Misinformation and Its Effects on Individuals and Society from 2015 - 2023: A Mixed Methods Review Study

Nicholas Della Giustina

A capstone project to fulfill the requirements for the degree of Master of Arts in Policy Studies

School of Interdisciplinary Arts and Sciences

Advisor: Charlie Collins, Ph.D.

Second Reader: Keith Nitta, Ph.D.

University of Washington Bothell, 2023

Abstract

The historical study of misinformation has been ongoing for decades and the modern era is no exception. This paper is a systematic, mixed methods review that explores the available peer-reviewed literature on misinformation that has been generated since 2015. Seven academic articles are systematically reviewed and thematically analyzed. In order to tie the effects of misinformation through the individual and to greater cultural events through motivated action, this paper will define and utilize a theoretical framework of generalized allostatic effect. This framework postulates that misinformation causes hypertension which leads to mood disorders that in turn foment into misinformed action. Misinformation distorts the perception of reality and corrupts the human practice of collective sense-making during times of crisis which subsequently delays solution-based responses. Thematic analyses were conducted to examine eight articles selected for the mixed methods review. Themes include memory distortion, continued influence effect and technological concerns. Results of this study find that misinformation is a big problem in American culture, causing stress in people which can develop into mental illness and disrupting solution-based efforts during crises. This study also found that more research is urgently needed in order to develop methods for mitigating the effects of misinformation.

Chapter 1: Purpose of the Study

The Issues:

Issues of misinformation have begun to boil over in U.S. society. National cases such as the defamation lawsuit brought against Fox News Network by Dominion Voting Systems, Inc. present concrete evidence of misinformation being used to influence the decision-making opportunities of Americans in many ways. What are the effects of widespread misinformation on the members of society in the modern era? How does the available research inform us about the effects of misinformation on the integrity and cohesiveness of a culture? The intention of this project is to examine the effects of mass-media produced misinformation on the well-being of a culture including its economic, political, educational, and social systems,; and the mental health of the general population affected by misinformation campaigns involving important cultural institutions such as the political and healthcare systems. This project is a mixed-studies review of available peer-reviewed research. I use information from government documents, public media sources, and cultural artifacts as examples of the ubiquity of misinformation in U.S. society. The results of this review will be used to assess policy vulnerabilities within the political programming rules of the Federal Communications Commission and suggest ways in which those policies can be modified for greater integrity.

Since 2015, several major misinformation campaigns have been propagated and maintained in the mass media and reflected through social media platforms such as Facebook and Twitter. This paper will focus on the allegations of election fraud during the 2020 US Presidential election because it is a well-documented case of misinformation on a national scale. This case was ensconced in propaganda with slogans such as “Stop the Steal” and “The Big Lie” vying for control of the opinion of the American voter towards the election results, which set the

stage for the January 6th, 2021, attack on the U.S. Capitol. The U.S. Department of Justice has documented the significance of this events and related criminal charges in an article titled "24 Months Since the January 6th Attack on the Capitol":

The people who were swayed by election day misinformation campaigns have found themselves in deep legal troubles. As a result of the January 6th attack on the capital, more than 950 defendants have been arrested in nearly all 50 states and the District of Columbia. In the federal jurisdiction, approximately 484 individuals have pleaded guilty to a variety of federal charges, many of whom faced or will face incarceration at sentencing. Nearly 1,000 people are being processed through the legal system for acting on misinformation and this number is rising. The current estimated cost of damages to the Capitol building and the Capitol Police exceed $2.7 million with the final cost of the riots to the American Taxpayer possibly exceeding $30 million (Smith, 2022). It is also important to note that this is just one example of several misinformation campaigns that have been active since 2015. Other examples include Pizzagate, covid-19 origin stories, the great replacement theory, as well as a variety of misinformation campaigns surrounding climate change. One of the problems is that the FCC does not generally restrict the content of political programming. In the FCC Political Programming Rules Fact Sheet, it states that the FCC does not review or pre-approve the content of political ads before they are broadcast, ensure the accuracy of statements that are made by candidates and ensure advertisers require broadcast stations and other regulatees to provide all sides of controversial issues, or oversee the nature and extent of the coverage that individual candidates receive in news programs. According to the background section of the FCC's website:

> The FCC's Political Programming staff is responsible for overseeing implementation of Federal statutes and for administering rules and regulations relating to political

> programming and campaign advertising on radio and television broadcast stations, cable television systems, satellite TV (also referred to as "Direct Broadcast Satellite" or "DBS") providers, and satellite radio (also referred to as "Satellite Digital Audio Radio Services" or "SDARS") licensees. The Political Programming staff carries out its responsibilities in the Media Bureau's Policy Division (FCC.gov, 2023).

Yet another issue exists in the way that social media platforms like Facebook and Twitter regulate themselves against the threat of political misinformation and its propagation on an international scale via the internet. The FCC's umbrella of influence does not cover content on social media networks, leaving such oversight to big tech companies that have little incentive to actively regulate political programming through their platforms.

Information about Misinformation:

Misinformation poses a range of threats regardless of the platform it is communicated through, from subverting democratic processes to undermining public health measures (Bak-Coleman, et al., 2022). False news often continues to influence people's memory and inferential reasoning after it has been retracted; this is known as the continued influence effect (CIE). Some studies have found that worldview can have a strong impact on the magnitude of the CIE, making retractions less effective if the misinformation is congruent with a person's relevant attitudes (Ecker & Ang, 2019). The spread of misinformation in social media has become a severe threat to public interests (Muhammed & Mathew, 2022).

Misinformation spread over social media platforms such as Twitter during the 2020 U.S. presidential election served to perpetuate an understanding of widespread election fraud. A study that audited Google's search headlines for misleading content revealed that videos (as compared

to stories, search results, and advertisements) are foremost in terms of exposing users to delegitimizing headlines (Zade, et.al., 2022). A study that tracked social media usage on election night in 2020 for specific keywords found that the asymmetry of misinformation spreading accounts associated with support for President Biden shared stories about election-based misinformation less than accounts supporting the opposition. That asymmetry remained among the accounts of all but two of the top 100 misinformation spreaders who were also supporters of then-President Trump. This study also concluded, "Examining misinformation spread over time shows that before the election there were already a large number of misinformation tweets each day from both Trump and Biden supporters, and that both sides saw an increase in late October and early November —going into and immediately following the election" (Kennedy, et. al., 2021, p. 25).

Moving forward, an important part of this project is defining misinformation. Below, I compare and contrast misinformation, disinformation, and propaganda; discuss the political science literature on misinformation; and point to a growing field of "Misinformation Studies". These three terms are often used interchangeably, with shifting and overlapping definitions. Each utilizes false or misleading messages spread under the guise of factual information, whether in the form of elite communication, online messages, advertising, or published articles (Guess & Lyons, 2020). This can result in a differentiation between people who are unknowingly misled or tricked by misinformation and those that confidently cling to misinformation as truth rather than admit to being misled. Research into misinformation has a long history, but the accelerated emergence of distorted and manipulative information has led to an increasingly visible, if still disparate, field of misinformation studies in the current era (Calo, et.al., 2021). For the purposes of this study, misinformation is defined as the intentional dissemination of misleading

information over public communication platforms for the purposes of influencing people towards particular outcomes in society.

Exploring the role of factual knowledge about politics is also important in understanding how destabilizing misinformation can be to a culture and its citizens. A democracy is based on shared truths, thus, addressing the various ways in which people acquire and use information is very important to the stability of such a system of governance. Honesty is a key component of a well-functioning democracy, and it bears the important role of developing trust and fostering the sorts of relationships among citizens that enable cooperative effort (Stitzlein, 2023). A persistent threat of misinformation, even after it has been debunked, is the adherence of the misinformed to the false knowledge they have been fed as a steady diet of truth. These have been called “belief echoes” and refer to data which reveals that exposure to negative political information continues to shape beliefs and attitudes even after the information has been thoroughly discredited. This means that belief echoes can propagate long-term, misinformed beliefs in people that can subsequently cause misinformed action on many levels of society. These types of beliefs have the potential to persist on an intergenerational basis and further misinform future citizens, making misinformation and the resulting distortion of reality that it foments a particularly tenacious threat to the stability of a society (Thorson, 2016).

