cognitive ability and the role of automatic (heuristic) and controlled (systematic) types of information processing.

Chapter 2: Fake News—It Is Real and It Is Misleading

Deceptiveness Online

Online deception is an important field to study, since it is prevalent on the internet (Tsikerdekis & Zeadally, 2014). It has been found that individuals have multiple motivations to deceive others online (Caspi & Gorsky, 2006) and that deception affects the emotional responses of those being deceived (Limbu et al., 2011). Deception, at its core, is defined as "knowingly transmitting messages to a receiver with the intent to foster a false belief or conclusion" (Caspi & Gorsky, 2006, p.54). Deception comes in many forms online; more recent studies have focused on deception in online dating (Guadagno et al., 2012), on social media (Tsikerdekis & Zeadally, 2014), and in online news (Y. Chen et al., 2015). These three areas primarily cover motivations to deceive (Utz, 2005), effects of being deceived (Caspi & Gorski, 2006), and strategies to detect deception online (Afroz et al., 2012). This chapter discusses scholarly work that has previously been done in these three areas.

Defining Deceit, Deception, and Deceptiveness

Before delving into the analysis of motivations for why individuals or organizations choose to mislead others, it is important to understand how deceit and deception are defined and how they differ from deceptiveness.

Deceit is a term that refers to the purposeful intention to misinform consumers, or "fraudulent misrepresentation" of goods or services (Richards & Preston, 1992, p.45). This term is commonly used to legally deem an advertisement as deceit (Preston & Richards, 1985; Richards & Preston, 1992; Richards, 1986). With that said, we can apply this same logic to news posts, as they carry similar implications of misinformation for consumers (i.e., consumers are making decisions based on the information presented). The Federal Trade Commission deems an

advertisement to be deceit when: "1) a claim has been made; 2) the claim was fact, rather than opinion; 3) the claim was untrue; 4) it was made with intent to influence the buyer's conduct; 5) the buyer acted in reliance on the claim; 6) the reliance was justified; 7) the buyer was injured; [and] 8) the deception caused the injury" (Richards & Preston, 1992, p.45).

Deception—an extension of deceit—is defined as the accomplishment of misleading consumers with false information (Preston & Richards, 1985). In this case, I believe we can define fake news posts as deceit, but not yet as being deceptive. In other words, claims are made, the posts are presented as facts, and the posts present false information. However, fake news in this case has only the potential to mislead and has not yet misinformed the reader.

This is where the distinctions between deceit, deception, and deceptiveness are important. *Deceptiveness* is defined as the potential of a message to deceive consumers (Richards, 1986). In exploring online deception and, more specifically, fake news posts, this distinction is important because intention to mislead is consequential. However, consumers can comprehend, counterargue, and make credibility judgments about information they read online, so they may not end up being deceived. Thus, it is important to explore the deceptiveness of fake news, rather than the deceit and deception.

Motivation for Deception

Caspi and Gorsky (2006) explored the underlying motivations to deceive online. They distributed a survey across 14 different online forums, asking individuals to answer questions about the use of online deception, motivations, and responses to online deception. The authors surveyed a total of 257 participants and found that individuals under the age of 20 use online deception most frequently. Results suggested that most people use online deception to hide their location and identity (e.g., age, gender, location of residence, etc.), while others choose to

conceal the level of their attractiveness. In online dating situations, these motivations have a reasonable explanation: people are motivated to deceive to protect their privacy (e.g., making sure others cannot determine their location) or elevate their status (e.g., indicating higher income levels). However, the motivations become more difficult to interpret when it comes to news-related deceit. Sampling the population of individuals who intentionally distribute deceptive news information online can be difficult because deceivers are difficult to identify on the internet.

Additionally, some of the distributors of fake news are not human (e.g., artificial intelligence, bots) and, thus, do not have a motivation by default. Y. Chen et al. (2015) set out to model online deception and found that there are two key motivators for online news deception. The first motivation is to increase self-gain, status, and authority on a news topic (Y. Chen et al., 2015). The second motivation is to decrease the trustworthiness of another individual or organization, such as an opposing presidential candidate (Tsikerdekis & Zeadally, 2014). For example, one might see the second motivation play out in the news during an election year. Upon examining past election campaigns, several campaigns were driven by the second motivation.

For instance, "Role Models | Hilary Clinton" missuses Donald Trump's quotes out of context in order to portray him as a poor role model (Clinton, 2016). While motivation will not be measured in this study, motivations for deception are important to address. They often explain the type of deception (e.g., satirical news, fake news, etc.) and deception intentions. Motivations can also influence one's ability to detect deceptive messages.

Detecting Deception

Detecting deception can be a daunting task, as most online deception is thoughtfully curated with malicious intent (Zhou et al., 2008). Currently, there are two ways in which one

detects deception. The first is automated detection through language processing software (Zhou et al., 2008; Afroz et al., 2012), where software tracks subtle changes in sentence structure, syntax, and semantics between false and genuine information. This computational detection processing happens, ideally, before the message reaches the consumer. While there is some great technology geared toward eliminating the distribution of deceptive messages online, there are some limitations in the technology's ability to detect deception on the internet with 100% accuracy.

The second—much less accurate—defense against deception is human detection (Y. Chen et al., 2015). There are many limitations in detecting deceptions because people tend to default to trusting a message's validity (Y. Chen et al., 2015). This assumption is consistent with the truth-default theory (McCornack & Parks, 1986; Zuckerman, DePaulo, & Rosenthal, 1981), a well-established persuasion theory that proposes the notion that people tend to default to believing information is true (Levine, 2014). For example, Levine et al. (2014) found that human falsity detection rates range from 50%–58% accuracy. In other words, when individuals are exposed to a deceptive message in an experimental setting, they are only able to detect deception about 50% of the time. Consistent with this finding, Bond and DePaulo (2006) conducted a meta-analysis, including 206 empirical studies assessed by a total of 24,483 judges. Results from that study suggested that the average person could detect deception with only approximately 54% accuracy.

Further, Levine's (2010, 2014) work explores the concept of veracity. Veracity is the notion that individuals tend to default to trusting others and perceiving them as telling the truth. People only revert to mistrust when circumstances prompt a motivation to deceive. This is nearly consistent with truth-default theory (Levine, 2014; McCornack & Parks, 1986; Zuckerman et al.,

1981), where individuals tend to believe, as a default, that others are telling the truth even when they are not (Street & Masip, 2015). To support both theoretical frameworks, empirical research shows that the majority of people default to believing that others are telling the truth. Levine, Kim, and Hamel (2010) examined the idea of veracity—that is, imbalance between deceit and honesty (i.e., you do not have to justify honesty, whereas you do have to justify dishonesty)—in a series of studies.

Their first study used deception motivation as the main independent variable. The researchers created scenarios, such as receiving a gift or commenting on a friend's body weight. Then the researchers manipulated this by developing two different versions of each scenario where the "motive to deceive" was present or absent. These scenarios with the two different versions were presented to the participants. Participants were asked to state what they would do in response to each situation. Results indicated that when a motive to deceive was present, respondents were more likely to be dishonest. When, however, the motive to deceive was absent, people tended to tell the truth. Study 2 replicated the results of Study 1. Study 3 used a trivia game to explore veracity. Participants were asked to come into a lab over two semesters and pair with a confederate to play the game for a prize. They were told that they would get a cash prize for all questions answered correctly and lose money from the prize for incorrect answers. A confederate played the role of additional participant/game player, while the researcher took the role of game host. After a few minutes, an additional researcher stepped into the room to pull the game host from the room with an emergency. While the game host was out of the room, the confederate either made small talk or asked the participant to cheat and look at the answers to the trivia game. Following the game, the participant was asked if they cheated. Results were consistent with the researchers' predictions based on the concept of veracity: cheaters were more

likely to lie, and those that did not cheat did not lie at all. In other words, those that had a reason to lie, did so.

Another pivotal concept is misperception (Preston, & Richards, 1986). Social norms theory (Perkins & Berkowitz, 1986)—a well-established communication theory that addresses the effectiveness of peer influences—posits that there are two sets of norms: perceived and actual (Perkins & Berkowitz, 1986). Perceived norms are what others perceive their peers to be doing, while actual norms are what their peers are actually doing (Perkins & Berkowitz, 1986). Misperception is the gap between what is happening (actual norms) and what people think is happening (perceived norms; Perkins & Berkowitz, 1986). This is also where deceptiveness lands, in that most people have the potential to misperceive information, and thus, be deceived—a key component in the spreading of fake news.

The concepts of veracity, truth bias, and misperception are ever more important because with this bias toward believing information is true, it is an uphill battle for consumers to recognize when something is fake or misleading. Thus, studying the impact of fake news posts, especially in situations where cognitive resources are limited, is increasingly important.

Fake News

The fake news phenomenon did not start with the development and popularization of the internet. Deceptiveness in media has existed in societies for centuries. The notion of fake news sends us back to the history of media, mass communication, and journalism. For example, yellow press gained its popularity over a century ago by providing readers with entertaining, unverified information. The term "yellow journalism" was coined in 1895 out of a rivalry between two newspapers—*New York Journal* and *New York World*, owned by famous media moguls Randolph Hearst and Joseph Pulitzer, respectively—and used consistently throughout the

Spanish-American War (April 21, 1898–December 10, 1898) in order to sell more newspapers. This type of journalism refers to dramatized typography and sensational headlines and was known for having a specific style featuring two-plus column exaggerated headlines, creative illustrations, and bold text (Kennedy, 2021). Today, yellow press has been modernized for the 20th century through the coining of fake news (Allcott & Gentzkow, 2017). Both fake news and yellow journalism are simply terms to describe factually incorrect information and show us that this type of deceit has been taking place in different forms and across varying channels for many years. In fact, we have seen fake news take many faces over the centuries, such as some propaganda—advertising in the form of posters, movies, and cartoons used to emphasize a respective county's agenda and influence citizens' buy-in—during World War II (September 1, 1939–September 2, 1945) (PBS, 2021). Germans used propaganda to depict the Russian army as strong, ruthless characters, whereas ally armies were portrayed as weak (PBS, 2021). Meanwhile, the U.S. army used propaganda to influence support for the war (PBS, 2021).

Another form of fake news took place during the Cold War era (1947–1991) with the Red Scare—the persecution of communism being a threat to the United States. The Red Scare was perpetuated by the news and entertainment media through misrepresentation of the Soviet Union and communism in the news and Hollywood roles. This type of news and misrepresentation of communism in the news and entertainment media caused many U.S. citizens to be fearful and anti-communist.

More recently, fake news takes place in many forms, such as celebrity gossip, where tabloids and gossip columnists exaggerate celebrity lifestyles. This may lead to people developing unrealistic expectations for how celebrities live on a regular basis. Other popular forms of fake news are satirical publications and news media like *The Onion* and *The Daily*

Show. These types of news sources are comedic in nature, but skew current new stores to create dark humor around news topics.

The most recent form of deceptiveness in journalism, fake news—an emerging term referring to misinformation distributed via the internet, specifically on social media platforms such as Facebook (Nelson & Taneja, 2018)—is prevalent on online social media platforms. The term fake news was officially coined during the lead-up to the 2016 U.S. presidential election (Allcott & Gentzkow, 2017). Fake news is defined as "fabricated information that mimics news media content in form, but not in organizational process or intent" (Lazer et al., 2018, p.1094; Tandoc, et al., 2021). For example, Tandoc, Thomas, and Bishop (2021) conducted a content analysis of 886 news webpages and found that fake news sites look very similar to real news sites. Another important distinction is the one made between fake news and satirical news, such as websites mentioned above. Fake news is different from satirical news because of the purposeful intention to mislead the reader, viewer, or listener (Allcott & Gentzkow, 2017). Thus, a more comprehensive definition of fake news put forth by Allcott and Gentzkow (2017), is "news articles that are intentionally and verifiably false, and could mislead readers" (p. 213). In this study, fake news refers to news that is presented in the form of real news with that present false information intended to mislead the consumer. Fake news can become a problem in situations where individuals need factually accurate information, such as during political elections or when making health decisions, e.g., deciding whether to vaccinate your child (Jang & Kim, 2018). It becomes problematic when individuals who are exposed to misinformation are unable to distinguish between real and fake facts and assess such information critically to make well-informed decisions.

Several important conclusions need to be made when reviewing the scholarly literature on the fake news topic. First, little experimental research examining the effects of fake news detection—and more specifically, detection while multitasking—has been previously done. In addition to the available knowledge, there have been no studies exploring the effects of media multitasking on fake news detection, assessment, processing, and behavioral reactions. Second, most studies have been conducted on computers' ability to detect patterns in news to identify fake news posts. With that said, it is important to emphasize the human factor in detecting deception. Both machines and humans work together to detect fake news and the human element is crucial in this process. One real-world example of human-computer collaboration is the partnership project between Facebook and Reuters. While Facebook has sophisticated algorithms to detect fake news posts on its social media, such technology still makes errors, where true content is labeled fake and misinformation is not detected. To reduce the possibility of error, Reuters provides human fact-checkers to verify that fake news posts were not missed by the algorithms, helping ensure that misinformation content was detected and labeled correctly. Algorithms helped flag numerous misinforming pieces of online content during the COVID-19 pandemic, and Reuters fact-checkers were able to additionally identify 40+ news posts that were fake (Reuters Communication, 2020).

As stated previously, there are several important articles to mention as scholars continue to build upon the fake news literature. Pérez-Rosas et al. (2017), in an article pertaining to the importance of fake news detection, procured 100 fake news and 100 real news samples on the internet. Linguistic patterns of fake news were studied to develop a computational model to detect fake news. The factors analyzed to contribute to the identification of fake news included readability, punctuation, and syntax. After testing several models of computational detection, it

was found that the topic (e.g., celebrity news versus political news) played a key role in the detection of fake news.

The second groundbreaking study (Tacchini et al., 2017) examined several different features of fake news (or hoax pages) on Facebook in order to develop an algorithm for detecting misleading information and pages. This study revealed three interesting results. First, it was found that, on average, fake news posts had more likes than real posts. Second, the "like" distribution of users consisted of 74% of people in the dataset linking at least one fake news post, 20% liking real pages, and about 5% liking a combination of fake news and real posts. Finally, results suggested that individuals who liked a fake page would also like other fake pages. From these two articles, we extract a few prominent conclusions. The first conclusion is that detecting fake news is a complicated procedure, even for the most sophisticated computational software. Second, fake news is distributed and liked within social media community members, regardless of their association with fake versus real pages. Even if individuals can detect online deceit in some cases with some accuracy (see the Detecting Deception subsection above), fake news presents a new set of challenges because of the similar structure and imitation to real news, as well as its advantageous use of trusted social networks to spread.

Moreover, it is important to note that the use of social media is a key component in the spreading of fake news (Nelson & Tenija, 2018). Nelson and Tenija (2018) examined the implications of fake news sharing and concluded that social media, while being crucial in spreading false information, also provides a unique civic opportunity that facilitates the discussion surrounding current political events (Khaldarova & Pantti, 2016). In the United States, it is common for individuals to express their personal political views online (Clement, 2019). Anderson, et al. (2018) conducted a Pew Research Center survey showing that

approximately half of the U.S. public uses social media for civic and political engagement. In addition, it was found that approximately 38% of the U.S. public gets their news online via social media (Mitchell et al., 2016). It stands to reason that if people obtain their political information through social media, candidates also use social media as campaign platforms (Clement, 2019). Clement (2019) found that social media, to date, is one of the most influential digital channels in promotion.

What makes social media so influential in forming attitudes and changing behaviors is a question that has perplexed scholars. More recent studies focused on the effects of fake news as part of such influence. Allcott and Gentzkow (2017) suggest that one component of social media that makes the spread and acceptance of fake news so efficient is the *socialness*—established networks of friends and family—of social media (Allcott & Gentzkow, 2017). Social media reach is much greater compared to interpersonal networks (Bond et al., 2012). Behavior changes within small interpersonal networks may be minimal, ranging from 1%–10% (Bond et al., 2012), meaning that only a few people would change their behavior because of interpersonal network influence, with an average size including approximately 20 individuals per network (Finkel & Baumeister, 2019). Information spread on social media has the potential to reach millions of people, which could result in a great number of people changing their behavior.

Finally, many articles pertaining to fake news discuss the urgency of explicating, studying, and detecting fake news, but do not provide empirical data. For example, Shao et al. (2017) focus on the spread of fake news, as well as reasons for and means of such spreading. Shao et al. (2017) conclude that fake news dissemination is considered effective (i.e., enabling some sort of behavior [e.g., sharing, voting, etc.] or attitude change [e.g., liking a new political candidate]) because of the use of social media and social networks. I suggest that the

dissemination of fake news on social media may produce "a perfect storm." That is, information comes to social media users from an established and trusted source (e.g., social media friends and followers) and, thus, is less likely to be questioned (Sherchan et al., 2013). It also must be noted that most individuals default to trusting information in general. In addition, information shared through a trusted social media network increases the trust factor (Anspach, 2017; Mohaisen et al., 2011). Finally, fake information mimics or imitates other trusted message sources, which also increases social media users' trust in it. Trusting a message's validity frequently stems from both the source and the structural features of the message (Wogalter & Mayhorn, 2008).

Though it seems that detecting deceit is a difficult task, there are some ways in which individuals pick up on detection. Rowe (2005) found that individuals detect deception in three distinct ways: (a) through visual cues, such as increased blinking of a speaker in an online video; (b) vocal cues, such as hesitation of the speaker; and (c) verbal cues, such as the increased use of negative language. Afroz et al. (2012) suggest that detecting online deception heavily depends on the writing style of a message, including author recognition (e.g., recognition of the source), text features (e.g., punctuation), content (e.g., word choice), and lexical features (e.g., vocabulary). Afroz et al. (2012) manipulated new posts with these features for 707 participants and found that those trained to detect the deceptive features were accurate approximately 96% of the time, on average.

The evidence of previous studies suggests that individuals do not naturally look for deception and, thus, do not tend to detect it when present. Furthermore, when individuals are looking for deception, they tend to only detect deception about 50%–58% of the time. Fortunately, there are subtle ways in which people pick up on deception, such as the use of

negative language and other message features, which means that training and education can help individuals become more aware of deceptive features and sort true information from false. For the present study, I will develop two types of news posts: fake news and real news stories with the cues for deceptive information detection in mind. I will use source type, negative tone, grammar and punctuation (e.g., adding a few grammatical mistakes), word choice, and fake factual content as cues to indicate fakeness of deceptive news stories. The first type of news post (the real news post) will be extracted from verified news sources and formatted (see below for formatting, Chapter 5). The second news post type (the fake news post) will be pulled from verified news sources and manipulated by changing the facts and increasing the presence of deception cues (see Chapter 5).

Credibility, Story Structural Features, and Source

We know from previous literature, such as the studies of the Elaboration Likelihood Model—a well-established dual-processing model (Petty & Cacioppo, 1986)—that the path to decision-making (e.g., assessing the credibility of a news post) depends on the route used to process information, that is, the central versus peripheral route (Petty & Cacioppo, 1986). The central route requires more thought and more cognitive resource allocation to information processing than the peripheral route. Using the peripheral route to information processing, individuals rely on vivid cues to make information judgments. For example, an online news reader can rely on information signaled by the presence of a reliable source and provided by cues in a headline (peripheral route processing), as well as engage in a more in-depth processing by thoroughly reading the body or blurb of an online news post (central route processing) to make the decision about whether the news post is true or false. In general, three main elements of a

news post may signal the level of its truthfulness: a source, a headline, and the main body of the news post. Each element may contribute to detecting deception at different levels.

The Source

Fake news typically mimics real news in its structural features. Therefore, structural features that cue the reader, such as a source or a headline, are important. Structural features are defined as the compilation of design elements within an online post (Hong & Kim, 2004; W. Zhang et al., 2013). Elements such as a headline or a logo (indicating the presence of a source) and a blurb are considered to be structural features (Knox, 2009). Structural features can provide the reader with cues about a post's fakeness or truthfulness, while examining information in depth may pertain to a post's quality (W. Zhang et al., 2013) and perceived credibility (Hong & Kim, 2004). Credibility is generally defined as truthfulness and "believability of information" (Sikdaret al., 2013).

The source of a message plays the key role in forming credibility judgments (Knox, 2009). Source is defined as an entity, individual, or organization that is perceived to be an original producer and/or distributor of the message (Sikdar et al., 2013). Seeing the source can cue an individual to perceive a news post as credible. Similarly, messages lacking reliable or well-established sources can suffer deceased perceived credibility (Echterhoff, Higgins, & Groll, 2005; Hong, 2006). In the context of fake news, the source of a deceptive message differs from that of real news. For one, fake news is typically produced by a bot, an organization affiliated with a particular cause (e.g., a partisan organization), or an individual trying to influence a particular cause. Contrastingly, real news is typically associated with a news organization (e.g., *The New York Times*) comprising qualified journalism professionals trained in fact-checking and objective news reporting (Graves, 2013).

Hong (2006) examined the effects of website structural features on perceived credibility. Hong's (2006) study explored domain names and the presence of advertisements on a webpage. The results of Hong's (2006) study indicated that that some features played a larger role in perceived credibility of a website than others. For example, domain names that ended with .org, .gov, or .edu had more credibility when compared with other domain names (e.g., .com). Consistent with this, Chung et al. (2012) explored the effects of online news sources—mainstream media (e.g., *The New York Times*) versus independent media (e.g., *Free Press*)—on perceived credibility. They also examined other features, such as the presence of hyperlinks within the text of a post. Results suggested that mainstream news sources were perceived to be more believable than independent news sources. In addition, the presence of hyperlinks in text had a positive effect on perceived credibility. To clarify, participants were not actually able to click on these hyperlinks; the link formatting was primarily there so that participants would perceive the content as hyperlinked. Wogalter and Mayhorn (2008) revealed similar results on the importance of source for credibility judgments. In short, empirical evidence demonstrates that source and in-text references (e.g., hyperlinks) within a story increase perceptions of credibility.

The Headline

Additional structural features of news posts, such as headlines, can help individuals assess information as believable and trustworthy (Hurst, 2016). Headlines typically provide a first look into the contents of a news post, with the aim to generate a click to read the rest of the post (Visentin et al., 2019). Headlines can be the first cue for individuals to judge a message as believable (Afroz et al., 2012; Hurst, 2016; Sundar et al., 2007). For example, Hurst (2016) examined the use of *clickbait* headlines—that is, sensational or attention-getting headlines—and

found that the headline can impact the perceived credibility of information. Participants were asked to read two types of headlines, clickbait headlines and science news headlines, and rate the perceived credibility of each story. Results indicated that clickbait language decreased the perceived story credibility as compared to the news science headlines. This means that the use of headlines is the cue that plays a key role in identifying the credibility of information and detecting deceit.

The News Post

It is frequently required that individuals engage in a more elaborative, thorough processing, to determine whether information is true or false (Hong, 2006). While sources and headlines may provide immediate cues for readers, the body of a news post engages readers in central route, or systematic, processing (Horne & Adali, 2017) before a credibility judgment is made. Johnson and Weidenback (2009) sought to understand the features of news texts that could be used to increase perceived credibility among news readers. The researchers manipulated the amount of information provided in the source and the presence of hyperlinks in news stories. They found that when there was more detailed information about a source and when hyperlinks were present within the body of text, it increased the perceived credibility of the new post. Other studies (Metzger & Flanagin, 2007) have supported these findings. Metzger and Flanagin (2007) examined the depth of content within the body of a news post and its effect on credibility. Metzger and Flanagin's (2007) study results suggest that the depth of content (i.e., how much information the author provides and the extent to which the author delves into the topic) is an important factor positively predicting perceived credibility. In summary, the presence of a source, the type of headline, and hyperlinks and details in the story can help individuals process online information and assess the level of its believability.

