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TARGET ARTICLE



## Deep Fakes and Memory Malleability: False Memories in the Service of Fake News

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### ABSTRACT

Deep fakes have rapidly emerged as one of the most ominous concerns within modern society. The ability to easily and cheaply generate convincing images, audio, and video via artificial intelligence will have repercussions within politics, privacy, law, security, and broadly across all of society. In light of the widespread apprehension, numerous technological efforts aim to develop tools to distinguish between reliable audio/video and the fakes. These tools and strategies will be particularly effective for consumers when their guard is naturally up, for example during election cycles. However, recent research suggests that not only can deep fakes create credible representations of reality, but they can also be employed to create false memories. Memory malleability research has been around for some time, but it relied on doctored photographs or text to generate fraudulent recollections. These recollected but fake memories take advantage of our cognitive miserliness that favors selecting those recalled memories that evoke our preferred *weltanschauung*. Even responsible consumers can be duped when false but belief-consistent memories, implanted when we are least vigilant can, like a Trojan horse, be later elicited at crucial dates to confirm our pre-determined biases and influence us to accomplish nefarious goals. This paper seeks to understand the process of how such memories are created, and, based on that, proposing ethical and legal guidelines for the legitimate use of fake technologies.

### KEYWORDS

Bioethics; law; media; mind-brain; morality/ethics; theory of mind

### INTRODUCTION

Fake news is a scourge within modern society, brought about by foreign powers amplifying messages throughout the recently constructed echo chambers of social media and exacerbated by the lack of counterbalance in a world where media companies are floundering in the internet age of cost-free access to news.

At least that is the conventional wisdom.

This politically expedient explanation, however, fails to fully explain the complex nature of fake news, and especially its unexpected virality. In particular, it is difficult to understand how seemingly rational educated adults believe, and even propagate, seemingly objectively unlikely news stories (Silverman and Singer-Vine 2016).

In particular: What is it about fake news that makes it so attractive and even believable such that these stories are rampantly shared online, seemingly in spite of their questionably veracity. What are the repercussions for society for the expected barrage of

fake videos and fake news? And, what does this pandemic say about our society?

Notably, the standard explanations, of which the aforementioned is one of many, fail to provide sufficient elucidation as to why readers are so willing to trust without even verifying or fact-checking them first—it's not like they don't have the world at their fingertips.

However, the more that is understood about how and why fake news is propagated, the more likely malicious and non-malicious actors will use that understanding to create fake news that is even more influential and more persuasive. One concern is that actors will employ deep fakes long in advance of pushing fake news to take advantage of the psychological quirks that make the news more believable and increase its eventual uptake and dispersion, further amplifying the problem.

This paper will explore why fake news is so addictive and counter this disclosure with an analysis of

what may be the legal and ethical concerns with manipulating the mind to even further increase this uptake and dispersion.

## IDENTITY PROTECTIVE COGNITION THEORY

Some scholars have suggested that Identity Protective Cognition Theory provides a reasonable explanation as to why fake news is so enticing. Under this theory, people, regardless of their educational level, are selective in what they credit or dismiss on- and off-line.

More specifically, people will ascribe greater believability to those stories that better correspond to, and thus reinforce, their identities, be it national, religious, race, political or otherwise. This is especially when those stories are identity confirming (Kahan 2017). The magnitude of this confirmation is such that when our identity-related misconceptions are undermined, we are especially unreceptive to any corrections thereof (Nyhan and Reifler 2010).

Some researchers see the source of our acceptance of fake news as a primarily emotional and cognitively lazy response: i.e., “some combination of a lack of analytic, deliberative thinking and heightened emotionality” (Martel et al. 2019). In one example, investigators show how in the area of science communication studies, in particular, misunderstanding and anti-scientific thought coincides with irrational beliefs, especially when it comes to complicated scientific or political stuff.

Others have grounded this theory within the analytic parts of the mind (Kahan 2017), noting that subjects that exhibit above average reasoning and acumen are actually more receptive to fake news; rational people rationally formulate beliefs to support their political ideologies and to fit fake news within that formulation (Kahan 2013).

In the example of science communication: rationally minded people attempt rational thinking even when their thinking contradicts scientific orthodoxy. This is because their attempts at rationality do not overcome their biases, especially when they are unfamiliar with the science, and thus lack the appropriate tools to apply their otherwise rational analysis (Pennycook and Rand 2019).

