

“Analog to Digital: The Indexical Function of Photographic Images,”
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Marshall McLuhan describes the impact of new media with the phrase “the medium is the message.” McLuhan’s “medium” is any extension of the human senses and he focuses on media such as print, photographs, telephones, and weapons throughout his text *Understanding Media: The Extensions of Man* (1964). McLuhan’s “message” explains the way a new medium affects a culture, “for the ‘message’ of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs.”¹ He provides the railway as an example. This medium “did not introduce movement or transportation or wheel or road into human society, but it accelerated and enlarged the scale of previous human function, creating totally new kinds of cities and new kinds of work and leisure.”² Similarly, digital photography “accelerates” or “enlarges” traditional photographic processes. Digital technology allows for greater ease in editing than analog photography, because it transforms photographs from objects into data. Thus, digital imaging technology theoretically disrupts previous notions of the indexical connection between photographic images and “reality.” Digital photography challenges the belief that photography is representative of reality. But have viewers’ perceptions shifted in relation to theoretical discussions? While digital technology affects the theoretical notion of the photographic index, these theories overlook the appearance of the image and the social applications of transparent lens-based media. Viewers continue to read digital photographs as representative of reality, a function they maintain

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¹ Marshall McLuhan, “The Medium is the Message,” *Understanding Media: The Extensions of Man* (Cambridge, MA: MIT Press, 2001; originally published by Routledge in 1964), 8.

² *Ibid.*, 8.

despite the transition from analog to digital.

The notion of the photograph as index relies on the physical and chemical processes that constitute the medium. In film-based photography, light bounces off an object and is recorded in the silver salts of the film's emulsion. This process depends on the presence of the object in front of the camera in order to record its image through projected light. Roland Barthes describes the relationship between object and image and time as "that-has-been." According to Barthes, this characteristic is unique to photography:

I call "photographic referent" not the *optionally* real thing to which an image or sign refers but the *necessarily* real thing which has been placed before the lens, without which there would be no photograph ... In the daily flood of photographs, in the thousand forms of interest they seem to provoke, it may be that the *noeme* "That-has-been" is not repressed ... but experienced with indifference, as a feature that goes without saying.³

Photographs are perceived to represent reality in their reference to a subject. As Barthes explains, "Show your photographs to someone—he will immediately show you his: 'Look, this is my brother; this is me as a child, etc.'"⁴ It was this physical, indexical connection to reality that resulted in photography's use as visual recorder in documentary contexts such as news imagery.

In contrast to the physicality of the analog photographic process, digital images are translated into code. This occurs at the moment the image is taken if it is photographed with a digital camera; during the editing process if the film is scanned to be altered, printed, or displayed; and in the distribution of the image if it is displayed on a computer or projection screen. The lack of physical connection between a digital

³ Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York: Noonday Press, 1981), 76–77. Italics are original.

⁴ *Ibid.*, 5.

photograph's subject and image theoretically causes digital images to function as pure iconicity.⁵ Mary Ann Doane suggests:

The index makes that claim [of its connection to reality] by virtue of its privileging of contact, of touch, of a physical connection. The digital can make no such claim and, in fact, is defined as its negation . . . Digital media emerges as the apparent endpoint of an accelerating dematerialization, so much so that it is difficult not to see the very term *digital media* as an oxymoron.⁶

On a theoretical level, digital photographs present a challenge to the indexicality of photographic media. No longer does light bounce from an object and cause a physical and chemical reaction of the silver on the photographic emulsion; instead, the image is converted into data, which is seemingly not physical.⁷ This shift in physicality caused some fearful reactions to the new technology. With digital technology, it is arguably easier to edit and create images of objects that never existed in reality, thus casting doubt on the reliability of photography's connection to the real. In her article "The Shadow of the Object': Photography and Realism," Sarah Kember quotes Fred Ritchin's reactions to digital image-making in the early 1990s. Ritchin called computer-imaging practices "the end of photography as we have known it" and lamented, "Certainly subjects have been told to smile, photographs have been staged, and other such manipulations have occurred, but now the viewer must question the photograph at the basic physical level of fact."⁸

But theoretical focus on this loss of physical connection, and reactions such as Ritchin's, do not account for the social function of photographic images. Many digitally

⁵ See Daniel Downes, *Interactive Realism: The Poetics of Cyberspace* (Montreal & Kingston: McGill-Queen's University Press, 2005), 60–61.