As mentioned above, fake news imitates real news posts; thus, it may present all real news post elements, including source, headline, and body elements. One goal of the present dissertation is to determine at what point individuals detect fakeness of a news story. Thus, the present study will manipulate three story elements: source, headline, and story body, with the expectation that individuals may detect deceit at any phase of processing, from looking at a headline and source to reading the news post.

Processing deceit or fake news online is difficult in general, as evidenced by the above literature review. In today's world, information is rarely received in incubator environments (or environments perfect for comprehending and processing information). In fact, media multitasking environments have become a more popular approach for many. With that said, media multitasking has decreased cognitive effects, such as decreased comprehension and counterarguing, that could make detecting fake news more difficult. It is also important to mention that most fake news is distributed and consumed on social media. Social media consumption typically takes place in media multitasking situations, where users are less likely to fully comprehend and counterargue and more likely to accept incoming information. In the following chapter, media multitasking and the potential implications for detecting fake news will be discussed.

Chapter 3: What Is Media Multitasking and How Does It Influence Cognitive and Affective Processing?

Media Defined

To understand if multitasking with media, especially in its newest digital forms, affects cognitive and emotional processing differently than multitasking that does not involve media, it is important to understand if media adds anything new to the process of communication. The definitional landscape of media is quite complicated to unpack. First, there are traditional types of media that include mass communication tools, such as print publications (e.g., magazines and newspapers), and electronic, broadcasting media—radio and television (Couldry, 2012). There are newer forms of media that are defined by the emergence of the internet and mobile technologies. Social media is one type of media that refers to mass communication and mediated interpersonal communication through digital forums, such as Facebook, LinkedIn, and Twitter (Boyd & Ellison, 2007). Nearly all of us are most familiar with the term "new media," which broadly refers to mass communication using, internet- and mobile-enabled technologies (developed within the last 30 years), for example, cell phones and computers (Rafaeli, 1988; Reeves & Nass, 1996). The distinctions between older (traditional) and newer forms of media are important because the purpose of media use and the gratifications one obtains from such use can be affected by the medium being used (Ruggiero, 2000). For example, traditional word-of-mouth advertising has been found to have a stronger influence than a poster (Z. Zhang et al., 2010). Despite such differences, traditional media and new media, a big part of which constitute social media, are all considered to be part of mediated communication because information is transmitted between senders and recipients through a medium, whether it be by television, newspaper, website, Facebook, text message, smartphone, or other vehicle or device. Thus,

mediated communication is defined by the "middle point" in the process of information transmission, whereas interpersonal communication would imply direct, face-to-face interaction between two or more individuals or within a group of people (Walther, 2007; You & Sundar, 2013).

In this paper, the term *media* refers to a media vehicle or device (e.g., smartphone, online video) through which communication occurs. The term *mediated communication* refers to the process of information (message) transmission via these media vehicles and devices. For example, a smartphone could be considered a new medium because it involves digital technology and texting via smartphone could be considered mediated communication because the device (along with the digital technology that allows message transmission) stands in the middle between two individuals who are not in direct interpersonal contact with each other.

A distinct feature of mass communication is its capacity to distribute a message to a group of people (e.g., a mass audience), as well as send it to a specific individual (personalized communication). While watching online videos (e.g., political advertisements) may be available to a large audience and a text message may concern only one individual, I would consider such communication to be mass communication or personalized mediated communication that is facilitated with the means of information and communication technologies (ICTs). At the same time, reading a news post via a sheet of paper (versus via social media) would not be considered mediated communication because (a) it not mediated through ITCs, (b) it is not intended for a group of people as the audience, and (c) it is not intended to be a personalized message targeting at least one individual. The following section will discuss some of the key differences between mediated and non-mediated communication, as well as important distinctions between traditional and new media.

Mediated Versus Non-Mediated Communication

Several researchers (Walther, 1992; Walther, 2011; Walther et al., 2010) have suggested that there are a number of key differences between mediated and non-mediated communication. The first difference is the use of different strategies to communicate through digital devices. Walther (1992) suggests that when communication is mediated through a device, a decrease in the use of social cues is observed (Walther et al., 2010). Through the use of modified or shortened words (e.g., the use of "irl" to mean "in real life"), emojis (e.g., ☺), and timing, communication changes in order to adapt our understanding of these variations in behavioral responses (Walther, 2007). For example, Kruger et al. (2005) manipulated the number of behavioral responses in interpersonal interviews when compared with computer-mediated interviews. They found that differences in the reception of racial content and high expectations via email were experienced to a much stronger degree when compared with voice communication. Consistent with this, Walther et al. (2010) found similar results manipulating intelligence expectations, when duplicating the Kruger et al. (2005) study. In the case of media multitasking (MMT), this means that filtered out communication received through digital devices is even more so filtered when one multitasks because multitasking pulls attention from one task to another, causing an increase in missed information (Jeong & Hwang, 2012).

Furthermore, increased access to mediated information via innovative ICTs is a unique characteristic when compared to non-mediated communication. From 2016 to 2018, Pew Research Center observed that adult mobile device ownership in the United States plateaued at 95% (Hilton, 2018), with an overwhelming number of adults in the United States having access to at least one mobile device. Young adults are becoming increasingly dependent on their smartphones for more than just calling or texting (Anderson, 2016). Reportedly, young adults are

using their phones for directions (95%), listening to music (87%), web purchases (73%), and streaming movies (52%) (M. Anderson, 2016). Finally, 28% of young adults aged 18–29 consider themselves smartphone dependent (M. Anderson, 2016). Uncapher et al. (2016) argue that the widespread presence of media through handheld devices has led multitasking to become commonplace among media users. Jeong and Fishbein (2007) found that media ownership (access to media devices in an individual's environment) was positively correlated with MMT. This suggests that having access to media may increase the likelihood that individuals will turn to MMT.

Moreover, attention is an important factor that can vary based on the type of communication (mediated versus non-mediated). Attention is a vital component in all forms of communication, including mediated communication (Lang, Bradley, et al., 2006). Attention is defined as allocating cognitive resources to a specific task (Navon & Gopher 1980). It is theorized that the demands for attention in mediated communication circumstances could be greater than the attentional demands in a traditional communication situation (Anderson et al., 1998).

Mediated messages, such as television programs and commercials, videos on social media, and others, often involve artificial, creative, multimodal, and overstimulating methods of execution, which may make them more complex and less natural than a non-mediated environment. Such artificiality may require additional cognitive resources. Some scholars argue that this type of mediated story complexity requires more mental resources when compared with other forms of communication (Greenfield et al., 1994; Thorson et al., 1987). For example, Lang, Zhou, et al. (2000) found that the number of edits (or changes in information) influences how much attention one pays to television. Lang et al. (2000) asked participants to watch videos

while connected to psychophysiological instruments to collect heart rate data, varying the number of edits by condition. Results indicated that those in the high-edits condition paid more attention to the videos when compared with the low-edits condition. While it is important to know that attention can vary by task, we can draw conclusions from this study about MMT. That is, if one is watching television and doing homework or having a conversation with a friend at the same time, the mediated task may require more attention due to television's complex organization.

New Media Versus Traditional Media

It is important to note the contrast between new media and traditional media. As defined above, new media are reliant on the mediation of information through internet-enabled devices, such as smartphones; desktop, laptop, and tablet computers; game consoles; etc. (Reeves & Nass, 1996), whereas traditional media typically refer to mass audience media where information is transmitted through print, television, or radio to a large group of people (Couldry, 2012). The following paragraph discusses specific differences between new and traditional media and the importance of the new media to the MMT discourse.

People use different media for different reasons and to satisfy different needs (Dimmick et al., 2004; Papacharissi & Rubin, 2000; Ruggiero, 2000), which is the root of the distinction between new and traditional media. Dimmick et al. (2004) found that access convenience, choice variety, schedule flexibility, updates, and immediacy were the strongest predictors of using the internet to access news. Additionally, Papacharissi and Rubin (2000), employing traditional uses and gratifications measures, found that individuals used the internet mostly for entertainment and sometimes because of easy access to content, free information, and social connection. From a MMT research perspective, access and convenience seem to be a consistent component in the

use of new media. Understanding the distinctions between mediated and non-mediated information and the differences in new media and traditional media are vital pieces that underline the importance of understanding MMT's effects. With that said, there are limited multitasking studies that include mediated and non-mediated secondary tasks. This is one area that still needs to me explored.

Media Multitasking Has Effects on Counterarguing

Today, it is rare that individuals living in technology-advanced societies process mediated messages without the presence of a technology-based distraction, which may affect message cognitive and emotional processing, including the processing of fake news messages. This section of the literature review explores psychological reactions to mediated messages in a MMT context.

Much of the MMT literature affirms that MMT disrupts cognitive processes such as learning, memory, and counterarguing (Armstrong & Chung, 2000; Armstrong et al., 1991; Brasel & Gips, 2011; Fulton, Schweitzer et al., 2011; Judd, 2014; Kononova, Joo, & Yuan, 2016; Kononova, McAlister, & Oh, 2018). The leading explanation of this effect in the media and psychology literature is related to the idea of limited cognitive capacity (Kahneman, 1973; Lang 2000, 2006; Lang & Chrzan, 2015). The Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) developed in the field of media psychology suggests that humans have limited cognitive resources to allocate for information processing (Lang, 2006). If one task or multiple tasks require(s) more than the allotted resources, then one will experience cognitive overload and, most likely, information will not be processed efficiently, i.e., attended to, encoded, and retained (Lang, Bradley, et al., 2006). MMT creates situations where individuals must use limited cognitive resources to complete more than one task (Armstrong & Chung,

2000; Jeong & Hwang, 2012; Wang & Tchernev, 2012). This can produce a detrimental impact during message processing, such as decreased classroom performance while using laptops (Fulton et al., 2011; Hembrooke & Gay, 2003), decreased memory for contextual content while watching television (Armstrong & Chung, 2000), and decreased work performance when listening to music (Furnham & Bradley, 1997).

With the increased presence of multiple devices in individuals' lives, it has become a challenge to avoid multitasking situations (Fulton et al., 2011). While having a negative effect on memory, for example, MMT has also been found to positively predict persuasion outcomes (Jeong & Hwang, 2012; Jeong et al., 2010; Kupor & Tormala, 2015). That is, MMT may hinder counterarguing and increase positive attitudes toward the message. In the following subsection, I will discuss empirical research identifying the impact of MMT on counterarguing and viral behavioral intentions in the context of mediated persuasive messages.

Media Multitasking Is an Effective Distraction

We know from previous literature, such as literature on the Elaboration Likelihood Model and similar well-established, dual-processing models (e.g., the Heuristic-Systematic Model [HSM]; Chaiken & Trope, 1999), that the path to behavior change depends on the route required to process information, i.e., central or systematic routes versus peripheral or heuristic routes (Chaiken & Trope, 1999; Petty & Cacioppo, 1986). As mentioned previously, central (or systematic) route processing requires an individual to put more thought and more resource allocation into the processed information. Whereas, when engaged in the peripheral (or heuristic) route processing, individuals rely on vivid, bold cues to make quick judgments and decisions about a message. Which type of processing is at play depends on ability and motivation to process information (Chaiken & Trope, 1999; Petty & Cacioppo, 1986).

Often, distraction adds a disadvantageous effect when individuals process information. For example, individuals may experience cognitive overload when exposed to multiple information sources at the same time, especially if these sources require them to allocate the same amount and types of recourses (e.g., Multiple Resource Theory; Wickens, 2008). Being distracted by another information source may cause an individual to process information through the peripheral route. This may become problematic in many situations, such as reading fake news or detecting deceit online and other situations in which efficient performance and cognition are essential (Armstrong & Chung, 2000; Furnham, Gunter, & Peterson, 1994; Ravizza et al., 2014). On the other hand, distraction or interruption created by MMT that facilitates peripheral-route (heuristic) processing may lead to more negative comprehension and counterarguing effects (Gilbert et al., 1993; Kupor & Tormala, 2015). Gilbert et al. (1993) have suggested that distractions related to MMT have a unique effect on counterarguing, such that counterarguing decreases in MMT situations, and viral behavioral intentions increase; as well, comprehension decreases in these environments. Furthermore, the intention to act in a way suggested by a persuasive mediated message increases when individuals multitask with media (Kononova, Joo, & Yuan, 2016). Thus, MMT presents a rare opportunity for fake news distributors through decreasing the reader's ability to counterargue and increasing the favorable effects of the messages (Jeong & Hwang, 2012; Petty et al., 1976; Ravizza et al., 2014; Roblyeret al., 2010).

Petty et al. (1976) examined distraction, comprehension, and counterarguing by manipulating: (a) message quality—how easy or hard it was to generate counterarguments—and (b) how much distraction participants were subjected to—no distraction, low, medium, or high. They found that as distraction increased, message comprehension and counterarguing decreased. Furthermore, Jeong and Hwang (2012) examined the effects of a single persuasive message in

mono- and multitasking contexts, using three different conditions: (a) persuasive message as the primary medium without any secondary media present, (b) persuasive message as the primary medium and video as a secondary medium, and (c) video as the primary medium and persuasive message as the secondary medium. The findings of Jeong and Hwang's (2012) study suggest that MMT, once again, affects counterarguing, wherein the highest level of counterarguing was indicated in the non-multitasking condition when compared with both MMT conditions.

To continue this line of scholarly exploration, Kupor and Tormala (2015) examined whether participants would be more likely to pay for a product if they were distracted. They used blind confederates to present persuasive content to individuals on the street. The process of product presentation was either interrupted or not interrupted. It was found that when the presentations were interrupted, individuals were more likely to pay for the products when compared with the presentations that were not interrupted. Kupor and Tormala (2015) also found increased behavioral intentions, as well as increased thought-favorability, in the interrupted-presentation conditions compared with the no-interruption condition. Further support of MMT's effect on persuasion outcomes stems from Jeong and Hwang's (2016) meta-analysis that indicates a consistent negative relationship between MMT and counterarguing and a positive relationship between MMT and attitude. In addition to the general study of MMT effects, processing deceitful or fake news information in MMT environments is important to understand. The following section will provide an overview of the key studies that have examined the effects of deception in MMT.

Deceit Online and Media Multitasking

One of the primary goals of the present study is to understand the nuances of cognitive and emotional fake news processing in MMT environments. There are few empirical studies

examining the effects of deceptive information online in the context of MMT, which constitutes the primary gap in the literature the present work aims to fill. To understand how fake news affects its readers, I turned to deception and cognitive load literature to inform the theoretical understanding of the subject in this dissertation work.

As it has been previously stated, MMT can increase cognitive load. When cognitive load is elevated, deceit becomes increasingly more difficult to determine. For instance, one study (Veer et al., 2014) found that increased cognitive load impacted our ability to lie. Furthermore, Vrij, Fisher, Mann, Leal, Milne, Savage, and Williamson (2009) found that asking participants to recall an event in a reversed order (increased cognitive load) versus recalling it in the chronological order, made it harder for participants to lie about the event. Along the same lines, Vrij, Leal, Mann, and Fisher (2010) found that the reversed-order manipulation (i.e., telling the story backwards) helps in identifying cues of lying, as well. This means that people who are asked to tell a story backward reveal more cues regarding deceptiveness (e.g., not making eye contact), and because of these added cues during the story, other individuals are able to detect deception with more ease. The implication here, while only indirectly related to the present study, is that cognitive load may have a mediating effect on one's ability to lie and, thus, may also have an impact on one's ability to process a lie. When we apply this to the context of this dissertation, it is likely that the increased cognitive load produced by the MMT environment will decrease participants' ability to detect deceit, especially in the context of fake news where the deceit cues are not easily available. The present study, will measure the level of perceived cognitive load to understand the mediating mechanism associated with cognitive load through which the fake news processing while multitasking happens.

A more recent study on fake news processing (Kirkwood & Minas, 2020) used the psychophysiological measures of heart rate variability and skin conductance—which are both indicators of elicited arousal (e.g., attention or excitement)—to understand fake news versus real news processing and believability. Kirkwood and Minas (2020) asked participants to view 50 news post as a primary task, while measuring physiological responses to the stimuli. Half of the posts were true, and the other half were false. After reading each news post, participants were asked about credibility. Results indicated that for true news posts, the aversive (motivation signals to an individual that it is okay to relax and explore the environment, meaning that no immediate threat is present) and appetitive (signals to a person that there is a direct or indirect threat: something negative in their environment, be it a physical threat) systems were both activate, whereas for the fake news posts, just the appetitive system was activated. This indicated that for true news posts, the parasympathetic and sympathetic nervous systems were active, eliciting mixed emotions from respondents. For fake news posts, just the parasympathetic nervous system was active, indicating an approach or explore response from participants. The important implication of the Kirkwood and Minas (2020) study is that, on average, when people read fake news posts, their parasympathetic nervous system is active, which may indicate that they are open to exploring or approaching fake news posts more so than real news posts.

Chapter 4: A Theoretical Approach to Understanding Media Multitasking Effects on Detection and Processing of Fake News

An important task of this dissertation project is to continue contributing to the body of multitasking and online deception detection literature to understand the impact of performing two or more tasks at once. In particular, the focus of this study is to understand what happens when one of the tasks involves the processing of fake online information in the form of news and, thus, the challenge for the individuals is to detect deceitful information while distracted by other tasks or stimuli in the environment. In an effort to achieve this study's primary objective in exploring distraction effects on mediated information processing, it is important to understand the limited cognitive capacity theoretical assumption, as it can explain how individuals process information when their cognitive load is increased due to multitasking. Many theories and theoretical models are based on the assumption of limited cognitive capacity that is thought to be the main reason why humans cannot effectively perform simultaneous tasks (Pashler, 1994; Paas & Merrienboer, 2008; Sweller, 1988).

Along with the notion of limited cognitive capacity comes the concept of cognitive load, which is thought to increase in media multitasking situations (Brasel & Gips, 2011; Lang & Chrzan, 2015; Lee et al., 2012). Furthermore, an additional assumption for studying media multitasking effects is rooted in the dual nature of information processing. Information can be processed superficially through a peripheral, heuristic-based route or thoroughly through a central, systematic route (Bohner et al., 2008; Chaiken, 1980). In summary, to provide a theoretical understanding of media multitasking effects on detecting and comprehending fake news, it is important to explicate the concept of cognitive load; elaborate on the assumption of limited information processing capacity, including cognitive and emotional aspects of

processing; and address the dual nature of information processing. This chapter aims to discuss these three theoretical concepts and assumptions by applying Cognitive Load Theory (CLT; Sweller, 1988), Threaded Cognition Theory (TCT; Taatgen et al., 2009), Limited Capacity Model of Motivated Mediated Message Processing (LC4MP; Lang, 2000, 2006), and the Heuristic-Systematic Model (HSM; Chaiken, 1980; 1987).

Cognitive Load Theory

As it has been stated in prior studies of media multitasking (Lang & Chrzan, 2015; Lee et al., 2012; Van Cauwenberge et al., 2014), when people engage in media use behavior, it may increase their cognitive load. It is often difficult to successfully complete multiple tasks simultaneously because the cognitive capacity of the human brain is limited. To understand the effects of media multitasking, we must first understand the complex psychological concept of cognitive load by applying CLT and discuss the notion of limited capacity in this and the following subsections.

CLT, developed by Sweller (1988) more than three decades ago, posits that the design structure of the human brain is intrinsically limited (Chandler & Sweller, 1991). CLT argues that memory consists of two distinct components: working memory (WM), with short-term memory (STM) as a subcomponent,[1] and long-term memory (LTM; Kirschner, 2002). WM in the most basic sense is the human ability to take in and store information for a nominal period of time (Miyake & Shah, 1999). According to Atkinson and Shiffrin (1968), the basic functions of WM include encoding, maintenance, and retrieval of information (p. 8). Information that is encoded is thought to be stored in the STM (Miyake & Shah, 1999). Information stored in STM quickly

[1] Different cognitive models refer to short-term and working memory as either distinctly separate or overlapping concepts (e.g., Miyake & Shah, 1999). This dissertation does not primarily focus on such distinction; thus, the discussion of similarities and differences in theoretical perspectives on short-term and working memory will be left out of this work.

dissipates without rehearsal (Miyake & Shah, 1999). Information that is deemed useful is transferred from STM to LTM. (Sweller, 1994). LTM is the existing knowledge previously stored in mind and used to make sense of the world (Miyake & Shah, 1999; Pass, Renkl, & Sweller, 2004; Sweller, 2011). In LTM, information is grouped into networks (groups of nodes connected in the mind based on their similarity and relatedness). Some researchers believe that LTM relies on schemas to encode information (Arbib, 1992). WM and LTM are connected (Miyake & Shah, 1999; Sweller, 2011). It is the function of WM to pull information from LTM networks to understand newly encoded information and place it within the existing knowledge (Pass, et al., 2004; Sweller, 1988; Sweller, 2011). It is thought that LTM has an infinite amount of storage space. On the contrary, WM has limited resources to make sense of the incoming information, generate decisions based on it, and selectively transition it to LTM (Pass, et al., 2004; Sweller 1988; Sweller, 2011). Cognitive load occurs when there are large amounts of information to process and WM does not have the resources to function efficiently (Pass, et al., 2004; Sweller 1988; Sweller, 2011). In situations when cognitive load is high, individuals do not properly store information in LTM and make errors in forming judgments based on novel information (Kirschner, 2002).

An important implication of CLT is that when too much information is introduced into an individual's environment, some of that information will not be processed or stored in LTM (Sweller, 1994). Many media and communication scholars have connected CLT to media multitasking (Lang & Chrzan, 2015; Lee at al., 2012; Brasel & Gips, 2011), as this theory provides a reasonable explanation for why cognitive performance decreases in media multitasking situations. For example, Lin, Lee, and Robertson (2011) examined levels of cognitive load in media multitasking environments with individuals reading and watching

television at the same time. Participants were assigned to reading tasks that varied in difficulty. While completing the reading tasks, a television was playing in the background (either a news report or a sitcom episode). Following the tasks, participants were asked to complete a set of comprehension and knowledge questions about the reading task and the videos. Lin, et al. (2011) predicted that telling the participant they would be tested on both the video and the reading task, versus being told that they were allowed to ignore the video, would increase the cognitive load and result in decreased cognitive performance.

Findings of Lin, et al. (2011) study indicated that when participants were told they could ignore the background video, their comprehension and knowledge scores increased by 12% and 7%, respectively. On the contrary, when participants were told that they would be tested on information from both the news posts and the video, comprehension and knowledge scores decreased. The conclusion of the study is that as cognitive load increases—evidenced by manipulating the amount of information participants must pay attention to (e.g., media multitasking)—cognitive measures of comprehension and knowledge decrease.

Furthermore, Van Cauwenberge et al. (2014) examined learning disadvantages when individuals viewed information on multiple screens, arguing that cognitive load increases in second-screen viewing environments. The authors assigned participants to one of the following conditions: (a) irrelevant media multitasking, (b) relevant media multitasking, and (c) control condition with media multitasking. Participants were asked to watch newscast videos while answering questions. In the irrelevant multitasking condition, participants were required to look up information to answer questions on an additional screen because the questions were not related to the video. In the relevant condition, participants were able to watch the video and answer questions relevant to the video content. Recall and comprehension were used as

dependent measures, along with cognitive load, measured as perceived task difficulty. Results indicated that the comprehension and recall scores were significantly lower in the irrelevant multitasking condition when compared to the relevant multitasking condition, and perceived cognitive load mediated this effect. As perceived cognitive load increased, the comprehension and recall scores decreased across all conditions.

