

Report

THE INTEGRITY OF THE IMAGE

Current practices and accepted standards relating to the manipulation
of still images in photojournalism and documentary photography

A World Press Photo Research Project
By Dr David Campbell

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Executive Summary

1 The World Press Photo research project on “The Integrity of the Image” was commissioned in June 2014 in order to assess what current practice and accepted standards relating to the manipulation of still images in photojournalism and documentary photography are world-wide.

2 The research is based on a survey of 45 industry professionals from 15 countries, conducted using both semi-structured personal interviews and email correspondence, and supplemented with secondary research of online and library resources.

3 The principal finding is that there is a de facto global consensus on how media organizations understand the manipulation of images.

4 Manipulation is seen as involving material changes to an image through the addition or subtraction of content, and is always deemed unacceptable for news and documentary pictures. Manipulation is therefore a specific form of processing, where the material change to the image through the addition or subtraction of element(s) is designed to deceive or mislead the reader/viewer.

5 Adjustments (such as limited cropping, dodging and burning, toning, color adjustment, conversion to grayscale) to photographs are accepted. These are usually described in terms of “minor” changes being permitted while “excessive” changes are prohibited.

6 What constitutes a “minor” versus an “excessive” change is necessarily interpretative. Respondents say that judgment is on a case-by-case basis, and suggest that there will never be a clear line demarcating these concepts.

7 We are now in an era of computational photography, where most cameras capture data rather than images. This means that there is no original image, and that all images require processing to exist.

8 A further consequence of this is that the darkroom analogy is no longer a useful guide for debates on manipulation. This is the case firstly because all manipulations are possible in a darkroom, and secondly because digital photography has changed image-making more than is usually appreciated.

1 Introduction

The status of the photographic image as a source of information has been questioned since the invention of photography. The credibility of news and documentary photography is conventionally secured in terms of objectivity: the faithful recording of the events and people before the lens is said to secure truth.^I

This questioning of the status of photography increased in intensity with the advent of digital technology. From the first days of the digital image revolution, analysts and practitioners were concerned with challenges to the integrity of the image.^{II} Philip Jones Griffiths observed in 1999 that “we are probably the last generation that will accept the integrity of the photograph.”^{III} Yet the fact that we now live in a world where more than 1.8 billion images are uploaded to social media sites *every day* suggests that people see images as having great value, while at the same time it poses further challenges with regard to the credibility of images.^{IV}

Over the past decade, concerns about the credibility of news and documentary images have erupted periodically, in debates about the manipulation and post-processing of digitally produced photographs. In 2009, World Press Photo revised its rules to make clear that photographs in the contest could not be altered except in accordance with accepted industry standards.^V

However, until now no one has researched whether or not there *are* accepted industry standards regarding what alterations (if any) media organizations around the world permit. World Press Photo has sought to encourage an understanding of the contemporary state of play, and in April 2014 hosted two sessions at the Awards Days in Amsterdam to discuss these issues.^{VI} After those sessions, World Press Photo commissioned Dr David Campbell to research current practice and accepted standards relating to the manipulation of still images in photojournalism and documentary photography worldwide, focusing predominantly on the post-processing of images. The research sought to answer nine questions, and this report is based on Campbell’s submission to World Press Photo.

The purpose of the research was to record, as comprehensively as possible, along what lines members of the photojournalism community are thinking about the issue of manipulation, and how they deal with it. The research was *not* designed to impose or recommend standards that organizations should adopt, rather to record the standards that organizations might currently hold or practice. The purpose of this report is twofold: to encourage industry debate on the integrity of the image, and to inform World Press Photo of issues relating to manipulation that are relevant to its annual contest.

I On the early debates on the status of photography, see Geoffrey Batchen, *Burning with Desire: The Conception of Photography* (Cambridge MA: MIT Press, 1999). On the conventional justifications of news and documentary photography, see Dona Schwartz, “To tell the truth: Codes of objectivity in photojournalism,” *Communication* 13 (1992), 95-109; and Julianne H. Newton, *The Burden of Visual Truth: The Role of Photojournalism in Mediating Reality* (New York: Routledge, 2000). For recent statements about objectivity and truth see Olivier Laurent, “World Press Photo controversy: Objectivity, manipulation and the search for truth,” *British Journal of Photography*, 22 May 2013, <http://www.bjp-online.com/2013/05/world-press-photo-controversy-objectivity-manipulation-and-the-search-for-truth/>; and Ami Vitale, “Safeguarding Truth in Photojournalism,” *Ochre*, 13 August 2014, <http://ochre.is/tools/safeguarding-truth-in-photojournalism-ami-vitales-survival-guide/>

II For example, in June 1992 New York University hosted *Framing the News: A Conference on Protecting the Integrity of News Photography in the Computer Age*. This event discussed a proposal from Members of the Committee to Develop Proposed Standards for the Reproduction of Photographs by the News Media in the Computer Age. In 1994, the NYU/ITP Committee for New Standards for Photographic Reproduction in the Media proposed media organizations used an icon to distinguish between lens-based images and computer-generated images so readers and viewers could have greater confidence in an image’s provenance. See “New Standards for Photographic Reproduction in the Media,” 1 May 1994, http://www.pixelpress.org/contents/newstandart_fs.html

III Philip Jones Griffiths, “Death of the Photographer,” *Index on Censorship* 19 (1999), 132, quoted in Liam Kennedy, “Framing September 11th: Photography After the Fall,” *History of Photography* 27 (2003), 274.

IV This data is from Mary Meeker, “Internet Trends 2014 - Code Conference,” 28 May 2014, <http://www.kpcb.com/internet-trends>, slide 62.

