

COMMUNICATING SCIENCE
IN TIMES OF CRISIS

EDITED BY

KEVIN B. WRIGHT

COMMUNICATION AND
MISINFORMATION

CRISIS EVENTS IN THE AGE OF
SOCIAL MEDIA



WILEY Blackwell

Communication and Misinformation

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Crisis Events in the Age of Social Media

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In Memory of H. Dan O'Hair
friend, mentor, and crisis communication pioneer

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Preface

The study of human communication has changed considerably since the turn of the century, with the advent of the Internet, the proliferation of social media platforms, and the many changes in human interaction and information exchange they led to. At the same time, we have witnessed a number of significant crises globally, including climate change, the COVID-19 pandemic, natural disasters, terrorism, and political unrest. During times of crisis, people often turn to social media for information and social support, as both content producers and consumers. The lack of traditional gatekeepers on many social media platforms and Web 2.0 technology has allowed misinformation to spread quickly and widely during times of crisis. Such events and changes in social media have offered a variety of opportunities for scholars to study the development, spread, and impact of online misinformation during crisis events. For example, as we witnessed with COVID-19, views of vaccinations and other preventive measures on social media were often influenced by the spread of misinformation according to differing political viewpoints and agendas, foreign adversary interference, and many other factors that contributed to the sea of misinformation across social media. Social media have become increasingly important sources for information in terms of health and crisis communication, and social media platforms often function as a convenient source of information during crisis situations. Such platforms, including Facebook, X (formerly Twitter), Instagram, and YouTube have accelerated information transmission in crisis contexts across social, cultural, and geographical boundaries. Real-time (mis)information exchange occurs rapidly online via a variety of social media platforms, which makes it challenging for government officials, researchers, public health experts, and other federal, state, and local government entities to identify and potentially correct misinformation about risk and crisis situations.

Communication plays an increasingly critical role in crisis events, particularly in identifying and analyzing the dissemination and impact of misinformation on various segments of the population and in correcting misinformation and/or replacing it with scientific, evidence-based explanations of causes as well as solutions to reduce harm. Social media's ability to tailor information in very specific ways may lead audiences to be exposed to relatively limited or politically biased information about the causes of crisis events or the best policies or course of action to mitigate risk to individuals. During times of crisis, the public may increase their reliance on social media to obtain information from these platforms and from social network members they trust. (Mis)information is rapidly shared, reshared, and commented on by others online as it is frequently disseminated across multiple social media platforms (e.g., Facebook, X (Twitter), TikTok). Individuals and their social media network members vary in their education level and scientific literacy, and this affects their interpretations of

scientific information reported by government officials or the media and their perceptions of the risk and severity of crisis events as well as their behaviors. While social media serve many useful functions by providing multiple sources of good information to the public during a crisis event, there is substantial evidence that misinformation about crisis events has spread rapidly on social media, including information about climate change, vaccinations, and COVID-19. A growing number of researchers have demonstrated, however, that it is possible to preemptively warn social media users about the spread of misinformation during crisis events and also to correct misinformation.

This book addresses these issues and many others in the study of online misinformation during crisis events. The contributors to this volume have extensive research experience of communication of misinformation on social media during times of crisis. They focus on a variety of important questions and issues related to social media misinformation during times of crisis. For example, to what extent can social media play a role in reducing risks to the public during times of crisis? What theoretical frameworks are useful in understanding the spread of misinformation and correcting misinformation on social media during crisis events? What research tools and approaches (e.g., information correction, big data analysis) can researchers use to identify and track misinformation about crisis events on social media? What approaches are most useful for reaching segments of the population who have extreme political views or who may be resistant to changing their perceptions of crisis events?

Kevin B. Wright

1

Characteristics of Crisis Misinformation Messages on Social Media

Christopher M. Dobmeier, Jessica A. Zier, and Nathan Walter

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Crisis and misinformation go hand in hand with what some may call a marriage made in hell. To be sure, during times of crisis, risk and uncertainty are elevated, while the quality and veracity of information tends to drop, contributing to an atmosphere ripe for rumors, misinformation, and outright deceptions. Adding to this mix are a plethora of social media platforms that tend to favor sensational and emotion-laden content; this is another way to say that this is a major problem.