While CLT provides an important contribution for understanding the cognitive limitations of the human brain, specifically within the WM structure, this theory is not specific to media multitasking situations. A more complete theory that explains why individuals can multitask in some situations and cannot do it in others is TCT, discussed in the following subsection of this chapter.

Threaded Cognition Theory

TCT, developed by Taatgen et al. (2009), proposes that tasks or thoughts can be symbolized as threads in the brain that use resources from different pools (e.g., cooking and speaking are two distinct resource pools, or threads). Individuals can use more than one thread at a time, tapping into those different resource pools. For example, walking requires motor resources and listening to music depends on aural resources, which makes true multitasking possible. While threads correspond to distinct flows of information (or thoughts) and can use resources from different pools, task management associated with micro-level decision-making (e.g., choice of action, task prioritization, etc.) is processed using the same procedural resources (Dux & Marios, 2009).

One unique idea that TCT proposes is that concurrent multitasking is possible when the management of multiple tasks does not require the use of procedural resources at the same time and the tasks tap into different resource pools. For example, non-media multitasking, such as

walking and talking, can be easily managed by the human brain because walking is a highly automatic, well-practiced activity that does not typically require procedural resources (unless there is an unexpected obstacle in the way, which needs to be overcome with the use of the procedural resource); thus, such resources can be used for the task of generating responses during a conversation. Additionally, walking depends on motor and, partially, visual resource pools while talking may need predominantly aural and vocal resources (Salvucci & Taatgen, 2008; Wickens, 2008).

Because there is little overlap in the types of resource pools used for walking and talking and procedural resource is in use mostly for just one of the tasks, concurrent multitasking is possible. However, in cases when individuals need to process information using the same processing mechanisms, which often happens when media devices and content are used simultaneously (e.g., processing visual and audio information from a smartphone screen and a television screen), individuals become less efficient in processing (Kirschner & Bruyckere, 2017). An example of this type of multitasking would be reading a book and watching television at the same time. Both media activities require visual processing and, thus, media users may take extra time to complete both activities and perform at least one of the tasks poorly. The underlying process of performing multiple tasks that require the same type of resources is known as *bottlenecking*.

Bottlenecking happens when threads compete for the same resources (Rohrer et al., 1998; Salvucci & Taatgen, 2008). When a bottleneck occurs, truly concurrent multitasking is not possible. One task must "wait its turn" until a portion of another task is complete. Thus, multitasking in this case becomes task switching, even if the time to switch between tasks takes only milliseconds (Rohrer et al., 1998). Procedural resource, in addition to other resources

required by concurrent tasks, is crucial to perform mental switching, as it is used to make decisions about when to switch and what task to prioritize over others. This is the reason multitasking, especially multitasking with media content and devices that may frequently overlap in resource demands, can pose additional cognitive costs on the multitasker. This is consistent with previous media multitasking literature that has shown negative effects of this media use behavior on cognitive performance and decision-making (Armstrong & Chung, 2000; Armstrong et al., 1991; Brasel & Gips, 2011; Fulton et al., 2011; Judd, 2014; Kononova, Joo, & Yuan, 2016; Kononova, McAlister, & Oh, 2018).

TCT is frequently applied in examining the effects of media multitasking behaviors (Salvucci & Taatgen, 2008; Wang et al., 2012; Wickens, 2008). Wang et al. (2012) used instant messaging (IM) and voice to manipulate single and dual tasks, where task was a within-subjects factor and IM and Google Chat (and video calling platform developed by Google) use was a between-subjects factor. In other words, every participant was asked to perform a single visual matching task, and once the participant completed the single task, they were instructed to immediately complete a dual task, where participants were asked to work on the visual matching task and give directions to a confederate via IM or Google Chat. Results indicated that performance on the visual matching task decreased in the IM condition when compared to the Google Chat condition.

This is consistent with the propositions of TCT. The IM chat dual-task condition relied primarily on participants' visual resource availability to complete both the visual matching task and giving directions over IM. In the Google Chat condition, the matching task relied on visual resources and Google Chat use relied primarily on verbal resources (i.e., two different threads). Thus, bottlenecking took place in the IM chat condition, causing subjects to task-switch between

the IM and the matching task. Consequently, they performed poorly on the matching task. This was not the case in the Google Chat dual-task condition due to the tasks requiring resources from different pools.

Consistent with the study by Wang et al. (2012), David et al. (2013) explored the effects of having multiple mediated conversations at one time. Among three conditions, participants were assigned to either a single IM conversation (instant messaging with a confederate only); two IM conversations (instant messaging with two distinct confederates) that required the same type of visual and motor resources; or one IM conversation (with one confederate) and one voice conversation (with another confederate), with the two tasks tapping into different pools of resources: visual and motor for the IM conversation and aural and vocal for the voice conversation. Participants were asked to come into a laboratory where they were randomly assigned to one of the three conditions and instructed to respond to either survival or worst-case scenarios. This study examined the effects of mono- and multitasking on perceived task demand, perceived task satisfaction, and perceived task performance.

Results indicated that perceived task demand level was the highest in the IM and voice communication condition, followed by dual IM communication and the single IM communication condition. Perceived task satisfaction was equally high in the IM and voice communication and single IM communication conditions, followed by the dual IM communication condition. Finally, perceived task performance, which was measured as a self-evaluation of collaboration, helpfulness, and response timeliness, was the highest in the single IM communication condition and lowest in the dual IM communication condition. To summarize, perceived task demands were consistently high in the multitasking conditions, compared to the single-task condition. More interestingly, lower levels of perceived task

satisfaction and perceived task performance were associated with the IM multitasking condition, where participants had to send and respond to messages from both confederates in the same manner. These results are consistent with TCT because dual-task situations that required participants to use the same type of resources saw lower efficiency than single-task situations and dual-task situations that relied on two separate resource pools.

The application of TCT in previous media multitasking studies is important for the present dissertation project because it explains why individuals may multitask efficiently in some situations—for example, when they combine media and non-media activities—and fail to stay efficient in other situations—when they pair activities that overlap in their resource demands, for example. Situations in which tasks demand the same resources and exhaust the limited-capacity procedural processor to manage multiple activities at the same time are associated with increased cognitive load and decreased cognitive performance. The present study's design, similar to studies that applied TCT (Wang et al., 2012; David et al., 2013), employs one multitasking condition. The primary task in this study is reading true or deceptive news stories online while watching a television show. It is predicted that participants will exhibit lower detection levels and cognitive processing of deceptive news in the multitasking condition than in the single-task condition due to the increased cognitive load. It is also predicted that multitasking with television will be more cognitively taxing than multitasking with a fish tank. While similar pools of resources will be required to watch the television show and observe the fish tank (visual and aural resources), It is suggested that due to television's more engaging and distracting nature (e.g., louder sound, narrative techniques that engage the viewer in following the episode storyline), participants will switch from reading the online news post to watching the television show more often than between reading the post and watching the fish tank. More frequent

switching will pose additional cognitive demands on the procedural resource that is thought to have limited capacity and, as a result, participants will be less likely to detect fake news and thoroughly cognitively process it in the reading-and-television condition.

Scholars have applied both CLT and TCT in multiple contexts, such as complex information processing (Sweller, 2005), instructional environments (Sweller, 1994), social media (Brasel & Gips, 2011), computer-mediated communication, and problem-solving (David et al., 2013; Wang et al., 2012). However, both theories are limited in their explanations of media multitasking effects because they predominantly focus on the cognitive aspect of information processing, rarely taking emotions into consideration. We must remember that mediated content, as well as media multitasking situations themselves, can affect not only cognition but also emotional processing of mediated information and the emotional experience with media use situations. To account for the emotional aspect of deceitful news processing, I apply LC4MP (Lang, 2000, 2006), which I describe in the following subsection.

Limited Capacity Model of Motivated Mediated Message Processing

LC4MP, introduced by Lang (2000, 2006) provides a unique explication of the effects of media multitasking on not only cognitive but also emotional processing. In addition to focusing on the limitations of the human brain due to limited cognitive capacity, Lang (2000, 2006) further explains that human emotion plays a significant role in processing mediated information (Lang 2006). Researchers frequently use LC4MP to understand cognitive load, attention paid to and memory for mediated messages (cognitive processing), and emotional message processing (Clayton et al., 2019; Fisher et al., 2018; Lang, 2000, 2006;). In terms of politics, political information is generally considered a tumultuous topic, especially in the United States (Walker et al., 2012). Thus, for this study, emotional processing should be taken into consideration as a key

component in detecting and processing fake news. This section will provide an overview of LC4MP and discuss important studies that examine these effects in the context of media multitasking.

LC4MP is based on five primary assumptions. The first assumption is that humans have a limited amount of cognitive recourses, or, in other words, their ability to process information, as it has been outlined above, is limited. The second assumption is that there are two motivational systems (appetitive and aversive) that are activated by the human brain when individuals interact with mediated and non-mediated environments. Appetitive motivation signals to an individual that it is okay to relax and explore the environment, meaning that no immediate threat is present. Some scholars refer to appetitive system activation as a state in which individuals can afford to be less aware of their surroundings (Li, 2008). Aversive motivation signals to a person that there is a direct or indirect threat: something negative in their environment, be it a physical threat (e.g., an aggressive dog running free) or mediated information about a threat (e.g., media coverage of the novel coronavirus). As a result of aversive motivational system activation, a person would generate a "fight or flight" response (Lang & Bradley, 2010).

The third assumption of LC4MP is that messages are mediated, i.e., they are presented through a variety of media in multiple formats (e.g., text, images, video, audio). Mediated information is taken in and interpreted through different human senses (e.g., vision, hearing, touch). The fourth assumption of the model is that individuals interact with media (i.e., perceive and process information in different modalities using their senses) over time. In other words, human responses are not stagnant, which distinguishes mediated message processing from media effects literature. For example, when we watch a television show, there are many emotions at play and these emotions may change within seconds or even milliseconds. A romantic comedy

may have us both laughing and crying within the first ten minutes. The final assumption of LC4MP is that communication is defined as an interaction—exchange between people and mediated messages (Lang, 2000, 2006).

Cognitive Message Processing

LC4MP is less concerned with the advanced details of memory (what happens in the brain when information is stored) and more concerned with the memory function. By using the associative memory network model (Carpenter, 1989) and the WM model (Baddeley, 2002), LC4MP examines limited capacity in the context of mediated message processing (Lang, 2000). In LC4MP terms, information processing is defined as an individual's ability to encode, store, and retrieve a particular media message (Lang, 2006). There are three memory subprocesses, which occur constantly and continuously (Lang, 2000). In the following sections, I define encoding, storage, and retrieval and I will explain each subprocess's function in relation to different memory networks.

Lang (2000) defines encoding as the extent to which individuals are able to perceive and make initial sense of a mediated message. During encoding, information is taken in through perceptual senses—eyes, nose, mouth, ears, and skin—and stored in the sensory memory (Lang, 2000). Sensory memory is limited by time, lasting approximately four to five seconds. For some senses, this time is even shorter. For example, visual sensory memory has approximately a 300-millisecond buffer to encode information (Lang, 2000). Recognition questions (e.g., forced-choice questions) are typically used to measure encoding.

Lang (2000) suggests that there are two ways in which people select information. These selection processes are both voluntary and involuntary. Controlled selection process (voluntary) is motivated by individual's goals. Individuals choose to notice or look for information.

Automatic selection process (involuntary) is stimulus driven and often unexpected. Usually, this process is caused by a change in the environment. For example, an individual may seek information on a website to purchase a new car, but motion orients the individual's attention to a web banner at the top of the automotive website.

LC4MP suggests that mental representations of information are created and eventually stored in WM (Lang, 2000). Lang (2000) defines storage as the "process of linking newly encoded information with previously encoded information" (p. 50)—that is, making associations between new information and previously stored, old information. The two primary memory networks that are important to discussing storage are WM and LTM. Consistent with Baddeley and Hitch's (1974) WM model, LC4MP states that storage takes place in WM (Lang, 2000). Baddeley (2002) defines WM as the temporary storage of units of information. In this case, units of information are mediated messages. Less is understood about LTM. Specifically, it is less clear how much information can be stored and for how long one can store it in LTM (Baddeley, 2002). An established conception of LTM refers to associative memory networks (Ericsson & Kintsch 1995; Lang, 2000). Associative memory can be understood as a network of connected units of information, or nodes, that are similar and related to each other. Lang (2000) argues the stronger associative links between encoded and stored information (or new and old information), the more likely it is one would store information in LTM. Storage is typically measured with the use of cued recall questions. Context is typically provided, but the information to be stored is left blank (e.g., a participant is asked to fill in the blank in a sentence where the sentence provides the context to activate relevant memories).

The third and final memory subprocess is retrieval. Retrieval is defined as "the process of reactivating stored mental representation of some aspect of the [mediated] message" (Lang,

2000, p. 50). In other words, mediated messages are pulled from one memory network (LTM) into another (WM) as a mental representation to understand the incoming information and connect it to previously stored information. For example, going back to purchasing a car, one might come across a particular car brand, Toyota. According to LC4MP, one would search memory networks to retrieve all the information that is known about Toyota. Another way to understand the three memory processes and how they work together is to think of them as a computer. The computer screen is sensory memory, which is also the subprocess known as encoding. The current open application—Word, Photoshop, Chrome—is WM, or the storage subprocess. Finally, previously saved files are LTM, which is also known as retrieval. When a person needs a saved file, they can search the computer and open it so that it is in front of them to use. Retrieval is usually measured with the use of open-ended questions where a participant is asked to recall anything they can about a certain object, idea, place, or person.

Motivational Systems and Emotional Processing

As it has been discussed earlier, there are two motivational systems that can be activated by mediated content and lead to certain responses to media messages. This subsection will explain how activation of appetitive and/or aversive motivational systems is linked to emotional message processing. The level of arousal and valence of a particular message may activate either or both motivational systems. Lang, Bailey, and Connolly (2015) define arousal as the level of calmness with which a message is perceived. Valence is defined as whether the message is perceived as negative or positive (Lang, Bailey, & Connolly, 2015).

Lang, Park, et al. (2007) suggest that the motivational systems influence a person to approach objects in their environment (appetitive motivational system) or avoid them—the fight or flight mechanism. The relationship between information processing and the human

motivational systems is important because the type of motivation determines the amount of resources allocated to information processing—more specifically, to encoding, storage, and retrieval. Thus, activation of one or both motivational system(s) influences memory for that particular stimulus (e.g., Bailey, 2015; Lang, Dhillon, & Dong, 1995). For example, Lang, Dhillon, and Dong (1995) found that more intense emotional experiences (e.g., negative/arousing) were thought to activate the aversive motivation system, and, thus, when compared to positive/calm messages, there was an increase in encoding, storage, and retrieval. Consistent with this, Lang, Park, et al. (2007) found that highly arousing and negative media messages are likely to activate the aversive motivational system, which will cause a decrease in processing resources that are allocated to encoding. They suggest that this will decrease memory for stimuli due to a limited amount of resources allocated to encoding. In contrast, a low-arousing, positive message may activate the appetitive motivational system, which allows for more resources to be allocated to encoding and storage. Lang, Park, et al. (2007) also found that low arousal in all circumstances (negative and positive) does not increase or decrease memory. This suggests that low arousal stimuli are not interesting enough and, thus, media users are not allocating attentional resources to encoding. In addition, positive information is less likely to be encoded. Information that is not encoded cannot be stored for later retrieval.

To clarify, emotional content can be manipulated to evoke emotional responses (Bolls et al., 2001; Eckler & Bolls, 2011; Wise et al., 2010). This study will not manipulate the emotional content, per se, but rather measure the emotional responses to real news and fake news posts in mono- and multitasking situations to reveal their relationships with cognition-related outcomes, such as cognitive load, recognition memory, and comprehension. For the present study, LC4MP is vital in explaining the role of emotion in message processing. If a message is detected as false,

it will elicit more negative emotions, which can affect encoding and storage of mediated information from the message. Past empirical evidence (Caspi & Gorsky, 2006; Ewens et al., 2016) indicated that when a person realizes they are being deceived, it is often met with a negative emotional response (e.g., anger, disgust). For example, Jehn and Jonsen (2010) found that consumers responded more negatively if they found out the deceit was encouraged by an organization. Consistent with this, Shapiro (1991) found that negative reactions to deceit occur because people feel as though there has been an injustice done to them personally. While Shapiro's (1991) experiment was conducted in a workplace setting, we can extrapolate that people respond negatively when they feel they are being deceived. it is thought that individuals will react negatively and with higher arousal to the fake news posts, compared to true news stories, especially if they realize that the posts are fake. In this case, it is proposed that the negative emotional response will indicate the aversive motivational system activation and lead to the fight or flight response and, thus, participants will be less likely to encode and comprehend information from fake news.

Heuristic-Systematic Model

Two dual-processing models, The Elaboration Likelihood Model (ELM) and the HSM can help explain message processing in media use and multitasking situations. The HSM is a more elaborated theoretical framework that addresses some of the limitations of the ELM (Chen & Chaiken, 1999). While individuals can process information elaborately, more thoroughly, and presumably with greater allocation of resources, there is room for people to process information on a superficial level that may require fewer cognitive resources (Chaiken, 1980; Todorov et al., 2002). According to the ELM framework, these two types of processes are referred to as the central route and peripheral route to information processing (Petty & Cacioppo, 1986). Central-

route processing requires more thought and more cognitive resource allocation than peripheral route. Whereas, when "taking" the peripheral route, individuals often rely on easy-to-process cues to make decisions, sometimes automatically.

Similarly, the HSM posits that individuals process information in two different ways (Griffin et al., 2002). According to the HSM, the two routes to information processing are (a) heuristic, which is similar to the peripheral route in the ELM that requires less processing resources and allows for quicker, more superficial, processing, and (b) systematic, which is similar to the central route in the ELM that requires more cognitive resources and in-depth processing (Luo et al., 2013; Trumbo, 1999). For both the HSM and ELM models, the most efficient path to behavior change depends on the route required to process information (Petty & Cacioppo, 1986). While the ELM states that individuals may engage in either peripheral- or central-route processing, the HLM states that they may engage in both at the same time (Chen & Chaiken, 1999). While central/systematic and peripheral/heuristic types of processing are often discussed interchangeably and the latter terms are derived from the former ones, hence, the terms – systematic or heuristic –consistent with the HSM framework will be used.

Judgments

In drawing upon the differences between the ELM and the HSM, there are several key features indicating that the HSM is a more flexible theoretical framework. As discussed above, when an individual processes something systemically, they will likely take more time and more cognitive resources to form a judgement (Chen & Chaiken, 1999). In comparison, heuristic processing relies on the existing cognitive beliefs that an individual can effortlessly extract and apply to make a quick judgement. For example, one study (Lancendorfer et al., 2008) examined animal images as a cue that would lead to heuristic processing in advertisements associated with

ad and brand attitude and purchase intention improvement. They found that when a dog was present in the ad messages, people engaged in heuristic processing and made more favorable judgments about the advertisement.

Srivastava (2010) strove to understand how media multitasking impacts a person's cognitive performance. The researcher used two different messages while asking participants to multitask. The first message was designed to require more resources to process and make judgments, requiring systematic processing. The second message was designed to rely on cues to process and make judgments, requiring heuristic processing. Srivastava (2010) aimed to determine what types of message design appealing to either systematic or heuristic ways of processing would allow for easier multitasking and result in increased multitasking performance. Overall, the results indicated that aid recall was better when people had to process information systemically. However, systematic processing took more time.

Further, Luo et al. (2013) applied the HSM in the context of online phishing, such as email spam and clickbaits designed to either spread a computer virus or collect personal information for fraudulent purposes (Masip, et al., 2009). The authors suggested that the HSM provides an explanation for how individuals defend against falling victim to phishing attacks. To better understand the role of the HSM in deceit effects, the authors developed a study by manipulating source credibility, argument quality, and message genre. They examined real phishing messages where there were approximately 38 victims of 105 message recipients. After a thorough analysis of phishing messages, they found that a credible source (such as a university), message quality, and genre played a role in the phishing success.

One important cue found to be used in phishing, online deceit, and fake news is source credibility. For example, Masip, et al. (2009) conducted an experiment pertaining to deceptive

information. With 52 participants, researchers examined how individuals make credibility judgments over time. Participants were asked to make credibility judgments on several three-minute videotapes. Half of the senders in the video lied, and the other half told the truth. Results indicated that heuristic processing took place immediately and a truth bias (mentioned in Chapter 2) decreased as time increased, likely allowing more systematic processing over time. Individuals were able to detect deceit more effectively over time rather than at the time of forming an immediate judgement. Consistent with the HSM, heuristic processing facilitates immediate judgments activated by relevant message cues, whereas systematic processing may require more time to arrive at a well-thought and rational conclusion. Since digital media users deal with great amounts of information, including true news and fake news, it is likely that they engage in heuristic processing when assessing trustworthiness and credibility. Media multitasking habits can further add to such superficial ways of reacting to digital messages.

In the context of the current study, it is asserted that multitasking will limit the availability of resources for systematic processing of a task and, thus, study participants will depend on heuristic processing (or immediate cues) in making judgments about true news and fake news posts, such as credibility judgments (Chaiken & Trope, 1999). Fake news has been studied limitedly (Shen, Li, Sun, Chen, & Wang, et al., 2019) in relation to media multitasking and with the application of the HSM. Shen et al. (2019) examined individual multitasking differences (high/low multitaskers) and their results indicated that those with higher preferences toward multitasking (or heavy multitaskers) had a hard time detecting fake news. In the present study, it is proposed that if an individual is engaged in heuristic information processing of stories due to multitasking, they might not easily recognize the falsity of information, which might require more in-depth, systematic processing.

Motivation

The HSM acknowledges that processing is continuous and, thus, individuals have the ability to switch between systematic and heuristic processes within a given message (Chen & Chaiken, 1999). In addition, there are different degrees to which someone might process messages heuristically or systematically. To this end, processing, in general, depends on the motivation to process, the availability of cognitive resources, and the accessibility of heuristic characteristics in a given message (Chen & Chaiken, 1999). For example, an individual looking to purchase a car might glance at five different cars, processing only the heuristics-related cues, such as size and color. When the individual finds a car that they like or search for, they will shift to systemic processing, examining details like the gas mileage and price in greater depth. In other words, individuals are motivated to process systematically only when they find the car within their interest and liking. Given that the individual has the cognitive availably to process systematically (e.g., no distractions in the car lot), they could do so when the right car comes along. On the other hand, one might not choose to process systemically.

The HSM addresses three main types of motivations: defensive motivation, accuracy motivation, and impression motivation. *Defensive motivation* is when one maintains or continues to hold personal attitudes or beliefs that are consistent with self-interest or existing beliefs (Chaiken et al., 1996). When defensive motivation is active, the available cognitive resources that one can allocate to a given topic are high. *Accuracy motivation* is the notion that one has a desire to hold accurate attitudes and beliefs. Individuals with this motivation will process information systematically and, thus, will have less cognitive resources available. *Impression motivations* are related to the desire to maintain beliefs that meet the present social objectives. Cognitive availability in this case can vary. For instance, if one is trying to be agreeable, there

will be increased capacity. Whereas, if debate is acceptable in a given social setting, one will have minimal resources.

Availability and Accessibility

It is thought that for the present study, media multitasking environments will create situations in which individuals will need to rely more heavily on heuristic processing because of the increased cognitive load required by the primary and secondary tasks. Thus, individuals' judgments of the news stories will depend on cues to make credibility judgments. It is expected that when individuals rely on cues to make creditability judgments, they will be less effective doing so in multitasking situations compared with non-multitasking situations. In terms of the HSM, *availability* refers to the amount of cognitive resources an individual has available to process a given message (Todorov et al., 2002). We know from the media multitasking literature (Armstrong & Chung, 2000; Armstrong et al., 1991; Brasel & Gips, 2011) that cognitive resources are decreased in multitasking situations. While other theories, such as CLT, TCT, and LC4MP, help to explain the cognitive limitations that occur during multitasking, the HSM helps to understand the message processing mechanisms (J. Srivastava, 2010). Srivastava (2010) found that processing availability for a single task, when compared with a dual task, was much greater. What this means for the current study is that when processing constraints are limited, individuals will process information in a systemic way, but when processing constraints are high, individuals will process information heuristically, thus, relying on cues to make fast judgments.