V For example, Jim Lewis, “Don’t Believe What You See in the Papers: The untrustworthiness of news photography,” *Slate*, 10 August 2006, http://www.slate.com/articles/news_and_politics/photography/2006/08/dont_believe_what_you_see_in_the_papers.html; “Meget Photoshop? Døm selv!” *Presse-Fotograf Forbundet*, 30 March 2009, <http://www.pressefotograf-forbundet.dk/index.php?id=11374>. The new rule stated: “The content of the image must not be altered. Only retouching which conforms to currently accepted standards in the industry is allowed. The jury is the ultimate arbiter of these standards and may at its discretion request the original, unretouched file as recorded by the camera or an untuned scan of the negative or slide.” In the 2014 contest, World Press Photo made it a requirement that all images entering the final round be analyzed by an independent digital expert, who compared RAW or unretouched files against the contest entry, and presented a report to the jury highlighting any differences.

VI See David Campbell, “What are the current standards relating to the manipulation of photographs? A discussion at the World Press Photo Awards Days 2014,” <http://www.david-campbell.org/2014/05/02/what-are-the-current-standards-relating-to-the-manipulation-of-photographs-discussion-world-press-photo-awards-days-2014/>

2 Methodology

For the primary research, this project used semi-structured interviews with directors of photography, senior photo editors, and relevant media executives at top-quality news organizations and international wire services; directors and relevant staff at photography agencies, and digital forensics experts.

The research was designed to be as global as was practically possible. We approached 95 individuals in 19 countries—the United States, China, Italy, Spain, the United Kingdom, Germany, India, France, Russia, Brazil, Egypt, South Africa, Nigeria, Kenya, Denmark, Mexico, Argentina, Japan, and Indonesia. These 19 countries were selected because they were the leading countries from which entrants to the 2014 World Press Photo contest came.

The only limitation was that a number of possible interviewees did not respond to requests for information. In the end 45 individuals from 15 countries were interviewed or provided information, giving us a 47% response rate. Our respondents included people working in all of the above professional categories in Argentina, Brazil, China, Denmark, Egypt, France, Germany, India, Indonesia, Italy, Japan, Nigeria, Russia, the UK, and the USA. A number of interviewees requested that their information be included without identifying either the specific organization they worked for, or their personal identity. As a result, to maintain consistency across our sources, we do not identify respondents beyond nationality.

For the secondary research, the project collected codes of ethics relating to the integrity of the image from media organizations and professional associations worldwide, with documents translated where necessary. It also reviewed online and library research for existing scholarship on ethical debates relevant to the integrity of the image.

3 The Meaning of Manipulation

‘Manipulation’ has a number of meanings. In its most general sense, the word refers to the skillful handling or use of equipment, or to technique. Other definitions are more negative in connotation, with an emphasis on influencing something skillfully, but in an unfair manner (as in “manipulating someone’s feelings”); or to changing something to suit one’s purpose or to gain advantage.

These more negative senses have informed contemporary debate about the production of photographic images, where the concern is often expressed that changes to original images, something that can be done with greater ease given digital technology, leads to photographs that represent reality in inaccurate ways. As a result, the contemporary debate is concerned first and foremost with the post-processing of negatives or RAW files.¹ Given this, we have to ask whether ‘manipulation’ and ‘post-processing’ are synonymous with each other, or whether manipulation is a specific, negative form of post-processing.

In addition, we need to recognize that the question of possible manipulation is far from exhausted by the focus on post-processing. Almost every stage in the photographic process, from capture and production to the publication and circulation of photographic images, contains the potential for manipulation. The mere act of going to place A rather than place B to produce an image involves a choice that might represent reality in a partial manner. How a photographer’s travel to a certain location was funded and enabled raises a series of questions. Once on location, the composition and framing of scenes necessarily involves choices that limit representation. The editing, selection, and captioning of images for potential publication adds further layers of decision. Which images are then distributed to media clients for purchase, and how those clients present, sequence, and contextualize the images, is another realm of creative choice that shapes the representation of events and issues. As David Levi Strauss has observed, “the truth is that every

photograph or digital image is manipulated, aesthetically and politically, when it is made and when it is distributed.”¹¹

It is hard to quantify how large a problem manipulation is. Our respondents both regarded it as a significant and growing problem (increased levels of fraud in scientific research images was one area of particular concern), while also noting that the number of problematic news and documentary images was small relative to the volume of photographs produced globally. The significance of manipulation is therefore probably not a quantitative problem. It is, rather, a qualitative problem whereby even small numbers of problematic images can undermine the overall credibility of photographs as documents of events and issues.

1 “Boundaries of Photo Editing,” Spiegel Online International, 8 May 2013, <http://www.spiegel.de/international/world/growing-concern-that-news-photos-are-being-excessively-manipulated-a-898509.html>

11 David Levi Strauss, “Doctored Photos: The Art of the Altered Image,” TIME Lightbox, 13 June 2011, <http://lightbox.time.com/2011/06/13/doctored-photos-the-art-of-the-altered-image/#1>

4 History of Manipulation

The manipulation of photographic images has a history as long as that of photography itself.^I Sometimes, historic manipulation involved setting up scenes to photograph, as in Roger Fenton's 1855 photo "The Valley of the Shadow of Death", or Alexander Gardner's Gettysburg pictures of slain soldiers.^{II} From the beginning, analogue photographs were also altered in the darkroom. Politicians had their heads placed on other people's bodies, absent individuals were inserted into portraits, political opponents were scrubbed from images after they fell out of favor, and damaging associations between individuals were made by splicing pictures together.^{III}

While the desire to manipulate photographic images through the addition or subtraction of some element in the picture is longstanding, digital technology has made that desire easier to achieve. As Hany Farid observes, "prior to the digital revolution, the enhancement and manipulation of images required talented artists and technicians to spend long hours in the dark room. With the advent of digital imaging, such alterations are now only a few computer mouse clicks away."^{IV} As a result, there are numerous examples where people are made to appear in scenes they weren't originally present at, governments buttress the claims of military might by cloning weaponry, and celebrities have their body shape enhanced.