## DUAL PROCESSING THEORY

Perhaps though, other foundational areas of cognitive studies can provide an even more comprehensive clarification for the current state of rampant

development and advancement of fake news. Here we, like others, suggest Dual Processing Theory.

While there are a number of variations on the dual processing theory, most share the basic components. Here we will focus on one of the most popular variants, that of Nobel Prize laureate Daniel Kahneman and his late colleague Amos Tversky (Evans 2006).

Kahneman and Tversky argued that a typical decision making process comprises one or two of at least two independent systems at play in the human mind. Succinctly, System 1 is the more active system which is designed to be fast and instinctive, often emotional, whereas System 2 reflects humanity’s more deliberative and logical thinking processes. These psychological systems are not necessarily grounded physically in one part of the brain, nor do they necessarily operate in a mutually exclusive fashion.

These dual systems may be the result of early humanity having evolved in a world where higher thinking abilities notwithstanding, survival still often depended on fast decisions, sometimes based on amorphous intuitions; there was no time for complex analysis in the face of imminent prehistoric threats.

The rapid decision-making processes of System 1, which have remained with us in our modern world, are often conducted via the unconscious parts of our mind, with just the end-results of the process shared with the consciousness (Evans 2003).

To many researchers, these intuition-like responses are thought to be just as reliable as the alternative, slower well-thought out solutions of System 2, albeit just faster and more frugal in their use of energetically expensive brainpower. Others frame System 1 as less reliable than System 2, but nevertheless forced upon us by the miserly nature of human cognition which seeks to limit the use of our costly brain-power wherever possible, even if that means less accurate results.

As per this understanding of the interplay between the systems, the underpinning economic theory that suggests that humans are generally rational actors (i.e., and not easily duped by fake news) is “fundamentally aspirational, under-empirical, and applies only in limited situations” (Bhalla 2013). Thus System 1, while potentially rational in design, is not necessarily rational in its output.

In day to day lives, humans tend to conserve brain power by relying mainly on the dominant System 1 thinking to get us through the daily grind. System 1 achieves its speed, according to Kahneman and others, by employing various heuristics and short cuts to deal with whatever life throws at us.

The more rational System 2, which relies less on those heuristics, is too slow to deal with these issues. System 2, can, if called upon, review System 1 results, accepting, blocking or otherwise controlling that initial judgement (Morewedge and Kahneman 2010).

So our cognitive outputs are the result of habit until interrupted by the rare problem that demands the computationally heavier System 2's attention. It is System 1 thinking and particularly the heuristics that it applies that typically gets us into trouble with fake news.

## FAKE NEWS AND ELECTIONS

Even if the common citizen is not more vigilant during the election cycle, social media companies, which host many of the fake news stories, intentionally or otherwise, will claim to be extra vigilant for us during election times, and ought to be. However, as this hypervigilance by consumers and corporations is unlikely to be sustainable all the time, it likely becomes less efficient the further we are from elections.

This can be problematic. We argue that there is no safe time not be vigilant against fake news vis-à-vis elections. And in fact, the more malicious promulgators of fake news might learn to effectively employ tools such that they can have an effect on elections long before the actual election.

In particular, tied to the heuristics and biases inherent in our System 1 thinking, research has shown that prior exposure to fake news and false information increases the subsequent believability of that news, regardless of the independent, unbiased and objective level of believability of that information (Pennycook et al. 2018). This aligns with long held scholarship in System 1 heuristics which found prior exposure to any statement of fact, truthful or otherwise, increases the likelihood that we will believe that fact when fully explained again.

This is processing fluency: System 1 is better able to process information that is already known and recognized, thus ascribing it greater validity, than confounding information. Research has shown that this holds true regardless of whether the site hosting the news, e.g., social media, labeled said news as contested information, and regardless of whether the subjects were even aware that they were previously exposed to the information (Pennycook et al. 2018).

Cognitive theory presented herein thus presents an incentive to expose an electorate to false, or plausibly false information and false memories even long before an election, in order to prime the electorate into eliciting positive responses to fake news when it eventually

becomes especially pertinent, e.g., during the election cycle.