Chapter 5: Hypotheses and Research Questions

This chapter provides an overview and summary of the theoretical frameworks discussed in depth in the previous chapter (Chapter 4) to develop theoretically driven hypotheses and research questions. All hypotheses will pertain to a media multitasking (MMT), or multitasking, condition and a non-multitasking (NMT), or control, condition.

It is evident from Cognitive Load Theory (CLT) that those in multitasking situations might experience a higher perceived cognitive load than those in NMT situations (Van Cauwenberge et al., 2014). It is also suggested, based on the assumptions of the Limited Capacity Model of Motivated Mediated Message Processing (LC4MP), that MMT situations may reduce the amount of available cognitive resources and, thus, people may experience cognitive overload (Lang & Chrzan, 2015). However, our knowledge related to the fake news processing in these types of media environments is limited. Thus the following hypothesis and research question are proposed:

H1: Participants in the MMT condition will report higher perceived cognitive load, when compared with the NMT (control) condition.

RQ1: Will there be a difference in perceived cognitive load for fake news versus real news between the MMT and NMT conditions?

The second hypothesis is extracted from applying CLT, the Heuristic-Systematic Model (HSM), and MMT literature. It is predicted that those in multitasking situations will experience a decrease in cognitive resource availability and, thus, individuals in multitasking situations will rely on cues to detect fake information (Griffin et al., 2002). In this case, it is possible that fake news will not be detected due to its purposeful similarities to real news. For this, the following hypothesis is proposed:

H2: Participants in the MMT condition will be less likely to detect fake news, when compared with the NMT condition.

The third hypotheses and research question set is founded based on CLT and LC4MP frameworks. It is predicted that those in the multitasking condition that requires more cognitive resources will be less likely to encode news story information. For this, the following hypotheses and research question are proposed:

H3a-b: Recognition memory for news post sources (H3a) and content (H3b) will be lower in the MMT condition when compared to the NMT (control) condition.

RQ2: Will there be a difference in recognition memory for fake news versus real news between the MMT and NMT conditions?

The next set of hypotheses is derived from literature on the HSM. We know from the HSM that there is greater comprehension and counterarguing when information is processed systematically (Luo et al., 2013; Trumbo, 1999). As resources are limited or reallocated to other tasks, as it happens in MMT situations (such as those in the Jeong and Hwang, 2012, study), comprehension and counterarguing take a toll. This happens because individuals in multitasking situations are more likely to switch from systematic to heuristic processing. The following hypotheses and research questions for comprehension and counterarguing are:

H4: In the MMT condition, participants' comprehension levels will be lower, when compared with the NMT (control) condition.

RQ3: Will there be a difference in comprehension of fake news and real news between the MMT and NMT (control) conditions?

H5: In the MMT condition, participants' counterarguing levels will be lower, when compared with the NMT (control) condition.

RQ4: Will there be a difference in counterarguing of fake news and real news between the MMT and NMT (control) conditions?

The following hypothesis about credibility judgments is based on the propositions of the HSM, as well as credibility literature. We know from the HSM that individuals who have limited cognitive resources are likely to rely more heavily on processing information heuristically, relying on message cues to process information (Chen & Chaiken, 1999). If resources are limited due to situational factors, such as multitasking, systematic processing will become more difficult, and participants will deal with the news story information on a more superficial processing level. They may be more likely to assess stories, both fake and true, as more credible. The following hypothesis are proposed:

H6: Participants in the MMT condition will be more likely to perceive fake news as credible, while in the NMT (control) condition, participants will evaluate real news as more credible than fake news.

If participants express more positive (in this study, credible) evaluations of the news stories in the MMT situations and if their comprehension and counterarguing with regard to news post content decreases, then they are more likely to express a greater intention to share, like, and comment on these posts (Lang, Dhillon, & Dong, 1995). In other words, they will express greater viral behavioral intentions (VBI; Alhabash, et al., 2015). With this in mind, it is proposed that:

H7: Participants in the MMT condition will show increased VBI when compared with those in the NMT (control) condition.

RQ5: How will VBI differ for fake news versus real news between the MMT and NMT (control) conditions?

Chapter 6: Method

Experimental Design

This experimental study will execute a 2 (*media multitasking [MMT]; non-multitasking [NMT]*) x 2 (news post type: *fake news; real news*) x 4 (message repetition) between/within-subjects factorial design. *Multitasking* is a between-subjects factor with 2 levels: an MMT condition where participants were asked to read articles on a computer while watching *Battle Fish* on Netflix and NMT control condition where participants were asked to turn off all distractions/devices and to read the same articles. The within-subjects factor, *news post type,* included two levels: fake news posts (FN) and real news posts (RN). Four topics per each news post type were used as the primary task in this study (the message-repetition within-subjects factor) and included the following topics: global warming, COVID-19, online privacy, and abortion (see Pretest section for method used in determining news post topics).

Participants

In total, the initial goal was to collect data from 173 participants after running a power analysis using G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007), where number of groups = 3, number of measurements = 12, effect size $f = .23$ (defined based on the lower fringe of *Eta Squared* = .05), power level = .95, α level = 0.5, correlations among repeated measures = 0.5, and non-sphericity correction = 1/(repetitions − 1) = 1/(12 − 1) = 1/11 = .091, and accounting for 20% incomplete or missing data. I partnered with Qualtrics to utilize their research panel for data collection. Paying Qualtrics $2,500 for the total number of panel responses allowed for timely data collection. Subsequent to programming the experimental surveys online, Qualtrics took the two surveys and sent them to their panel participants. Qualtrics was not explicit to the number of participants the surveys were originally sent to. Due to the

panel being skewed toward females, ages 55+, and People of European origin, Qualtrics was requested to balance the sample for age and race (budget did not allow me to balance for gender). Age was important to balance for due to the differences in media use between generations (Pew, 2021). Race was important to balance for due to discrepancies in access to media technologies among representatives of different racial and ethnic groups (Campos-Castillo & Laestadius, 2020). The Qualtrics platform was responsible for collecting data and rewarding each participant for study participation. Qualtrics was not forthcoming about how they monetarily reward their respondents, but they did provide a range of $5–$10, which is reasonable for a 15-minute survey (the average time of both surveys was about 12 minutes).

A total of 1,239 respondents participated in our three-question screening survey (including questions about their device ownership and whether they had a Netflix subscription). Out of them, 214 respondents qualified and completed the study. Due to incomplete or missing responses, data from 27 respondents were eliminated from the study, leaving a total sample size of 186. Responses were deleted because of incomplete questionnaires or because responses were evaluated as not reliable (e.g., some participants entered "gibberish" answers to open-ended questions). Of the 186 participants who provided valid responses, 53% were female (46% male), 70% where White (followed by 12% Black and 9% Asian), 69% held an associate degree or higher, and the majority (52%) had an annual income of $25,000–$99,000. All participants owned a television and laptop and had access to a Netflix streaming account, as all of them were screened for these types of media ownership.

Procedure and Apparatus

All Conditions

All procedures and materials were reviewed and approved by Michigan State University (MSU)'s Institutional Review Board (IRB). The study took place online, and all participants were asked to answer three screening questions before qualifying for the study. The three questions included: 1) "Do you own a TV?", 2) "Do you own a laptop?", and 3) "Do you have access to Netflix streaming service?" These questions were included because this study took place online and the researcher needed to ensure that (a) those in the MMT condition had access to Netflix to engage in the secondary task, (b) the control and MMT conditions did not differ by screen device ownership and Netflix, and (c) all study participants could use their laptop to participate. Each participant was randomly assigned to one of the two conditions (MMT and NMT control). All participants were asked to sign a consent form prior to their participation if they agreed to take part in the research. Each condition began with a pretest, where participants were asked to answer questions about MMT preference (Baumgartner et al., 2017), political affiliation (Fielding et al., 2012), political ideology (Fielding et al., 2012), and demographics. To meet sample balancing requirements by age and race, Qualtrics recommend demographic questions be added at the beginning of the study.

After completing the study, all participants from all conditions were sent to a final debriefing form at the end of the online survey containing more detailed information about the study, the researcher, and the IRB contact information. Should participants have had further questions or concerns, they had the researchers' and IRB contact information. Finally, each participant received an incentive via Qualtrics for their participation. As Qualtrics assigns and

distributes all incentives when using their sample population, the platform was not explicit about the monetary amount awarded to participants for their responses.

Media Multitasking Condition

Following the pretest, in the MMT condition, participants were instructed to read and evaluate a series of news posts (in random order) while watching a popular *Battle Fish* episode (Season 1, Episode 3). A question was added to the multitasking condition: "You will now be asked to open up your Netflix account and spend some time watching a TV show. Would you like to continue with the study?" Response options were "yes" and "no" (if participants responded "no," they were filtered out)—after the study fielded, due to difficultly in recruiting MMT participants. Due to high dropout rates, attributed to participants not wanting to watch the video, adding this question was necessary to (a) point out to participants that they will be required to watch a video in the study and (b) filter out those that do not want to watch the video. Participants were given explicit instructions on how to find the video on Netflix and asked to pay attention to both the video and the news posts. To ensure the episode and the news posts were viewed at the same time, participants were asked to "play" the video and "proceed to the new page." In total, each participant read eight short news posts (four real news posts and four fake news posts), presented in random order. First, participants saw the entire news post, including the source, headline, and a short paragraph (averaging 46 words).

After reading each news post, participants were asked to respond to post-specific questions (See the Dependent Variables subsection below) in the following order: judging whether the post is fake or true; the difficulty of the task of post reading (perceived cognitive load); self-reported valence and arousal elicited by the post; credibility of the post; post

comprehension and counterarguing; and intentions to like, comment on, and share the post on social media.

After reading and responding to questions about each news post, participants were asked to complete a final posttest survey. This included one multiple-select recognition question for the source of the news posts—eight of the new posts' sources and eight additional sources participants did not see (16 response options in total). Following the source recognition question, 16 recognition questions about the content of the news posts were asked in random order. All questions were offered in a true-or-false format. Of the 16 question correct answers, eight were true and eight were false. This means that the respondents answered two questions per each news post (one question with a true correct answer and one question with a false correct answer).

Non-Multitasking (Control) Condition

Following the pretest in the control condition, each participant was instructed to read and respond to a series of news posts (in random order). The rest of the procedure was identical to the one in the MMT condition, but without any secondary tasks (i.e., participants were not instructed to watch a Netflix episode).

Stimuli

The following section will detail the pretest strategy for both the streaming video of choice for the multitasking condition and the eight news posts included in the experiment.

Pretest 1: News Posts

The primary purpose of this pretest was to determine the news posts used in the main study. Data for the pretest were collected from SONA's online recruitment system, a recruitment resource in the Department of Advertising and Public Relations at MSU's College of Communication Arts and Sciences. All materials used in the pretest were approved by MSU's

IRB and consent was acquired prior to participation in the study. Data were collected from a total of 75 participants who were MSU students. The pretest took approximately 15 minutes and participants received .5 SONA credit for their time. SONA credits represent the incentive to MSU students who participate in the SONA student pool. They participated in research and typically receive class credit as a compensation. Those students that participated in this research earned half a class credit.

In Pretest 1, participants read a total of 18 news posts in random order, including nine fake news and nine real news posts. News post content was developed using the following platform: https://www.snopes.com, which is a news content fact-checking website. Response questions included fake news detection at the levels of fake/realness of the news post, familiarity with the news post topic, belief about the topic (e.g., "I believe COVID-19 is dangerous"), and viral behavioral intentions (VBI)—intentions to share and spread the news post. Demographic information was also collected. Of the 75 respondents, 71% were female (28% were male); 74% were People of European origin (17% Asian and 5% African American/Black); and the majority were working on their undergraduate degrees (19% freshmen, 29% sophomores, 28% juniors, 22% seniors).

News post topics included voting, immigration, vaccination, COVID-19, global warming, online privacy, LGBTQ+ rights, abortion, birth control, and net neutrality. I determined the topics based on the news posts that were perceived as least fake (i.e., respondents felt the fake news post were real and the real news was also real), low familiarity with the news post, high VBI scores, and news posts with low levels of being polarizing. Polarization here refers to a belief that a topic is not associated with extreme disagreements from both sides. Low familiarity and not extremely polarizing topics were important factors for selection to reduce any unwanted

covariance. In addition, it was important that the articles were likeable/shareable, so higher VBI ratings were considered, as well. Finally, it was important that the articles mimic a real-world situation where fake news posts are present on social media and often perceived as real. Thus, fake news posts that were perceived as real, as well as the real news posts perceived as real, were selected as stimuli.

Familiarity—measured on a scale of 1 (*low familiarity*) to 7 (*high familiarity*)—for all topics resulted in similar scores with means of 2.09–2.68 for fake news posts (means of 2.34–3.48 for real news posts). Familiarity was only used in the pretest, not the main study. VBI—measured on a scale of 1 (*low VBI*) to 7 (*high VBI*)—was similar among the topics and resulted in means of 1.69–2.26 for fake news posts and means of 1.83–2.70 for real news posts. Beliefs about the topic were extreme and skewed more toward a liberal point of view—which is expected in a college-aged demographic (Niche, 2021). With that said, this was true for all topics, with means of 5.58–6.45.

The four topics that were chosen for the study are (a) global warming, (b) COVID-19, (c) online privacy, and (d) abortion. For global warming, 30% of the fake news posts were determined as real, while 84% of the real news post were identified as real. For the topic of COVID-19, 48% perceived the fake news post as real and 58% perceived the real news post as real. For the online privacy topic, 39% perceived the fake news post as real, while 51% perceived the real news post as real. Finally, for abortion-related news posts, 48% perceived the fake news post as real and 63% perceived the real news post as real. See Table 1 for all key indicator scores.

Table 1: Pretest—Key Indicator Scores

Table 1: Pretest – Key Indicator Scores.

	Fake New Posts	Real News Posts	Fake New Posts	Real News Posts	Fake New Posts	Real News Posts	
	% of 'Real' Response		Mean of Familiarity		Mean of VBI		Mean of Belief on Topic
Global Warming	30%	84%	2.58	3.48	1.96	2.70	6.00
Voting	19%	60%	2.15	2.80	1.69	2.15	5.91
Immigration	33%	55%	2.26	2.34	1.81	1.83	5.58
COVID-19	48%	58%	2.65	3.23	2.26	1.92	5.55
Online Privacy	39%	51%	2.55	2.68	2.01	2.11	5.28
Vaccination	27%	64%	2.09	2.86	1.84	2.41	6.02
LGBTQ Rights	21%	54%	2.85	2.82	1.7	2.18	6.45
Abortion	48%	63%	2.68	2.60	1.84	2.00	6.18
New Neutrality	18%	64%	2.28	3.08	1.90	2.11	5.69

Pretest 2: Streaming Videos

Of young adults aged 18–29, 61% have an online streaming service (Pew, 2017). According to Pew Internet Research (2017), about six in 10 young adults in the United States primarily use online streaming to watch television. Thus, Netflix and Hulu were chosen to be tested in the pretest as the streaming services for this experiment. Netflix streaming service was chosen due to consumer popularity; affordable price; and the offerings of a variety of shows, movies, and original content (Honorof, 2019). In addition, according to Pew Research Center (2017), 61% of young adults use Hulu as their primary streaming service. Netflix and Hulu were both chosen to provide ecological validity to the experimental environment.

Due to the COVID-19 pandemic, this experiment's design changed from an in-person to an online format. Prior to this decision, it was proposed that the study be conducted in a laboratory (lab) setting with three multitasking conditions—media-to-media multitasking, non-media–to–media multitasking, and no multitasking. I initially proposed a fish topic as a secondary task because participants in the media-to-media multitasking condition could watch a fish television show and participants in the non-media–to–media condition could watch a fish tank (a comparable secondary task to the fish television show, as it had color, movement, and

sound/white noise). Again, due to the COVID-19 pandemic, in-person experiments were restricted, thus it was not possible to conduct the study in the lab. Therefore, the fish-tank (non-media–to–media) condition was eliminated from the study in order to transform the study to an online-survey format.

There was a total of two accessible shows related to the topic of fishing on Netflix and Hulu. The fish show was chosen because it was thought to be less familiar to the initially targeted population (i.e., students) and because it was thought to be a low-involvement topic. Each show episode is approximately 45 minutes in length. Shows include *Battle Fish* and *Legendary Catch*. *Legendary Catch* has a total of five available episodes across one season on Hulu, and *Battle Fish* has a total of eight episodes across one season on Netflix. For each show, three episodes were cut down to two-minute clips to sample for pretesting. One clip was selected from the 12 based on the neutral-to-high levels of involvement and low levels of familiarity. It was important for the television show to be distracting, but not too distracting, hence higher levels of involvement were important for engaging the participant. In addition, lower levels of familiarity ensured the show was not seen by most participants previously.

Data for Pretest 2 were collected from the same SONA online recruitment system described above. All materials used in the pretest were approved by MSU's IRB and consent was acquired prior to participation in the study. Qualtrics was used to administer the survey. Data were collected from a total of 89 participants. Of those, 14 responses were eliminated due to incomplete or missing data, so in total, 75 responses were included in the study. The pretest took approximately 15 minutes and participants received 0.5 SONA credit for their time, similar to receiving the SONA credits as previously described in relation to Pretest 1.

Two surveys were created to decrease the amount of time it took to complete the study and reduce participant fatigue. One survey asked about the episode from *Battle Fish* and the other asked about the *Legendary Catch* episode. Each clip was shown to the participants in random order (i.e., one clip was not shown first to the participants every time). Random order was used to eliminate testing bias. Participants were randomly assigned to one of the two surveys and asked to watch and respond to three 2-minute clips of episodes from two fish shows on Netflix and Hulu. Questions included the measures of familiarity and involvement. Demographic questions were also included. Of the 75 participants, 63% were male (37% female); participants were aged 21–25 years; all respondents were undergraduate students (26% freshmen, 32% sophomores, 21% juniors, and 21% seniors); and 79% were White, 16% were African American/Black, and 5% were Asian. When compared to other clips, *Battle Fish* Season 1, Episode 3 fit the conditions of familiarity ($M = 2.95$) and involvement ($M = 3.88$) the best and, thus, was chosen for the study. See Table 2 for secondary task scores.

Table 2: Pretest—Secondary Task Scores

Table 2: Pretest – Secondary Task Scores.

	Battle Fish	Legendary Catch	Battle Fish	Legendary Catch
	Mean of Familiarity		Mean of Involvement	
S1:E4	–	2.81	–	3.84
S1:E5	–	3.52	–	3.82
S1:E6	–	2.79	–	3.71
S1:E1	3.23	–	3.75	–
S1:E3	2.95	–	3.88	–
S1:E8	3.58	–	3.59	–

Dependent Variables

Fake News Detection

Participants were asked to detect which news post they identify as a hoax or fake as an immediate response to the news post as a whole. The following prompt followed each news post: "I think the news post I just read was…" Response options included: (a) "fake" and (b) "real."

Fake news detection was calculated into one variable for fake news using Singh et al.'s (1988) Signal Detection equation. Signal Detection is a well-established measure to determine recognition sensitivity (Singh et al., 1988). This measure uses both hit/miss signals. Hits are recognition sensitivity signals—or cues in the form of questions—presented to the participant that are true (Stanslaw & Todorov, 1999), whereas misses are noise signal questions or distractors—or questions that control for false positives, e.g., the participant guessing correctly (Stanslaw & Todorov, 1999). Both signals factored together can indicate that an individual recognizes a stimulus—in this case fake news or real news posts. The equation used in this study was Singh et al.'s (1988) Signal Detection equation: $A' = 0.5 + (H - M) * (1 + H - M)/4 * H * (1 - M)$—where H stands for hit and M stands for miss.

Cognitive Load

A single-item scale developed by Paas and van Merrienboer (1994) was used to measure perceived cognitive load. The question is as follows: "On a scale of 1 to 7 (1 being 'very little effort' and 7 being 'a lot of effort'), what was the amount of mental effort that you invested in this study?" Response option was a 7-point semantic differential scale.

Source Recognition

A list of 16 sources was displayed on the screen (eight hits/eight misses) Participants were asked: "You read news stories from 8 different sources today. Please select all of the sources that you remember seeing." Participants were able to select a total of 16 sources. Source recognition was then calculated in two variables: (a) recognition sensitivity for true news posts and (b) recognition sensitivity for fake news posts. Calculations were made using the Singh et al. (1988) Signal Detection equation.

News Post Recognition

After reading and responding to recognition questions about news post sources, news post content recognition was measured. Recognition questions were adapted using the Signal Detection Theory (Singh et al., 1988). One true (hit) question and one false (miss) question were created for each post. In total, eight hit questions and eight miss questions were asked (16 questions in random order). Questions were presented one-by-one, followed by true/false response options. News post recognition, similar to news post source recognition, was calculated in two variables: (a) recognition sensitivity for true news posts and (b) recognition sensitivity for fake news posts. Calculations were made using the Singh et al. (1988) Signal Detection equation.

Comprehension

A single-item scale adapted from Jeong and Hwang (2012) was used to measure perceived comprehension. The question is as follows: "Please rate on a scale of 1 to 7 (1 being 'Very hard to understand' and 7 being 'Very easy to understand') the extent to which you understood the message presented in the news post you just read." Response option was a 7-point semantic differential scale.

Counterarguing

Counterarguing was measured adapting the Jeong and Hwang (2012) single-item scale. The following was asked: "Please rate on a scale of 1 to 7 (1 being 'Did not try to find flaws at all' and 7 being 'Tried very hard to find flaws') the extent to which you tried to find flaws in the argument presented in the news post you just read." Response option was a 7-point semantic differential scale for rating.

Perceived Credibility

Perceived credibility was measured with a five-item scale adapted from Meyer (1988). Participants were asked to rate on a 7-point Likert scale the following the prompts: (a) fair, (b) trustworthy, (c) accurate, (d) comprehensive, and (e) unbiased (Meyer, 1988).

Viral Behavioral Intentions

The VBI scale was adapted from Alhabash, McAlister, Quilliam, Richards, and Lou (2014). This scale included nine 7-point Likert scale items (1 = *strongly disagree* to 7 = *strongly agree*). The examples of the items are: 1) "I would like this [news story] on social media (e.g., Facebook, Instagram, Reddit)", 2) "I would share this [news story] on social media (e.g., Facebook, Instagram, Reddit), and 3) "I would comment on this [news story] on social media (e.g., Facebook, Instagram, Reddit)".

Control Variables

Several control variables were used in the main study. This included any additional number of tasks (entered as an open-ended response) the participants may have participated in while taking the study. For this, participants were asked to list all the tasks they participated in while also completing the study. Tasks varied from drinking coffee to chatting with a spouse, to watching sports on television. This variable was then computed into a ratio-level variable by using two coders to count the number of tasks. Intercoder reliability was calculated Using Kirppendorf's Alpha ($\alpha = .93$). Political affiliation and political ideology (Fishkin et al., 1973) were measured with the following question: "Where do you consider yourself to be in terms of political party affiliation and ideology?" and response options were dichotomous: "Very Republican/Very Democratic" and "Very Conservative/Very Liberal." Knowledge about the topic was measured using the following statement: "On a scale from 1 to 7 (1 being 'Not

knowledgeable at all' and 7 being 'Extremely knowledgeable'), rate how knowledgeable you are about the following topics."