Over the past decade, several studies have focused on the effects of misinformation on human memory but in the last two decades, research has been published showing that updated, post event information often becomes incorporated into memory, changing a person's recollection (Loftus, 1996). Distortions of memory also occur and there are instances in which some form of memory is present, but incorrect (Schacter & Slotnick, 2004). Furthermore, research into the cognitive neuroscience of memory distortion has developed, concluding that

regions within the medial temporal lobe are related to the generation of false recognition, unlike regions within the prefrontal cortex that are related to memory monitoring activities (Schacter & Slotnick, 2004). Misinformation causes individual and collective memory distortion due to individuals recalling shared events differently which can lead to the misinformation effect, referring to memory distortions of past events that result from exposure to misleading post-event information (PEI); (Ulatowski, et al., 2016).

Another factor in how humans recollect events is the modality through which the information is presented. Studies into memory distortion due to misinformation have focused mainly on pictorial material such as slides and videos. A study that also applied a verbal description of the event both visually and auditorily found that two major factors play crucial roles in false memory production: the encoding specificity effect Tulving & Thomson, 1973) and the strength of a verbal acoustic code (Penney, 1989; Ulatowski, et al., 2016). A verbal acoustic code is a concept found in memory research and has to do with how the mind processes acoustic information for later retrieval from memory (Penney, 1989). Acoustic code refers to the way in which memory encodes acoustic or heard information for later decoding via retrieval and recall. The encoding specificity effect is postulated as the way in which the memory trace of an event and its retrieval cues in memory are determined by the specific encoding operations performed by the system producing the input stimuli (Tulving & Thomson, 1973). This is a theory in memory research that suggests that the environment in which information is encoded will affect how well people remember that information during recall of the memories.

Historically, the limitations of these studies center around the lack of current examples of events caused by known misinformation through political programming. The political events of the past decade, leading up to and including the January 6th attack upon the capital building in

Washington, DC have changed that. One of the reasons for this shift in awareness of misinformation can be found in the defamation suit brought against Fox News Network, LLC by Dominion Voting Systems, Inc. during which the executives of Fox News admit to knowingly disseminating false information for political and economic gain.

The contribution of this current project will be the production of a concise report that presents a review of the available empirical literature about misinformation and its effects on a society, taking into account the ramifications of the January 6th insurrection with a clear intention of providing suggestions to further regulate political programming through public policy. In particular, I frame this study around concepts of cultural stress and the ways in which misinformation may result in a collective form of allostasis that hampers the ability of humans to establish and maintain order in times of crisis. In order to do this, I will establish a theoretical framework of generalized allostatic effect which will attempt to explain the process through which individual hypertension can be fomented into misinformed action through the belief in false interpretations of reality.

Generalized Allostatic Effect:

Misinformation exaggerates attention to threatening information, which in turn has been implicated in the development and maintenance of anxiety disorders (Egan & Dennis-Tiwary, 2018). The brain is the focal organ of adaptation, and both the social and physical environments have a powerful effect on the body through the nervous system (McEwen, 2012). Allostasis is the term used to describe the process through which the nervous system prepares the body for adaptation due to adversity and change in everyday life; i.e., stress. This process happens in the autonomic nervous system and produces neurotransmitters associated with the 'fight or flight' reactivity framework, activating cortisol and adrenalin (but also neurotransmitters and other

tissue and hormonal mediators). These chemicals are released in the body in response to stressors or lifestyle factors such as diet, sleep–wake cycles, and exercise, which subsequently promote adaptation and are generally beneficial. When life events cause the expression of these chemicals, they are used in response to the stimuli that caused them and result in positive adaptation to the stressor. When they are not turned off when no longer needed, or are not turned on when they are needed, or are overused by excessive challenge, they can remain and build up in the nervous system as hypertension. These cumulative changes lead to a wear and tear, called "allostatic load," on the body and brain (McEwan, 2003). Over time, consequences of this may be a strain on the body that results in a number of pathophysiologic consequences such as mood disorders (Schulkin et al., 1994; McEwan, 2003). A study that attempted to determine if social factors such as housing conditions and social support affect allostatic load in older adults defined allostatic load as accumulated physiological deterioration resulting from poor adaptational responses to environmental stressors (Morales-Jinez, 2018).

Allostasis is the process by which the body expresses neurotransmitters such as adrenaline during adaptational challenges whereas allostatic load is the cumulative build-up of those neurotransmitters that are left over in the nervous system if not expended while meeting the needs of the adaptational challenges. Allostasis can further be expanded to implicate allostatic load as a foundational catalyst in the creation of stress-related psychological illnesses such as major depressive disorder and generalized anxiety disorder. The adversities that people experience and how they respond to events in their daily lives have long-term implications for their mental health and these adversities include reactions to politics and political programming (Charles, et.al., 2012). In other words, allostatic load, when not properly exhausted during adaptational events builds up in the body as hypertension, which in turn becomes stress that can

transform into mental illnesses such as generalized anxiety disorder or clinical depression. Misinformation provides adaptational challenges that produce allostasis in the body and therefore can be considered as adding to the current level of allostatic load in an individual's nervous system. When groups of people fall victim to the same misinformation, such as the group of Americans that believed in voter fraud during the 2020 US Presidential Election, their individual levels of stress can be influenced into collective misinformed action such as January 6th, 2020 attack on the U.S. Capitol building in Washington, DC.

Misinformation spreads rapidly via social media platforms such as Facebook and Twitter. This makes its impact much more distressing because in a crisis, humans communicate in order to work towards solutions to issues. In crises, humans communicate in a process called collective sensemaking in order to reason through chaotic events as they unfold. Collective sensemaking is a vital process, but we can make mistakes – or the process can be manipulated and exploited (Starbird, et.al., 2020). Political misinformation affects society by influencing the beliefs of its cultural exponents, its individual citizens, and causing them to become polarized against each other for the achievement of political goals. This causes conflict between individuals which in turn causes a stress-response in individual nervous systems that adds to each individual's allostatic load or feeling of general hypertension. When the actual outcomes of those goals do not match the expected outcomes influenced by the misinformed beliefs, paradox ensues, and collective sense-making is influenced by what will be referred to in this paper as 'generalized allostatic effect'. Generalized allostatic effect is defined here as a cultural phenomenon affecting groups of people and resulting from the expression of individual allostatic load in a collective context.

Current Study:

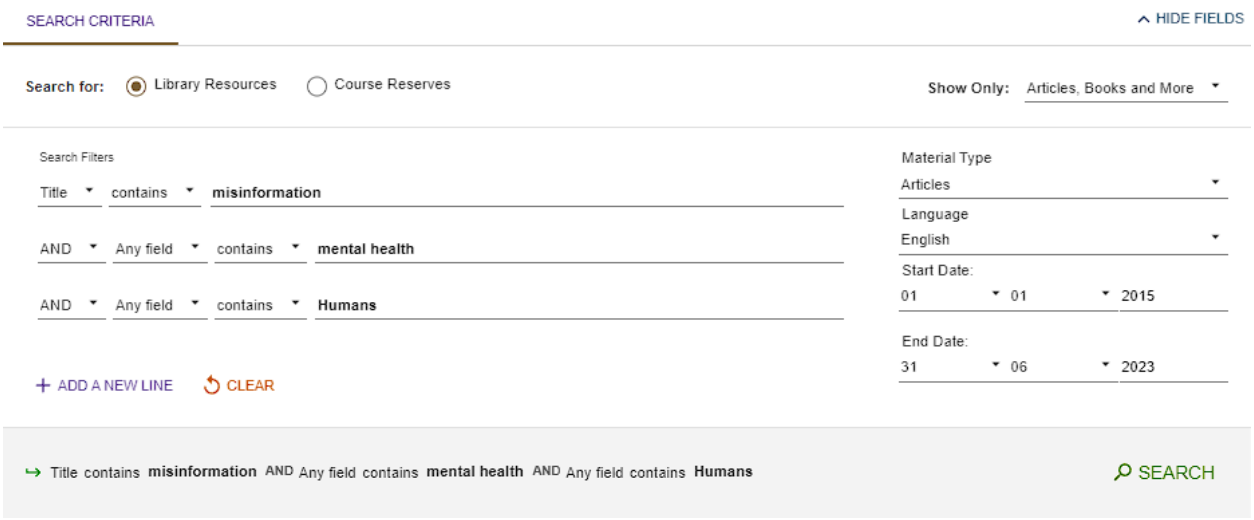
The current study explores the effects of misinformation on people and society by reviewing academic literature on misinformation and its effects on individual nervous systems. It then further expands into a discussion of how individual allostatic load can be influenced into collective, misinformed action. It concludes with recommendations for mitigating the effects of misinformation in society.

