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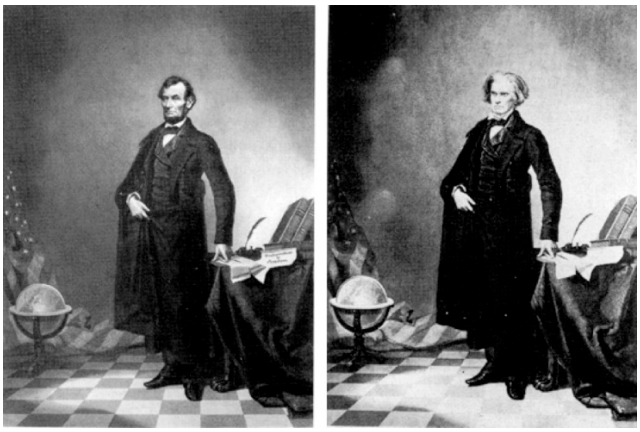
Signal-To-Lies Ratio: the Use and Abuse of Image Manipulation

Consider for a moment the word “Photoshop.” The term is among those few brand names to become as common a household word as Kleenex, Aspirin, or Thermos. Moreover, it has become a verb. “Photoshopped” has entered the common lexicon as a way to describe any image which has been digitally manipulated. Once a time-consuming process reserved for novelty and political use, photo manipulation has become a routine part of the image-creation process. People now expect reality to be doctored in its presentation. Models’ skin has been airbrushed. Hairlines have been touched up. The sky is a bit more blue and the shadows in the rocks are deeper. Reality has been reshaped by the expectations doctored photographs have created, and the new normal is assumed to have been polished up for public consumption. The human desire to manipulate truth has made way for the age of digital photo retouching, which has in turn changed the popular conception of what is true and how to represent truth. The use of image manipulation tools in politics, fashion, and news media shows an ongoing shift towards usability and power in image editing software that threatens society’s understanding of the truth of imagery.

The editing and manipulation of photographs has a history almost as far-reaching as photography itself. Manipulative image compositing has been in use at least as far back as the 1860s. A famous portrait of Abraham Lincoln, shown below, seems to show Lincoln himself standing proudly, but it is actually a composite of Lincoln’s head onto the body of John Calhoun (“Photo”). The image depicts Lincoln standing with a stern stature and heroic composition. Not only has Lincoln’s head been attached to Calhoun’s body, but the text next to Calhoun has been

altered to better support the ideals Lincoln was meant to embody. An artist required this heroic portrait of Lincoln. Lacking the ideal image, that image was artificially constructed. Its components are authentic and truthful, as both men did exist and the visible images were photographs of them. However, that authenticity only heightens the potency of falsehood in the final image. This development armed politicians and media with some of the most believable lies imaginable. The need to falsify history has driven the creation of unprecedented tools for that falsification. This development would continue through history. Joseph Stalin infamously removed his political enemies from photographs through retouching ("Photo"). There, the authenticity of the falsified image serves to erase history altogether. The doctored photograph can just as easily lend its authenticity to the false absence of a person as to their false presence. One photo of a woman mourning the deaths at Kent State University was edited to remove a fencepost before the photo's publication in *Time* magazine ("Photo"). That sort of manipulation is the legacy of past fictionalization. Now that a desire to reshape political history has promoted the development of retouching tools, the lies of imagery are often merely aesthetic. The removal of a fencepost is no more honest than the removal of a KGB officer. Yet, it is a trivialization of alterations in images made only to improve an image's composition. The long history of such lies has conditioned society to accept and expect a tailored reality.



Doctored photograph depicting Lincoln's head on another politician's body. (https://spectrum.ieee.org/ns/slideshows/08S_Slide_PhotoTamper2/fullscreen/08w.slides_incoln.jpg)