In discussing crisis misinformation and social media, it is important to put some hard truths on the table. First, *misinformation* is as old as its more responsible sibling, *information*, so it is important to firmly foreground any discussion on misinformation in a historical context. Second, because the label of “misinformation” is used to cover a wide array of content, from minor inaccuracies and harmless hoaxes to vicious propaganda and conspiracy theories, the need to define and distinguish different types of misinformation is a challenge in and of itself. Third, that for millennia individuals, groups, and entire societies have fallen victim to misinformation strongly suggests that humans may have a collective blind spot when it comes to accepting untruths. Fourth, whether one supports that technology fundamentally changes humans or it simply allows humans to change, misinformation has an undeniable strong reaction in conjunction with information technology, most recently social media.

Broadly speaking, the structure of this chapter corresponds with these four hard truths. We begin with a brief historical review showing how our understanding of misinformation both is affected by and transcends social and technological evolutions. This review is followed by an attempt to define misinformation, which examines both its general features and its common taxonomies. The bulk of the chapter, however, outlines some of the psychological, sociological, and technological factors that perpetuate humans’ susceptibility to misinformation. Then we focus on a series of very different case studies to illustrate how and why misinformation spreads on social media. The chapter concludes with a deceptively optimistic prognosis for social recovery.

A (Very) Brief History of Misinformation: From Hunter-Gatherers to Russian Bots

Human beings are the animal that cannot become anything without pretending to be it first.

—W. H. Auden (1907–1973)

While a comprehensive review of the history of misinformation or every lie ever told is beyond the scope of this chapter, it is difficult to grasp the role played by misinformation in times of crisis without some historical context. Consider the astonishing fact that humans have spent nearly 99% of their history as hunter-gatherers, living in small groups and dividing their time between fighting and fleeing from predators or other competing groups. This lifestyle highlighted two very important but often scarce resources—food and shelter. Indeed, there are good reasons to suspect that much of human communication in ancestral times revolved around securing these resources. When food and shelter are the two main concerns an individual must grapple with, knowingly or unknowingly misinforming their group is likely to lead to severe consequences. For instance, if they were to tell their tribe that a poisonous berry was edible, that sabretooth cats are docile, or that there was an elephant near the lake but omit to add that hyenas as big as bears also gather there, the result was likely to be swift and bloody. This may explain why estimated murder rates within hunter-gatherer societies were often over 10% (Rosling, Rosling, & Rosling, 2018). Simply put, misinformation had no place during these times.

Over the 10 millennia from the end of hunter-gatherer society to the Greek empire's rise, misinformation evolved considerably. As information gained functions well beyond mere survival, misinformation also served more purposes. One such purpose was found in the ancient Greeks' art of storytelling, and there was no better storyteller than Herodotus (484–425 BCE), who was known as “the father of history.” Despite this, depicting Herodotus as a historian is both wrong and a paradox: the label is a misnomer because Herodotus' accounts included more fiction than fact, and a paradox because the English word “history” owes its origin to Herodotus' travelogues, called *Histories*, which are an entertaining cocktail of exaggerated encounters and fanciful tales, garnished with a tiny drizzle of facts. From camel-eating ants in Persia to a 300-foot-thick wall in Babylon, Herodotus had a penchant for not spoiling a good story with facts. Although this part-historian part-fantast was criticized by his contemporaries for telling lies (Baragwanath & de Bakker, 2012), he was also celebrated as a brilliant storyteller who had an immense influence on generations of orators, particularly those embracing the gray area between embellished truth and deception.

Although early misinformation was characterized by playful and even comical humbuggery, it eventually took a dark turn in the twentieth century, ushering in a new era of far more serious and consequential deceit. As global tensions grew in the lead-up to World War I, misinformation took on a new meaning as European countries began devoting considerable resources to voluntary military recruitment. The result of these efforts was the first large-scale and modern attempt at propaganda (from the Latin *propagare*, to disseminate), which demonized enemies and justified the government's cause. The scale and magnitude of the propaganda machine during World War I ensured that falsehoods about the enemy traveled far and wide, and with great consequences.

Over the next two decades, the traditional propaganda tools of World War I, such as newspapers, leaflets, and full-color posters, were supplanted by more sophisticated media

technologies, including radio and film. Although propaganda had become virtually unavoidable during World War I, its influence and impact somehow intensified during the ensuing decades. After Adolf Hitler took over the reins of the national government in 1932, for instance, one of his first political moves was to establish the Ministry of Propaganda and Public Enlightenment, which he placed in the hands of Joseph Goebbels. This meant that for the first time in history a country at peace would have a propaganda ministry, or a lie factory, to glorify its ideology and dehumanize its enemies. Meanwhile, in the West the propaganda machine was picking up steam as well, with award-winning directors such as Frank Capra and John Huston being recruited to create “orientation” (a fancy word for propaganda) films for the US Department of War. One such orientation film series, *Why We Fight*, had been viewed by at least 54 million Americans by the end of the war (Rollins, 1996). While empirical evidence on its impact in swaying public opinion was inconclusive, its cultural significance in offering a coherent and memorable rationale for a total war is undeniable.