Research question: What are the effects of misinformation on mental health during the "MAGA" era?

Chapter 2: Methodology

This is an interdisciplinary, mixed studies review exploring the available research surrounding misinformation and its effects on humans from 2015 - present. A mixed studies review is a literature review approach in which qualitative, quantitative, and mixed methods studies are identified, selected, appraised, and synthesized (Pluye & Hong, 2014). The articles for this review were chosen using keyword searches in the scholarly databases at Social Sciences Citation Index (Web of Science), PubMed Central, and Gale Academic OneFile. I utilized the University of Washington's Library database search engine for this part of the query process, specifying that it should search for library resources rather than course reserves. Keywords included misinformation, humans, mental health, and were filtered as follows in the search engine: *misinformation* in the title of the article AND *humans* in any field of the article AND *mental health* in any field of the article (See Figure 1).

Figure 1: Initial search criteria.

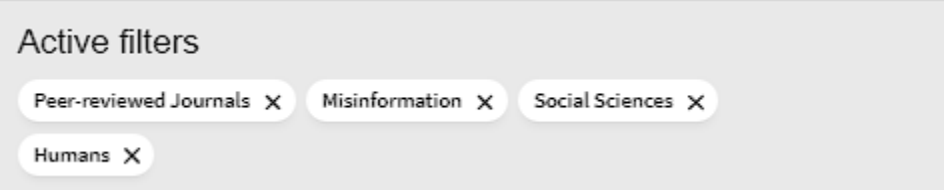


Peer-reviewed material published between 2015 and 2023 was selected based on the results of the keyword searches. The temporal range for inclusion is an effort to get the most recently published articles but also because several major misinformation campaigns have been active during this timeframe in US society including but not confined to election fraud in the 2020 US Presidential election, Q-anon related conspiracy theories, healthcare misinformation surrounding Covid-19, and the "great replacement theory" phenomenon, for example. My initial search yielded 19,272 results. Using the 'AND' operator in the search engine, I added the keyword 'humans' which narrowed my results down to 4,202. Continuing to pare down the results, I added my third and final keyword, 'mental health' to the search, which brought the total number of offerings down to 415.

I continued to fine-tune my searches further through the library search engine's more granular settings, starting by ticking the box to include only peer-reviewed journals which narrowed the results further to 220 entries. From here I added specific databases, which again were Social Sciences Citation Index (Web of Science), PubMed Central, and Gale Academic OneFile. I then went through and removed any research review papers since other research reviews are not appropriate for inclusion in a systematic research review. This removed articles by Krishna, et.al., 2021; Chan, et.al., 2017; Pantazi, et.al., 2021; Lewandowsky & van der Linden, 2021 (see Bibliography for references). This reduced the overall number of articles to be analyzed in this review to eight. These eight articles were published between the years 2015-2023; focus on the U.S.; contain the keyword "misinformation" in their titles along with terms "mental health" and "human" anywhere in their text; they are empirical, i.e., utilize quantitative, qualitative, or mixed methods to examine misinformation; and are published in peer-reviewed journals in the social sciences (See Figure 2 for Active Filters). Of these eight articles, seven of

them utilize quantitative methods as their main analysis technique and one utilizes qualitative methods. As such, the analyses for this study will reflect the quantitative nature of the articles selected for review.

Figure 2: Active filters for University of Washington Library Search parameters



Analysis:

This is a systematic mixed studies review with a thematic design based on a theoretical framework of a generalized allostatic effect. The methodology is a reflection of this thematic design as I chose keywords and search criteria based on an intention to investigate the extant research on misinformation in relationship to mental illness. After separating them by research type, either qualitative (QUAL) or quantitative (QUAN), these articles were analyzed for possible similarities and themes (see Table 1 below):

Table 1: Analysis matrix of reviewed literature.

Chang, et al.	2019	QUAN	CIE, memory distortion, misinformation research, mental health, retrieval and recall,	CIE, memory distortion
Dodson, et al.	2015	QUAN	tech. concerns, memory distortion, misinformation research, belief, retrieval and recall, experimentation	tech. concerns, memory distortion
Ecker & Ang	2019	QUAN	memory distortion, misinformation research, CIE, belief, experimentation	CIE, memory distortion, tech. concerns
Ecker, et al.	2020	QUAN	memory correction, belief, CIE, misinformation research, experimentation, solution-based	CIE, tech. concerns, memory distortion
Pennycook, et al.	2021	QUAL	tech. concerns, experimentation, instructional, solution-based	tech. concerns, memory distortion
Pluviano, et al.	2017	QUAN	memory distortion, continued influence effect, experimentation, solution-based	CIE, memory distortion
Ulatowska, et al.	2016	QUAN	experimentation, memory, belief, misinformation research, retrieval and recall	memory distortion, tech. concerns

The selected articles were analyzed according to the analysis stages specified by Braun and Clark (2006). This involved reading through the material to find similarities, identifying the most common ones and developing those further into themes and sub-themes for further analysis. (Braun & Clark, 2006). Although Thematic Analysis is typically a grounded approach to coding, I developed themes with a specific focus on misinformation and its relationship to stress and as such, themes reflect this relationship. Three themes were developed as a result of the thematic analysis of the selected articles. These themes included memory distortion, continued influence effect (CIE), and technological concerns.

Across all seven articles there is an over-arching theme of memory distortion, either as a byproduct of misinformation consumption or as a factor in experiments testing human memory. Continued influence effect was mentioned in four of the articles and although this is possibly an outcome of memory distortion, I did not feel that it was of a lesser magnitude because CIE persists even after correctional information has been consumed by the individual. This makes

CIE more choice based and belief oriented rather than falling victim to incorrect memory considered under the theme of memory distortion. Technological concerns, or a recognition of urgency in the need to further research the effects of misinformation due to advancing technological platforms such as social media, was mentioned in five of the articles. Because of this I chose the following themes which reflect persistent, dysregulating effects in both the human nervous system and in the communications platforms through which humans receive external information:

1) **Memory distortion** is the process by which individuals' recall of certain information is rendered incorrect due to the misremembering of past events transpired. Misinformation causes individual and collective memory distortion due to individuals recalling shared events differently. Memory distortions occur when people remember things incorrectly and can be influenced by a variety of factors, including misinformation.
2) **Continued Influence Effect (CIE)** is a long-term effect of misinformation that causes people to maintain belief in false information even after it has been thoroughly debunked for them. An example of CIE in relation to misinformation is the continued belief by some Americans that voter fraud occurred during the 2020 U.S. Presidential election even though there is plenty of information available that asserts otherwise.
3) **Technological Concerns:** This theme is defined as concern over rapidly advancing technologies such as artificial intelligence and social media platforms due to a lack of understanding of how they influence human behavior. There is an urgent need to develop solutions to problems of misinformation because modern technological platforms are able to deliver information to consumers at a historically unprecedented speed and volume.

Chapter 3: Results

Memory Distortion:

The theme of memory distortion was evident in the seven articles reviewed for this study. Generally, these studies utilized experimental methods to understand how memory was affected by misinformation. This research showed that people will amend their recollection of events when presented with augmentative content. However, some research showed variation in this pattern. In particular, (Dodson, et.al., 2015) found that older adults are more susceptible to memory distortion from misinformation compared to younger people due to being less apt to change their minds about the original information. One study used cognitive interviewing to research the differences in retrieval and recall of memories in younger people vs. older people. Cognitive interviewing utilizes existing methods that have proven effective in memory research such as instructing the interviewee to mentally reinstate the context of the witnessed event when recalling what occurred (Dodson, et.al., 2015).