## HOW TO MAKE FAKE MEMORIES

While creating, updating, and forgetting memories are complicated neurological processes for which we lack a full appreciation as to how they occur, we have nevertheless long been able manipulate some cognitive aspects of the memory process during memory acquisition, storage and recall (Heaps and Nash 2001; Hyman et al. 1995; Loftus and Pickrell 1995).

Science has long hypothesized that memories are not simply static bits of information encoded in our minds, but rather data that is iteratively updated and modified. The plasticity of the memory creation and storage process can be hacked in all phases of the memory processes through both pharmaceutical and non-pharmaceutical methods. This includes growing abilities to enhance memory recall, enable forgetting through inhibiting memory recall, and planting fake memories altogether. The pharmaceutical process is typically heavily regulated through limiting access to the drugs. The non-pharmaceutical process, not so much.

Carl Sagan thought that false memory implantation was relatively easy. "False memories can be implanted even in minds that do not consider themselves vulnerable and uncritical" (Sagan 1997). It is thought that in a lab setting memories can be implanted with a range of success rates from 15 (Andrews and Berwin 2017) to 50% (Pomeroy 2013).

An early paradigm for the creation of false memories was the Deese–Roediger–Mcdermott experiments in which lists of related words (e.g., bed, pillow, and sleep) were verbally presented to the participants of the experiment, after they've been instructed to memorize as many words as possible. The experiment showed that typically participants remembered related words that were not on the list (e.g., dream) and about half of the participants reported they were absolutely sure they've heard the unrepresented words (Deese 1959; Roediger and McDermott 1995). In another experiment, Frederick Bartlett asked British college students to learn a folk Indian story then asked them to recall the story after sometime. He found that over time students remembered the story in a way that aligned with their own British cultural values (Bartlett 1995). These experiments show that our brains tend to 'auto-fill' false details, do it with high levels of confidence, and in a manner that aligns with our worldview. To human memory experts in

the fields of Psychology or Neuroscience none of this is new.

In Elizabeth Loftus' review of the effect of misinformation, she sought to explain the fundamental principle of Discrepancy Detection in which recollections are more likely to change if a person does not immediately detect discrepancies between misinformation and memory (Loftus 2005). Loftus' analysis showed that in general, misinformation affects some people more than others: such as those with empathy, absorption, and self-monitoring. Others have also found that those defined as open-minded are more likely to accept false memories. Loftus concludes that real world misinformation comes in many forms. It can lead people to have very rich false memories.

There is substantial literature relating to false memory therapy (FMT) (Andrews and Berwin 2017), particularly in the service of improving behavior or attitudes. Further, the public's general acceptance of FMT has been assessed by some. It has been shown that there is a wide range of acceptance of the technology. Although some are enthused, many are not accepting of manipulating memories, even for positive outcomes (Nash et al. 2016).

Research has shown that false memories can be created by images alone, with those images employed as cognitive springboards for eventually eliciting thoughts and feelings about the image that could be confused with an actual memory of the event. Apropos, one study attempted to create false memories of a political events employing doctored photographs of those events that didn't occur (Saletan 2010).

Doctored photographs have been around since as early as 1860, only decades after the invention of the camera in 1814. One of the earliest instances for the practice of fabricating photos for political purposes is the iconic Abraham Lincoln portrait created by an unknown entrepreneur by combining a headshot of Lincoln with the body pose of John C. Calhoun (Stevens 1931). This was done to create a respectful and heroic photograph of Lincoln's, as no such photo was taken during his lifetime.

Another example is the case of the Malaysian political Jeffrey Wong Su En who produced a fake picture of him receiving a chivalry title from the Queen of England. A spokesperson for the British High Commission denied that any honor has been conferred to Jeffrey Wong Su En by the British Government (Redi et al. 2011).

Research has also shown, however, that the influence of these types of doctored images in developing false memories is weaker than the effect of narrative (Garry

and Gerrie 2005). However, when images are more immersive, such as videos, then they are able to elicit even stronger false memories within a passive observer that could be used in the service of developing more believable fake news (Segovia and Bailenson 2009).