⁶ Mary Ann Doane, "Indexicality and the Concept of Medium Specificity," in Robin Kelsey and Blake Stimson, ed., *The Meaning of Photography* (New Haven & London: Yale University Press, 2008), 9.

⁷ For a discussion of "transcoding" see Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001), 45–48.

⁸ Fred Ritchin quoted in Sarah Kember, "The shadow of the object,' photography and realism," *Virtual Anxiety: Photography, New Technologies and Subjectivity* (Manchester and New York: Manchester University Press, 1998), 18–20.

constructed or distributed images “look like” analog photographs and are used in similar applications to their analog predecessors. Thus, the digital images function within the tradition of how a viewer understands analog photography. Damian Sutton deemphasized the loss of indexicality of digital technology in his essay “Real Photography.” He explains:

Digital photography, and especially its apparently invisible manipulability, destroyed the photograph’s privileged connection to the object. Without this anchor to reality, the semiotic relationship seemed over-balanced towards the iconic and the symbolic—i.e. representation. Yet the concerns expressed in the 1990s, that the digital image equates photography with fallibility and distrust, now seem caught up in the historical moment of digital technology’s first real flourishing; photography has always been “dubitative”. . . and this characteristic is not the province of the digital image alone.⁹

As Sutton argues, reading an analog photograph as connected to reality is an ideological function of photographs based on their indexicality. The perceived connection between analog photographs and reality has always been ideological, and thus, the shift from analog to digital is not as great a change when looking at the function of digital photographs. Viewers expect “photographs to embody transparency and objecthood” in precisely the same way, whether viewing an analog or digital photographic image.¹⁰

Ken Goldberg’s web-based project *Telegarden* (1995–2004) demonstrates spectators’ continued assumption of the connection between digital photographic images and reality.¹¹ This “Web telerobotics” project allowed users to plant and maintain a

⁹ Damian Sutton, “Real Photography,” in Damian Sutton, Susan Brind, and Ray McKenzie, ed., *The State of the Real: Aesthetics in the Digital Age* (London: I.B. Tauris & Co. Ltd., 2007), 165. Sutton cites Peter Lunenfeld, “Art Post-History: digital photography and electronic semiotics,” in Hubertus von Amlunxen, ed., *Photography after Photography: Memory and representation in the digital age* (Munich: G&B Arts, 1996), 95.

¹⁰ Sutton, 169.

¹¹ The archive for Telegarden is online at www.telegarden.org/tg/ (accessed December 9, 2008). Lev Manovich used Telegarden as an example of the possibility to “teleact” through the still images that were provided to Internet users. See Manovich, 169–170.

collective, physical garden from some distance through the use of digital photography and internet technology. Still photographic images of the physical garden were presented to viewers via the internet. Goldberg developed this garden in 1995 at the University of Southern California; it was displayed online for nine years. In 1996, the physical garden was moved to the lobby of the Ars Electronica Center in Austria where it remained until 2004.¹²

Telegarden illustrates the viewing subject's ability to become involved with an activity and an object, i.e., the actual garden, through digital technology as remote participants became responsible for this garden's well-being. A camera on the end of a robotic arm extended into and moved around the garden as viewers controlled the robot's movement. The user interface consisted of two circular images. The image on the left represented a schematic diagram of the entire garden and was labeled with letters in a horizontal row above the round diagram and odd numbers in a column to the left. The diagram depicted the position of the robot's arm and illustrated the sector of the garden the viewer was seeing on the right. The sector was identified beneath and between the two circular images. For example, in the "Tele-Garden Demo," sector F6 is identified.¹³ The end of the robotic arm is positioned in sector F6 in the diagram. An image of purple flowers surrounded by green foliage, seemingly from the identified sector, is then shown to the viewer in the right image. Participants used buttons beneath the images on the screen to water and plant seeds and also were able to access help, comments, information, and other options. A bar to the right of the images allowed participants to zoom. Once

¹² Ken Goldberg, "The Telegarden," available at www.ieor.berkeley.edu/~goldberg/garden/Ars/ (accessed December 10, 2008).

¹³ See "Tele-Garden Member View," available at www.telegarden.org/tg/tour/demo1.html (accessed May 19, 2009).

registered, members could use the robot to look around the garden through the camera and to water plants. After making fifty moves, a member could plant their own seed and watch it grow. More than 10,000 members registered and participated in maintaining *Telegarden* and more than 100,000 visits were made to the garden, showing widespread curiosity in the project and its technology.¹⁴ These numbers illustrate spectators' continued belief in the connection between image and reality, here the reality of the commonplace activity of keeping a garden, even though the activity is performed remotely and through digital imagery.