Continued Influence Effect:

Continued Influence Effect (CIE) is a common result of misinformation and is discussed in four of the reviews articles. Although related to memory distortion, it is distinguished from that theme here because over time, it becomes something the individual believes in and will not change their understanding towards. It is not just an incorrect memory but an incorrect memory that has become an incontrovertible fact in the mind of the individual. The CIE has been documented in real-world settings as well as laboratory studies using fictional materials, which makes it both reproduceable and at least partially predictable. Essentially this means that people can develop a form of concrete thinking about misinformation that can cause them to reject the

truth in favor of the faulty information. For example, Ecker and Ang (2019) examined political partisan-attitude effects on information processing and found that that this is a long-term effect of misinformation that causes people to maintain belief in false information even after it has been thoroughly debunked for them (Ecker and Ang, 2019).

Technological Concerns:

Results of the thematic analysis revealed that there is an urgent need to develop solutions to problems of misinformation. This is further exacerbated by social media which has an accelerating effect on the spread of misinformation. In general, these studies found that our current paradigm of communications technologies was itself under-researched as far as its effects on people is concerned and this, coupled with the fact that social media accelerates the spread of misinformation needs more urgent attention from the research community. One study that lays out a practical approach for researching misinformation found that it is absolutely necessary for social scientists to form a better understanding of why and how falsehood is being spread via modern technological platforms (Pennycook, et al., 2021). In today's world the information landscape is marked by social media, citizen journalism, and fast paced information flow that places specific cognitive demands on the consumer. One such demand is that revisions of outdated, no longer relevant, or invalidated information require continuous updating in memory (Ecker and Ang, 2019). Modern forms of communication include a variety of presentation modalities, such as videos or images that are accompanied by verbal or written descriptions. Social media platforms tend to mix together these presentation methodologies as a matter of course. Another study found that the way information is encoded and the congruence between encoding and test conditions might influence the likelihood of retrieving the original information (Ulatowski, et al., 2016). This means that layering of sensory information through material on

social media platforms may itself be part of the issue of pinpointing ways to counter misinformation. The theme of technological concerns can be more easily understood here as a recognition of the fact that we do not understand the effects on the human nervous system of prolonged exposure to modern forms of technology such as cell phones and social media platforms, which in turn are effective vehicles for transmitting false information.

Chapter 4: General Discussion

A mixed methods review was conducted to examine the effects of misinformation on human cognitive processing. Seven articles were found through a comprehensive literature search and analyzed using thematic analysis. The results of this analysis found three themes regarding misinformation and cognitive processing. The following themes were identified and elaborated upon: memory distortion referring to the way the memory encodes experiences for later remembering; continued influence effect referring to the phenomena of people believing misinformation even after they have received ample correctional information; technological concerns referring to the fact that there is an urgent need for more research in the domain of the effects of modern communications technologies on people and also to address why misinformation spreads in an accelerated manner over social media.

Misinformation is rampant in American culture and the outcomes are disastrous for large portions of society. This study finds that misinformation effects people at very deep, cognitive levels, specifically in the encoding of memories, and forces adaptational responses in the human nervous system that can augment individual allostatic load. Allostatic load is cumulative and can further propagate into mood disorders and mental illness. Memory distortion is a common effect of misinformation and so is the continued influence effect which establishes a form of concrete thinking to support belief in non-factual information. Older adults are more susceptible to both allostatic load and the continued influence effect. Advances in communication technologies such as the internet and social media networks have accelerated the dissemination and increased the virility of misinformation, and the outcomes of this are disastrous. More research in the area of misinformation studies is urgently needed to develop solutions to this ongoing problem because

we still don't understand the implications of prolonged exposure to digital media and misinformation spreads very rapidly over social media platforms.

Partisan attitudes on retraction processing tended to be more effective if attitude-dissonant information was retracted. This was true for both left-wing and right-wing participants, however, if the parts of misinformation that affect attitudes were omitted from retractions, the retraction was entirely effective (Ecker and Ang, 2019). Furthermore, retractions were consistently found to be ineffective in Liberal supporters, corroborating the notion that conservative traits such as perceived threat, ambiguity intolerance, and closed-mindedness may foster resistance to attitude-dissonant retractions (Ecker and Ang, 2019). This means that people will accept retractions of misinformation if the correctional information does not conflict with their attitudes about the subject of the misinformation. Commonly referred to as a backfire effect, it is when a correction increases belief in the misconception it is attempting to debunk (Swire-Thompson, et al., 2022).

In January 2023, the Council of Canadian Academics published their report on misinformation titled 'Fault Lines' summarized, misinformation causes significant harm to individuals, communities, and societies because it is designed to appeal to our emotions and exploit our cognitive shortcuts. Vulnerability to misinformation is amplified in times of crisis when the consequences are most acute, and people are most dependent upon each other for collective sense-making. Misinformation damages community integrity through otherwise preventable outcomes and our social stability through division and the erosion of public trust. These adversities land most heavily on the least empowered amongst us, requiring rational, evidence-informed decision-making at all levels of culture in order to mitigate these outcomes. Furthermore, they reported that there is robust evidence supporting the contribution of science

and health misinformation to the following individual and collective impacts: “Illness, poisoning, and death from unsafe health interventions and products, illness and death from communicable and vaccine-preventable diseases, money wasted on disproven products and services, susceptibility to further and potentially more insidious forms of misinformation, increased healthcare and societal costs due to vaccine-preventable diseases, inaction or delayed public policy action.” (cca-reports.ca, 2023).

In the context of depressive rumination, Change et. al. (2019) concluded that “the findings in the present study suggest that increasing the salience of negative information/thoughts before implementing strategies to replace them with more positive and adaptive information/thoughts may achieve better treatment outcomes by facilitating updating” (p..27). In other words, this study found that reinforcing misinformed beliefs before introducing correctional information is more effective in countering CIE than simply attempting to debunk it. This study also found that depressive rumination is related to an updating enhancement for negative misinformation following a correction, which they speculated was due to a negative attentional bias that enhances the believability of negative information. This means that a person with depressive rumination is more apt to seek reinforcement of negative beliefs in response to corrective information because that’s how they have neuroplasticized the original information thus corroborating how they already feel.

In another series of experiments the persuasive efficacy of different message formats was researched, focusing on the difference between narrative and non-narrative information correction. Ecker et. al. (2020) found that narrative versus non-narrative format used for corrections had no impact on the correction’s effectiveness, in terms of either misinformation belief change or inferential reasoning scores. Another explanation for the lingering effect of

misinformation assumes that people build mental models of unfolding events and that if a central piece of the model is invalidated, they are presented with a gap in their knowledge of the event. This representation of their expectations simply does not make any sense unless one decides to maintain the false and invalidated information (Pluviano, et al., 2017). The research on CIE typically investigates mechanisms to restructure the thinking of people who hold beliefs created by misinformation. These results show that CIE is a powerful effect in physical memory that is difficult to reverse.

Digging deeper into technological concerns, a study that associates COVID-19 related media consumption and symptoms of mental illness found that social media usage was associated with more pronounced psychological strain. Participants with pre-existing fears seem to be vulnerable for mental distress related to media consumption (Bendau, et.al., 2021). Another study looked into anxiety caused by unreliable health information and concluded that information overload and the excessive use of social media were found to be predictive of health-related anxiety (Pallavi, et.al., 2022).

Mitigating Misinformation:

Considering the significant role the internet plays in modern life, remarkably, social media regulation is virtually non-existent in the U.S. To date, social media platforms are self-regulating and subject only to their own corporate boards' oversight to manage user-posted content (O'Connell, 2022). One-off fake news exposure may have behavioral consequences, though the effects may not be large. A study that researched the effects of fake news on behavior during COVID-19 found there were no effects of providing a general warning about the dangers of online misinformation in response to misinformation, regardless of the framing of the warning

in positive or negative terms, suggesting that generic warnings about online misinformation are unlikely to be effective (Greene, et.al., 2021). Pieces of misinformation that are only encountered once by an individual may only have minor behavioral effects. Countering misinformation campaigns is not as easy as simply reaching people with correctional information

The FCC's political programming and campaign advertising rules generally govern the circumstances under which broadcast stations and other regulatees air political-related advertisements. The FCC's Political Programming staff resolves issues relating to, among other things:

> Reasonable access by legally qualified candidates for federal office. Equal opportunities (frequently referred to as equal time) for legally qualified federal, state, and local candidates. The prohibition on censorship of candidate-sponsored ads. Lowest Unit Charges and Comparable Rates that broadcast stations and cable systems may charge legally qualified candidates for their advertisements. On-air sponsorship identification for political advertisements. Online political files that broadcast stations and other regulatees must maintain for public inspection (FCC.gov, 2023).