One interesting experiment studied the effect of a given film (*The Good, the Bad and the Ugly*) on viewers' brain activity. Participants were asked to watch the movie while their brains were scanned with fMRI. The data were registered and processed so that corresponding regions of each brain were aligned with one another, and correlating response time in a given brain region across viewers. The study found brain activity was similar across viewers' brains. The correlation covered different brain regions, including visual areas, auditory areas, language areas, emotional and sensory areas. The experiment concludes with two implications. First, that some films may have the potential to "control" the neural responses of the viewers, i.e., the movie can evoke a predictable sequence of neural states. Second, given that brain states and mental states are tightly related, controlling the viewers' brain states equals controlling their mental states; emotions, thoughts, perceptions, and attitudes. This similarity in brain activity across viewers stresses the central role the external environment has in shaping our thoughts, intentions, and behaviors (Hasson et al. 2008).

More than just film, technology has recently given us something even more realistic, deep fakes, those increasingly hyper-realistic AI falsified videos that can be especially powerful in providing the necessary immersive environment for the creation of falsified memories to be called upon later to substantiate fake news stories. False information presented through doctored images and video can be further used to elicit false memories, which in-turn can make the likelihood of future related fake news more likely to be believed (Murphy et al. 2019).

Deep fake videos, however, provide an even more powerful tool to create fabricated memories that can be recollected, not just be familiar. Compared to doctored photographs, deep fake videos have greater potential to influence the human mind, in terms of engaging neural networks and controlling mental, emotional, perceptual, and cognitive states. Thus the potential threat posed by such fabricated videos is especially problematic.

## CREATING FAKE MEMORIES IN THE SERVICE OF FAKE NEWS

The hacking of the brain is not always conducted for therapeutic purposes. There is nothing preventing us



from manipulating our and others' memories for ulterior goals. In these cases, false memories can be used to bolster the ideology of those already in your ideological camp, by adding more information to the well of information called upon by the availability heuristic. Or alternatively, through counterfactual priming of those outside of your ideological camp to, counteract these individuals' heuristics, such as the confirmation biases (Galinsky et al. 2000).

Frenda et al. have showed specifically how fake memories could be created and manipulated for political gain, and how uptake of those fake memories depended somewhat on political orientation (Frenda et al. 2013). Providing the necessary tools to develop politically biased fake memories would promote the later uptake of similar fake news.

## CREATING FALSE MEMORIES FOR THE MASSES

False memories need not be limited to a single-person phenomenon. There are numerous documented cases wherein hundreds, if not thousands have the same or similar false memory.

Consider the Mandela effect. The supposed memory that Nobel Prize Laureate Nelson Mandela died in a South African prison during the 1980s. This memory is so pervasive that many claim it is the result of some conspiracy theory or break in the space-time continuum. Similar false memories shared by thousands include the misremembering of the title of the popular children's book series as the Berenstein Bears (in reality, Berenstain Bears) or of the Warner Bros. cartoon series as Looney Toons (Looney Tunes). In some instances, like the misremembering of "Mirror Mirror on the wall" (Magic Mirror, on the wall) from Snow White, or "Hello Clarice" ("Good morning") from Silence of the Lambs or "Luke, I am your father" ("No, I am your father") from Star Wars or "Play it again, Sam" ("You played it for her, you can play it for me") from Casablanca, these false memories are all the result of the language being mangled and misquoted by others and then that social misinformation misremembered and reinforced over and over as the legitimate wording. "Once a false belief has been lodged into our minds, it festers there, distorting our ability to learn accurate information" (Howard 2019).

While some will suggest that the Mandela Effect is proof of alternate realities, others suggest a neurological effect based on how we categorize memories, the effect of post-event information on memory recall, memory priming, or confabulation by the brain

through filling in gaps of missing information. If nothing else, the Mandela effect and all of its iterations show that the memories of thousands can be manipulated.

Creating false memories to promote the uptake of fake news, both on the individual and mass scale can be enabled through multiple different means, including narrative, video, photos, and virtual reality. In 2008, the actress Tina Fey, in a Saturday Night Live skit, parodied Sarah Palin by saying "I can see Russia from my house." Many voters still attribute that line to Palin herself, employing it to skewer her, leading to what became known as the Fey Effect where priming via parody has been shown to create interrelated constructs that serve to modify other associated memories (Baumgartner et al. 2012; Cacciatore et al. 2014; Esralew and Young 2012).

## ETHICS OF CREATING FALSE MEMORIES THROUGH DEEP FAKES AND OTHER METHODS

Creating false memories to influence one's perception of reality is morally challenging. However, as discussed above, it is not a new phenomena. What is new is the richness of the stimuli provided by technologies, such as deep fakes, and thus their increased potential to influence the human brain in terms of engaging neural networks and controlling mental, perceptual, emotional, and cognitive states.