While the process of reading photographs is influenced by the context of the image, just because a photograph is created or distributed with digital technology does not negate its indexical function as many theorists have suggested. Focusing only on the theoretical lack of indexicality in digital images ignores the social uses of analog photography that are now performed by digital images. Because photography functions in multiple areas of society, it is helpful to explore a vernacular example apart from an art context.

Kember stressed the continued social function of photographic images with the introduction of digital technologies. She argues:

If a completely simulated computer image, or even a digitally manipulated photograph can masquerade effectively as a straight photograph, then surely the authority and integrity of photography are always going to be in question? This is certainly so if you accept the prior existence of straight photography and an unmediated real, and if you only consider change wrought by technology itself. But photography is clearly much more than a particular technology of image-making. It is also a social and cultural practice embedded in history and human agency.¹⁵

¹⁴ Goldberg.

¹⁵ Kember, 22.

As such, digital transcoding of images does not result in the negation of photographs' indexical function on the practical level. For example, I am not any more inclined to "believe" a photograph in a newspaper compared to the online version of that newspaper. While the online version is transcoded through data, its indexical link theoretically broken, as a viewer, one does not gain less or different information from the online newspaper and digital images. Recently, newspapers such as the *Detroit Free Press / Detroit News* and *Christian Science Monitor* have become available less frequently in print versions while their online presence increases. Other newspapers such as the *Cincinnati Post*, *Capital Times* of Madison, Wisconsin; and the *Seattle Post-Intelligencer* have become available solely through online editions.¹⁶ Additionally, many news photographs are captured with digital cameras so that they can be transmitted from the field to the publisher immediately. No longer is there a developing process and physical film that has to be submitted from photographer to publisher. But these digital photographs still fulfill photography's indexical role; viewers assume the digitally captured or transmitted appearance of a subject in the context of photojournalism matches the appearance of the same subject in reality.¹⁷

Jay David Bolter and Richard Grusin use the term "remediation" to describe the way characteristics of older media are used to establish cultural uses of newer media. This borrowing results from viewers' desire for a direct, or seemingly natural, connection

¹⁶ Eric Pryne, "Newspapers make move to online only," *The Seattle Times* (Saturday, March 7, 2009), available at http://seattletimes.nwsourc.com/html/business/technology/2008823971_onlinepapers07.html (accessed May 17, 2009).

¹⁷ I would like to thank Jeremy M. Lange, documentary and editorial photographer based in Durham, North Carolina (www.jeremymlange.com), for discussing with me the reasons for using analog versus digital photography in his working process.

between representation and reality. As Bolter and Grusin argue, “Whenever one medium seems to have convinced viewers of its immediacy, other media try to appropriate that conviction.”¹⁸ For example, the graphic interfaces of computer desktops reference prior media and office tools such as folders, desktops, and paintboxes. A computer user’s prior experience and familiarity with these physical tools causes users’ interactions with the graphic interface’s similar tools to seem more natural.¹⁹

Similarly, social applications of digital photography still rely on the assumptions about the functions of analog photographs. The benefits of the new technology, such as the ease of editing and transmission, have resulted in the adoption of digital photography in practices previously completed with analog photographs such as in photojournalism, snapshot photography, and scientific imaging. In using digital images, conventions of earlier formats are maintained in order to create a transition between analog and digital, instead of a distinct switch. For example, online newspapers, which involve digital technology in both the capturing and distribution of images through the internet, use conventions of printed newspapers. The homepage of various online newspapers, such as the *New York Times*, contain the paper’s title distinctly at the top of the page. The current date and a photographic image of one of the headline stories follows the title and is surrounded by captions and text in columns, similar to the layout of a physical newspaper.²⁰ Digital technology is a new format, or medium, for newspaper content but its layout follows conventions of the previous medium, allowing the new format to function similarly to the older format and thus, digital photographs function as printed

¹⁸ Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 2000), 9.

¹⁹ *Ibid.*, 31–32.

²⁰ See the *New York Times*, available at www.nytimes.com.

images once did.