A grid of each topic was included for participants to rate. Beliefs about a topic were prompted by the following: "Please rate on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) to what extent you believe that…" with statements like "global warming is real," and "COVID-19 is a dangerous virus" for each topic. For the MMT preference (Baumgartner et al., 2017), 14 items on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) were used, with examples as follows: "I am more efficient when I am multitasking" and "Before multitasking, I deliberately think about specific tasks that I can do concurrently." Arousal (Cacioppo & Berntson, 1994) and valence (Alhabash et al., 2015) were measured repeatedly after each news post. Participants were asked to complete the following statement: "The news post I just read made me feel…" and included the following dichotomous response options: "Relaxed/Stimulated," "Calm/Excited," "Unaroused/Aroused" (for arousal) and "Negative/Positive," "Good/Bad," "Unfavorable/Favorable" (for valence). Demographic variables such as gender, age, education, location by state, income, and race/ethnicity were also included as control variables.

Prior to the main analysis, correlations were run with the dependent and independent variables and control variables, including knowledge, belief, political affiliation, and ideology, as well as race, gender, age, and income. Control variables were not correlated with the dependent variables. Independent-sample t-tests were conducted with control variables as dependent to check for any significant differences by media multitasking group/condition. No significant differences were found for knowledge, belief, political affiliation, and ideology, as well as race, gender, age, and income between MMT condition and the NMT condition. Thus, these control variables were not included in the analysis as covariates.

A factor analysis was run on all scale items, including perceived credibility, VBI, MMT preference, arousal, and valence. There were no concerns for scales' internal validity. See Table 3 for factor analysis results.

Table 3: Exploratory Factor Analysis Results

Table 3: Exploratory Factor Analysis Results				
Construct/Items	M	SD	Loadings	Eigenvalues
Media Multitasking (MMT) Preference				60.73
I am more efficient when I am multitasking.	4.92	1.59	0.82	
I try to multitask whenever possible.	5.04	1.53	0.87	
I enjoy multitasking.	5.03	1.65	0.87	
I am in a state of flow when multitasking.	4.80	1.62	0.86	
I multitask out of habit.	4.98	1.66	0.87	
Before multitasking I deliberately think about specific tasks that I can do concurrently.	5.07	1.66	0.76	
I lose track of time when multitasking.	4.52	1.78	0.53	
I can do more through multitasking.	5.16	1.55	0.85	
When I am on a computer or using my mobile phone, I am always drawn to do more than one thing at a time.	5.15	1.56	0.80	
I am distracted when I have to focus on only one task.	3.85	1.92	0.62	
I am bored when I am not multitasking.	3.91	1.94	0.56	
I find it entertaining and enjoyable when multitasking.	4.88	1.69	0.83	
Viral Behvorial Intentions (VBI)				90.2
This news post is worth sharing with others	3.03	2.22	0.92	
I will recommend this news post to others	2.96	2.11	0.93	
I will 'like' this news post on Facebook	2.86	2.18	0.96	
I will 'share' this news post on Facebook	2.83	2.14	0.96	
I will 'comment' on this news post on Facebook	2.96	2.21	0.93	
I will post on this news post Facebook wall	2.82	2.15	0.95	
I will 'like' this news post Facebook page	2.78	2.20	0.96	
I will 'like' posts on this news post Facebook page	2.85	2.21	0.97	
I will 'comment' on this news post Facebook page	2.95	2.20	0.95	
Perceived Credibility				81.86
Fair	2.74	1.35	0.88	
Trustworthy	2.48	1.36	0.93	
Comprehensive	2.69	1.34	0.90	
Unbiased	2.61	1.40	0.88	
Accurated	2.58	1.43	0.94	
Arousal				74.68
Relaxed/Stimulated	4.29	1.61	0.86	
Calm/Excited	4.17	1.54	0.91	
Aroused/Unaroused	4.14	1.73	0.82	
Valance				91.68
Negtive/Positive	3.59	1.90	0.94	
Bad/Good	3.56	1.93	0.97	
Unfavorable/Favorable	3.59	1.88	0.96	

Chapter 7: Results

Hypothesis Testing

To test the hypotheses, one-way and repeated-measures analyses of covariance (ANCOVAs) were conducted to compare the effects of media multitasking (MMT) and non-multitasking (NMT), the control, on each of the dependent variables using the α level of .05 adjusted for Bonferroni corrections. One-way ANCOVAs were run to test the effects of the multitasking manipulation on fake news detection, news post source recognition, and news post content recognition. All measures were considered acceptable, assumptions of normal distribution of the variables were met (e.g., Skewness and Kurtosis were within acceptable ranges, data plotting indicated normality and linearity of distribution). Repeated-measures ANCOVAs were run with various control variables as covariates. Control variables included the following: MMT preference, arousal, and valence. Those control variables that had interaction effects with the news posts or MMT manipulations were used in the main statistical analyses. Other control variables were dropped from the analysis if they did not interact with the manipulation factors or correlate with dependent measures. See Table 4 for tests of normality using Skew and Kurtosis.

Table 4: Test of Normality

Table 4: Test of Normality			
Variable	News Post	Skewness	Kurtosis
Cognitive Load	Fake News Global Warming	0.53	-1.04
	Fake News COVID-19	0.08	-1.23
	Fake News Online Privacy	-0.03	-1.22
	Fake News Abotion	-0.17	-1.06
	Real News Global Warming	-0.31	-0.97
	Real News COVID-19	0.09	-1.25
	Real News Online Privacy	-0.05	-1
	Real News Abotion	-0.05	-0.97
Comprehension	Fake News Global Warming	-0.5	-0.64
	Fake News COVID-19	-0.45	-0.62
	Fake News Online Privacy	-0.29	-0.72
	Fake News Abotion	-0.37	-0.86
	Real News Global Warming	-0.06	-1.11
	Real News COVID-19	-0.36	-0.79
	Real News Online Privacy	-0.37	-0.59
	Real News Abotion	0.01	-0.81
Counterarguing	Fake News Global Warming	-0.73	-0.13
	Fake News COVID-19	-0.61	-0.14
	Fake News Online Privacy	-0.65	-0.38
	Fake News Abotion	-0.5	-0.11
	Real News Global Warming	-0.84	-0.25
	Real News COVID-19	-0.62	-0.63
	Real News Online Privacy	-0.6	-0.25
	Real News Abotion	-0.08	-0.59
Perceived Crecibility	Fake News Global Warming	0.002	-0.168
	Fake News COVID-19	-0.1	-1.63
	Fake News Online Privacy	-0.16	-1.63
	Fake News Abotion	-0.15	-1.66
	Real News Global Warming	-0.2	-1.7
	Real News COVID-19	0.03	-1.64
	Real News Online Privacy	-0.23	-1.68
	Real News Abotion	-1.29	0.33
VBI	Fake News Global Warming	0.65	-1.09
	Fake News COVID-19	0.46	-1.27
	Fake News Online Privacy	0.38	-1.33
	Fake News Abotion	0.38	-1.38
	Real News Global Warming	-0.14	-1.33
	Real News COVID-19	0.62	-1.1
	Real News Online Privacy	0.21	-1.45
	Real News Abortion	0.57	-1.05

Cognitive Load

Hypothesis 1 predicted that in the MMT condition, perceived cognitive load would be reported higher when compared with the control condition. Additionally, Research Question 1 asked about the differences in perceived cognitive load in fake news versus real news between the MMT and NMT conditions. A repeated-measures ANCOVA with multitasking manipulation as a between-subjects factor and type of news post (real, fake) as a within-subjects factor was conducted to compare the perceived cognitive load scores for the eight different articles: fake news post on global warming, fake news post on abortion, fake news post on online privacy, fake

news post on COVID-19, real news post on global warming, real news post on abortion, real news post on online privacy, and real news post on COVID-19. Control variables included in the analysis were MMT preference, arousal, and valence. No significant results were found among the MMT and NMT experimental conditions, $F(1, 177) = .18$, $p = .67$. The main effect for fake news versus real news posts was also not significant, $F(1, 177) = .52$, $p = .47$. The interaction effect for condition and news type was not significant, $F(1, 177) = 1.19$, $p = .17$. Hypothesis 1 was not supported. See Table 5 for full report of repeated-measures ANCOVA results.

Table 5: Required Measures ANCOVA Results MMT and NMT

Table 5: Repeated Measures ANCOVA Results MMT and NMT

DV	News Post	Condition	M	SD	F	p	Eta Squared
Cognitive Load					0.18	0.67	0.01
	Fake News Global Warming	MMT	4.64	3.439			
		NMT	4.59	2.849			
	Fake News COVID-19	MMT	3.68	2.166			
		NMT	3.79	1.883			
	Fake News Online Privacy	MMT	3.88	2.071			
		NMT	3.91	1.87			
	Fake News Abotion	MMT	3.83	2.029			
		NMT	4.36	1.831			
	Real News Global Warming	MMT	4.46	2.007			
		NMT	4.33	1.865			
	Real News COVID-19	MMT	3.73	2.151			
		NMT	3.77	1.996			
	Real News Online Privacy	MMT	3.82	1.981			
		NMT	3.98	1.82			
	Real News Abotion	MMT	3.94	1.983			
		NMT	4.02	1.715			
Comprehension					0.51	0.47	0.03
	Fake News Global Warming	MMT	5.34	1.685			
		NMT	5.29	1.486			
	Fake News COVID-19	MMT	5.39	1.419			
		NMT	4.94	1.531			
	Fake News Online Privacy	MMT	5.42	1.444			
		NMT	5.09	1.592			
	Fake News Abotion	MMT	5.24	1.56			
		NMT	5.27	1.312			
	Real News Global Warming	MMT	5.56	1.609			
		NMT	5.49	1.449			
	Real News COVID-19	MMT	5.36	1.604			
		NMT	5.48	1.396			
	Real News Online Privacy	MMT	5.34	1.484			
		NMT	5.34	1.363			
	Real News Abotion	MMT	5.16	1.224			
		NMT	5.23	1.054			
Counterarguing					0.99	0.32	0.005
	Fake News Global Warming	MMT	4.8	1.907			
		NMT	4.49	1.812			
	Fake News COVID-19	MMT	4.76	1.875			
		NMT	4.56	1.787			

Table 5 (cont'd)

	Fake News Online Privacy	MMT	4.65	1.93			
		NMT	4.24	1.739			
	Fake News Abotion	MMT	4.33	2.004			
		NMT	4.48	1.806			
	Real News Global Warming	MMT	3.89	2.157			
		NMT	3.99	1.811			
	Real News COVID-19	MMT	4.32	1.98			
		NMT	4.33	1.869			
	Real News Online Privacy	MMT	4.35	1.906			
		NMT	4.19	1.706			
	Real News Abotion	MMT	4.08	1.261			
		NMT	3.98	1.173			
Credibility					0.16	0.69	0.001
	Fake News Global Warming	MMT	2.51	1.26			
		NMT	2.74	1.24			
	Fake News COVID-19	MMT	2.72	1.19			
		NMT	3.01	1.22			
	Fake News Online Privacy	MMT	2.84	1.23			
		NMT	2.85	1.14			
	Fake News Abotion	MMT	3.01	1.15			
		NMT	3.13	1.05			
	Real News Global Warming	MMT	3.58	1.06			
		NMT	3.70	0.84			
	Real News COVID-19	MMT	2.79	1.23			
		NMT	2.76	1.27			
	Real News Online Privacy	MMT	3.30	1.09			
		NMT	3.32	0.87			
	Real News Abotion	MMT	3.78	0.99			
		NMT	3.79	0.88			
VBI					0.65	0.42	0.004
	Fake News Global Warming	MMT	2.69	2.02			
		NMT	3.08	2.10			
	Fake News COVID-19	MMT	2.94	2.09			
		NMT	3.33	2.04			
	Fake News Online Privacy	MMT	3.12	2.06			
		NMT	3.28	2.14			
	Fake News Abotion	MMT	3.10	2.09			
		NMT	3.46	2.16			
	Real News Global Warming	MMT	3.80	2.15			
		NMT	4.13	1.92			
	Real News COVID-19	MMT	2.89	2.05			
		NMT	3.06	2.09			
	Real News Online Privacy	MMT	3.36	2.17			
		NMT	3.59	2.03			
	Real News Abortion	MMT	2.87	1.99			
		NMT	3.23	2.03			

Results of the Pearson correlations between independent, control, and dependent variables indicated that there were significant positive associations between the cognitive load and arousal reported for global warming, COVID-19, and online privacy; valence reported for COVID-19; and MMT preference scores. This means that as cognitive load increased, so did arousal (from calm to

aroused), valence (from negative to positive), and MMT preference. See Table 6 for correlations between cognitive load and covariates.

Table 6: Correlations Between Cognitive Load and Covariates

Table 6: Correlations between Cognitive Load and Covariates									
Variable	1	2	3	4	5	6	7	10	12
Cognitive Load									
1. Fake News Global Warming									
2. Fake News COVID	.667**								
3. Fake News Online Privacy	.562**	.536**							
4. Fake News Abortion	.556**	.581**	.577**						
5. Real News Global Warming	.501**	.639**	.594**	.646**					
6. Real News COVID	.541**	.540**	.544**	.546**	.512**				
7. Real News Online Privacy	.501**	.561**	.505**	.575**	.550**	.535**			
8. Real News Abortion	.579**	.587**	.560**	.518**	.531**	.586**	.574**		
Covariates									
9. MMT Preference	.297**	.341**	.328**	.262**	.332**	.340**	.322**		
10. Arousal Fake News Global Warming	.440**	.231**	.171*	.146*	.146*	.258**	.165*		
11. Valance Fake News COVID	.312**	.493**	.285**	.295**	.416**	.196**	.242**	.296**	
12. Arousal Real News COVID	.202**	0.127	0.118	.213**	.145*	.399**	.257**	.561**	
13. Arousal Real News Online Privacy	.201**	.188*	.207**	.198**	.227**	.251**	.344**	.498**	.497**

To further test the effects of multitasking, a repeated-measures ANCOVA was run with a variable as a between-subjects factor representing additional tasks that participants engaged in during the study procedure (tasks irrelevant to the study manipulations). The two levels of this factor were 1 = participants engaged in one or more additional tasks during the study and 2 = participants did not engage in additional tasks during the study). Other independent variables in the analysis included condition (multitasking, no multitasking) as a between-subjects factor and type of news post (real, fake) as a within-subjects factor to compare the perceived cognitive load scores for the eight different new posts. Results were not significant. See Table 7 for ANCOVA results.

Table 7: Additional Task Repeated Measures ANCOVA Results

Table 7: Additional Task Repeated Measures ANCOVA Results.						
		F	df	*P*	Eta Squared	Power
Cogntive Load						
	Condition	0.07	1	0.79	0.00	0.06
	Additional Task	2.05	1	0.15	0.01	0.30
	Real/Fake News Post	0.70	1	0.41	0.00	0.13
	Condition x Additional Task	1.02	1	0.32	0.01	0.17
	Condition x Real/Fake News Post	0.44	1	0.51	0.00	0.10
	Additional Task x Real/Fake News Post	3.54	1	0.06	0.02	0.47
	Condition x Additional Task x Real/Fake News Post	0.29	1	0.59	0.00	0.08
Comprehension						
	Condition	0.73	1	0.40	0.00	0.14
	Additional Task	2.40	1	0.12	0.01	0.34
	Real/Fake News Post	1.45	1	0.23	0.01	0.22
	Condition x Additional Task	0.11	1	0.74	0.00	0.06
	Condition x Real/Fake News Post	0.31	1	0.58	0.00	0.09
	Additional Task x Real/Fake News Post	1.33	1	0.25	0.01	0.21
	Condition x Additional Task x Real/Fake News Post	0.04	1	0.84	0.00	0.06
Counterarguing						
	Condition	0.35	1	0.56	0.00	0.09
	Additional Task	0.88	1	0.35	0.01	0.15
	Real/Fake News Post	0.30	1	0.58	0.00	0.09
	Condition x Additional Task	0.92	1	0.34	0.01	0.16
	Condition x Real/Fake News Post	1.25	1	0.27	0.01	0.20
	Additional Task x Real/Fake News Post	4.89	1	0.03	0.03	0.59
	Condition x Additional Task x Real/Fake News Post	2.00	1	0.16	0.01	0.29
Credibility						
	Condition	4.37	1	0.04	0.03	0.55
	Additional Task	2.41	1	0.12	0.01	0.34
	Real/Fake News Post	3.47	1	0.06	0.02	0.46
	Condition x Additional Task	0.43	1	0.52	0.00	0.10
	Condition x Real/Fake News Post	0.01	1	0.93	0.00	0.05
	Additional Task x Real/Fake News Post	0.06	1	0.81	0.00	0.06
	Condition x Additional Task x Real/Fake News Post	4.27	1	0.04	0.02	0.54
VBI						
	Condition	0.88	1	0.35	0.01	0.16
	Additional Task	0.66	1	0.42	0.00	0.13
	Real/Fake News Post	6.62	1	0.01	0.04	0.73
	Condition x Additional Task	0.69	1	0.41	0.00	0.13
	Condition x Real/Fake News Post	0.01	1	0.91	0.00	0.05
	Additional Task x Real/Fake News Post	0.32	1	0.57	0.00	0.09
	Condition x Additional Task x Real/Fake News Post	0.11	1	0.74	0.00	0.06

Fake News Detection

Hypothesis 2 predicted that participants in the MMT condition would be less likely to detect fake news posts when compared to those in the NMT condition. A one-way analysis of variance (ANOVA), with multitasking manipulation as a between-subjects factor and detection as the outcome variable, was conducted to test Hypothesis 2. MMT preference and arousal were used as control variables. There was a significant effect found for detecting fake news posts for those in the MMT condition and the NMT condition, $F(1, 183) = 4.95$, $p = .03$. Those in the

MMT condition (*M* = .6,) were able to detect fake news posts with more accuracy than those in the NMT condition (*M* = .56). Hypothesis 2 was not supported, as the significant results were in the opposite direction as predicted. See Table 8 for ANOVA results.

Table 8: Fake News Detection ANOVA Results

Table 8: Fake News Detection ANOVA Results.

Variable	Condition	M	SD	df	MS	F	P
"Fake" News Detection	MMT	0.6	0.14	1	0.07	4.95	0.027
	NMT	0.56	0.1				

Results of the Pearson correlations between independent, control, and dependent variables indicated that there were significant negative associations between fake news detection and MMT preference and fake news detection and arousal for the online privacy post. This means that as MMT preference increased, detection decreased. There were also significant negative associations between arousal and fake news detection—as arousal increased, detection decreased. See Table 9 for correlation results.

Table 9: Correlations Between Fake News Detection and Covariates

Table 9: Correlations between Fake News Detection and Covariates.

Variable	1	2	3
Fake News			
1. Detection			
Covariates			
2. MMT Preference	-.223**		
3. Arousal Fake News Online Privacy	-.201**	0.017	

Additionally, a similar one-way ANOVA was conducted with the main factor of additional tasks. There was no significant effect found for detecting fake news posts for those doingvs. not doing additional tasks $F(1, 184) = 2.82$, $p = .09$.

News Source and News Post Recognition

Hypotheses 3a and 3b predicted that recognition memory for news post source and news post content would be lower in the MMT condition when compared to the NMT condition. A

one-way ANOVA was conducted to examine the differences in news post source recognition between the MMT condition and the NMT condition. MMT preference and arousal were used as control variables. No significance was found for news post source recognition between the MMT and NMT conditions, $F(1, 186) = 1.1$, $p = .3$. A similar test showed no significance for news post recognition between the MMT and NMT conditions, $F(1, 186) = 1.53$, $p = .22$. See Table 10 for full one-way ANOVA results. Hypothesis 3 was not supported.

Table 10: Fake News Detection ANOVA Results

Table 10: Fake News Detection ANOVA Results.

Variable	Condition	M	SD	df	MS	F	P
Fake News Post Source Recognition	MMT	0.53	0.52	1	0.003	1.1	0.3
	NMT	0.52	0.04	1			
Real News Post Source Recognition	MMT	0.52	0.05	1	0.01	2.41	0.12
	NMT	0.52	0.08	1			
Fake News Post Recognition	MMT	0.68	0.2	1	0.1	1.53	0.22
	NMT	0.73	0.3	1			
Real News Post Recognition	MMT	0.77	0.19	1	0.12	7.66	0.06
	NMT	0.72	0.19	1			

A Pearson's correlation test was run for dependent variables and control variables. There was a significant negative correlation between fake news post recognition scores and MMT preference, meaning that fake news recognition scores increased at lower MMT preference levels. See Table 11 for correlation results.

Table 11: Correlations Between Recognition of News Post and Covariates

Table 11: Correlations between Recognition of News Post and Covariates

Variable	1	2	3	4	5	6
Recognition Sensitivity						
1. Fake News Post Source Recognition						
2. Real News Post Source Recognition	.288**					
3. Fake News Post Recognition	0.06	.176*				
4. Real News Post Recognition	0.112	.213**	.375**			
Covariates						
5. MMT Preference	-0.034	-0.098	-0.131	-.285**		
6. Arousal Fake News COVID	0.04	-0.003	-0.02	-.175*	.147*	

In addition, Research Question 2 asked if there would be any differences in recognition memory for fake news versus real news. A pair sample *t*-test was conducted. There was no significance at the level of news post source ($t_{186} = -0.95$, $p = .34$) or at the level of news post content ($t_{187} = -1.83$, $p = .07$) for recognition memory.

An additional one-way ANOVA was conducted to determine if there were any differences in recognition at the level of news post and news source for participants doing additional task and not doing additional. There was no significant difference found at the level of source for fake news recognition, $F(1, 184) = 1.26$, $p = .26$, or for real news recognition, $F(1, 184) = .33$, $p = .57$. Further, there was no significant difference found at the level of news post for fake news recognition, $F(1, 184) = .88$, $p = .35$, or for real new recognition, $F(1, 184) = 3.3$, $p = .07$.

Comprehension

Hypothesis 4 predicted that in the MMT condition, perceived comprehension scores would be reported lower when compared with the control condition. Additionally, Research Question 3 asked about the differences in self-reported comprehension in fake news versus real news between MMT and NMT conditions. A repeated-measures ANCOVA with multitasking manipulation as a between-subjects factor and type of news post (real, fake) as a within-subjects factor was conducted to compare the comprehension reported for the eight different articles: fake news post on global warming, fake news post on abortion, fake news post on online privacy, fake news post on COVID-19, real news post on global warming, real news post on abortion, real news post on online privacy, and real news post on COVID-19. Control variables included in the analysis were MMT preference, arousal, and valence. No significant results were found between the MMT and NMT conditions, $F(1, 178) = 0.51$, $p = .47$. The main effect for fake news versus real news posts was not significant, $F(1, 178) = 2.12$, $p = .15$. The interaction effect for the between-conditions and news post type was not significant, $F(1, 178) = 3.31$, $p = .07$. Hypothesis 4 not was supported. See Table 5 for full report of repeated-measures ANCOVA results.

Pearson correlation analysis resulted in a significant positive relationship between self-reported comprehension and MMT preference. As reported, comprehension increased with the increase in MMT preference. See Table 12 for correlations between comprehension and covariates.