Notably, the general implanting of false memories by deep fakes, or otherwise, need not be malicious. In fact, there are theoretically beneficial applications of fake memories, for example, as a way to promote good or healthy behaviors (Bernstein et al. 2011; Clifasefi et al. 2013).

Still, it is questionable whether such therapeutic methods are ethical, the benefits of their outcomes notwithstanding; there are advocates of both sides of the debate (Nash et al. 2016).

In some instances, therapists, who may have had their clients' best interests in mind, have been sued for malpractice for having implanted false memories relating to sexual abuse through their use of hypnosis, dream interpretation, and other scientifically problematic methods. For example, in *Roberts v. Kathryn Salmi, LPC*, a Michigan Court of Appeals ruled in 2014 that the therapist owed a duty of care to third party non-patients to not introduce false memories.

Courts in general are increasingly weary of including evidence of repressed memories extrapolated by therapists given their concerns that rediscovered repressed memories may be implanted false memories

(Finer 1996). The recently dissolved False Memory Syndrome Foundation, a nonprofit group with members from the National Academy of Science, cataloged what they claimed were a number of similar cases (Mann and Naugle 2019).

While it is unclear as to whether sued therapists have malicious intent, or simply following their intuition, the ethical concerns regarding implanted memories would likely be further amplified if false memories were to be implanted to help promote the later acceptance of information, particularly partisan information.

Some might seek to justify the introduction of false information and memories planted for the sake of non-factual stories; that the ends justify the means. For example, when the creator of the fake news has non-malicious, even benevolent intentions; simply to make sure that their side, which they believe is the legitimate and right side (in contrast to the other side, which they believe is evil, morally corrupt or wrong), wins.

To wit: an increasingly common type of fake news occurs when clearly and demonstrably false information is presented as fact. But, while that information is not true *per se*, the purveyor of the information deems it a sufficiently statistically likely counterfactual; i.e., if circumstances would have been different, the counterfactual would have occurred. In these instances, it is true enough for the source. Perhaps, even the more likely the counterfactual comports with the source's political perspective, the more likely it will be perceived as either an ethically excusable falsehood or a clearly moral truth, albeit not a factual truth (Borden and Tew 2007; Effron 2018). This fits in well with the simulation heuristic employed by System 1, wherein we establish the likelihood of any particular event based on our ability to conjure an image of said event in our mind. The easier it is to conjure that image, the more likely we are to believe it.

Some might find ethical support for this fake-ish news wherein the facts were slightly altered or minimally modified, in some instances to simply magnify or highlight facts representative or in support of strongly-held political worldviews. Perhaps suggestive of the cultural acceptance of this, the Pew Research Center reported that nearly a quarter of all Americans admitted to sharing fake news on social media, with half of those admitting to knowing that the news was false at the time that they shared it (Barthel et al. 2016). In these instances, fake news creators might legitimately believe that the ends justify the means.

We argue that trends in cognitive rights say that the ends do not necessarily justify the means. Human rights in cognition raise new ethical, if not legal concerns regarding the implantation of fake memories for the purpose of making later-presented fake news, no matter the goals, more believable.

The ethics relating to memory are not necessarily a modern construct. The idea that we should have and maintain a fairly accurate historical record of ourselves—Socrates' "know thyself"—is longstanding argument against the manipulation of memory.

In the alternative, other longstanding ideals, such as the pursuit of happiness—even through memory creation, manipulation, and especially through forgetting—pulls in the opposite direction, in favor of creating and modifying memories that will lead us to better and happier lives (Bioethics Commission 2015).

In an innovative article, Ienca and Andorno address the new possibilities for manipulating the brain in the era of neuro-technologies. They argue that the current legal framework for the protection of human rights is not sufficient to deal with emerging challenges and they identify the need to promote four human rights: the long standing right to cognitive liberty (Sententia 2006), the right to mental privacy, the right to mental integrity, and the right to psychological continuity (Ienca and Andorno 2017). As we are essentially the sum total of our memories, we ought to have protection over their manipulation particularly our semantic and episodic memories that provide us with our *weltanschauung* and our autobiographical record.