Photographic artists, too, have used the idea of digital photographic images remediating analog photographs. Thus, artists employ the tradition of photography's indexical function so digital images seem to represent reality to viewers. For example, Kerry Skarbakka created multiple series in which his body is represented in a frozen moment of action through the use of digital and photographic technologies. For the series "Fluid" (2005—present), Skarbakka physically submerged himself in various sources of water. In images such as *Underwater Brush Pile* (2006), Skarbakka digitally combined multiple photographs of his body in this site in order to create his final composition (Figure 1). *Underwater Brush Pile* depicts Skarbakka in a panoramic image as his body floats caught in wooden branches underwater. A layer of yellowish algae covers the branches as a male body dressed in a red shirt, blue pants, and a dark coat is visible in the center of the image. His face is obscured by a slight blur of the photographic image and by one of the branches that extends in front of his face.

While Skarbakka digitally manipulated this image, and others in this series, his body was present in front of the camera when it was recorded to film. And though the artist digitally edited the image, it looks like an analog photograph. The scene depicted is realistic enough to be believable due to visual elements such as the scale of Skarbakka's body in relation to the setting and his clothing choices. The lighting of the background of the underwater scene is lighter blue toward the top of the image, as it would appear in reality, with more light visible toward the water's surface. The perspectival space of the image matches the photographic representation of space; branches closer to the camera lens are larger and brighter in tone when compared to the smaller and darker branches in

the background. Thus, viewers may look past the construction of the image and either believe what they see in order to view its indexical function as connected to a moment of reality, or suspend their disbelief to derive pleasure from believing in the fantasy of the scene.

Similarly, Skarbakka uses mountain climbing gear in order to represent himself in suspended poses falling or floating for the series “The Struggle to Right Oneself” (2002–present).²¹ After repeating a fall multiple times in order to have a number of images, Skarbakka scans the photographic film that recorded his actions. He then digitally removes evidence of the mountain climbing gear that aided his fall. Skarbakka’s image *Stairs* (2002) from this series was posted to FailBlog.org on February 8, 2008 (Figure 2). This website allows users to post humorous images, often snapshots, labeled with the caption “fail.” Some of the online viewers’ comments regarding *Stairs* illustrate the believability of Skarbakka’s constructed images. In *Stairs*, the artist appears to fall toward the camera lens, and the viewer, from the corner of a L-shaped staircase. His right boot rests on the edge of one of the stairs as his left leg extends up behind his body. His head comes close to the stairway banister as he reaches his left arm toward the viewer and he readies his body for his landing. On FailBlog.org, one viewer commented, “Oouchh!!! He surely hurt himself!!!” Another posted, “I think there’s also implicit fail in how his friend is photographing this instead of helping him.”²² Though *Stairs* was created with digital technology and was furthermore viewed as a digital image once posted to Skarbakka’s artist website or to FailBlog.org, viewers may still read these

²¹ For images from “Fluid” and “The Struggle to Right Oneself” see Kerry Skarbakka, “Portfolio,” available at www.skarbakka.com (accessed May 19, 2009).

²² “Stairs Fail,” FailBlog.org, available at <http://failblog.org/2008/02/08/stairs-fail/> (accessed February 5, 2009).

images as representing action as it occurred in reality. The photographic appearance of Skarbakka's images, the tradition of the transparency of lens-based media and the context surrounding the images' display impacted viewers' reception of these images more so than did the theoretical lack of indexicality of digital imagery.

Joan Fontcuberta argues, "The dramatic metamorphosis from the grain of silver to the pixel represents nothing more than a screen which conceals the evolution taking place in the whole framework that provided photography with a cultural, instrumental and historical context."²³ This suggests that in the shift from analog to digital photography, theories need not focus solely on the feared outcomes of technological shifts. Whatever is happening in the larger cultural context of photography, as Fontcuberta notes, will apply to both analog and digital photographs because digital images have assumed some of the functions of their analog forerunners. There are instances in which the theoretical differences between analog and digital photographs do not change the viewing process as is demonstrated by members' participation in *Telegarden*, in the vernacular use of images in online newspapers, and by Skarbakka's reliance on the assumed connection of a photographic image to reality in his series "The Struggle to Right Oneself" and "Fluid." While the message of digital photographic practices includes a new ease of editing and transmission of images, it does not necessarily result in the sudden mistrust of photographic transparency as it was once feared to do. Imaging technologies will continue to provide new possibilities for the format and distribution of images, and these developments will continue to be rooted in previous social uses of photography.

²³ Joan Fontcuberta, "Revisiting the Histories of Photography," in Joan Fontcuberta, ed., *Photography: Crisis of History* (Barcelona: Actar, 2002), 10–11.



Figure 1. Kerry Skarbakka, *Underwater Brush Pile*, 2006.



Figure 2. Kerry Skarbakka, *Stairs*, 2002.