Table 12: Correlations Between Comprehension and Covariates

Table 12: Correlations between Comprehension and Covariates.									
Variable	1	2	3	4	5	6	7	10	12
Comprehension									
1. Fake News Global Warming									
2. Fake News COVID	.303**								
3. Fake News Online Privacy	.378**	.408**							
4. Fake News Abortion	.380**	.301**	.475**						
5. Real News Global Warming	.362**	.335**	.416**	.502**					
6. Real News COVID	.392**	.385**	.476**	.585**	.440**				
7. Real News Online Privacy	.300**	.319**	.476**	.378**	.465**	.474**			
8. Real News Abortion	.147*	.184*	.302**	.290**	0.122	.232**	.155*		
Covariates									
9. MMT Preference	0.11	0.144	.232**	0.115	0.079	0.081	.159*		
10. Arousal Fake News Online Privacy	0.089	.178*	.198**	0.099	0.081	0.093	.175*		
11. Valance Real News Global Warming	-0.038	0.121	0.137	0.052	0.068	-0.002	.209**	0.021	
12. Arousal Real News Online Privacy	.151*	-0.046	.155*	0.039	0.134	0	.211**	.507**	

Similar to my other dependent variables, a repeated-measures ANCOVA was run with additional tasks (did additional task(s) during the study; did not do additional tasks during the study) as a between-subjects factor, condition (multitasking, no multitasking) as a between-subjects factor, and type of news post (real, fake) as a within-subjects factor to compare comprehension across the conditions. No significant results were found. See Table 7 for ANCOVA results.

Counterarguing

Hypothesis 5 predicted that the MMT condition would score low in counterarguing, when compared with the control condition. Research Question 4 inquired about the differences in measured counterarguing elicited by fake news posts versus real news posts between the MMT and control condition. A repeated-measures ANCOVA with multitasking manipulation as a between-subjects factor and type of news post (real, fake) as a within-subjects factor was conducted to compare the counterarguing for the eight different articles: fake news post on global warming, fake news post on abortion, fake news post on online privacy, fake news post on

COVID-19, real news post on global warming, real news post on abortion, real news post on online privacy, and real news post on COVID-19. MMT preference was used as a control variable. The main effect of MMT was not significant, $F(1, 179) = 0.99$, $p = .32$. No significance was found for the main effect to fake news posts versus real news posts, $F(1, 179) = 1.28$, $p = .26$. The interaction effect for MMT condition and news post type was not significant, $F(1, 179) = 0.88$, $p = .35$. Hypothesis 5 not was supported. See Table 5 for full report of repeated-measures ANCOVA results.

Results from the Pearson correlation indicated significant positive correlations between reported counterarguing and arousal reported for global warming, COVID-19, and online privacy; valence reported for COVID-19; and MMT preference scores. See Table 13 for correlations between comprehension and covariates.

Table 13: Correlations Between Counterarguing and MMT Preferences

Table 13: Correlations between Counterarguing and MMT Preferences.

Variable	1	2	3	4	5	6	7
Counterarguing							
1. Fake News Global Warming							
2. Fake News COVID	.529**						
3. Fake News Online Privacy	.557**	.611**					
4. Fake News Abortion	.577**	.535**	.434**				
5. Real News Global Warming	.336**	.493**	.449**	.526**			
6. Real News COVID	.442**	.542**	.491**	.399**	.382**		
7. Real News Online Privacy	.448**	.553**	.506**	.460**	.513**	.523**	
8. Real News Abortion	.230**	.186*	.195**	.215**	.267**	.290**	.315**
Covariates							
9. MMT Preference	.255**	.336**	.281**	.366**	.338**	.304**	.358**

Another repeated-measures ANCOVA was run with additional tasks (did additional task(s) during the study; did not do additional tasks during the study) as a between-subjects factor, condition (multitasking, no multitasking) as a between-subjects factor, and type of news post (real, fake) as a within-subjects factor to compare counterarguing across the conditions. There was no significant difference found for the main effects of news type, MMT condition, and additional task. The interaction between additional tasks and fake/real news posts was

significant, $F(1, 177) = 4.89$, $p = .03$, $n^2 = .00$. See Table 7 for ANCOVA results. A simple-effects analysis showed not significant differences.

Perceived Credibility

Hypothesis 6 predicted that participants in the MMT condition would be more likely to perceive fake news as credible, while in the NMT (control) condition, participants would evaluate real news as more credible than fake news. A repeated-measures ANCOVA with multitasking manipulation as a between-subjects factor and type of news post (real, fake) as a within-subjects factor was conducted to compare the perceived credibility reported for the eight different articles: fake news post on global warming, fake news post on abortion, fake news post on online privacy, fake news post on COVID-19, real news post on global warming, real news post on abortion, real news post on online privacy, and real news post on COVID-19. Arousal, valence, and MMT preference were used as control variables. There was no significance for the main effect of MMT, $F(1, 172) = 0.13$, $p = .716$. The main effect of fake news posts versus real news posts was also not significant, $F(1, 172) = 0.39$, $p = .53$. No significance was found for the interaction effect of multitasking and news post type, $F(1, 172) = 1.53$, $p = .22$. Hypothesis 6 not was supported. See Table 5 for full report of repeated-measures ANCOVA results.

A Pearson correlation that indicated significant positive correlations between reported perceived credibility and arousal reported for global warming, COVID-19, and online privacy; valence reported for COVID-19, online privacy, and abortion; and MMT preference scores. As arousal, valence, and MMT preference increased, perceived creditability also increased. See Table 14 for correlations between perceived credibility and covariates.

Table 14: Correlations Between Perceived Credibility and Covariates

Table 14: Correlations between Perceived Credibility and Covariates.												
Variable	1	2	3	4	5	6	7	10	12	13	14	15
Perceived Credibility												
1. Fake News Global Warming												
2. Fake News COVID	.586**											
3. Fake News Online Privacy	.606**	.586**										
4. Fake News Abortion	.365**	.502**	.545**									
5. Real News Global Warming	0.128	.386**	.273**	.280**								
6. Real News COVID	.447**	.482**	.494**	.562**	.286**							
7. Real News Online Privacy	.331**	.453**	.490**	.506**	.457**	.436**						
8. Real News Abortion	.499**	.482**	.528**	.478**	.405**	.478**	.450**					
Covariates												
9. MMT Preference	.696**	.489**	.473**	.354**	-0.036	.407**	.261**					
10. Arousal Fake News Global Warming	.511**	.512**	.674**	.471**	.149*	.447**	.419**					
11. Valance Fake News Online Privacy	.149*	0.141	.161*	.195**	.148*	.363**	.244**	.272**				
12. Arousal Real News COVID	.487**	.378**	.458**	.393**	0.07	.597**	.370**	.655**				
13. Valance Real News COVID	.313**	.423**	.481**	.419**	.289**	.355**	.711**	.455**	.431**			
14. Valance Real News Online Privacy	.412**	.466**	.445**	.440**	.239**	.452**	.348**	.667**	.579**	.371**		
15. Valance Real News Abortion	.357**	.408**	.438**	.360**	.150*	.380**	.324**	.477**	.412**	.400**	.282**	

Another repeated-measures ANCOVA with additional tasks (did additional task(s) during the study; did not do additional tasks during the study) as a between-subjects factor, condition (multitasking, no multitasking) as a between-subjects factor, and type of news post (real, fake) as a within-subjects factor to compare the perceived credibility across conditions. Significant results were found for the main effect of MMT condition, $F(1, 171) = 4.37$, $p = .04$, $n^2 = .03$ as well as a main effect for news post type, $F(1, 171) = 3.47$, $p = .03$, $n^2 = .02$. For the main effect of condition, participants in the MMT condition ($M = 2.68$) perceived the news posts to be less credible, when compared to those in the NMT (control) condition ($M = 3.04$). See Table 7 for ANCOVA results.

Viral Behavioral Intentions

Hypothesis 7 predicted that viral behavioral intentions (VBI) would be higher in the MMT condition, when compared with the control condition. Research Question 5 asked about the differences in VBI for fake news posts versus real news posts between the MMT condition

and control condition. A repeated-measures ANCOVA with multitasking manipulation as a between-subjects factor and type of news post (real, fake) as a within-subjects factor was conducted to compare VBI reported for the eight different articles: fake news post on global warming, fake news post on abortion, fake news post on online privacy, fake news post on COVID-19, real news post on global warming, real news post on abortion, real news post on online privacy, and real news post on COVID-19. Both arousal and valence were used as controls. In addition, MMT preference was also used as a covariate. No significance was found for the main effect of MMT, $F(1, 177) = 0.65$, $p = .42$. There was no significance for the main effect of fake news posts versus real news posts, $F(1, 177) = 0.84$, $p = .36$. For the interaction effect for MMT condition and news post type, there was also no significance, $F(1, 177) = 0.63$, $p = .43$. Hypothesis 7 not was supported. See Table 5 for full report of repeated-measures ANCOVA results.

Pearson correlation results indicated significant positive associations between reported VBI and arousal reported for global warming and COVID-19, valence reported for global warming and abortion, and MMT preference scores. Perceived VBI scores increased when arousal reported for global warming and COVID-19, valence reported for global warming and abortion, and MMT preference scores increased. See Table 15 for correlations between VBI and covariates.

Table 15: Correlations Between VBI and Covariates

Table 15: Correlations between VBI and Covariates.

Variable	1	2	3	4	5	6	7	10	12	13
VBI										
1. Fake News Global Warming										
2. Fake News COVID	.759**									
3. Fake News Online Privacy	.821**	.820**								
4. Fake News Abortion	.703**	.809**	.778**							
5. Real News Global Warming	.583**	.654**	.660**	.673**						
6. Real News COVID	.738**	.780**	.769**	.825**	.638**					
7. Real News Online Privacy	.698**	.753**	.817**	.766**	.754**	.726**				
8. Real News Abortion	.812**	.859**	.844**	.835**	.660**	.812**	.753**			
Covariates										
9. MMT Preference	.432**	.539**	.500**	.510**	.471**	.488**	.492**			
10. Valance Fake News Global Warming	.692**	.490**	.523**	.418**	.210**	.503**	.366**			
11. Arousal Real News COVID	.231**	.411**	.287**	.337**	.161*	.249**	.189*	.258**		
12. Arousal Real News Onlne Privacy	.481**	.560**	.459**	.471**	.341**	.486**	.459**	.488**		
13. Valance Real News Abortion	.491**	.526**	.475**	.514**	.352**	.543**	.386**	.542**	.491**	

For VBI, a repeated-measures ANCOVA was run with additional tasks (did additional task(s) during the study; did not do additional tasks during the study) as a between-subjects factor, condition (multitasking, no multitasking) as a between-subjects factor, and type of news post (real, fake) as a within-subjects factor to compare the perceived VBI scores across conditions. Significant results were found for the main effect of real/fake news posts, $F(1, 177) = 6.62$, $p = .01$, $n^2 = .04$. Participants reading fake news posts ($M = 3.4$) were more likely to share when compared with those reading real news posts ($M = 3.12$). See Table 7 for ANCOVA results.

Additional Analysis

Additionally, this next analysis was not motivated by the original set of hypotheses. However, MMT preference has consistently predicted the outcome variables. Thus, I ran a series of repeated-measures ANCOVAs with MMT preference (high preference, low preference) as a between-subjects factor, condition (multitasking, no multitasking) as a between-subjects factor, and type of news post (real, fake) as a within-subjects factor to compare the dependent variable scores across the conditions. For this analysis, the MMT preference variable was transformed into a binary variable using a median split (4.50 medium split) of the original continuous MMT preference variable. MMT originally had a maximum of 7 and a minimum of 1.36.

Cognitive Load

An ANCOVA included cognitive load as a DV and additional tasks, arousal, and valence as control variables. There was a significant main effect of MMT preference on cognitive load, $F(1, 175) = 9.86$, $p = .001$, $n^2 = .05$. Participants with higher MMT preference ($M = 4.41$) reported higher cognitive load, compared with low MMT preference ($M = 3.7$). See Table 16 for MMT preference ANCOVA results.

Table 16: MMT Preference Repeated Measures ANCOVA Results

Table 16: MMT Preference Repeated Measures ANCOVA Results.		F	df	p	Eta Squared	Power
Cognitive Load						
	Condition	0.02	1	0.89	0.00	0.05
	MMT Preference	9.86	1	0.00	0.05	0.88
	Real/Fake News Post	0.35	1	0.55	0.00	0.09
	Condition x MMT Preference	0.13	1	0.72	0.00	0.07
	Condition x Real/Fake News Post	0.56	1	0.46	0.00	0.12
	Additional MMT Preference x Real/Fake News Post	0.79	1	0.38	0.00	0.14
	Condition x MMT Preference x Real/Fake News Post	2.26	1	0.13	0.01	0.32
Comprehension						
	Condition	0.67	1	0.41	0.67	0.13
	MMT Preference	4.55	1	0.03	0.03	0.56
	Real/Fake News Post	0.39	1	0.53	0.00	0.10
	Condition x MMT Preference	0.76	1	0.39	0.76	0.14
	Condition x Real/Fake News Post	0.28	1	0.60	0.00	0.08
	Additional MMT Preference x Real/Fake News Post	0.38	1	0.54	0.00	0.09
	Condition x MMT Preference x Real/Fake News Post	0.47	1	0.50	0.00	0.10
Counterarguing						
	Condition	0.19	1	0.66	0.19	0.07
	MMT Preference	35.58	1	0.00	0.17	1.00
	Real/Fake News Post	1.22	1	0.27	1.22	0.20
	Condition x MMT Preference	1.08	1	0.30	1.08	0.18
	Condition x Real/Fake News Post	0.83	1	0.36	0.83	0.15
	Additional MMT Preference x Real/Fake News Post	0.36	1	0.55	0.36	0.09
	Condition x MMT Preference x Real/Fake News Post	0.00	1	0.98	0.00	0.05
Credibility						
	Condition	4.85	1	0.03	0.03	0.59
	MMT Preference	0.39	1	0.54	0.00	0.10
	Real/Fake News Post	6.70	1	0.01	0.04	0.73
	Condition x MMT Preference	0.42	1	0.52	0.00	0.10
	Condition x Real/Fake News Post	0.04	1	0.84	0.00	0.06
	MMT Preference x Real/Fake News Post	1.35	1	0.25	0.01	0.21
	Condition x MMT Preference x Real/Fake News Post	0.37	1	0.55	0.00	0.09
VBI						
	Condition	0.69	1	0.41	0.00	0.13
	MMT Preference	22.40	1	0.00	0.11	1.00
	Real/Fake News Post	10.10	1	0.00	0.05	0.89
	Condition x MMT Preference	0.03	1	0.87	0.00	0.05
	Condition x Real/Fake News Post	0.03	1	0.87	0.00	0.05
	Additional MMT Preference x Real/Fake News Post	0.29	1	0.59	0.00	0.08
	Condition x MMT Preference x Real/Fake News Post	0.13	1	0.72	0.00	0.07

Fake News Detection

A one-way ANOVA was conducted with the main factor of MMT preference. There was a significant effect found for detecting fake news posts for MMT preferences, $F(1, 184) = 9.63$, $p = .002$. Those with lower MMT preferences ($M = .60$) more accurately detected fake news posts when compared to those with higher MMT preferences ($M = .55$).

Fake News Source and Post Recognition

An additional one-way ANOVA was conducted to determine the differences between high and low MMT preferences for fake and real new recognition at the source and post levels. There was no significant effects found at the level of source for fake news recognition, $F(1, 184) = .22$, $p = .64$, or for real news recognition, $F(1, 184) = 1.78$, $p = .18$. Further, there was not significant difference found at the level of news post for fake news recognition, $F(1, 184) = 3.21$, $p = .07$, but there was a significant effect found for real news recognition, $F(1, 184) = 16.24$, $p = .001$. Those with low MMT preferences. ($M = .80$) were better at recognizing real news posts than those with higher MTM preferences ($M = .69$).

Comprehension

An ANCOVA included comprehension as a DV and additional tasks, arousal, and valence as control variables. A significant main effect for MMT preference was found, $F(1, 175) = 4.55$, $p = .03$, $n^2 = .03$. Participants with high MMT preference ($M= 5.23$) reported higher comprehension scores, when compared with low MMT preferences ($M = 4.91$) resulting in low comprehension scores. See Table 16 for MMT preference ANCOVA results.

Counterarguing

An ANCOVA included counterarguing as a DV and additional tasks, arousal, and valence as control variables. The main effect of MMT preference was significant, F(1, 175) =

35.38, $p = .00$, $n^2 = .17$. Participants with high MMT preferences ($M = 4.73$) reported higher counterarguing scores, when compared with low MMT preferences ($M = 3.68$), which resulted in lower counterarguing scores. See Table 16 for MMT preference ANCOVA results.

Perceived Credibility

An ANCOVA included credibility as a DV and additional tasks, arousal, and valence as control variables. There was a significant main effect for condition, $F(1, 171) = 4.85$, $p = .03$, $n^2 = .03$, and for news post type, $F(1, 171) = 6.7$, $p = .01$, $n^2 = .04$. Note that the main effects of MMT and news type are significant in this ANCOVA but they were not significant in the primary analysis. This may be due to a Type 1 error. Participants in the MMT condition ($M = 2.66$) reported lower perceived credibility scores, when compared with the NMT (control) condition ($M = 3.03$) reporting low perceived credibility scores. For news post type, reported perceived credibility scores were low for fake news posts ($M = 2.82$) when compared to real news posts ($M = 2.88$) which results in higher perceived credibility scores. See Table 16 for MMT preference ANCOVA results.

Viral Behavioral Intentions

An ANCOVA included VBI as a DV and additional tasks, arousal, and valence as control variables. Significant main effects were found for MMT preference, $F(1, 171) = 22.40$, $p = .001$, $n^2 = .11$, and for condition, $F(1, 171) = 10.10$, $p = .01$, $n^2 = .05$. Participants with high MMT preferences ($M = 3.75$) reported lower VBI, when compared with low MMT preferences ($M = 2.77$). The main effects of MMT condition are significant in this ANCOVA but they were not significant in the primary analysis. This may be due to a Type 1 error. For condition, reported VBI scores were lower in the MMT condition ($M = 3.18$), when compared to the NMT condition ($M = 3.34$). See Table 16 for ANCOVA results.

Chapter 8: Discussion

Summary of Results

The present study revealed a number of important findings. There was a significant main effect for fake news detection between the media multitasking (MMT) and non-multitasking (NMT) conditions. However, this effect was in the opposite direction from what was predicted. That is, those in the MMT condition detected fake news better than those in the NMT condition. It was expected that participants in the NMT condition would have more cognitive resources that are not depleted by an additional task of viewing the Netflix show and, thus, be able to detect fake news with more efficiency.

This result could be partially explained by emotional processing factors that could affect cognition. Lee and Lang (2015) found a curvilinear relationship between arousal (part of emotional processing) and cognition. Low arousal (e.g., just reading the news posts in this study) could have resulted in lower levels of cognition; medium arousal (e.g., adding a TV show to the task of reading the news posts in this study) increases cognition; and high arousal levels lead to cognitive overload. In this study, the multitasking condition did not seem to have produced a cognitive overload. At the same time, watching a show might have added some excitement to the task of news post reading, which, at the end, resulted in a higher level of fake news detection for people who multitasked compared to people who did not.

The effects of media multitasking and news type on news source and news post recognition were not significant. There was no difference in recognition for news source in the MMT condition when compared to the NMT condition, and the same was found for news post recognition. The analysis with comprehension, counterarguing, perceived credibility, and viral behavioral intentions (VBI) as dependent variables all, similarly, resulted in that there were no

differences between the MMT condition and the NMT condition. This indicates that the present study's MMT condition was not producing similar results to past MMT studies (Armstrong & Chung, 2000; Furnham, Gunter, & Peterson, 1994; Ravizza et al., 2014).

There are several possible reasons why this study's results differ from past MMT studies. First, the nature of online experiments is limited by decreased control over manipulation and control conditions in the experiment. In other words, it was not possible to take the necessary precautions to limit participants from taking on or participating in other tasks during the study or be completely honest with the researcher about it. Second, the stimuli used in the present study (the Netflix show episode) could have also posed a limitation as it may not have been distracting enough to reproduce the results to past studies. This means that media multitasking is a broad overarching concept that can hold diverse meanings and yet to be defined in parsimonious theoretical terms. Additional discussion on this matter is provided below.

Upon further analysis, it was discovered that participating in additional, not manipulated, tasks during an online experimental procedure may be a factor into cognitive processing. In the additional analysis beyond hypothesized effects, results indicated that counterarguing scores were higher for fake news posts for those participants who engaged in doing additional (not manipulated) tasks during the study compared to those who followed the study instructions and did not report doing additional, not manipulated tasks.

The lowest counterarguing scores were found for those not doing additional tasks and doing additional task while reading real news posts. This indicates two key insights: 1) participants tried to find flaws in fake news more than in real news posts and 2) those doing additional tasks tried to find flaws more than those not doing additional tasks. This is very interesting because it speaks to one's perceived ability or motivation to counterargue and look

for flaws in suspected false information, indicating that people may be more able to scrutinize fake news.

Further, self-reported counterarguing scores increased for those who reported doing additional tasks regardless of fake/real news post type compared to those who did not report doing additional tasks. Yet again, this result is in the opposite direction from what was expected (as one would expect increased counterarguing score for those not engaged with any additional tasks). At the same time, this finding supports an earlier claim from prior theoretical literature (Van Cauwenberge, Schaap, & Van Roy, 2014) that engagement in additional tasks may be stimulating for individuals to increase cognitive processing in the form of counterarguing and decrease it for individuals focusing on only one task.

Another interesting finding was the interaction results of the three study independent variables: MMT, additional tasks, and news type, for perceived credibility. Regardless of MMT condition or additional task, fake news posts were consistently perceived as less credible than real news posts. Further, those in the MMT condition perceived all news types are less credible compared to those in the NMT condition. Finally, those not doing additional tasks perceived all news types as less credible than those doing additional tasks. Those in the MMT condition doing additional tasks perceived fakes news posts as the least credible compared to all other scenarios. If we think of the result of this three-way interaction in terms on cognitive load, MMT/no additional tasks/fake news posts, MMT/no additional tasks/real news posts (the two lowest credibility scores) and NMT/additional tasks/fake news posts NMT/additional tasks/real news posts (the two highest credibility scores) could fall into the medium cognitive load range (Lee & Lang, 2015) and, thus, produce the lowest perceived credibility scores. Whereas, what could be considered to produce the highest cognitive load (MMT/additional tasks/fake news posts,

MMT/additional tasks/real news posts) and the lowest cognitive load (NMT/no additional tasks/fake news posts, NMT/no additional tasks/real news posts) were associated with higher perceived credibility scores.

Finally, the main effect of news types in terms of viral behavioral intentions (VBI) was indicated when additional tasks and media multitasking variables were both included in the analysis. Fake news posts where more likely to be shared online compared to real news posts. This finding requires additional research and exploration to provide meaningful explanation.

The results associated with the effects of engagement with additional tasks, while not supporting the proposed hypotheses, eluded that further examination was needed than just the main manipulation of multitasking, and that other constructs may have been impacting the outcome variables more so than multitasking. For example, the control variable – MMT preference – was important here. The MMT preference variable was correlated with all dependent variables. And so, it was important to examine this finding with further analysis.

After running a similar analysis to the initial analysis, with MMT preference transformed by median split into a categorical variable including two groups of participants with high preference and low preference for MMT, the variable was then used as an independent variable rather than a control variable. This additional statistical analysis indicated that MMT preferences played a key role in predicting cognitive load, comprehension, counterarguing, and VBI. Those with higher MMT preferences reported increased cognitive load, comprehension, counterarguing, and intention to share, but perceived credibility was not impacted by this factor.