Basically, this says that the FCC only resolves issues of political programming that deal with a candidate's access to elected office via the political process, a candidate's access to advertising their campaign, the fees a broadcaster may charge for running political ads, identifying ads as political advertisements, and access to online political files. This means that the FCC does not regulate political speech in relation to factual integrity which provides opportunities for misinformation campaigns to occur.

Misinformation has been used over the past decade to alter the outcomes of the United States political process which led to the January 6th attack on the US Capital building in Washington, DC. Misinformation has been used over the past decade to confuse public health protocols and cause behavior in massive numbers of people during the COVID-19 pandemic response around the world, which in turn led to confusion and preventable suffering. Misinformation has been used over the past decade to alter people's perceptions of climate change causing a dramatic increase in fossil fuel usage which appears to be growing exponentially, irrevocably altering the ecological matrices of our only known, habitable planet. This has led to a global, human-sponsored era of mass-extinction referred to as an 'Anthropocene' (Chakrabarty, 2018). Furthermore, climate action is being undermined by bad actors seeking to derail efforts to save the planet from the abuses of fossil fuels utilizing misinformation, spread via social media, as their primary weapon (Fleming, 2022).

Political misinformation is an on-going threat to American democracy and steps should be taken to mitigate its spread and consumption. Warnings of misinformation are an increasingly common feature of American political communication. First, warnings of misinformation are biased when they target factual information rather than misinformation. Second, warnings of misinformation may be less valid because their effects are inefficient and imprecise (Freeze, 2020).

Misinformation is particularly dangerous because it continues to influence people even after the misinformation is debunked. Much media and scholarly attention to misinformation in recent years has focused on explaining belief persistence, situations in which people maintain their misperceptions even in the face of seemingly credible corrections. Belief persistence is normatively problematic partly because it could lead a person to hold a different opinion than she

would if she were correctly informed. For example, believing President Obama was born in Kenya could cause a voter to evaluate him more negatively (Thorson, 2016).

Currently, the spread of misinformation online is mostly underregulated as this is the domain of the corporations that own platforms such as Facebook and Twitter. Measures to regulate the online spread of misinformation will have to be developed by these disparate companies for any meaningful regulatory efforts to be established and maintained. Under current United States law, social media platforms like Facebook can continue to operate and implement harmful algorithms because there is little congressional oversight on these issues. Regulation of social media content and use has been especially problematic because it inevitably implicates issues involving intellectual property ownership as well as First Amendment Rights. In addition, drafting and implementing effective regulations requires significant expertise in computer science and data engineering (Denny, 2022). However, political speech is protected and not regulated by the FCC so fighting misinformation may be more about identifying and addressing false information rather than preventing that which can be said.

Machine learning systems may also be effective in identifying and tracking down the sources of misinformation, but further research is urgent and essential in continuing to identify issues surrounding misinformation and the development of ways to deal with it due to the accelerated paradigm of information dissemination presented by modern communications technologies. Research on this topic has developed unevenly. Over time, scholars have elaborated on the psychological origins of misinformation, and this work has cumulated in a productive way. By contrast, although there is an extensive body of research on how to correct misinformation, this literature is less coherent in its recommendations (Jerit & Zhao, 2020).

Chapter 5: Conclusion and Recommendations

In conclusion, the First Amendment of the United States Constitution protects free speech and the press, but it should not be interpreted as a protected way to exploit massive numbers of people through the unaccountable spread of misinformation via news and social media networks. Fox News Network executives admit to allowing their organization to broadcast non-factual information about important cultural events for the purposes of profiteering and the outcomes are disastrous. The freedom of the press as presented over social media should be aggressively re-evaluated by the Federal Communications Commission for regulatory purposes. Furthermore, the long-term effects of misinformation and misinformed action on individual people and how that influences collective behavior, including cultural outcomes, needs to be further researched in order to fully understand how to mitigate these effects before they corrupt solution-based, collective action in times of crisis.

Recommendations:

- Educate the public about misinformation
- Develop policies to help the FCC regulate political speech for factual integrity
- Develop policies to help the FCC regulate political speech on social media
- Sponsor research into the effects of misinformation on people and societies

Limitations and Future Research:

1. Small number of articles reviewed. Future research could benefit from expanding the search criteria.
2. Small time frame. Future research could benefit from expanding the search to earlier studies.
3. General focus: Future research could look at a specific misinformation event, such as COVID-19 vaccine misinformation.
4. The relationship between the human nervous system, the presentation frameworks of digital technologies such as cell phones and computer monitors, and the spread of misinformation. Future research could focus on the qualities of social media and its associated technologies that cause the accelerated spread of misinformation.

References

24 Months Since the January 6 Attack on the Capitol. (2022, February 15). https://www.justice.gov/usao-dc/24-months-january-6-attack-capitol

Bak-Coleman, J. B., Kennedy, I., Wack, M., Beers, A., Schafer, J. S., Spiro, E. S., Starbird, K., & West, J. D. (2022). Combining interventions to reduce the spread of viral misinformation. *Nature Human Behaviour*, *6*(10), Article 10.

Bendau, A., Petzold, M. B., Pyrkosch, L., Mascarell Maricic, L., Betzler, F., Rogoll, J., Große, J., Ströhle, A., & Plag, J. (2021). Associations between COVID-19 related media consumption and symptoms of anxiety, depression and COVID-19 related fear in the general population in Germany. *European Archives of Psychiatry and Clinical Neuroscience*, *271*(2), 283–291.

Boukes, M., & Vliegenthart, R. (2017). News Consumption and Its Unpleasant Side Effect: Studying the Effect of Hard and Soft News Exposure on Mental Well-Being Over Time. *Journal of Media Psychology*, *29*(3), 137–147.

Calo, R., Chris Coward, Emma S. Spiro, Kate Starbird, Jevin D. West (2021). How do you solve a problem like misinformation? Science Advances, 50(7), 1-2.

Casero-Ripollés, A. (2012). Beyond Newspapers: News Consumption among Young People in the Digital Era. *Comunicar*, *20*(39), 151–158.

CCA (Council of Canadian Academies). (2023). Fault Lines. Ottawa (ON): Expert Panel on the Socioeconomic Impacts of Science and Health Misinformation, CCA.

Chakrabarty, D. (2018). ANTHROPOCENE TIME. History and Theory, 57(1), 5–32.

Chan, M. S., Jones, C. R., Jamieson, K. H., & Albarracín, (2017). Debunking: A Meta-Analysis of the Psychological Efficacy of Messages Countering Misinformation. *Psychological Science*, *28*(11), 1531–1546.

Chang, E. P., Ecker, U. K. H., & Page, A. C. (2019). Not wallowing in misery—Retractions of negative misinformation are effective in depressive rumination. *Cognition and Emotion*, *33*(5), 991–1005.

Charles, S. T., Piazza, J. R., Mogle, J., Sliwinski, M. J., & Almeida, D. M. (2013). The Wear and Tear of Daily Stressors on Mental Health. *Psychological Science*, *24*(5), 733–741.

Dodson, C. S., Powers, E., & Lytell, M. (2015). Aging, confidence, and misinformation: Recalling information with the cognitive interview. *Psychology and Aging*, *30*(1), 46–61.

Ecker, U. K. H., & Ang, L. C. (2019). Political Attitudes and the Processing of Misinformation Corrections. *Political Psychology*, *40*(2), 241–260.

Ecker, U. K. H., Butler, L. H., & Hamby, A. (2020). You don't have to tell a story! A registered report testing the effectiveness of narrative versus non-narrative misinformation corrections. Cognitive Research: Principles and Implications, 5(1), 64–64.

Egan, L. J., & Dennis-Tiwary, T. A. (2018). Dynamic measures of anxiety-related threat bias: Links to stress reactivity. *Motivation and Emotion*, *42*(4), 546–554.

Farnan, B., & Farnan, M. (n.d.). *FARNANLLP 919 N. Market St., 12th Floor*.