The pursuit of tailored and controlled aesthetics has become its own significant field. The fashion industry makes frequent and often controversial use of heavy manipulation of models and clothing. The problem of body image is the most common offender. Tansy Hoskins describes the practice clothier H&M used to apply the faces of their clothing models onto computer-generated bodies (Hoskins 111). Obviously, no human can compete with a computer-simulated body for shape, complexion, or other perfection. Digital creation and manipulation is introducing new dangerously perfect ideals. Once again, photorealism lends images an unearned authenticity. Though that authenticity is what lends potency to the image, it is also what makes the image dangerous. Eric Kee and Hany Farid note that unrealistically edited photos of models are so prevalent that the American Medical Association has had to step in to regulate the retouching of photos to reduce the damage of unrealistic body image (Kee 1). The idea that people are starving themselves in order to fit an unattainable image is tragic, but there is another unfortunate element to the promotion of false body image. The tendency of people to doubt the condition of their own bodies before they doubt the veracity of images is telling. People have become so conditioned to the altered nature of images that they do not care that the images are altered. The believability of a "real" photograph is seemingly unassailable. Only knowing with certainty that an image has been modified do people seem able to comfortably ignore it as an ideal or a standard. Hoskins notes that education is starting to include a focus on media literacy as a means of fighting against damaged body image (Hoskins 126). Thus, the dangers presented by the tools we have made force a change in our culture. Although the image cannot be trusted, the consumer of the image is adapting. The children of the next generation will have a matter of

fact awareness that most of what they see will be lying to them. Moreover, they will be alarmingly adept at the manipulation and control of imagery.

"Jennifer in Paradise." The first image used to demonstrate Adobe Photoshop. (http://www.baxterst.org/wp-content/uploads/2015/06/jennifer.jpg)

Of course, the fashion industry provides an example of how willingly society embraces the tools that tailor their perception. Paul frosh writes, "What photojournalists perceive as causing an ontological and ethical crisis, for example, commercial and advertising photographers may see in an entirely different light" (Frosh 190). Indeed, fashion photography and advertisements are edited to best allure customers and thus must match edited images to the tastes and preferences of said customers. The acceptance of altered imagery is driven by a desire to see the images as they are altered. Thin models with impossibly perfect skin will naturally

appeal to a mass audience, as will a product devoid of blemishes. The appeal of doctored images is not limited to manipulative advertising, though. The same tools are, after all, used to create special effects and alter the look of films and television. Audiences could not enjoy the sights of flying superheroes or explosive space battles without the power of image editing. This, admittedly, is one of the advantages of image manipulation. Although it can be used as a tool of intentional deception, it can also be used to present fantastic and futuristic imagery that would otherwise be impossible. Still, even the imaginative edits of film effects normalize the idea of an image being changed from its original and “true” form.

The bright and fanciful editing of images is of little concern, however. The danger of image manipulation is in those edited images that masquerade as truth. Michael Emme, writing on the editing of research images, notes:

> “Digital technologies also allow us to selectively "break the chain of evidence" between the subject, the lens, and the viewer. The computer's obses sively simple capacity to break an image into billions of manageable, pixel-sized pieces can allow us to obscure personal details represented in an image while re taining other information (such as eye-line, gesture, or proximity) that support research questions in the schools.” (148)

This is among the most blatant and concerning abuses of image manipulation. Research often makes use of photos to show the results of a scientific experiment or represent a certain claim the research supports. Say, for example, a scientist claims that there is a drastic change in the chemical composition of a given substance under a given condition. To illustrate this, he takes two photos of the substance. The change is not drastic, however the scientist adjusts the exposure of the second image so that the change appears to be as dramatic as his claims suggested. Surely, this is unethical. However, it can be done almost untraceably by anyone with basic skills in modern photo manipulation software. The results of that research would be inaccurate, but the

deception is backed by a century of authentic photographs. The compromised nature of photographs as evidence forces even scientists to work on the assumption that the creator of an image will choose to present it honestly.

The manipulative powers of images keep photography and video critically relevant to the process of providing messaging in politics and social discourse. Limor Shifman quotes Ethan Zuckerberg, “The Web was invented so physicists could share research papers. Web 2.0 was invented so we could share cute pictures of our cats (Shifman 119).” The new media of blogs, web video, basic photography, and more all contribute to an atmosphere drowning in images. Political memes are not merely commonplace, they are inescapably aggressive. Viral videos and edited photos have become a language almost unto themselves. Shifman asserts that “new media” played a significant role in various critical strategies of the 2012 US Presidential election (122-123). This is an observable effect of people having new ways to shape and share imagery. The Occupy Wall Street movement started off alongside a heavily edited advertisement of a ballerina atop the Wall Street Bull statue (132-133). The photo has been changed dramatically from what it could have looked like in-camera. Editing has allowed the artist to perfect his composition and to introduce impossible and fantastical elements. For all its social impact on a movement with the goal of exposing underappreciated truths, the image is really quite artificial. Henry Jenkins describes an influential video from the 2004 which attacks George W. Bush by mashing up his campaign footage with clips of *The Apprentice* (Jenkins 206). At that time, that simple edit required the resources of an organized political group. Now, it could be the work of an afternoon for an enthused hobbyist.