Running the additional statistical analysis with MMT preferences as an independent variable produced some interesting results for comprehension and counterarguing – both well-established cognitive processing measures. Those that indicated high MMT preferences resulted

in increased comprehension and counterarguing scores when compared to those that expressed low MMT preferences. This signals that MMT preference plays a key role in cognitive processing (specifically comprehension and counterarguing) indicating that MMT preference may be a considerable measurement in further research and that high MMT preferences produced increased comprehension and counterarguing scores – an intuitively adverse result. One would expect that low preference for MMT would result in higher comprehension and counterarguing scores. It is possible that due to the current demands for switching tasks frequently in work, school, and life in general we have adapted to the cognitive demands that multitasking requires. It is also possible that those with a preference toward multitasking are better practiced at switching tasks and, thus, miss less information when doing so despite some research suggesting the opposite (Ophir, Nass, & Wagner, 2009). It is also possible that setting the expectation that participation would require more than one task, thus increasing cognitive load (via multitasking condition) may have set their expectations of cognitive load (Lin, Schulz, & Straube, 2016) and therefore their cognitive resources increase. The present study gave detailed instructions in multitasking in this MMT condition. This may have allowed respondents to set the expectation of increased cognitive load, allowing them to adjust their resources allocated. Future research should examine the concept of task load expectation in multitasking situations.

At the same time, it is possible that this result was due to self-reported nature of the variables. Those who reported high preference for multitasking also reported higher levels of comprehension and counterarguing. However, comprehension and counterarguing were measured as perceived variables, thus, they did not reflect actual levels of cognitive processing of the news posts. Considering MMT preference as an additional dimension to MMTs effect on

cognitive processing allows us to examine MMT effect from another angle. In future studies, MMT preference should be measured and analyzed as a continuous moderator variable.

Furthermore, significant main effects of MMT and news types on perceived credibility were found when controlled for MMT preference. Those in the MMT condition were less likely to perceive the news posts as credible when compared to those in the NMT condition. Further, participants reported lower perceived credibility for fake news post than for real news posts. This finding may allude to some sort of cognitive defense mechanism. In situations when people are unable to fully process the information, they default to perceiving the information as less credible. Although this result is inconsistent with Truth Default Theory (Levine, 2014), where people tend to default to believing information to be true, though Truth Default Theory is yet to be tested in media multitasking and other media-related distraction situations. Future research should apply Truth-Default Theory to explain and predict the effects of multitasking environments.

Another finding here is that the fake news posts were perceived a less credible than real news posts. In other words, regardless of the MMT condition, people were still able to pick out the fake news posts and respond accordingly, which is also inconsistent with Truth Default Theory. Perhaps the sample of the participants who leaned to be more liberal and Democrat supporting influenced their perception of fake and real news. It would be interesting and important to further explore this result in future studies.

Interestingly, the main effect of the MMT manipulation on VBI that was not found significant in the initial analyses was present in follow-up analyses when controlled for additional tasks and exploring the interaction between MMT and MMT preference. This finding could be explained by a Type I error as many variables were added to the analysis, thus the

interpretation of this result should be interpreted with caution. Overall, those in the MMT condition reported lower intentions to share news posts compared to those in the NMT condition. It is possible that doing multiple tasks may decrease the intention to engage in additional behaviors, such as online content sharing. To support this conclusion, it was found that the MMT preference was also a significant negative predictor of VBI. Those with high MMT preference reported lower VBI, compared to those with low MMT preferences. Perhaps exploring preferences for certain tasks would be beneficial here. Could sharing online news posts be a task of secondary significance to high-MMT-preference individuals who had their time occupied by engaging in multiple other activities?

Another, key finding that is important to mentioned are the correlation results between each outcome variable and emotional responses (i.e., arousal and valence). In most cases (exceptions being counterarguing and comprehension), there was a positive correlation, meaning that as arousal/valence scores increased (moving from less to more arousal and from negative to positive valence), cognitive load, perceived credibility, and VBI also increased. As people reported higher arousal by a news post, their cognitive load increased. Past studies (Lang, 2000; 2006; Lang, Chung, Lee, Schwartz, & Shin, 2005) indicate that increased cognitive load and, eventually, cognitive overload, is a predictor of decreased information processing abilities. Similarly, perceived credibility was also correlated with arousal and valence in the directions outlined above. As arousal and valence increased participants found the news post to be more credible regardless of the fake or real post type. This could suggest that increased emotional responses may impact our ability to cognitively process information. It is also important to note that the two information processing measures in this study, counterarguing and comprehension, were not significantly correlated with arousal and valence. As this effect could be due to the

perceived nature of the two measures, stimuli limitations, or the nature of two-dimensional emotional processing (i.e., high arousal/positive response; high arousal/negative response; low arousal/positive response; low arousal/negative response) where each response quadrant warrants a varying flight of fight reaction. This is something that could be examined in future studies.

Limitations

There are several limitations to this study. The first and, arguably, the most impactful limitation was the ability to control the multitasking condition. This study was conducted online due to the COVID-19 pandemic. I could not invite participants to a physical lab space where I could control media multitasking manipulation, i.e., ensure that participants who were in the NMT condition did not multitask and that the participants in the multitasking condition did multitask by watching the Netflix show episode. While several control variables were measured and attention checks were implemented, it seems that some respondents in the NMT condition did multitask with tasks like talking or texting on their phones, speaking in person to their spouse or child, and/or watching television in the background. However, given the opportunity, changing the format of the study from an online to an in-person experiment (as originally intended during the pre-pandemic times) may impact the outcome of this study. Future research examining MMT and fake news should try to replicate findings in a lab setting, where MMT can be fully controlled.

A second limitation in this study was the stimuli. News posts were collected from snopes.com, a well-established fact-checking website. Both true and false articles were collected from this website and modified to fit the study needs. In other words, news posts were built as minimally as possible, with 30–60 words and a headline.

In addition, while both fake news and real news posts were created for each topic (e.g., a global warming fake news post and a global warming real news post), the articles were not the same due to the implementation of within-subjects design. It is possible that different news posts that addressed different topics produced different levels of emotional response and, therefore, affected the results of the study. Future researchers should improve upon the study by using (a) news posts that are replicated to build ecological validity (e.g., mimic a Facebook news post with a headline, photo, and short blurb) and (b) between-subjects experimental designs to replicate similar news posts, one that is fake and one that is real.

A third limitation of this study is the sample population. Data were collected in partnership with Qualtrics survey platform, using their panel. It was brought to the researcher's attention that the incentives participants received to participate in a Qualtrics study were limited and seemingly not motivating. Thus, the quality of responses in this study had the potential to be higher. In addition, the sample reported to be more liberal and leaning toward Democrats, which could limit the variability of responses to fake and real news posts. Future research should replicate this study with higher incentives to increase motivation for quality and engaged participation and use more politically and ideologically diverse stimuli and samples.

A fourth limitation is that this study solely examined only media-related multitasking (MMT). As we know, there are many different types of multitasking (e.g., walking and talking, cooking and watching television, etc.) that may impact our ability to counterargue, comprehend, and make credibility judgments. Thus, future research should examine multiple forms of multitasking, such as media-to-media multitasking, non-media–to–media multitasking, and so on. Wang Irwin, Cooper, and Srivastava (2015) showed that multitasking situations may be classified based on 11 dimensions including key items such as user differences, time pressure,

emotional content, task switching, and so on. The possibilities to manipulate this media use behavior are limitless. At the sample time, media multitasking and general multitasking research is in high need of theoretical development similar to Wang et. al. (2015) efforts to systematize the research on this media use phenomenon and its effects on cognition, emotion, and behavior.

A fifth possible limitation of this study is the manipulated secondary task (the Netflix show *The Battle Fish*). Initially, lower levels of familiarity and higher levels of involvement were sought for the media task. However, results from the pretest indicated that none of the tested shows were that involving. Thus, the television show may not have been distracting enough to influence the outcome variables as past MMT research has shown. In future research, it may be beneficial to the study to increase the level of involvement and possibly measure engagement as well.

A sixth limitation is that the present study did not measure the amount of time it took for each participant to complete the primary task. It is possible that there were time differences between the media multitasking condition and the non-multitasking condition. Future research should measure this variable as control as it may provide additional insights into the amount of cognitive load each condition produced.

Additionally, it's possible that there were generational differences in participants' abilities to process information while multitasking (Voorveld, & Goot, 2013; Carrier, Cheever, Rosen, Benitez, & Chang, 2009). The present study did not examine these differences in detail. Both future analysis and future research should take age and generation factors into consideration when designing proceeding studies.

Finally, this present study examined only dual-screen MMT (e.g., television and device). We know from past research (Kononova, McAlister, & Oh, 2018) that there are some cognitive

effects of multitasking with more than two screens (e.g., phone, computer, and television) and activities (e.g., media-related and non-media-related). In future studies, the effects of these multitasking tasks should also be considered in the study design.

Theoretical and Practical Implications

The results of the present study have a number of major theoretical implications. First, this study examined the Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) framework, which hinges on limited capacity for processing information (Lang, 2006). In other words, as individuals reach their respective cognitive capacity, their processing abilities decrease, thus increasing the chances for missed information. In the present study, it was hypothesized that fake news would not be detected as effectively in the MMT condition as it would in the NMT condition. Results indicated that this was not the case. In fact, the results of the present study indicated that the opposite effect takes places—individuals were better at detecting fakes news posts when they were multitasking with media compared to those who were not multitasking. While this could indicate some possible flaws in the LC4MP framework, it could also indicate that the present demands for multitask have made us more adapted to multitasking and its effects. Lin, Lee, and Robertson (2012) suggest that the brains of the next generation are indeed shaped by the increased technology usage and high demand for multitasking. Though, it is important to reiterate the limitations including the method (e.g., online experiment), the limitation within the second task (e.g., it is possible the stimuli was not distracting enough), and the limitations within the primary task given (i.e., the task may not have utilized a large amount of cognitive resources).

Second, this study contributes to the literature on the processing deceiving information online while multitasking with media. Results indicated that our primary cognitive measures

(detecting fake news, cognitive load, comprehension, counterarguing, and perceived credibility) were not impacted by the media multitasking manipulation. In other words, there was no differences in cognitive processing for those in the MMT condition compared to those in the NMT condition. Unexpectedly, the more successful measure in the present study related to multitasking was the additional tasks variable. This variable indicated whether participants engaged in other tasks not relevant to the study procedure while participating. This variable did produce some significant results. This suggests that organically occurring media multitasking (e.g., voluntary multitasking, Kononova, Joo, Yuan, 2017) could affect people's cognition differently from multitasking imposed on participants and producing involuntary distraction.

Moreover, this study showed that MMT preferences, arousal, and valence were correlated with the outcome variables (detecting fake news, cognitive load, comprehension, counterarguing, and perceived credibility). This implies that there is more to online fake and real news processing than just multitasking. Both emotional processing and individual differences (e.g., MMT preference) are important for cognitive information processing. These results are consistent with the results from the Shen et al. (2019) study, which found that individual differences are more important in detecting fake news than the act of multitasking or attention switching itself. This suggests a shift in terms of manipulating and measuring multitasking, in that, today, it may not be as important to manipulate multitasking (especially, as forced, imposed distraction) as is it to measure MMT preferences that could reflect people's long-term daily routines.

As mentioned above, multitasking can mean many different things (Wang et. al., 2015). For instance, one can drink a beverage and think simultaneously, while others can do dishes and have a conversation. In relation to media multitasking, this behavior also has different dimensions. For example, one could be watching a show on one screen, playing a video game on

a second screen, and texting on a third screen. Or, like in the present study, one could be asked to watch a show and read online news post while talking to a family member or texting a friend. Thus, from a theoretical standpoint, there should be more theoretical approaches developed to studying media multitasking that go beyond the general term that can mean very different things.

As we moved into remote data collection during the pandemic, testing the effect of media multitasking was difficult. The lack of control that one would normally have through a lab experiment was lost due to remote data collection. In other words, there was not a standard approach studying multitasking remotely. This study produced results that allude to the fact that simply asking someone to watch TV and read a news post may not be a successful measure for understanding media multitasking remotely. What I learned from conducting this study was adding a control variable to account for all possible tasks not relevant to the study procedure in addition to the study manipulation. In the future, I plan to include two different categorical variables as factors. The first variable would be how many tasks one participated in while doing the experiment. The second variable would be related to task types to understand the nature and the effects of the additional tasks (e.g., media-related and non-media related) better. Finally, it might be a more effective approach to measure and explore the effects of MMT preference as an individual difference rather than manipulate MMT conditions, as the MMT preference seems to be a more consistent and reliable predictor of media users' cognition and behavioral intentions.

Finally, another significant contribution this study made to theory is understanding the behavioral intentions to share fake news, while not reporting online news information to be credible. Could this be that emotional processing (which is consistent with the correlation results in this study) was a stronger predictor of sharing intentions than perceptions of information

credibility. Sudhir and Unnithan (2019) suggested arousal plays a key role in predicting sharing behaviors. This may help explain why fake news posts spread with such voracity.

One of the main findings of this study has some major practical implications. In my main analysis, I found that people were able to detect fake news as fake more accurately when they multitasked, opposite as expected, and predicted in my hypothesis. Information sharing is part of why studying fake news is so imperative. The present study sheds light on the processing circumstances in which one would share fake news versus real news. By itself, MMT does not seem to have an impact on sharing (VBI). Nor did the news post type, whether it was a fake news or real news post, impact intentions to share the information. For VBI, people were more likely to share fake news, but only when we added in the context of adding the additional task variable. Practically speaking, this indicates that possibly some non-media related tasks may have a large cognitive impact the specifically watching TV and reading news posts. Realistically, there are some limiting factors in this study (i.e., cognitive load of the primary and secondary and collecting) that may have impacted the results. Though, this effect still calls for an emphasis on the importance of education for fake news posts (helping people to understand the differences between fake and real news posts and the importance stop sharing fake information) and self-regulation when it comes to all forms of multitasking.

Conclusion

The main purpose of this study was to understand gaps in the MMT literature, specifically, how MMT impacts cognitive processing of deceptive messages, or fake news posts. Results indicated that the manipulated MMT does not hinder the ability to detect fake news posts. MMT, in this study, also did not influence counterarguing, comprehension, perceived credibility, or VBI. What did was the multitasking situations in which participants engaged

organically and which they reported in the study. This study results indicate that those participating in additional tasks while completing the study have the highest counterarguing scores for fake news posts. this means participants were able to discern flaws in the fake news posts even when their cognitive load increased with additional tasks. Perceived credibility was also influenced by additional tasks – those that were media multitasking but were not doing additional tasks perceived fake news posts as the least credible and no media multitasking/additional tasks perceived the real news articles as the most credible. This is interesting because these results indicate that participants are able to media multitask to an extent. However, as additional tasks were added to their load, their cognitive processing decreased.

Findings of this study also led to a deeper understanding of what could add to the effects of organic (voluntary) media multitasking on cognitive processing, detecting fake news, and ones' motivation to share fake news posts. It was brought to light that emotional processing may lead to high VBI and that MMT preference played a key role in one's ability to process information. Thus, the primary conclusion of this dissertation research is that manipulated MMT may be less influential with regard to impacting cognitive processing measures than other constructs, such as organic MMT in which participants engage while completing the study, MMT preference, and arousal and valence elicited by media content, specifically fake or real news posts. Further research analysis is needed to understand the impact of MMT preference on cognitive processing measures (e.g., counterarguing, cognitive load, credibility, etc.). More research is also needed to replicate the findings of this study and further understand MMT preferences in relation to online deceptiveness.

APPENDICES

APPENDIX A:

Non-Multitasking Survey

Q1 CONSENT FORM

Kristen Lynch, Ph.D. Candidate Information and Media Studies, Michigan State University
E: lynchkr3@msu.edu P: (530) 276-4945 BRIEF SUMMARY You are being asked to participate in a research study. Researchers are required to provide a consent form to inform you about the research study, to convey that participation is voluntary, to explain risks and benefits of participation including why you might or might not want to participate, and to empower you to make an informed decision. You should feel free to discuss and ask the researchers any questions you may have. You are being asked to participate in a research study that examines current news topics. Your participation in this study will take about 35 - 40 minutes. You will be asked to read and respond to information about news topics that are currently covered in media. There are no foreseeable risks of participation in this study. You will not directly benefit from your participation in this study other than receiving the predetermined incentive provided by QuestionPro or Qualtrics. However, your participation in this study may contribute to the understanding how multitasking contributes to comprehension.

You are invited to participate in a research study conducted by a team of researchers at Michigan State University. When you are invited to participate in research, you have the right to be informed about the study procedures so that you can decide whether you want to participate. This form may contain words that you do not know. Please ask the researcher to explain any words or information that you do not understand before you agree to participate in the study. DESCRIPTION In the current study, you will be asked to respond to certain news posts that you might see in the media (e.g., in your social media feed). You will also complete a demographic questionnaire at the end of the study. RISKS Your participation in this study is not expected to cause you any risks greater than those encountered in everyday life. Your answers will not harm you in any way. Some of the news posts in the study include content that may potentially be fake and offensive. If you feel uncomfortable at any point, you can withdraw from the study. If you feel uncomfortable after you've started the research, you have the right to withdraw from the study without consequences. Participation in this study is voluntary, thus you may withdraw at any time without penalty. CONFIDENTIALITY Participation in this study is anonymous. Your identity, participation, and any information you provide will be kept confidential in this experiment. Your information will not be shared with anyone, and will only be used for the purpose of the research. MSU Human Research Protection Program (MSU HRPP), including MSU Institutional Review Board (IRB) representatives, as well as the researchers will have access to the data. The data will be kept for at least three years after the project closes. INCENTIVE FOR PARTICIPATION You will be compensated upon completion of the survey by your panel provider.35 to 40 minutes of research participation. The duration of this study is approximately 35-40 minutes. Please note that if you do not complete all parts of the study you will not receive the incentive. Participation in this study is voluntary. You may withdraw at any time without penalty. Participants who click through whole sections of the study without answering the questions will be only awarded credit based on the portion of the study they have completed. QUESTIONS, CONCERNS, AND COMPLAINTS If you have any questions about the research or to report a research-related injury, please contact Kristen Lynch by phone: 530-276-4945; email: lynchkr3@msu.edu. If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or email irb@ora.msu.edu or regular mail at 4000 Collins Rd, Suite 136, MI 48910. CONSENT I have read this consent form and my questions have been answered. I hereby give my voluntary consent to participate in this study. By clicking the >> button you are agreeing to participate in this study.

Q447

Before you participate in this study, please turn off/silence and put away all other personal communication devices, other than the device you are using to complete this study. It is important that there are no distractions while you complete the tasks required in this study.

Please complete this study on your laptop. If you are currently on a mobile device such as a smartphone or tablet, please take a moment to switch to your laptop.

Q607 Do you have a television?

- Yes (1)
- No (2)

Q608 Do you have access to a Netflix streaming service account?

- Yes (1)
- No (2)

Q609 Do you have a laptop, desktop, or tablet computer?

- Yes (1)
- No (3)

D1 How do you identify?

- Male (1)
- Female (2)
- In some other way (4)
- Prefer not to answer (5)

D2 What year were you born?

▼ 1920 (1) ... 2003 (84)

D3 What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

- ○ No schooling completed (1)
- ○ Nursery school to 8th grade (2)
- ○ Some high school, no diploma (3)
- ○ High school graduate, diploma or the equivalent (for example: GED) (4)
- ○ Some college credit, no degreeTrade/technical/vocational training (5)
- ○ Associate degree (6)
- ○ Bachelor's degree (7)
- ○ Master's degree (8)
- ○ Professional degree (9)
- ○ Doctorate degree (10)
- ○ Other (11) _____

D4 What region do you live in?

- ○ West (1)
- ○ Midwest (2)
- ○ Southwest (3)
- ○ Southeast (4)
- ○ Northeast (5)

D5 Which of the following best describes your ethnicity/race background?

- ☐ American Indian of Native (non-Hispanic) (1)
- ☐ Asian (2)
- ☐ Black of African American (3)
- ☐ Native Hawaiian or other Pacific Islander (5)
- ☐ White (6)
- ☐ Two or more ethnicities/races (7)
- ☐ Other, please specify (8) _____

D6 Are you...?

- ○ Hispanic or Latino/Latina/Latinx (1)
- ○ Non-Hispanic or Latino/Latina/Latinx (2)

D7 What is your total annual income?

- ○ Less than $10,000 (1)
- ○ $10,000 to $24,999 (2)
- ○ $25,000 to $49,999 (3)
- ○ $50,000 to $74,999 (4)
- ○ $75,000 to $99,999 (5)
- ○ $100,000 to $124,999 (6)
- ○ $125,000 to $149,999 (7)
- ○ $150,000 or more (8)

D8 Where do you consider yourself to be in terms of political party affiliation and ideology?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very Republican	○	○	○	○	○	○	○	Very Democrat
Very Conservative	○	○	○	○	○	○	○	Very Liberal

Q2 Please tell us a little bit about your media use.

Q6 Please rate on a scale of 1 to 7 (1 being "Strongly Disagree" and 7 being "Strongly Agree") the extent to which you agree/disagree with the following statements. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- I am more efficient when I am multitasking.
- I try to multitask whenever possible.
- I enjoy multitasking.
- I am in a state of flow when multitasking.
- I multitask out of habit.
- Before multitasking I deliberately think about specific tasks that I can do concurrently.
- I lose track of time when multitasking.
- I can do more through multitasking.
- When I am on a computer or using my mobile phone, I am always drawn to do more than one thing at a time.
- I am distracted when I have to focus on only one task.
- I find it difficult to do more than one task at a time.
- I am bored when I am not multitasking.
- I find it entertaining and enjoyable when multitasking.
- I find it distracting to engage in different activities concurrently.

Q227 In the next section, you are going to read several short news posts that could appear on your social media page. After each post, you will be asked to answer seven questions. Please give us your honest responses about each post.

Q10 Source: New Yorkers NewsHeadline: NASA and the NOAA Fake Global Warming Data

Q11 In what might be the largest scientific fraud ever uncovered, NASA and the NOAA have been caught red-handed altering historical temperature data to produce a “climate change narrative” that defies reality.

Q552 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q12 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q13 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	(5)	6 (6)	(7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q529 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q531 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q533 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q535 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q537 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will 'like' this news post on Facebook
- I will 'share' this news post on Facebook
- I will 'comment' on this news post on Facebook
- I will post on this news post Facebook wall
- I will 'like' this news post Facebook page
- I will 'like' posts on this news post Facebook page
- I will 'comment' on this news post Facebook page

Q534 Source: Global Net
Headline: Kids with COVID-19 Symptoms Be Quarantined Without Parental Consent

Q536 The U.S. Congress passed a law in 2020 called the "Coronavirus Act" that give school officials the powers to quarantined without parental consent in order to stop the spread. It is suggested that every parent do research on legislation of the Coronavirus Act 2020 regarding the laws for children in school.

Q551 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q538 I think that news post I just read was...

○ Real (1)

○ Fake (2)

Q540 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q542 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q544 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q546 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q548 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q550 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will 'like' this news post on Facebook
- I will 'share' this news post on Facebook
- I will 'comment' on this news post on Facebook
- I will post on this news post Facebook wall
- I will 'like' this news post Facebook page
- I will 'like' posts on this news post Facebook page
- I will 'comment' on this news post Facebook page

Q554 Source: Public News Headline: Lawmakers Considering a Bill To Microchip Residents

Q556 Technology tends to be scary for some, but upcoming legislation about new technology is not for the faint of heart. In June 2020, the House of Representatives passed legislation that would allow employers to microchip workers on a voluntary basis.

Q571 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q558 I think that news post I just read was...