Fleming, M. (2022, May 16). Rampant climate disinformation online is distorting dangers, delaying climate action. We The Peoples.

Freeze, M., Baumgartner, M., Bruno, P., Gunderson, J. R., Olin, J., Ross, M. Q., & Szafran, J. (2021). Fake Claims of Fake News: Political Misinformation, Warnings, and the Tainted Truth Effect. *Political Behavior*, *43*(4), 1433–1465.

Greene, C. M., & Murphy, G. (2021). Quantifying the effects of fake news on behavior: Evidence from a study of COVID-19 misinformation. *Journal of Experimental Psychology: Applied*, *27*(4), 773–784.

Guess, A. M., & Lyons, B. A. (2020). Misinformation, Disinformation, and Online Propaganda. In N. Persily & J. A. Tucker (Eds.), Social Media and Democracy (1st ed., pp. 10–33). Cambridge University Press.

Hochschild, J. L., & Einstein, K. L. (2023). *Do Facts Matter? Information and Misinformation in American Politics*.

Hoog, N., & Verboon, P. (2020). Is the news making us unhappy? The influence of daily news exposure on emotional states. *British Journal of Psychology*, *111*(2), 157–173.

January: COVID-19 pandemic cost of misinformation | News and features | University of Bristol. University of Bristol. Retrieved July 19, 2023

Jerit, J., & Zhao, Y. (2020). Political Misinformation. Annual Review of Political Science, 23(1), 77–94.

Kennedy, I., Wack, M., Beers, A., Schafer, J. S., Garcia-Camargo, I., Spiro, E. S., & Starbird, K. (2022). Repeat Spreaders and Election Delegitimization: A Comprehensive Dataset of Misinformation Tweets from the 2020 U.S. Election. *Journal of Quantitative Description: Digital Media*, *2*.

Krishna, A., & Thompson, T. L. (2021). Misinformation About Health: A Review of Health Communication and Misinformation Scholarship. American Behavioral Scientist, 65(2), 316–332.

Lewandowsky, S., & van der Linden, S. (2021). Countering Misinformation and Fake News Through Inoculation and Prebunking. *European Review of Social Psychology*, *32*(2), 348–384.

Longpré, C., Sauvageau, C., Cernik, R., Journault, A.-A., Marin, M.-F., & Lupien, S. (2021). Staying informed without a cost: No effect of positive news media on stress reactivity, memory and affect in young adults. *PLOS ONE*, *16*(10), e0259094.

McEwen, B. S. (2012). Brain on stress: How the social environment gets under the skin. *Proceedings of the National Academy of Sciences*, *109*(supplement_2), 17180–17185.

McEwen, B. S. (2003). Mood disorders and allostatic load. Biological Psychiatry, 54(3), 200–207.

Morales-Jinez, A., Gallegos Cabriales, E. C., D'Alonzo, K. T., Ugarte-Esquivel, A., López-Rincón, F. J., & Salazar-González, B. C. (2018). Social Factors Contributing to the Development of Allostatic Load in Older Adults: 18(3), 298–310.

Muhammed T, S., & Mathew, S. K. (2022). The disaster of misinformation: A review of research in social media. *International Journal of Data Science and Analytics*, *13*(4), 271–285.

OConnell, E. (n.d.). *Navigating the Internet's Information Cesspool, Fake News and What to Do About It*.

Pallavi, P., Bakhla, A. K., Kisku, R. R., Guria, R., Mundu, M., & Bala, R. (2022). Excessive and Unreliable Health Information and Its Predictability for Anxiety: A Cross-Sectional Observational Study. *Cureus*.

Pantazi, M., Hale, S., & Klein, O. (2021). Social and Cognitive Aspects of the Vulnerability to Political Misinformation. *Political Psychology*, *42*(S1), 267–304.

Penney, C. G. (1989). Modality effects and the structure of short-term verbal memory. *Memory & Cognition*, *17*(4), 398–422.

Pennycook, G., Binnendyk, J., Newton, C., & Rand, D. G. (2021). A Practical Guide to Doing Behavioral Research on Fake News and Misinformation. *Collabra. Psychology*, *7*(1).

Pluviano, S., Watt, C., & Della Sala, S. (2017). Misinformation lingers in memory: Failure of three pro-vaccination strategies. *PloS One*, *12*(7), e0181640-.

Pluye, P., & Hong, Q. N. (2014). Combining the Power of Stories and the Power of Numbers: Mixed Methods Research and Mixed Studies Reviews. Annual Review of Public Health, 35(1), 29–45. https://doi.org/10.1146/annurev-publhealth-032013-182440

Political programming. Federal Communications Commission. (n.d.). https://www.fcc.gov/media/policy/political-programming

Schulkin, J., McEwen, B. S., & Gold, P. W. (1994). Allostasis, amygdala, and anticipatory angst. Neuroscience & Biobehavioral Reviews, 18(3), 385–396.

Should Social Media Companies Be Regulated? - New York State Science & Technology Law Center Should Social Media Companies Be Regulated? (2022, February 8). New York State Science & Technology Law Center.

Smith, Z. S. (n.d.). Capitol Riot Costs Go Up: Government Estimates $2.73 Million In Property Damage. Forbes. Retrieved July 19, 2023, from https://www.forbes.com/sites/zacharysmith/2022/04/08/capitol-riot-costs-go-up-government-estimates-273-million-in-property-damage/

Starbird, K., Spiro, E. S., & Koltai, K. (2020). *Misinformation, Crisis, and Public Health—Reviewing the Literature*. MediaWell, Social Science Research Council.

Stitzlein, S. (2023). Teaching Honesty and Improving Democracy in the Post-Truth Era. Educational Theory, 73(1), 51–73.

Swire-Thompson, B., Miklaucic, N., Wihbey, J. P., Lazer, D., & DeGutis, J. (2022). The backfire effect after correcting misinformation is strongly associated with reliability. *Journal of Experimental Psychology. General*, *151*(7), 1655–1665.

Thorson, E. (2016). Belief Echoes: The Persistent Effects of Corrected Misinformation. *Political Communication*, *33*(3), 460–480.

Tulving, E., & Thomson, D. M. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review*, *80*(5), 352–373.

Ulatowska, J., Olszewska, J., & Hanson, M. D. (2016). Do Format Differences in the Presentation of Information Affect Susceptibility to Memory Distortions? The Three-Stage Misinformation Procedure Reconsidered. *The American Journal of Psychology*, *129*(4), 407–417.

Vraga, E. K., & Bode, L. (2020). Defining Misinformation and Understanding its Bounded Nature: Using Expertise and Evidence for Describing Misinformation. *Political Communication*, *37*(1), 136–144.

Zade, H., Wack, M., Zhang, Y., Starbird, K., Calo, R., Young, J., & West, J. D. (2022). Auditing Google's Search Headlines as a Potential Gateway to Misleading Content: Evidence from the 2020 US Election. *Journal of Online Trust and Safety*, *1*(4), Article 4.

Figures & Tables

Search Parameters:

Figure 1: Initial University of Washington Library Search parameters

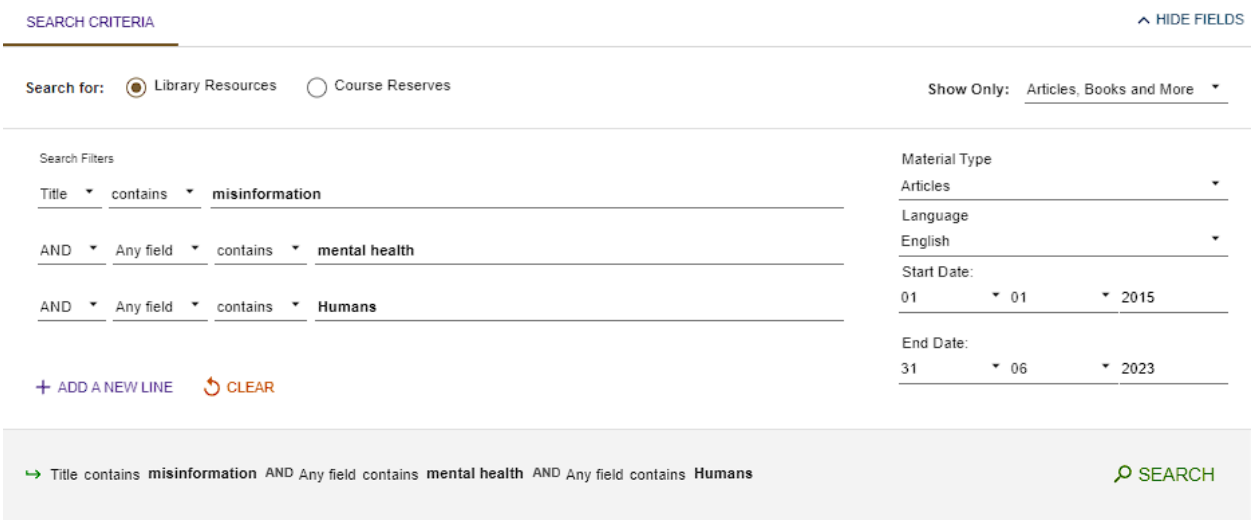


Figure 2: Active filters for University of Washington Library Search parameters

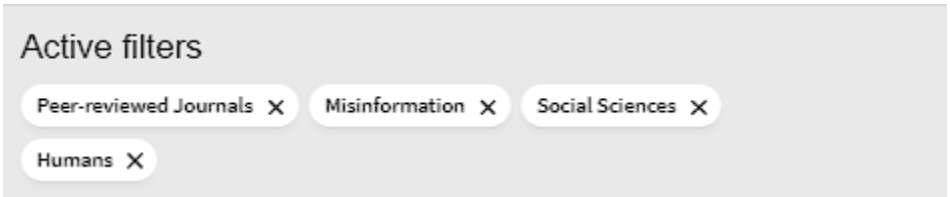


Table 1: Analysis matrix of reviewed literature.

Chang, et al.	2019	QUAN	CIE, memory distortion, misinformation research, mental health, retrieval and recall,	CIE, memory distortion
Dodson, et al.	2015	QUAN	tech. concerns, memory distortion, misinformation research, belief, retrieval and recall, experimentation	tech. concerns, memory distortion
Ecker & Ang	2019	QUAN	memory distortion, misinformation research, CIE, belief, experimentation	CIE, memory distortion, tech. concerns
Ecker, et al.	2020	QUAN	memory correction, belief, CIE, misinformation research, experimentation, solution-based	CIE, tech. concerns, memory distortion
Pennycook, et al.	2021	QUAL	tech. concerns, experimentation, instructional, solution-based	tech. concerns, memory distortion
Pluviano, et al.	2017	QUAN	memory distortion, continued influence effect, experimentation, solution-based	CIE, memory distortion
Ulatowska, et al.	2016	QUAN	experimentation, memory, belief, misinformation research, retrieval and recall	memory distortion, tech. concerns

Appendix I: Chosen Review Articles

A Practical Guide to Doing Behavioral Research on Fake News and Misinformation Author: Pennycook, Gordon, Binnendyk, Jabin, Newton, Christie, Rand, David G. Subjects: Accuracy; Digital broadcasting; False information; Intervention; Media literacy; Social networks MESH Genre: peer reviewed Language: English Is Part Of: Collabra. Psychology, 2021, Vol.7 (1)
Description: Coincident with the global rise in concern about the spread of misinformation on social media, there has been influx of behavioral research on so-called "fake news" (fabricated or false news headlines that are presented as if legitimate) and other forms of misinformation. These studies often present participants with news content that varies on relevant dimensions (e.g., true v. false, politically consistent v. inconsistent, etc.) and ask participants to make judgments (e.g., accuracy) or choices (e.g., whether they would share it on social media). This guide is intended to help researchers navigate the unique challenges that come with this type of research. Principle among these issues is that the nature of news content that is being spread on social media (whether it is false, misleading, or true) is a moving target that reflects current affairs in the context of interest. Steps are required if one wishes to present stimuli that allow generalization from the study to the real-world phenomenon of online misinformation. Furthermore, the selection of content to include can be highly consequential for the study's outcome, and researcher biases can easily result in biases in a stimulus set. As such, we advocate for pretesting materials and, to this end, report our own pretest of 224 recent true and false news headlines, both relating to U.S. political issues and the COVID-19 pandemic. These headlines may be of use in the short term, but, more importantly, the pretest is intended to serve as an example of best practices in a quickly evolving area of research. Publisher: Oakland: University of California Press, Journals & Digital Publishing Division Identifier: ISSN: 2474-7394; EISSN: 2474-7394; DOI: 10.1525/collabra.25293

Aging, Confidence, and Misinformation: Recalling Information With the Cognitive Interview Author: Dodson, Chad S. ; Powers, Emma ; Lytell, Mariko Author: Mayr, Ulrich Subjects: Adolescent ; Adult ; Age Differences ; Aged ; Aged, 80 and over ; Aging ; Aging - physiology ; Aging - psychology ; Burglary investigation ; Case studies ; Cognition & reasoning ; Cognition in old age ; Cognitive Ability ; Cognitive Interview ; Communication ; Confidence ; Demographic aspects ; Emotions ; Experiments ; Geriatrics & Gerontology ; Gerontology ; Human ; Humans ; Influence ; Information ; Interviews ; Interviews as Topic ; Investigations ; Life Sciences & Biomedicine ; Mental Recall - physiology ; Middle Aged ; Psychological aspects ; Psychology ; Psychology, Developmental ; Recall ; Recall (Learning) ; Robbery ; Science & Technology ; Social Sciences ; Young Adult MESH Genre: peer reviewed Language: English Is Part Of: Psychology and aging, 2015, Vol.30 (1), p.46-61
Description: In 2 experiments, younger and older adults witnessed a simulated robbery, received misleading information about the event, and then were interviewed with the Cognitive Interview about their memory for the robbery. In both experiments, older adults were disproportionately more confident than younger adults in the accuracy of incorrect information that they recalled than in the accuracy of correct information. Critically, this age-related increase in high-confidence errors occurred even in comparison with younger adults who were matched with older adults on the overall amount and accuracy of the information remembered about the robbery. In addition, Experiment 2 showed that retrieval warnings to disregard the misinformation were just as effective in older adults as compared with younger adults at

reducing the reporting of misleading information. Finally, both experiments showed that across the multiple retrieval stages of the Cognitive Interview, the final retrieval stage is roughly half as effective for older adults relative to younger adults at eliciting previously unreported information. These results indicate that investigators have much less to gain from older adults than they do from younger adults with repeated inquiries (during the same session) about a witnessed event. Publisher: WASHINGTON: American Psychological Association Identifier: ISSN: 0882-7974; EISSN: 1939-1498; DOI: 10.1037/a0038492; PMID: 25528064

Do Format Differences in the Presentation of Information Affect Susceptibility to Memory Distortions? The Three-Stage Misinformation Procedure Reconsidered Author: Ulatowska, Joanna ; Olszewska, Justyna ; Hanson, Matthew D. Subjects: Acoustic data ; Acoustic Stimulation - methods ; Adult ; Auditory stimuli ; Communication ; Congruence ; Control groups ; Encoding ; encoding modality ; encoding–retrieval match ; Experimental psychology ; False information ; False memories ; False memory ; Female ; format of information ; Humans ; Male ; Memory ; Memory - physiology ; Memory encoding ; Memory recall ; Misinformation ; misinformation effect ; Photic Stimulation - methods ; Presentation slides ; Psychological aspects ; Psychological research ; Psychology ; Psychology, Multidisciplinary ; Recovered memory (Psychology) ; Retrieval ; Social Sciences ; Students - psychology ; Students - statistics & numerical data ; Susceptibility ; Universities ; Working memory ; Written narratives ; Young Adult MESH Genre: peer reviewed Language: English Is Part Of: The American journal of psychology, 2016, Vol.129 (4), p.407-417