Since the emergence of social media, the misinformation playbook has only become more complex. While social media platforms have been associated with the democratization of information and mass communication, they have also opened a Pandora’s box of potential threats to democracy. These matters came to the fore when Russia was found meddling in the 2016 US presidential election by employing *bots*—spam accounts that post autonomously using preprogrammed scripts—to spread misinformation and even hijack civic conversations across social media, sowing distrust in electoral procedures and polarizing constituents (Howard, 2018). In an instant, this so-called computational propaganda became an international hazard, as countries near and far grappled with the new cyberreality (Woolley & Howard, 2018). As 2016 drew to a close, Oxford Languages offered the perfect epitaph by declaring its 2016 Word of the Year to be “post-truth”: “relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief” (Oxford Languages, 2016).

These new agents of misinformation, social media bots, are just the tip of the iceberg. Artificial intelligence (AI) and machine learning, for example, underlie new misinformation technologies such as the often playful but sometimes nefarious *deepfakes*, programs designed to manipulate pictures, videos, and audio to pass as authentic primary sources of information. As these technologies become more advanced, the misinformation they spread may become more convincing and harder to detect and to deter.

The picture that emerges from this brief overview illustrates that misinformation has been one of the true constants throughout human history from hunter-gatherers to bots and AI. Although cultural, social, and technological environments change, the hold that misinformation has on humans has remained. So, rather than searching for a magical algorithm or a technological fix that would rid the world of misinformation, it is time to look in the mirror and understand what makes humans so vulnerable. To begin, it is necessary to know what exactly misinformation is.

What Is, What Is Not, and What May Be Defined as Misinformation

You’re saying it’s a falsehood and ... Sean Spicer, our press secretary, gave alternative facts to that.

—Kellyanne Conway

When Kellyanne Conway, counselor to President Trump, used the phrase “alternative facts” to defend the White House press secretary Sean Spicer’s false statements about the attendance numbers for Donald Trump’s inauguration, she was probably not aware that she was contributing yet another term to the already overcrowded concept of misinformation. Indeed, the exponential growth in misinformation has arguably been outpaced only by ill-fated attempts to define it, as was painfully illustrated in a recent systematic review that yielded more than 30 distinct definitions of this very popular concept (Wang, Their, & Nan, 2022). A closer look at how the literature on misinformation has tackled the challenge of defining its subject of research reveals two distinct approaches: structural definition and taxonomy.

The structural approach attempts to define misinformation by highlighting the essential elements that make up the concept. Consider the following definition of misinformation: “Cases in which people’s beliefs about factual matters are not supported by clear evidence and expert opinion” (Nyhan & Reifler, 2010, p. 305). Although similar definitions are commonly used in research and practice, it does not take too long to identify a number of loose ends. To start, the benchmarks for “clear evidence and expert opinion” are fuzzy: how clear should the evidence be, and who has the monopoly on expertise? For instance, next time a dentist who recommends flossing can rightfully be accused of spreading misinformation since the health benefits of routine flossing are not supported by scientific evidence, according to a meta-analysis published by the Cochrane Library, a reputable hub for health information (Berchier et al., 2008). Similarly, one may sneer at an individual who refuses to wear a surgical mask while coughing on a crowded train, but the Surgeon General, Jerome Adams, tweeted “Stop buying masks!” not too long ago. As these examples show, not only do experts sometimes disagree, but the scientific basis for evidence is rarely clear.

Recent attempts have been made to improve existing definitions by emphasizing the dynamic nature of expertise and evidence. One promising attempt comes from Vraga and Bode (2020), who distinguish between different levels of expert consensus from controversial (e.g., astronauts are essential to the future of space programs) to settled (e.g., human activity contributes to climate change), as well as different levels of amount and quality of evidence from controversial (e.g., it is safe to eat foods grown using pesticides) to settled (e.g., there is no evidence that vaccines cause autism). Although this approach retains greater nuance than binary definitions, it has limitations, notably the rarity of near-universal agreement and strong evidence during crises.