Edited WWE wrestling .GIF depicting Donald Trump, tweeted by the 45th US President. (https://www.dailydot.com/wp-content/uploads/fe6/66/ac4801ec334d55b2-2048x1024.jpg)

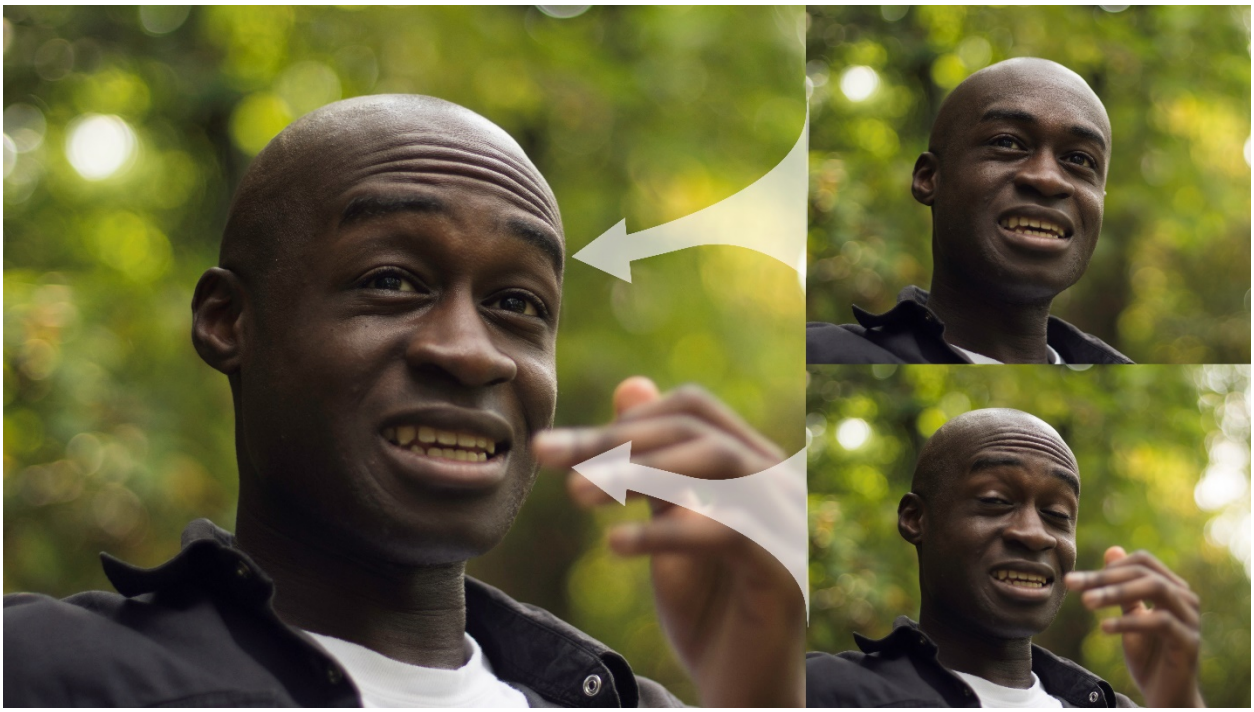
The image above shows frames from a .GIF tweeted out by the President. The gif is edited from footage of Donald Trump performing a clothesline takedown on WWE CEO Vince McMahon. The footage has been altered to place the CNN logo over Mr. McMahon's face, implying that Trump will "take down" CNN. At the time, the tweet caused significant controversy. Journalists derided the imagery for potentially inciting violence and spite against the press, though some citizens praised the move as a way for the president to "control the media narrative" (Grynbaum). Both perspectives speak to the power of imagery. Without a direct verbal attack, the President could speak out with violent connotations against critical press outlets. At the same time, those press outlets spent days covering a 28-second amateurish looping video. The addition of the CNN logo changes the context and meaning of the original imagery, and editing software allowed the original wrestling clip to be shortened into a small .GIF for easy sharing on the internet. The original edit was made and posted by a single Reddit user (Grynbaum). Unlike the Bush attack ad, this was indeed made by a hobbyist, or even a layman

without much experience. This is the danger of advancing image manipulation technology. As the technology improves, it becomes available and easy to use for a much less knowledgeable and much wider base of users. Notably, this .GIF and the Bush attack ad represent another advance. Editing photos has become simple already, but the new frontier is video.