What is perhaps different in the digital era, are cases where post-processing becomes manipulation through the excessive use of color-correction or toning. Sometimes that is done to create a more dramatic aesthetic, as in the 2006 case of *The Charlotte Observer* photographer Patrick Schneider, who was fired for transforming a brownish sky silhouetting a fireman into a bright orange backdrop. More significant was the 1994 *Time* cover, in which O.J. Simpson's mug shot was darkened; or the 1997 Swiss tabloid image that transformed a pool of water at the site of the Luxor massacre into a stream of blood.^V

Another form of manipulation involves the appropriation of images from one context to be used in another, one that is often unrelated. This is referred to as "scraping."^{VI} Recent examples include the use—both by the BBC and individuals on social media—of Ami Vitale's photographs of women in Guinea-Bissau to illustrate the #BringBackOurGirls campaign, about schoolgirls captured by Boko Haram in Nigeria; or the recirculation of Ron Haviv's 1992 Bosnian War images by propagandists claiming that they showed incidents in the Ukraine conflict.^{VII} Responding to this form of manipulation requires different strategies from those concerned with pixel changes and post-processing levels.

I Mia Fineman, *Faking It: Manipulated Photography Before Photoshop* (New York: Metropolitan Museum of Art, 2012).

II On Roger Fenton's photograph, see Errol Morris, *Believing is Seeing: Observations on the Mysteries of Photography* (New York: Penguin Press, 2011). Morris discusses this image and his investigation in "In the Valley of the Shadow of Doubt," *Radiolab*, WNYC, 24 September 2012, <http://www.radiolab.org/story/239499-in-the-valley-of-the-shadow-of-doubt/>. On Gardner, see "Home of a Rebel Sharpshooter," *The Civil War in Art*, <http://www.civilwarinart.org/items/show/85>.

III For a gallery of examples, see FourandSix, "Photo Tampering Through History," <http://www.fourandsix.com/photo-tampering-history/>

IV Hany Farid, "Digital Imaging," *Encyclopedia of Perception*, 2009, <http://www.cs.dartmouth.edu/farid/downloads/publications/digitalimaging09.pdf>

V These examples can be found at FourandSix, "Photo Tampering Through History," <http://www.fourandsix.com/photo-tampering-history/>

VI Claire Wardle, "Verifying User Generated Content," *Verification Handbook*, <http://verificationhandbook.com/book/chapter3.php>

VII James Estrin, "The Real Story About the Wrong Photos in #BringBackOurGirls," *Lens*, 8 May 2014, <http://lens.blogs.nytimes.com/2014/05/08/the-real-story-about-the-wrong-photos-in-bringbackourgirls/>; and Josh Raab, "In Ukraine, A Battle of Words and Images," *TIME Lightbox*, 8 July 2014, <http://lightbox.time.com/2014/07/08/ukraine-fake-images-claim/#1>

5 The Impact of the Digital Revolution

The digital revolution has transformed photography in more ways than we may have realized. To appreciate this we need to be clear about how images were made using analogue technologies.

We have conventionally thought of photography as a process that creates images directly. This is largely the case with analogue techniques. Chemicals on the surface of film and paper is exposed to light, resulting either in an observable or in a latent image, which is made visible after further chemical processing.¹ Importantly, the observable or latent image produced through the exposure of chemicals results in something we can regard as the original image: a source from which copies can be made, and against which these copies can be compared.¹¹

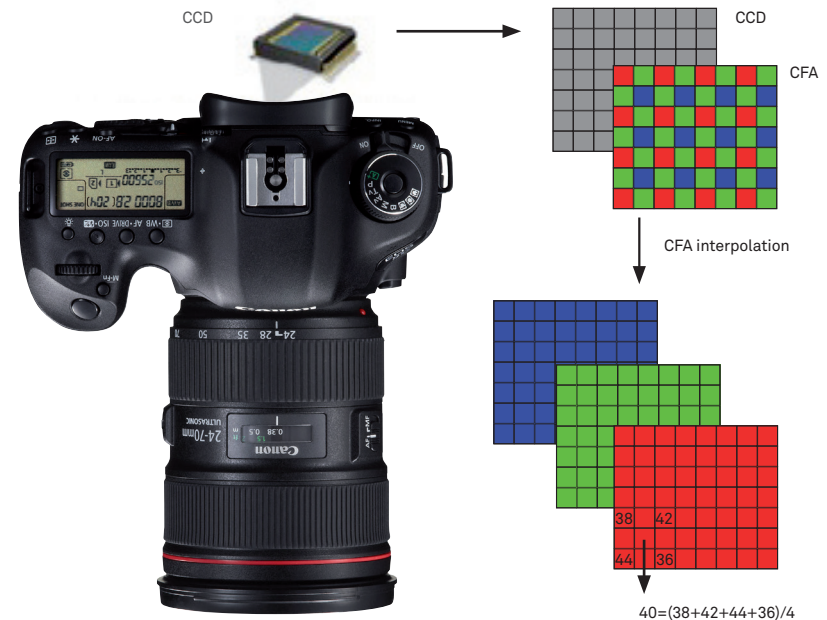
In this conventional understanding of photography, the camera is understood as a *picture-making device*. We believe that “you form the picture in the instant you click the shutter on the camera. You might modify the exposure or coloring of the photo after the fact, but the essential characteristics of the image were defined in that initial instant.”¹¹¹¹

In the digital era, we still think of the camera of a picture-making device. This, however, is a mistake. In the digital era, we need to understand the camera as a *data-collection device*, a device which is “gathering as much data as you can about the scene, and then later using advanced computational techniques to process that data into the final image. That creates a much more slippery definition of an original, because what is defined at the time of capture is not necessarily a fully formed picture.”¹¹¹¹¹ With this understanding, we can appreciate that photography has become “computational photography.”¹¹¹¹¹¹