Moreover, the distinction definitions make between factual and nonfactual matters is key. On the face of it, the focus on fact-based statements, which can be proved or disproved by objective evidence, makes total sense. On a second glance, however, this distinction raises several concerns. If only fact-based or checkable claims can be labeled as misinformation, the vast majority of public discourse, including opinions, rumors, predictions, and general speculation, is off-limits. This gray area between fact- and opinion-based statements, however, is often what characterizes rumors, innuendo, and pseudoscience. Further, this concern is amplified by people’s general tendency to conflate fact and opinion, as revealed by a Pew Research Center (Mitchell et al., 2018) poll showing that only 26% of US adults could accurately and reliably classify them. To this end, if people are unable to distinguish factual from nonfactual matters, the definition is unnecessarily limiting.

Furthermore, this definition of misinformation does not say much about intentionality. Typically, the notion of intentionality helps distinguish misinformation and disinformation, with the latter being defined as false information deliberately created and

disseminated with malicious intent (Nan, Thier, & Wang, 2023), whereas the former focuses on instances where there is no clear evidence of intent to mislead or deceive. As with murder cases, where intent is often an essential element in securing a conviction, intent in spreading falsehoods is a major consideration. Antitobacco policymakers and campaigns were successful at dismantling the industry because they were able to show that tobacco companies deliberately deceived the public by minimizing the risk of smoking and by downplaying their responsibility to their customers. Although there is practical value in this distinction, intent is difficult to prove (at least not without litigation), leading some to conclude that “for the purpose of studying misinformation impact, [proving intent] ... is not necessary” (Nan et al., 2023, p. 3).

Structural definitions of misinformation are useful in that they attempt to bound the concept by its underlying components, such as expertise, evidence, checkability, and intent. Still, given the variety of what can be labeled misinformation, perhaps it is an unbounded phenomenon. To address this problem, scholars have offered to pinpoint misinformation not by focusing on its structure but rather by outlining the variety of categories that constitute it. One noteworthy attempt has provided a typology of *fake news* using level of facticity (or the degree to which a message relies on facts) and author’s intention to deceive as its delineating factors (Tandoc, Lim, & Ling, 2018). This typology is informative on a number of levels. First, it houses a wide variety of genres—from conventional (e.g., native advertising and fabrication) to unconventional (e.g., parody and news satire) misinformation. Dimensions of facticity and intent further help crystalize similarities and differences between types of fake news. According to this typology, for instance, both fabrication and news parody contain a low degree of facts (low facticity) but whereas the former intends to mislead, news parody (e.g., *The Onion*) forges ludicrous stories to provide a commentary on current affairs. Similarly, while native advertising and news satire tend to share a relatively high degree of factual basis (high facticity), they fulfill drastically different functions: selling products versus using humor and wit to offer constructive social criticism.

All things considered, researchers and practitioners will continue to wrestle with the definitional challenges of misinformation for the foreseeable future, especially as the demand for effective responses to its proliferation grows. Common to all types of misinformation, however, are underlying psychological mechanisms that make individuals vulnerable to their influence.

The Six Degrees of Susceptibility

When thoughts flow smoothly, people nod along.

—Schwarz et al. (2016)

The need for deliberate misinformation control arises from the growing discrepancy between the rapid spread of false information and humans’ cognitive capacity to recognize and counteract it. Their brains, with their complex thought, memory, emotional experiences, and information-processing abilities developed over a 200,000-year history, set humans apart from other species. Yet, misinformation has evolved swiftly, taking advantage of individuals’ cognitive and emotional vulnerabilities. The six influences that follow exemplify the paradox that the qualities that define humanity also make humans prone to misinformation.

Mental Models

Derived from Craik's (1943) hypothesis that humans hold their own mental maps of the world as they experience it, mental models being internal representations of how the world operates (Johnson-Laird, 2013). More concretely, mental models are intuitive systems that help an individual attend, contextualize, and establish links between prior knowledge and new information, which are used to understand the world before them. Consequently, mental modeling is what coheres all relevant pieces of information, allowing an individual to assess a scenario and ultimately take appropriate action. For example, they may understand the potential consequences of drunk driving through mental modeling (e.g., if they drink alcohol, they will be impaired; and if they drive while impaired, they may cause an accident).

One crucial pitfall of mental modeling is that it is also prone to connecting irrelevant or inaccurate cognitions to form an inaccurate—albeit coherent—inference, paving the perilous path for the flourishing of superstitions and conspiracy theories (Van Prooijen, Douglas, & De Inocencio, 2018). The moon landing conspiracy theory, for example, has survived decades of debunking because it provides people with a relatively simple mental model that easily explains away a lot of questions arising from the moon landing, such as why the iconic moon landing photo shows no stars or why the United States has not conducted another lunar landing since 1972 (for an illustration of the moon landing conspiracy theory mental model, see Figure 1.1). Although these questions often have sound answers, none are as simple and encompassing as the suggestion that the landing was faked by the US government. A well-crafted conspiracy theory like this provides its victims with a coherent story to explain phenomena that are otherwise difficult or tedious to understand, ultimately exploiting the human preference for complete explanations (Korman & Khemlani, 2020). To this end, debunking conspiracy theories is a mammoth task that requires an alternative explanation not for a single piece of misinformation, but for a constellation of misinformation.