These frames are generated by a machine learning program, generating a mouth over existing video to create a convincing lip-sync for an audio clip.
(http://www.washington.edu/news/2017/07/11/lip-syncing-obama-new-tools-turn-audio-clips-into-realistic-video/)

What Photoshop and its ilk have done for image editing, Adobe Premiere and others are now doing for video. Video still seems like an unassailable fortress of believability, but companies like Adobe keep pushing boundaries. Soon, Adobe will introduce a “Cloak” feature that will allow for the realistic removal of people and things from video. Other technology already allows the superimposition of mouth movements and facial expressions onto existing video. The image above shows frames from a machine-generated edit to a video of Barack Obama speaking. The computer-generated mouth matches lip movements to an audio file, generating an image of a moving mouth which matches the appearance of mouths in the program’s database. The result is unnervingly believable. This sort of experiment most clearly illustrates the challenges and risks of improved image alteration. At the present moment, a politician or celebrity is generally believed to have said something as long as they are on video.

After all, an audio impersonator most likely cannot match the appearance of the person they are impersonating. This technology automates the process of applying faked audio to real video. The progression of technologies like this and CGI make the creation of perfectly believable computer-generated human seem inevitable. The onward march of editing software will continue to be a threat to simple and truthful images, and advancements now threaten even the mediums that seem to be trustworthy.



Two photos edited together to alter a facial expression.
(Image by Caleb Beverly, November 16, 2017).

The rapid and dynamic development of editing tools is their most important feature. With each passing day, professional tools like Photoshop become available to more laymen. No longer just the tools of industry professionals, editing software can now be the method of creation for a wide array of impactful images. Paul Frosh notes that even writing on stock photography is difficult, as the related digital technologies advance too fast to avoid being outdated upon publishing (Frosh 184). Indeed, throughout the industry, editing software is becoming

worryingly easy to acquire and learn. There are great benefits to this. Amateur photographers largely owe their livelihood to the editing tools they are able to access. A mediocre photo used to be incurably ineffective. Now, simple adjustments to contrast, color, and clarity can make even unremarkable images striking. Cropping an image allows one to adjust composition. White balance and color tones can be altered. Everything is increasingly under control. The above image shows two photos taken by an amateur photographer. The images have been combined by the photographer to create a preferred facial expression with both the mouth and eyes wide open. The model never made the expression presented in the image, but a viewer would have no reason to assume so. This convincing deception is now achievable in minutes by anyone with Photoshop and the training to use it.

As time passes, more and more people will be able to reshape images to suit their needs. The advancement of basic editing tools allows for the creation of viral web content, reshaping of bodies, and enhancement of photos. As more advanced tools become cheaper and easier to use, the believable reshaping of historical documents and present-day recordings will be commonplace. Political candidates, celebrities, preachers, police, and more will all be moldable to the needs of whoever is presenting their image. This won't necessarily be an end to truth in society. Rather, this could breed a culture that is highly aware of the manipulative power of images and highly skeptical of the veracity of images. The need to reframe reality has created a situation where the medium cannot be trusted. Paul Frosh writes, "As I have said, new digital technologies, by dematerializing and reconfiguring the photograph before our eyes, by allowing for our absolute mastery over its every particle, disenchant photography just as photography disenchanted the visible world." (Frosh 191). The innocent assumption of photography's honesty has quite died already, and rightly so. As much as any other tool, the development and

advancement of image editing is driven by people's desires. Photographers and the organizations that employ them want control over truth and perception. As a result, more powerful tools are made to give that control. People become so accustomed to the modification of images that the modification is mundane, and the image is assumed to have been edited. The pursuit of a controllable image has produced a society with unprecedented control over imagery, but imagery has lost its credibility in the exchange.

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