The path to this new understanding becomes clear if we break down the way digital (i.e. computational) photography works. The camera sensor

consists of two elements, the first being the Charge-Coupled Device (CCD), or a complementary metal-oxide-semiconductor (CMOS) array that becomes electrically charged when exposed to light, with the amount of charge proportional to the intensity of the light. While sensitive to light intensity, this array does not differentiate light *wavelength*, because it records light *intensity* via grayscale. To transform that differential grayscale into color images, a second element, the Color Filter Array (CFA) is overlaid on the CCD/CMOS sensor. Each sensor element

Figure 1



of the CFA records a limited range of wavelengths, corresponding to either red, green, or blue (see figure 1).^{vi}

One important feature of this capture process is that “only one-third of the samples in a color image are captured by the camera. The other two-thirds are computed by the camera software—a process known as color filter array (CFA) interpolation, or demosaicing.” Because of this we can conclude that “two thirds of your pixels are fake.” We can use this to underpin the statement that “color is a construction of our visual system and imaging devices and not a fundamental property of light in the physical world.”^{vii} The color we see in photographs is produced through computational processes.

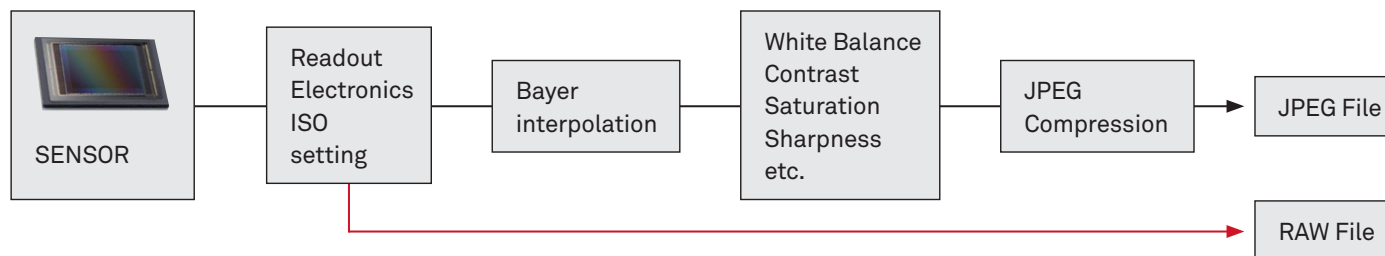
In the absence of an original image in computational photography, the process by which an image is produced begins with the RAW file.^{viii} RAW is not an observable or latent image. It is a record of the data captured by the sensor. RAW stores the pixel values directly recorded by the CCD prior to CFA interpolation, as well as the image metadata. Pixel values are stored efficiently because only one number is stored for each pixel, but it requires photo-editing software to perform the CFA interpolation, using a RAW converter. This is the process of “demosaicing”, which uses

portions of the metadata embedded in the file at the time of capture, as well as algorithms in the conversion software. RAW conversion also involves white balance, colorimetric interpretation, gamma correction, noise reduction.

When a photographer shoots solely in RAW format, the computational process that results in an image is done after data capture and outside the camera, by photo-editing software (e.g. Adobe Camera Raw, Lightroom, Photoshop). The only on-camera settings that have an effect on the captured pixels are the ISO speed, the shutter speed, and the aperture setting.

When a photographer shoots in JPEG format, however, a RAW converter built into the camera carries out all the tasks noted above to produce a color image, then compresses it to the JPEG format (see Figure 2).^{ix} The algorithms driving this process are produced by the camera maker’s engineers, and will vary from manufacturer to manufacturer, and model to model. Some cameras also let you set parameters for this conversion (e.g. choice of sRGB or Adobe RGB as color space, a sharpness value, a tone curve or contrast setting). Because it is difficult to adjust these parameters on an image-by-image basis, in JPEG mode you are locked

Figure 2



into the camera's interpretation of the scene. According to Fraser, "most camera vendors...impose a fairly steep contrast curve in the raw-to-JPEG conversion in an effort to produce a JPEG that resembles a transparency. In the process, they throw away about a stop of usable dynamic range, and you have essentially no control over what gets discarded."^x

As a result it becomes clear that both JPEG and RAW process the data using algorithms and software. The difference is, firstly, the amount of control over the data someone shooting RAW has and, secondly, the location of processing. JPEG processes are done in-camera following the manufacturer's algorithms while RAW conversion is outside of the camera under the control of the photographer or editor.

Debates about digital manipulation often proceed in terms of how images are captured in camera and then post-processed outside the camera. However, this is a rendering of the problem dependent on an analogue view of photography, one which fails to appreciate the radical changes of the digital era. If we understand that digital photography is computational, then every image requires "post-processing" in order to be an image. We have no original image in computational, digital photography. At the point of capture there is only data that has to be processed. This means "post-processing" is a necessity in the making of an image. Therefore, the assumption that we have an in-camera image which can function as the authentic, original image is no longer sustainable.

I See Tomáš Štanzel, National Technical Museum (Prague), "Historical photographic processes," <http://www.ntm.cz/projekty/fototechniky/en/>; and "Photographic Processes," British Library, <http://www.bl.uk/onlinegallery/features/photographicproject/photographicprocesses.html>
II Of course, film negatives are not always secure, original images. W. Eugene Smith famously spliced negatives together to produce some photographs. See Ben Cosgrove, "Behind the Picture: Albert Schweitzer in Africa," <http://life.time.com/history/albert-schweitzer-in-africa-behind-the-picture/#1>.
III Kevin Connor, "Photojournalism Ethics on Shifting Technological Ground," 13 February 2012, <http://www.fourandsix.com/blog/2012/2/13/photojournalism-ethics-on-shifting-technological-ground.html>,
IV Kevin Connor, "Photojournalism Ethics on Shifting Technological Ground," 13 February 2012, <http://www.fourandsix.com/blog/2012/2/13/photojournalism-ethics-on-shifting-technological-ground.html>,
V Seeing digital photography as essentially computational photography is to adopt a broader definition of computational photography, and take it beyond its more common concern with specific digital processes like HDR.