Motivated Reasoning

As discussed, the reasoning process of mental modeling can be influenced by external factors such as the quality and completeness of information. Mental modeling may further be biased by one's internal motivations (Kunda, 1990). According to the motivated reasoning approach, individuals are not always motivated to reach the most accurate conclusion and often prefer explanations that align with their preexisting beliefs. Additionally, they tend to accept confirmatory information and to reject disconfirmatory information, which

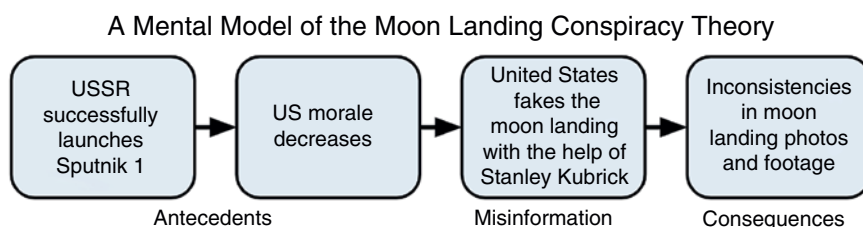


Figure 1.1 A mental model of the moon landing conspiracy theory. Successfully debunking the theory requires the reconciliation not only of its perceived consequences but also of its perceived antecedent motivations—a tall order for standard misinformation corrections.

means that mental models are continually self-reinforcing (Johnson-Laird, 2013; Korman & Khemlani, 2020). Put succinctly, people do not always rationalize in rational ways.

Continuing with the moon landing example, a cynic who naturally distrusts the institutions of government and science is likely more susceptible to the moon landing conspiracy theory than the average person because the conspiracy aligns with their preexisting beliefs (i.e., it fits neatly into their mental model). Further, a cynic may hold implicit or explicit goals to confirm evidence that supports the conspiracy theory and/or to reject or avoid any information intended to debunk the conspiracy theory (e.g., Kahan, 2016; Kim & Cao, 2016). In tandem, these dispositions create the perfect environment for either misinformation or its corrections to thrive—but rarely both.

Memory

Memory is limited, malleable, and prone to error—whether such memories are mundane (e.g., what time one went to the bathroom last night) or significant (e.g., where one was when they received the news of the September 11 attacks). When it comes to communication, not only does one need to remember *what* was said, but maybe also *who* said it and *what the response was* to it, all of which influence the believability of a message. Such details may play a role in distinguishing fact from fiction; for example, if one received a message that President Bush knew about the September 11 attacks before they happened, one might notice that it was from a conspiratorial uncle and promptly ignore it. In this case, the untrustworthiness of the uncle functions as a *discounting cue*, a signal that indicates that the message should be taken with a grain of salt. However, discounting cues are useful only if they are remembered. One may come across misinformation and immediately discount it, but may later remember the misinformation without recalling why it had been discounted or that it was ever discounted. This phenomenon is known as the *sleeper effect*, and it makes people vulnerable to the delayed influence of misinformation (Priester et al., 1999).

Especially in crisis communication, conveying false or incomplete memory can not only lead to suboptimal public action or inaction but also fuel related conspiracy theories that undermine the public's trust in government. Bush's benign lapse in memory recall of the September 11 events heightened public speculation and conspiracy theories that the government had known about the attack before it happened (Greenberg, 2004). And, if one forgot that the person propounding such a theory was one's tin-foil-hat uncle (i.e., the discounting cue), one was just a bit more prone to believe it.

Source Credibility

Echoing the assumptions of the sleeper effect, believability of misinformation falls not only on the message itself but also on the relationship between the messenger and recipient. Swindles, shams, hoaxes, and other fraudulent spectacles have been known throughout history, but their success is often not a testament to the stupidity of the individuals who fall for them but rather to the persuasiveness of the individuals who pedal them. Each fraudster—from the eponymous Charles Ponzi to InfoWars host Alex Jones—played a crucial role for their target audience: a credible source.

More particularly, these sources are seen as competent and trustworthy (O'Keefe, 2018). The InfoWars audience, for example, perceived Alex Jones to be knowledgeable, intelligent, and qualified to speak on the topics at hand and his reporting to be honest, unselfish, and