Description: To date most studies within the misinformation paradigm have used the visual presentation of a to-be-remembered event that is later tested verbally or visually. However, the well-established encoding specificity hypothesis predicts that congruence between encoding and test phases should lead to fewer memory errors. In Study 1, we examined the susceptibility to misinformation after encoding original information in 1 of 4 different formats: as a film, slides, and as a written or auditory narrative. All participants were tested verbally, and those who encoded original information pictorially (as a video or slides) were more likely to incorrectly accept verbally suggested information. This might be a consequence of encoding–retrieval format match. In Study 2, using either verbal or pictorial modality during encoding, post event information, and test (fully crossed design), we partially supported the encoding–retrieval format match hypothesis; however, auditory presentation of original or post event information modified the effect, showing that a memory trace created after auditory description was the strongest. Publisher: CHAMPAIGN: University of Illinois Press Identifier: ISSN: 0002-9556; EISSN: 1939-8298; DOI: 10.5406/amerjpsyc.129.4.0407; PMID: 29558049; CODEN: AJPCAA

Misinformation lingers in memory: Failure of three pro-vaccination strategies Author: Pluviano, Sara ; Watt, Caroline ; Della Sala, Sergio Author: Moore, Anne C. Subjects: Adult ; Archives & records ; Autism ; Autistic Disorder - etiology ; Backfire ; Biology and Life Sciences ; Children ; Communication ; False information ; Fear ; Female ; Health aspects ; Health Knowledge, Attitudes, Practice ; Humans ; Immunization ; Immunological memory ; Laboratories ; Male ; Medical errors ; Medicine and Health Sciences ; Memory ; Memory, Long-Term ; Methods ; Motivation ; Multidisciplinary Sciences ; Parents ; Patient Acceptance of Health Care - psychology ; Psychology ; Public health ; Science & Technology ; Science & Technology - Other Topics ; Side effects ; Social Sciences ; Systematic review ; Vaccination ; Vaccination - statistics & numerical data ; Vaccines ; Vaccines - adverse effects ; Validity ; Young Adult

MESH Genre: peer reviewed Language: English Is Part Of: PloS one, 2017, Vol.12 (7), p.e0181640, Article 0181640
Description: People's inability to update their memories in light of corrective information may have important public health consequences, as in the case of vaccination choice. In the present study, we compare three potentially effective strategies in vaccine promotion: one contrasting myths vs. facts, one employing fact and icon boxes, and one showing images of non-vaccinated sick children. Beliefs in the autism/vaccines link and in vaccines side effects, along with intention to vaccinate a future child, were evaluated both immediately after the correction intervention and after a 7-day delay to reveal possible backfire effects. Results show that existing strategies to correct vaccine misinformation are ineffective and often backfire, resulting in the unintended opposite effect, reinforcing ill-founded beliefs about vaccination and reducing intentions to vaccinate. The implications for research on vaccines misinformation and recommendations for progress are discussed. Publisher: SAN FRANCISCO: Public Library Science Identifier: ISSN: 1932-6203; EISSN: 1932-6203; DOI: 10.1371/journal.pone.0181640; PMID: 28749996

Not wallowing in misery - retractions of negative misinformation are effective in depressive rumination
Author: Chang, Ee Pin ; Ecker, Ullrich K. H. ; Page, Andrew C. Subjects: Adolescent ; Adult ; Aged ; Attentional bias ; Attentional Bias - physiology ; Communication ; continued-influence effect ; depression ; Depression - psychology ; False information ; Female ; Humans ; Male ; Mental depression ; Middle Aged ; Misinformation ; Rumination ; Rumination, Cognitive - physiology ; Western Australia ; Worldview ; Young Adult MESH Genre: peer reviewed Language: English Is Part Of: Cognition and emotion, 2019, Vol.33 (5), p.991-1005
Description: People often continue to rely on misinformation in their reasoning after they have acknowledged a retraction; this phenomenon is known as the continued-influence effect. Retractions can be particularly ineffective when the retracted misinformation is consistent with a pre-existing worldview. We investigated this effect in the context of depressive rumination. Given the prevalence of depressotypic worldviews in depressive rumination, we hypothesized that depressive rumination may affect the processing of retractions of valenced misinformation; specifically, we predicted that the retraction of negative misinformation might be less effective in depressive ruminators. In two experiments, we found evidence against this hypothesis: in depressive ruminators, retractions of negative misinformation were at least as effective as they were in control participants, and more effective than retractions of positive misinformation. Findings are interpreted in terms of an attentional bias that may enhance the salience of negative misinformation and may thus facilitate its updating in depressive rumination. Publisher: England: Routledge 8/3/23, 8:14 AM about: blank about: blank 2/7 Identifier: ISSN: 0269-9931; EISSN: 1464-0600; DOI: 10.1080/02699931.2018.1533808; PMID: 30319039

Political Attitudes and the Processing of Misinformation Corrections Author: Ecker, Ullrich K. H. ; Ang, Li Chang Subjects: Attitudes ; continued influence effect ; False information ; Influence ; Misconduct ; Misinformation ; Motivated reasoning ; Partisanship ; Political aspects ; Political attitudes ; Political parties ; Politicians ; Right and left (Political science) ; Worldview ; worldview-backfire effect MESH Genre: peer reviewed Language: English Is Part Of: Political psychology, 2019, Vol.40 (2), p.241-260
Description: Misinformation often continues to influence people's memory and inferential reasoning after it has been retracted; this is known as the continued influence effect (CIE). Previous research investigating the role of attitude-based motivated reasoning in this context has

found conflicting results: Some studies have found that worldview can have a strong impact on the magnitude of the CIE, such that retractions are less effective if the misinformation is congruent with a person's relevant attitudes, in which case the retractions can even backfire. Other studies have failed to find evidence for an effect of attitudes on the processing of misinformation corrections. The present study used political misinformation—specifically fictional scenarios involving misconduct by politicians from left-wing and right-wing parties—and tested participants identifying with those political parties. Results showed that in this type of scenario, partisan attitudes have an impact on the processing of retractions, in particular (1) if the misinformation relates to a general assertion rather than just a specific singular event and (2) if the misinformation is congruent with a conservative partisanship. Publisher: Oxford: Wiley Periodicals, Inc Identifier: ISSN: 0162-895X; EISSN: 1467-9221; DOI: 10.1111/pops.12494

You don’t have to tell a story! A registered report testing the effectiveness of narrative versus non-narrative misinformation corrections Author: Ecker, Ullrich K. H. ; Butler, Lucy H. ; Hamby, Anne Subjects: Behavioral Science and Psychology ; Cognitive Psychology ; Continued influence effect ; Error Correction ; Experimental Psychology ; Experiments ; False information ; Intervals ; Memory ; Misconceptions ; Misinformation ; Myth debunking ; Narrative processing ; Neurosciences ; Psychology ; Registered Reports and ; Registered Reports and Replication ; Resistance (Psychology) ; Retention (Psychology) ; Stories ; Story Telling ; The Psychology of Fake News MESH Genre: peer reviewed Language: English Is Part Of: Cognitive research: principles and implications, 2020, Vol.5 (1), p.64-64, Article 64
Description: Misinformation often has an ongoing effect on people’s memory and inferential reasoning even after clear corrections are provided; this is known as the continued influence effect. In pursuit of more effective corrections, one factor that has not yet been investigated systematically is the narrative versus non-narrative format of the correction. Some scholars have suggested that a narrative format facilitates comprehension and retention of complex information and may serve to overcome resistance to worldview-dissonant corrections. It is, therefore, a possibility that misinformation corrections are more effective if they are presented in a narrative format versus a non-narrative format. The present study tests this possibility. We designed corrections that are either narrative or non-narrative, while minimizing differences in informativeness. We compared narrative and non-narrative corrections in three preregistered experiments (total N = 2279). Experiment 1 targeted misinformation contained in fictional event reports; Experiment 2 used false claims commonly encountered in the real world; Experiment 3 used real-world false claims that are controversial, in order to test the notion that a narrative format may facilitate corrective updating primarily when it serves to reduce resistance to correction. In all experiments, we also manipulated test delay (immediate vs. 2 days), as any potential benefit of the narrative format may only arise in the short term (if the story format aids primarily with initial comprehension and updating of the relevant mental model) or after a delay (if the story format aids primarily with later correction retrieval). In all three experiments, it was found that narrative corrections are no more effective than non-narrative corrections. Therefore, while stories and anecdotes can be powerful, there is no fundamental benefit of using a narrative format when debunking misinformation. Publisher: Cham: Springer International Publishing Identifier: ISSN: 2365-7464; EISSN: 2365-7464; DOI: 10.1186/s41235-020-00266-x; PMID: 33300094