VI Hany Farid, *Digital Imaging, Encyclopedia of Perception*, 2009, <http://www.cs.dartmouth.edu/farid/downloads/publications/digitalimaging09.pdf>
VII Hany Farid, "Two-Thirds of Your Pixels Are Fake," 26 March 2013, <http://www.fourandsix.com/blog/2013/3/26/two-thirds-of-your-pixels-are-fake.html>.
VIII The following section is indebted to Bruce Fraser, *Understanding Digital Raw Capture*, Adobe White Paper, 2004, http://www.adobe.com/digitalimag/pdfs/understanding_digitalrawcapture.pdf. RAW, though, is not a specific format - it is a general term for a variety of proprietary file formats (e.g. Canon's .CRW and .CR2, Minolta's .MRW, Nikon's .NEF, Olympus'.ORF) that share important common features.
IX Figure 1 taken from Bob Atkins, "RAW, JPEG, TIFF," <http://photo.net/learn/raw/>, 2004 (updated June 2008).
X Bruce Fraser, *Understanding Digital Raw Capture*, Adobe White Paper, 2004, http://www.adobe.com/digitalimag/pdfs/understanding_digitalrawcapture.pdf

6 Accepted Standards and Current Practices

Media organizations respond to the ethical challenges of manipulation through a combination of codes and practices that embody accepted standards.

In some cases, those standards are codified in formal ethics policies. This is most common in North America. From the people we interviewed or contacted for information, we received only two written policies from an organization outside of North America. Professional journalism associations both have their own policies and aggregate links to others. Prominent examples include the American Society of Newspaper Editors, Pew Research Journalism Project, and the Society of Professional Journalists.^I Not every organization with a written ethics policy explicitly mentions photography. In some of those cases, policies implicitly suggest that the guidelines for fair and accurate reporting are also the criteria for judging what may be done to a photograph. There are publicly available codes of ethics dealing with photography from The Associated Press, *The New York Times*, and the National Press Photographers Association.^{II} The Consumers Union report *Photo Manipulation Policies* summarizes the codes of 38 American organizations.^{III} Outside of North America, and taking a global perspective, is the Reuters code, along with codes from Hong Kong, the Philippines, and Turkey.^{IV}

On reviewing these written policies, a consensus on how news and documentary images should be handled becomes evident, regardless of whether we are dealing with legacy media companies or new media organizations. The essence of this consensus is that media organizations prohibit the alteration of images beyond traditional darkroom techniques. The consensus has the following elements:

- The alteration of images—where alteration means the digital addition or subtraction of elements—is forbidden.

- The ban on alteration is often cast in terms of not deceiving or misleading readers/viewers.
- The only generally permitted alteration is retouching or the use of the cloning tool to eliminate dust on camera sensors or scratches on scanned negatives/prints.
- Some media organizations additionally permit the blurring of faces or other forms of identification (e.g. vehicle registrations), where this is either required by the law or judged by the organizations to be necessary.
- Any images that are altered for illustrative purposes must be credited and/or captioned as “photo-illustrations”, or with a similar term.
- Adjustments made by image-processing software (e.g. limited cropping, dodging and burning, toning, color adjustment, conversion to grayscale) are acceptable so long as they are deemed “minor/normal/subtle/moderate”, while “excessive use” is not acceptable.
- Those “minor/normal/subtle/moderate” adjustments are regularly justified by reference to “traditional darkroom practices”, or to not violating the “emotional truthfulness” of an image, and are considered necessary in order to make clear and accurate reproduction possible.
- Photos cannot be staged, posed or re-enacted.

This consensus applies most directly to news and documentary images. Our respondents noted that they generally regarded nature and sports images in the same way as news and documentary images. Fashion and staged portraits were a different matter altogether. In those genres, there were no policies, and in fashion especially the prevailing attitude was that anything goes and all is permitted. Even for *The New York Times*, certain

images (“portraits or still-lives...photos of food, shoes, etc.”) could be set up or altered without being clearly labeled as a photo illustration.^v

It is clear from this consensus that “manipulation” means alteration to an image where something is added to, or subtracted from, the image after capture; or something is posed in order to create a scene to photograph. As such, manipulation is a specific form of processing, where the material change to the image through the addition or subtraction of element(s) is designed to deceive or mislead the reader/viewer. In the discussion on “The Grey Area of Processing” we will discuss the issues arising from the consensus on permitted adjustments in processing.

Our research found that many organizations rely on conventions and norms instead of written codes and policies. In fact, relying on conventions and norms is more common than written codes and policies. This is the case in Europe and North America as well as in the rest of the world, and includes both established and newer media organizations. These organizations depend either on a culture that has been established in photo departments over a long period of time, or on the personal convictions of photo editors managing those departments.

However, even when written policies were few and far between, the way our respondents described their conventions and norms mirrored exactly the consensus on manipulation as described above, suggesting a broad, if de facto, global agreement. This conclusion is obviously contingent on the number of responses we received, but their uniformity is significant. As one Russian respondent said “we follow the policy regarding image manipulation common for the photojournalistic industry and particularly for news-related images.” An Indian respondent similarly noted their organization’s practices were “based on the general notion and standards of the industry everywhere...[of] a strict policy against manipulation.”

This de facto global agreement means that, without exception amongst our respondents:

- 1 Manipulation was seen as involving material changes to an image through the addition or subtraction of content, and was always deemed unacceptable for news and documentary pictures.
- 2 Adjustments (such as limited cropping, dodging and burning, toning, color adjustment, conversion to grayscale) to photographs were accepted. These changes were usually described in terms similar to those detailed above: “minor” changes, such as those said previously to have been used in darkrooms, were permitted; “excessive” use of such adjustment was not.
- 3 What constitutes a “minor” versus an “excessive” change is necessarily open to interpretation. Respondents said that judgment was on a case-by-case basis, and often used the anachronistic terms of the dark-room analogy.