Cognitive liberty is an umbrella-like right that incorporates many of the standard rights of freedom of speech, freedom of religion and freedom of choice. The right to cognitive liberty is the right to make your own choices, unencumbered by the unknown or undesired influence of others. When false memories are implanted such that we are primed to accept fake news, our choices and freedoms are inhibited and manipulated. If we are coerced into accepting fake news, by way of implanted memories, our rights have arguably been violated.

In a book about neuro-enhancement Bublitz advocates for the recognition of cognitive liberty as a human right and defines it as "cognitive liberty or mental self-determination which guarantees an individual's sovereignty over her mind and entails the permission to both use and refuse neuro-enhancement" (Bublitz 2013).

The right to mental integrity is the right to have control over your own thoughts According to Ienca

and Andorno, the right to mental integrity refers to intrusions to people's brains. The right encompasses the obligation that others not introduce their own thoughts into your mind. The introduction of fake memories is clearly a violation thereof. The right is meant to ensure people can protect their identity from external changes, to refuse changes in their brain activity, and protect ourselves from abusing technologies to manipulate our own neural activities. In a related article Ienca and Haselegar presented the notion of malicious brain-hacking to describe criminal activities that influence neural computation in users with neuro-devices, specifically brain computer interfaces (Ienca and Haselager 2016). However, influencing neural activity does not necessarily require invasive technology such as brain computer interfaces in order to directly manipulate a person's neural activity, it can be accomplished through standard tools and methods for introducing false memories.

The right to mental privacy relates to the idea that our ideas are our own, and should not be shared or extracted without permission. While fake memories do not extract any information from your mind, *per se*, they do add and therefore alter that information. And the external knowledge that those memories have been added to your mind is arguably an invasion of your privacy, especially if they are specifically designed to be added to your mind so as to make fake news more acceptable.

*"I have memories, but they're not real. They're just implants"* (K, Blade Runner 2049). The science fiction movie Blade Runner 2049 presents a dystopia where humans are bioengineered for slave-labor; dubbed replicants. To make their slavery bearable, a scientist constructs memories and installs them into the replicants. The replicants are aware they did not experience these memories in person, yet they improve their mental stability. In the movie, memory design is a procedure reserved for slaves and the use of real memories formed by real people for this purpose is illegal. This illustrates the significance of real memories to human identity and mental privacy.

The human right to psychological continuity, also proposed by Ienca and Andorno refers to the right to not have foreign ideas and memories implanted into your mind. Anything that harms or changes your particular mental sense of self is a violation of this right. Any alternations in mental states may affect areas critical to a person's identity and personality (Ienca and Andorno 2017).

If we couch these as heretofore unenumerated basic human rights, then they cannot be impinged upon

regardless of whether the actors threatening the rights are state or private actors.

States can also arguably also limit an individual's right to impinge on their own rights. Legally, while most modern states allow for self-determinism and the ability of each citizen to decide for themselves who they are, there are also aspects of paternalism within the modern state that will step in to prevent self-harm.

To this end, it is worth noting that the regulation of pharmaceuticals that alter memories, might bolster the argument that the state is interested in limiting the ability of others and of even ourselves to fiddle with our memories.

In the alternative, the lack of any real regulation of the non-pharmaceutical technologies such as deep fakes, fake news and virtual reality, that can be employed to also alter memories, suggests that the states are actually currently uninterested in regulating this area of memory creation.

This might change as we see more and more efforts to alter memories to make fake news more accepted, particularly leading up to elections.

## CONCLUSIONS

Fake news is a growing concern, particularly because of our willingness to believe and forward the information to even larger audiences. The heuristics employed by dual process theory helps to explain why fake news works. More importantly, it provides cause for creating fake memories to promote a more successful uptake of fake news, long before the fake news is politically necessary.

While likely ethically problematic under novel cognitive rights theories, it remains likely legal; although it would be interesting to see a case where criminal charges of obstruction or contempt were brought for implanting fake memories in a witness; i.e., actively interfering in governing activities. Notably, researchers have already been able to implant rich false memories of committing a crime (Shaw and Porter 2015).

To this end, citizens and their social media have to be vigilant vis-à-vis fake news and fake information, not only in the immediate run-up to elections, but even long before where they are at risk for the introduction of priming and counterpriming fake information and even memories. Fake memories can be created by both hitech methods like deep fakes, but even simple photoshopped images can influence an electorate and implant fake memories that can



influence them to accept a later fake news story that could make or break an election.

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