○ Real (1)

○ Fake (2)

Q560 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q562 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q564 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q566 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q568 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q570 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q573 Source: News TalkHeadline: Abortion Rates Fall During Democratic Administrations and Rise During Republican Ones

Q575 The Centers for Disease Control and Prevention (CDC) began collecting nationwide data on the numbers of abortions, the abortion ratio (abortions versus live births), and the abortion rate. Abortion rates have risen and fallen throughout presidencies of both parties, making drawing a direct correlation between the two untenable. Abortion rates drop during Democratic presidencies and rise during Republican administrations.

Q590 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q577 I think that new post I just read was...

○ Real (1)

○ Fake (2)

Q579 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q581 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q583 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q585 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q587 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q589 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q592 Source: TechmereHeadline: The Amazon Rainforest was on Fire in August 2019

Q594 There have been a total of 72,843 fires in Brazil this year, with more than half in the Amazon region, INPE said. That’s more than an 80% increase compared with the same period last year. The Amazon is often referred to as the planet’s lungs, producing 20% of the oxygen in the earth’s atmosphere.

Q609 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q596 I think that news post I just read was...

○ Real (1)

○ Fake (2)

Q598 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q600 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q602 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q604 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q606 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q608 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will 'like' this news post on Facebook
- I will 'share' this news post on Facebook
- I will 'comment' on this news post on Facebook
- I will post on this news post Facebook wall
- I will 'like' this news post Facebook page
- I will 'like' posts on this news post Facebook page
- I will 'comment' on this news post Facebook page

Q611 Source: AxiosHeadline: Trump Blames Obama for 'Bad' COVID-19 Tests

Q613 U.S. President Donald Trump implied the Obama administration left behind "bad," "broken," and "obsolete" COVID-19 diagnostic tests. It wasn't the first time the U.S. president suggested his predecessor was somehow responsible for difficulties his administration faced in responding to the coronavirus pandemic.

Q628 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q615 I think that news post I just read was...

○ Real (1)

○ Fake (2)

Q617 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q619 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q621 I feel the article i just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q623 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q625 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q627 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q630 Source: CNETHeadline: BBB Warn Against Sharing High School Senior Photos

Q632 Facebook users started a posting trend to show solidarity with 2020's graduating seniors who are finishing high school at home. The Better Business Bureau advised Facebook users to reconsider posting high school senior photos in spring 2020 to help protect their online privacy.

Q647 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q634 I think that new post I just read was...

○ Real (1)

○ Fake (2)

Q636 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q638 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q640 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q642 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q644 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q646 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will 'like' this news post on Facebook
- I will 'share' this news post on Facebook
- I will 'comment' on this news post on Facebook
- I will post on this news post Facebook wall
- I will 'like' this news post Facebook page
- I will 'like' posts on this news post Facebook page
- I will 'comment' on this news post Facebook page

Q649 Source: The Economist Headline: Did The Satanic Temple Sues Over Missouri Abortion Law?

Q651 A member's lawsuit against a Missouri abortion rule opened up a significant debate. A member of The Satanic Temple filed a lawsuit in 2018 arguing that a Missouri law that requires a woman seeking an abortion to receive a pamphlet asserting that life begins at conception violated her religious beliefs.

Q664 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q653 I think that news post I just read was...

○ Real (1)

○ Fake (2)

Q655 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q657 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q661 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q663 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q659 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q666 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

QA2 I am paying attention the new posts that I'm reading.

○ Yes (1)

○ No (2)

QA1 I would like to finish this study and receive my incentive.

○ Yes (1)

○ No (2)

Q82 In the following section, you will be asked about your beliefs and your previous knowledge about various topics. Please respond honestly.

Q83 Please rate on a scale of 1 (Strongly Disagree) to 7 (Strongly Agree) to what extent you believe that...

	Strongly Disagree (1) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree (7) (7)
Global Warming is real (1)	○	○	○	○	○	○	○
COVID-19 is a dangerous virus (10)	○	○	○	○	○	○	○
You should protect your online privacy (12)	○	○	○	○	○	○	○
Women should be free to have an abortion (14)	○	○	○	○	○	○	○

Q84 On a scale from 1 to 7 (1 being "Not knowledgeable at all" and 7 being "Extremely knowledgeable"), rate how knowledgeable you are about the following topics.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Global Warming (1)	○	○	○	○	○	○	○
COVID-19 (3)	○	○	○	○	○	○	○
Online Privacy (4)	○	○	○	○	○	○	○
Abortion (5)	○	○	○	○	○	○	○

QA3 Please list any other activities that you may have participated in while reading the news posts in this experiment today. List anything that could have distracted you from completing this study (e.g., leaving the room to use bathroom, eating, thinking about something else during the study, texting with a friend, etc.)

Q628 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q604 In the following section, you will be asked several true-and-false questions about the content of the news posts you just read. Please note that these questions pertain to WHAT you read in the news posts and NOT whether the information you read is actually true or false.

Q612 To the best of your ability, select all the news outlets that published the news posts you've just read. Select all news outlet titles that you remember.

- [ ] New Yorkers News (2)
- [ ] NYNS (4)
- [ ] Global Net (5)
- [ ] COVID Global Network (6)
- [ ] News Talk (7)
- [ ] Talking News Network (8)
- [ ] Public News (9)
- [ ] News to and for the Public (10)
- [ ] Techmere (11)
- [ ] Mere Technology News (12)
- [ ] Axios (13)
- [ ] Alternative News (14)
- [ ] CNET (15)
- [ ] KNET (16)
- [ ] The Economist (17)
- [ ] Economic News (18)

Q614 You read a news post about NASA and NOAA faking Global Warming data.

- True (1)
- False (3)

Q616 You read a news post about NASA and the NOAA producing Real Global Warming data.

- True (1)
- False (2)

Q618 You read a news post about children with COVID being quarantined without parental consent.

- True (1)
- False (2)

Q620 You read a news post about parents willingly quarantining their children that have been infected with COVID-19.

- True (1)
- False (2)

Q622 You read a news post about abortion rates fluctuating.

- True (1)
- False (2)

Q624 You read a news post about abortion rates being falsified by the U.S. Government.

- True (1)
- False (2)

Q626 You read a news post about lawmakers passing a bill to microchip people.

- True (1)
- False (2)

Q628 You read a news post about microchipping house animals.

- True (1)
- False (2)

Q630 You read a news post about the Amazon rain forest.

- True (1)
- False (2)

Q632 You read a news post about rain forests in the continent of Africa.

- True (1)
- False (2)

Q634 You read a new post about President Trump implying that President Obama was at fault for poor response to COVID-19 testing.

- True (1)
- False (2)

Q636 You read a news post about how former Senator Hillary Clinton blamed Trump for COVID-19 tests.

- True (1)
- False (2)

Q638 You read a news post about high schoolers who are warned about sharing their senior photos on social media.

- True (1)
- False (2)

Q640 You read a news post about middle schoolers publishing photos of their pets on social media.

- True (1)
- False (2)

Q642 You read a news post about the Satanic Temple.

- True (1)
- False (2)

Q644 You read a news post about a Christian denomination.

- True (1)
- False (2)

Q610 The purpose of this study was to understand how multitasking interferes with information processing. During the course of the study, you were exposed to both fake and real news posts. We are interested in seeing how multitasking influenced your ability to determine whether you were reading "fake news" posts. Your identity will remain confidential in the reporting of this study's results. As a research participant, you have the right to voluntarily take part in a study as well as remove yourself from a study at any point, including after completing the study.

If you have any questions about this procedure or wish that your data be removed from the study, please contact the primary investigator:

Kristen Lynch
404 Wilson Road, Michigan State University

East Lansing MI 48824-1212
Email: lynchkr3@msu.edu

Best regards,
Kristen Lynch Ph.D. Candidate
Michigan State University

APPENDIX B:

Multitasking Survey

Q1 CONSENT FORM

Kristen Lynch, Ph.D. Candidate Information and Media Studies, Michigan State University E: lynchkr3@msu.edu P: (530) 276-4945 BRIEF SUMMARY You are being asked to participate in a research study. Researchers are required to provide a consent form to inform you about the research study, to convey that participation is voluntary, to explain risks and benefits of participation including why you might or might not want to participate, and to empower you to make an informed decision. You should feel free to discuss and ask the researchers any questions you may have. You are being asked to participate in a research study that examines current news topics. Your participation in this study will take about 35 - 40 minutes. You will be asked to read and respond to information about news topics that are currently covered in media. There are no foreseeable risks of participation in this study. You will not directly benefit from your participation in this study other than receiving the predetermined incentive provided by QuestionPro or Qualtrics. However, your participation in this study may contribute to the understanding how multitasking contributes to comprehension.

You are invited to participate in a research study conducted by a team of researchers at Michigan State University. When you are invited to participate in research, you have the right to be informed about the study procedures so that you can decide whether you want to participate. This form may contain words that you do not know. Please ask the researcher to explain any words or information that you do not understand before you agree to participate in the study. DESCRIPTION In the current study, you will be asked to respond to certain news posts that you might see in the media (e.g., in your social media feed). You will also watch a TV show while reading the posts. You will complete a demographic questionnaire at the end of the study. RISKS Your participation in this study is not expected to cause you any risks greater than those encountered in everyday life. Your answers will not harm you in any way. Some of the news posts in the study include content that may potentially be fake and offensive. If you feel uncomfortable at any point, you can withdraw from the study. If you feel uncomfortable after you've started the research, you have the right to withdraw from the study without consequences. Participation in this study is voluntary, thus you may withdraw at any time without penalty. CONFIDENTIALITY Participation in this study is anonymous. Your identity, participation, and any information you provide will be kept confidential in this experiment. Your information will not be shared with anyone, and will only be used for the purpose of the research. MSU Human Research Protection Program (MSU HRPP), including MSU Institutional Review Board (IRB) representatives, as well as the researchers will have access to the data. The data will be kept for at least three years after the project closes. INCENTIVE FOR PARTICIPATION You will be compensated upon completion of the survey by your panel provider.35 to 40 minutes of research participation. The duration of this study is approximately 35-40 minutes. Please note that if you do not complete all parts of the study you will not receive the incentive. Participation in this study is voluntary. You may withdraw at any time without penalty. Participants who click through whole sections of the study without answering the questions will be only awarded credit based on the portion of the study they have completed. QUESTIONS, CONCERNS, AND COMPLAINTS If you have any questions about the research or to report a research-related injury, please contact Kristen Lynch by phone: 530-276-4945; email: lynchkr3@msu.edu. If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or email irb@ora.msu.edu or regular mail at 4000 Collins Rd, Suite 136, MI 48910. CONSENT I have read this consent form and my questions have been answered. I hereby give my voluntary consent to participate in this study. By clicking the >> button you are agreeing to participate in this study.

Q447 Before you participate in this study, please turn off/silence and put away all other personal communication devices, other than the devices you are using to complete this study. It is important that there are no distractions while you complete the tasks required in this study.

Please complete this study on your laptop. If you are currently on an other mobile device such as a smartphone, please take a moment to switch to your laptop. Additionally, we will ask you to use your television to watch a show.

Q607 Do you have a television?

- ○ Yes (1)
- ○ No (2)

Q608 Do you have access to a Netflix streaming service account?

- ○ Yes (1)
- ○ No (2)

Q609 Do you have a laptop, desktop, or tablet computer?

- ○ Yes (1)
- ○ No (3)

D1 How do you identify?

- ○ Male (1)
- ○ Female (2)
- ○ In some other way (4)
- ○ Prefer not to answer (5)

D2 What year were you born?

▼ 1920 (1) ... 2003 (84)

D3 What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

- ○ No schooling completed (1)
- ○ Nursery school to 8th grade (2)
- ○ Some high school, no diploma (3)
- ○ High school graduate, diploma or the equivalent (for example: GED) (4)
- ○ Some college credit, no degreeTrade/technical/vocational training (5)
- ○ Associate degree (6)
- ○ Bachelor's degree (7)
- ○ Master's degree (8)
- ○ Professional degree (9)
- ○ Doctorate degree (10)
- ○ Other (11) _____

D4 What region do you live in?

- ○ West (1)
- ○ Midwest (2)
- ○ Southwest (3)
- ○ Southeast (4)
- ○ Northeast (5)

D5 Which of the following best describes your ethnicity/race background?

- ☐ American Indian of Native (non-Hispanic) (1)
- ☐ Asian (2)
- ☐ Black of African American (3)
- ☐ Native Hawaiian or other Pacific Islander (5)
- ☐ White (6)
- ☐ Two or more ethnicities/races (7)
- ☐ Other, please specify (8) _____

D6 Are you...?

- ○ Hispanic or Latino/Latina/Latinx (1)
- ○ Non-Hispanic or Latino/Latina/Latinx (2)

D7 What is your total annual income?

- ○ Less than $10,000 (1)
- ○ $10,000 to $24,999 (2)
- ○ $25,000 to $49,999 (3)
- ○ $50,000 to $74,999 (4)
- ○ $75,000 to $99,999 (5)
- ○ $100,000 to $124,999 (6)
- ○ $125,000 to $149,999 (7)
- ○ $150,000 or more (8)

D8 Where do you consider yourself to be in terms of political party affiliation and ideology?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very Republican	○	○	○	○	○	○	○	Very Democrat
Very Conservative	○	○	○	○	○	○	○	Very Liberal

Q2 Please tell us a little bit about your media use.

Q6 Please rate on a scale of 1 to 7 (1 being "Strongly Disagree" and 7 being "Strongly Agree") the extent to which you agree/disagree with the following statements. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- I am more efficient when I am multitasking.
- I try to multitask whenever possible.
- I enjoy multitasking.
- I am in a state of flow when multitasking.
- I multitask out of habit.
- Before multitasking I deliberately think about specific tasks that I can do concurrently.
- I lose track of time when multitasking.
- I can do more through multitasking.
- When I am on a computer or using my mobile phone, I am always drawn to do more than one thing at a time.
- I am distracted when I have to focus on only one task.
- I find it difficult to do more than one task at a time.
- I am bored when I am not multitasking.
- I find it entertaining and enjoyable when multitasking.
- I find it distracting to engage in different activities concurrently.

Q227 In the next section, you are going to read several short news posts that could appear on your social media page. After each post, you will be asked to answer seven questions. Please give us your honest responses about each post.

Q10 Source: New Yorkers NewsHeadline: NASA and the NOAA Fake Global Warming Data

Q11 In what might be the largest scientific fraud ever uncovered, NASA and the NOAA have been caught red-handed altering historical temperature data to produce a “climate change narrative” that defies reality.

Q552 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q12 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q13 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	(5)	6 (6)	(7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q529 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q531 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q533 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q535 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q537 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q534 Source: Global Net
Headline: Kids with COVID-19 Symptoms Be Quarantined Without Parental Consent

Q536 The U.S. Congress passed a law in 2020 called the “Coronavirus Act” that give school officials the powers to quarantined without parental consent in order to stop the spread. It is suggested that every parent do research on legislation of the Coronavirus Act 2020 regarding the laws for children in school.

Q551 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q538 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q540 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q542 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q544 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q546 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q548 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q550 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q554 Source: Public News Headline: Lawmakers Considering a Bill To Microchip Residents

Q556 Technology tends to be scary for some, but upcoming legislation about new technology is not for the faint of heart. In June 2020, the House of Representatives passed legislation that would allow employers to microchip workers on a voluntary basis.

Q571 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q558 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q560 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q562 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q564 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q566 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q568 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q570 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q573 Source: News TalkHeadline: Abortion Rates Fall During Democratic Administrations and Rise During Republican Ones

Q575 The Centers for Disease Control and Prevention (CDC) began collecting nationwide data on the numbers of abortions, the abortion ratio (abortions versus live births), and the abortion rate. Abortion rates have risen and fallen

throughout presidencies of both parties, making drawing a direct correlation between the two untenable. Abortion rates drop during Democratic presidencies and rise during Republican administrations.

Q590 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q577 I think that new post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q579 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q581 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q583 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q585 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q587 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q589 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q592 Source: TechmereHeadline: The Amazon Rainforest was on Fire in August 2019

Q594 There have been a total of 72,843 fires in Brazil this year, with more than half in the Amazon region, INPE said. That's more than an 80% increase compared with the same period last year. The Amazon is often referred to as the planet's lungs, producing 20% of the oxygen in the earth's atmosphere.

Q609 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q596 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q598 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q600 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q602 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q604 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q606 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q608 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q611 Source: AxiosHeadline: Trump Blames Obama for ‘Bad’ COVID-19 Tests

Q613 U.S. President Donald Trump implied the Obama administration left behind "bad," "broken," and "obsolete" COVID-19 diagnostic tests. It wasn't the first time the U.S. president suggested his predecessor was somehow responsible for difficulties his administration faced in responding to the coronavirus pandemic.

Q628 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q615 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q617 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q619 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q621 I feel the article i just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q623 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q625 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q627 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q630 Source: CNETHeadline: BBB Warn Against Sharing High School Senior Photos

Q632 Facebook users started a posting trend to show solidarity with 2020's graduating seniors who are finishing high school at home. The Better Business Bureau advised Facebook users to reconsider posting high school senior photos in spring 2020 to help protect their online privacy.

Q647 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q634 I think that new post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q636 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q638 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q640 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q642 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q644 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q646 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

Q649 Source: The Economist Headline: Did The Satanic Temple Sues Over Missouri Abortion Law?

Q651 A member’s lawsuit against a Missouri abortion rule opened up a significant debate. A member of The Satanic Temple filed a lawsuit in 2018 arguing that a Missouri law that requires a woman seeking an abortion to receive a pamphlet asserting that life begins at conception violated her religious beliefs.

Q664 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q653 I think that news post I just read was...

- ○ Real (1)
- ○ Fake (2)

Q655 Please rate on a scale of 1 to 7 (1 being "Very little effort" and 7 being "A lot of effort") the amount of mental effort that you invested in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very little effort	○	○	○	○	○	○	○	A lot of effort

Q657 The news post I just read made me feel…

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Relaxed	○	○	○	○	○	○	○	Stimulated
Calm	○	○	○	○	○	○	○	Excited
Unaroused	○	○	○	○	○	○	○	Aroused
Negative	○	○	○	○	○	○	○	Positive
Bad	○	○	○	○	○	○	○	Good
Unfavorable	○	○	○	○	○	○	○	Favorable

Q661 Please rate on a scale of 1 to 7 (1 being "Did not try to find flaws at all" and 7 being "Tried very hard to find flaws") the extent to which you tried to find flaws in the argument presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Did not try to find flaws	○	○	○	○	○	○	○	Tried to find flaws

Q663 Please rate on a scale of 1 to 7 (1 being "Very hard to understand" and 7 being "Very easy to understand") the extent to which you understood the message presented in the news post you just read.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very hard to understand	○	○	○	○	○	○	○	Very easy to understand

Q659 I feel the news post I just read was...

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
Fair (1)	○	○	○	○	○
Trustworthy (4)	○	○	○	○	○
Comprehensive (3)	○	○	○	○	○
Unbiased (2)	○	○	○	○	○
Accurate (5)	○	○	○	○	○

Q666 Please rate on a scale of (1 being "Strongly Disagree" and 7 being "Strongly Agree") how likely you are to do the following. [matrix: Strongly Disagree (1), 2, 3, 4, 5, 6, Strongly Agree (7)]

- This news post is worth sharing with others
- I will recommend this news post to others
- I will ‘like’ this news post on Facebook
- I will ‘share’ this news post on Facebook
- I will ‘comment’ on this news post on Facebook
- I will post on this news post Facebook wall
- I will ‘like’ this news post Facebook page
- I will ‘like’ posts on this news post Facebook page
- I will ‘comment’ on this news post Facebook page

QA2 I am paying attention the new posts that I'm reading.

○ Yes (1)

○ No (2)

QA1 I would like to finish this study and receive my incentive.

○ Yes (1)

○ No (2)

Q82 In the following section, you will be asked about your beliefs and your previous knowledge about various topics. Please respond honestly.

Q83 Please rate on a scale of 1 (Strongly Disagree) to 7 (Strongly Agree) to what extent you believe that...

	Strongly Disagree (1) (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree (7) (7)
Global Warming is real (1)	○	○	○	○	○	○	○
COVID-19 is a dangerous virus (10)	○	○	○	○	○	○	○
You should protect your online privacy (12)	○	○	○	○	○	○	○
Women should be free to have an abortion (14)	○	○	○	○	○	○	○

Q84 On a scale from 1 to 7 (1 being "Not knowledgeable at all" and 7 being "Extremely knowledgeable"), rate how knowledgeable you are about the following topics.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Global Warming (1)	○	○	○	○	○	○	○
COVID-19 (3)	○	○	○	○	○	○	○
Online Privacy (4)	○	○	○	○	○	○	○
Abortion (5)	○	○	○	○	○	○	○

QA3 Please list any other activities that you may have participated in while reading the news posts in this experiment today. List anything that could have distracted you from completing this study (e.g., leaving the room to use bathroom, eating, thinking about something else during the study, texting with a friend, etc.)

Q628 Timing
First Click (1)
Last Click (2)
Page Submit (3)
Click Count (4)

Q604 In the following section, you will be asked several true-and-false questions about the content of the news posts you just read. Please note that these questions pertain to WHAT you read in the news posts and NOT whether the information you read is actually true or false.

Q612 To the best of your ability, select all the news outlets that published the news posts you've just read. Select all news outlet titles that you remember.

- [ ] New Yorkers News (2)
- [ ] NYNS (4)
- [ ] Global Net (5)
- [ ] COVID Global Network (6)
- [ ] News Talk (7)
- [ ] Talking News Network (8)
- [ ] Public News (9)
- [ ] News to and for the Public (10)
- [ ] Techmere (11)
- [ ] Mere Technology News (12)
- [ ] Axios (13)
- [ ] Alternative News (14)
- [ ] CNET (15)
- [ ] KNET (16)
- [ ] The Economist (17)
- [ ] Economic News (18)

Q614 You read a news post about NASA and NOAA faking Global Warming data.

- True (1)
- False (3)

Q616 You read a news post about NASA and the NOAA producing Real Global Warming data.

- True (1)
- False (2)

Q618 You read a news post about children with COVID being quarantined without parental consent.

- True (1)
- False (2)

Q620 You read a news post about parents willingly quarantining their children that have been infected with COVID-19.

- True (1)
- False (2)

Q622 You read a news post about abortion rates fluctuating.

- True (1)
- False (2)

Q624 You read a news post about abortion rates being falsified by the U.S. Government.

- True (1)
- False (2)

Q626 You read a news post about lawmakers passing a bill to microchip people.

- True (1)
- False (2)

Q628 You read a news post about microchipping house animals.

- True (1)
- False (2)

Q630 You read a news post about the Amazon rain forest.

- True (1)
- False (2)

Q632 You read a news post about rain forests in the continent of Africa.

- True (1)
- False (2)

Q634 You read a new post about President Trump implying that President Obama was at fault for poor response to COVID-19 testing.

- True (1)
- False (2)

Q636 You read a news post about how former Senator Hillary Clinton blamed Trump for COVID-19 tests.

- True (1)
- False (2)

Q638 You read a news post about high schoolers who are warned about sharing their senior photos on social media.

- True (1)
- False (2)

Q640 You read a news post about middle schoolers publishing photos of their pets on social media.

- True (1)
- False (2)

Q642 You read a news post about the Satanic Temple.

- True (1)
- False (2)

Q644 You read a news post about a Christian denomination.

- True (1)
- False (2)

Q610 The purpose of this study was to understand how multitasking interferes with information processing. During the course of the study, you were exposed to both fake and real news posts. We are interested in seeing how multitasking influenced your ability to determine whether you were reading "fake news" posts. Your identity will remain confidential in the reporting of this study's results. As a research participant, you have the right to voluntarily take part in a study as well as remove yourself from a study at any point, including after completing the study.

If you have any questions about this procedure or wish that your data be removed from the study, please contact the primary investigator:

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Best regards,
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