I American Society of Newspaper Editors, *Overview: Ethics*, <http://asne.org/content.asp?pl=19&sl=236&contentid=236>; Pew Research Journalism Project, *Ethics Codes*, <http://www.journalism.org/resources/ethics-codes/>; Society of Professional Journalists, *SPJ Code of Ethics*, <http://www.spj.org/ethicscode.asp>.

II The Associated Press, *AP News Values and Principles*, <http://www.ap.org/company/news-values>; The New York Times, *Standards and Ethics*, <http://www.nytimes.com/who-we-are/culture/standards-and-ethics/>; National Newspaper Photographers Association, *NPPA Code of Ethics*, https://nppa.org/code_of_ethics.

III Consumers Union, *Photo Manipulation Policies*, 27 January 2009, <http://consumersunion.org/research/photo-manipulation-policies/>

IV Reuters, *Handbook of Journalism: A BRIEF GUIDE TO STANDARDS, PHOTOSHOP and CAPTIONS*, http://handbook.reuters.com/index.php?title=A_Brief_Guide_to_Standards,_Photoshop_and_Captions; Hong Kong Journalists Association, “Joint Code of Ethics of the 4 Journalistic Organizations,” <http://www.hkja.org.hk/site/portal/Site.aspx?id=A1-602>; Photojournalists’ Center of the Philippines, “Code of Ethics,” <http://pcp.ph/pcp-code-of-ethics/>.

Writing from a Pakistani perspective, Fawad Kaiser’s states that when journalism codes from Europe and the Islamic world are compared, although there are differences, “the analysis shows that there is a broad intercultural consensus that standards of truth and objectivity should be central values of journalism.” See “Ethics in Photojournalism,” 14 April 2014, Pakistan Press Foundation, <http://www.pakistanpressfoundation.org/media-ethics/76048/ethics-in-photojournalism/>
V T The New York Times, “Guidelines on Integrity,” <http://www.nytimes.com/wp-content/uploads/Guidelines-on-Integrity-updated-2008.pdf>

7 The Grey Area of Processing

When we speak of image manipulation, we mean a subcategory of processing: specific material changes made to an image through the addition or subtraction of content. This is always deemed unacceptable for news and documentary pictures, as well as for nature and sport photos. This is the position advanced in the ethics statement of the well-known digital processing lab iob: “we believe that talking of ‘manipulation’ is correct only when actual pixels are ‘moved’...when the minimum unit of a digital image is at least either replaced or cloned.”^I It is also the position advanced by World Press Photo, as evinced by the organization’s disqualification in 2010 of Stepan Rudik, who transgressed contest rules by removing a detail from his photograph.^{II}

The computational nature of contemporary photography means that almost all images are produced by processing data that is captured by the camera. With regard to processing, our review of standards and practices demonstrated widespread acceptance of “minor” adjustments (such as limited cropping, dodging and burning, toning, color adjustment, conversion to grayscale) as opposed to “excessive” changes.

Together, these two factors—unacceptable manipulation and permitted adjustment—form part of a de facto global consensus on manipulation and processing. In practice, the consequences of violating this consensus, especially with regard to manipulation, are clear: photographers such as Narciso Contreras, Adnan Hajj, and Brian Walski have lost their jobs for adding or subtracting content from an image, even if, in some cases, the changes had a minimal impact on the meaning of the image.^{III}

What is left undetermined in the global consensus, is the grey area of processing. What is the line between a minor and an extreme change? And who decides just where that line falls? Can processing adjustments become instances of manipulation?

The biggest problem is that judging the acceptability of processing in terms of what is “minor/normal/subtle/moderate” versus “excessive” is inescapably a matter of interpretation. None of our respondents specified a boundary between “minor” and “excessive”, other than to say that it was a matter of case-by-case judgment, in which a major consideration was how the photographer saw the scene. Few policies detail the digital tools that can be used to make minor changes.^{IV}

To try and get out of this interpretative bind, respondents and organizations often attempt to make judgments about legitimate processing by referencing “darkroom techniques.” However, using darkroom techniques as a standard for judgment is now out of date. In many ways, the idea that darkroom techniques have ever been an appropriate foundation for judgment is flawed, because—as the history of manipulation demonstrates—darkroom techniques have regularly been used to fake images. Skilled practitioners could achieve just about every form of manipulation in a darkroom, making “darkroom techniques” a weak defense against manipulation. Continual reference to darkroom techniques in the digital era is all the more anachronistic given that photography now does not begin with the capture of an image itself, but requires the processing of data to produce an image.

Processing can become manipulation if it involves substantial toning that results in the obscuring of details, thereby in effect materially altering the content of the image. This was one of criteria used by the 2014 World Press Photo jury to disqualify a number of contest entries.^V An additional issue arises when publications, rather than the photographer, process images to such an extent that it changes the look substantially, leading to a possible manipulation of meaning.^{VI}

However, that still leaves the question of how to make judgments about what amount or level of processing is deemed acceptable. Recall that

Stepan Rudik's 2010 photograph was disqualified for the removal of an object, not the color correction, tilt correction and vignetting that made his image.^{vii} This is where the debate about Paul Hansen's 2012 World Press Photo of the Year was located.^{viii} After thorough forensic examination, it was clearly determined that Hansen's photograph was not manipulated. However, critics still alleged it was an inaccurate representation of reality, not as 'objective' as photojournalism should be; or that it violated their sense of taste by being "overcooked." Similar arguments have been used when assessing the work of photographers using labs like rob for processing.^{ix}

Framing objections in this way is neither helpful nor sustainable. Because photography is an interpretation of the world through the construction of an image, it cannot be considered as either a mirror to, or window on, the world. Therefore, the traditional claims of objectivity as the basis for truth are themselves misleading. Are we then left only with the photographer's view with which to establish the veracity of the image? If the integrity of the image cannot be secured by either anachronistic analogies or subjective claims, how do we proceed to make judgments about veracity?

The first part of the answer to these questions lies in reframing the debate about manipulation. Once we shed the false faith in objectivity, the veracity of the image has to be considered in relation to its function and purpose, rather than its philosophical status. We need to consider the issue in terms of what images *do* rather than what images *are*.

I 10b, "Ethics," <http://www.10bphotography.com/index.php?page=ethic&lang=eng>

II See M. Scott Brauer, "Stepan Rudik disqualified from World Press Photo, dvaphoto, 5 March 2010, <http://www.dvafoto.com/2010/03/stepan-rudik-disqualified-from-world-press-photo/>

III On the Contreras case, see James Estrin, "Truth and Consequences for a War Photographer," *Lens*, 24 January 2014, <http://lens.blogs.nytimes.com/2014/01/24/truth-and-consequences-for-a-war-photographer/>; on Hadj, see "Altered Images Prompt Photographers Firing," *NBCNews.com*, 7 August 2006, http://www.nbcnews.com/id/13165165/ns/world_news-mideast_n_africa/t/alterd-images-prompt-photographers-firing/#.VE1ZFof3c7E; and on Walski, see Kenneth Irby, "L.A. Times Photographer Fired Over Altered Image," <http://www.poynter.org/how-tos/newsgathering-storytelling/9289/l-a-times-photographer-fired-over-altered-image/>, 2 April 2003.

IV Reuters' policy is one of the few that explicitly lists which Photoshop tools can and cannot be used, although it does not reference new tools in Photoshop like Content Aware Fill or Fill Flash.

V Examples of changes that led to disqualification in the 2014 contest can be seen at <http://www.david-campbell.org/photography/manipulation-examples/>

VI One example was the way *The Times* (London) published an AP photograph of the downed Malaysian Airlines jet in Ukraine. Bag News Notes, "On That Over-Processed Times Cover Photo of MA17 Crash Site," 20 July 2014, <http://www.bagnewsnotes.com/2014/07/about-that-over-processed-cover-photo-of-the-ukraine-malaysia-air-crash-site/>

VII M. Scott Brauer, "Stepan Rudik disqualified from World Press Photo, dvaphoto, 5 March 2010, <http://www.dvafoto.com/2010/03/stepan-rudik-disqualified-from-world-press-photo/>

VIII For a collection of the commentary and debate on this issue, see <https://bitly.com/bundles/martijnkleppe/>

IX See the examples from Yuri Kozyrev, Stefano de Luigi, David Furst, and Francesco Zizola presented at <http://www.10bphotography.com/index.php?page=ethic&lang=eng>

8 Detecting Manipulation

Our research revealed that trust plays a significant role within the photo-journalism industry, when it comes to ensuring the integrity of the image. Organizations that commissioned photographers directly, often did so on the basis of their trust in the ethical approach of those photographers. Sometimes this involved specific conversations with those being commissioned, about what was acceptable and what was not, prior to their undertaking the commission. In other cases, it meant deferring to the photographer's experience and track record. Organizations that subscribed to news and photo agencies for the provision of images, also deferred ethical questions to those agencies, accepting that what was released by the agencies was inherently trustworthy.

When trust breaks down, the detection of image manipulation involves both human and technological means. Interpretation by photo editors themselves is the primary detection practice in most media organizations. Respondents detailed how their best practice involved relying on the personal judgment of one or more photo editors, whose experience enabled them to decide when questions should be asked about the veracity of an image. Basic technical means for image analysis and verification were used if photo editors asked staff in their departments to open a file to see how it was produced. The only organization we encountered that uses forensic software in-house is Agence France-Presse (AFP), employing the Tungstene program.ⁱ However, many organizations said they contracted external digital forensics experts, who made use of such software, to advise them on the integrity of images in any especially contentious or important cases.

Digital forensics is a forensic science concerned with the investigation of digital files. In the context of imagery, digital forensics is a new science, with a history of no more than 15 years. The growing capabilities of image data-processing software provide a constant challenge to digital forensics. Tools such as Photoshop's Content-Aware Fill enable image transforma-

tions that once took skilled practitioners enormous amounts of time, and the task of detecting such changes in digital image files becomes all the more difficult. Nevertheless, digital forensics has developed a range of tests that can, in the hands of trained analysts, detect changes. These can be roughly grouped into five categories:

- Pixel-based techniques that detect anomalies introduced at the pixel level (such anomalies include cloning, resampling, splicing, statistical)
- Format-based techniques reveal statistical information deleted by specific lossy compression schemes (whereby certain information is permanently deleted during the compression of a file). Such schemes include JPEG quantization; double JPEG; JPEG blocking.
- Camera-based techniques that exploit artifacts introduced by the camera lens, sensor, or on-chip post-processing (such as chromatic aberration; color filter array; camera response; sensor noise)
- Physically based techniques that explicitly model and detect anomalies in the three-dimensional interaction between physical objects, light, and the camera. Such techniques include Light direction 2D; Light direction 3D; Light environment.
- Geometric-based techniques that make measurements of objects in the world and their positions relative to the camera (such as principal point; metrics).ⁱⁱ

A sixth category is emerging, which involves processes to deal with "recapture attacks", in which a photo is manipulated, displayed on a hi-resolution monitor, and then a new picture is made from the monitor, so that it looks like an original image. Technologies are being developed to detect these images of images.

Digital forensic science—as with measures taken against computer viruses and spam—is in a state of constant competition with its opponents, often reacting to new attempts to alter pictures as they arise. However, digital forensics has succeeded in one very important respect: to get a fake image through forensic tests without detection means you have to be highly skilled, invest a lot of time, and take a considerable risk. This means that the average person can no longer easily produce fraudulent images that can escape detection. Successful image manipulation has, because of digital forensics, become the province of experts rather than amateurs, which means it is less widespread.

In this context, it is important to understand the limitations of digital forensics, and to focus on what it does best. Digital forensics can determine automatically and reliably whether an image file is a camera original, and if it is not a camera original, whether processing steps have been undertaken. Forensics assumes the RAW file is a reasonable guarantee of a camera original, and therefore focuses on JPEG files, with current technology enabling analysts to detect how many compressions a JPEG file has gone through and therefore how original it is. This technology is what is behind Fourandsix's Izitru product (and is likely similar to AFP's Tungstene program).^{III} Certifying the source is what can currently be best achieved with scientific assurance. This means digital forensics will likely be very useful for media organizations wishing to authenticate social media images and user-generated content. It is far less appropriate for the judgment of professional imagery, because almost every picture published will have undergone some alteration by image-processing software, in line with the accepted practices identified in this research.

In countering manipulation of the camera file, there is no doubt that forensic science will get better at detecting the use of new processing tools, but there will never be a fully automatic, efficient forensic analysis that gives an image an unequivocal seal of approval. Forensics will not work this way because judging what constitutes manipulation is too complex, given the different contexts in which particular tools are used.

Because the same tool can be used for legitimate as well as illegitimate changes, forensics has to appreciate false negatives and false positives, and is therefore also inescapably interpretive. These limitations means that few media organizations are likely to invest in in-house analytical software, relying instead on the judgment of editors for verification.

I For a brief description of how Tungstene works, see Roland de Courson, "Detecting North Korea's doctored photos," *AFP* Correspondent, no date, <http://blogs.afp.com/correspondent/?post/Detecting-North-Korea's-doctored-photos#.VE1gnlf3c7E>

II Hany Farid, "Image Forgery Detection: A Survey," *IEEE Signal Processing Magazine*, 16, March 2009.

III See <http://www.fourandsix.com>.

9 Verification: A Possible Way Forward

Securing the integrity of an image goes beyond the question of manipulation. The credibility of news and documentary photographs depends on issues that go further than confidence about techniques of processing, despite the de facto global consensus identified in this research.

The realities of computational photography mean that we need a new discourse of justification for the integrity of the image. We have to move from the ontology of the image to its pragmatics, shifting our concern from what images are to what images *do*. In the past, believing that photography involved the capture of an original image, the authenticity of which was determined by its relationship to the scene it depicted, we justified an image in terms of objectivity. That understanding has always been subject to criticism. However, once we appreciate that computational photography is based on the collection of data, and that there is no original image, we have moved beyond the idea of reference between image and reality to such an extent, that the idea of objectivity is no longer tenable.

Shifting our focus from what images *are* to what images *do* requires us to make the purpose of images, the work of images, the function of images, what producers want them to do, and what consumers expect them to do, our principal concerns. This is very different from contemporary claims about showing the real. It means that if we want an image to work for news and documentary purposes, it will have to satisfy a range of criteria much more stringent than an image designed for art or entertainment. These criteria would include the techniques of its processing, but should also take in every dimension of the image's production, from conception to circulation. Such criteria could then become data points that would allow the image to be verified.

The concept of verification arose in a large number of the interviews conducted for this research. One reason for this is the considerable

attention paid within contemporary journalism to the challenge of verifying user-generated content, given the significance of social media.^I Verification literature details various questions and techniques organizations can employ to check the veracity of material they receive for possible publication. While numerous digital tools and online sources can help, this process depends on human investigation and interpretation above all else.^{II}

The process of verification would be enhanced and encouraged if image producers and publishers were to adopt new and transparent practices detailing how an image has been made. Creating an open digital audit trail and certified workflow could be the foundation on which verification of the integrity of an image may be built. As Kevin O'Connor of FourandSix states, "one way you can provide that assurance is with effective chain of evidence procedures that allow you to document exactly what has happened with an image from the time it was captured until the time it is being presented to the viewer."^{III}

Creating an open digital audit trail and certified workflow of image production means considering everything from the moment of commissioning to the moment of circulation of the image or story. It would involve:

- **Personal verification:** a biographical statement about the image maker, their previous work, and their general perspective.
- **Project verification:** records showing who funded the commission, who provided the logistics, and details on anything from the field that could influence how the image or story is compiled.
- **Image verification:** a file containing all EXIF/IPTC data, geotags, and all actions detailing how the data captured in the camera has been

processed. This could build on the History Log option in Photoshop, and use the ability of tools such as Lightroom to store metadata about the settings used. However, because these recording elements are not currently foolproof, photographers would always be required to keep two files—the original, verifiably unmodified file, and the modified version with an edit history.

Together these levels of verification might provide data points that could enable third parties to authenticate an image or story they are publishing.^{IV}

The purpose of verification is to assure readers/viewers that they can have confidence in the integrity of images. If image producers were open and transparent, and were to compile a digital audit trail and certified workflow for their images/stories, this could itself be a major statement of authenticity *before* any questions might arise about “manipulation”. Image makers and publishers would be equipped with the relevant information to reassure consumers about the integrity of the image, should questions be raised about particular images or stories.

The proposal that there be a digital audit trail and certified workflow for images/stories takes on board an awareness of the constraints of modern-day digital forensic science, when it comes to assessing instances of manipulation. Digital forensics can show us what changes have been made to the in-camera data file, but as all professional images require processing of that in-camera data file, we need to be able to offer a more extensive account of the actions taken on that file.

Such a proposal would extend the response to the question of assessing photo manipulation further than the conventional focus on post-processing, and also beyond the current capacity of digital forensics. In effect, it would turn the question of how to respond to the challenge of manipulation around. Instead of certifying image integrity through post-production checks and tests, it would ask image makers to offer evidence of the credibility of their image before it was used, and to present an account that allowed others to easily verify their work. This would shift the onus

from forensic detection after the fact, to validation and verification of the image production process as it happens. The result would be enhanced credibility for news and documentary images.

I See “Truth in the Age of Social Media,” *Nieman Reports* 66 (2012), 3-31; Verification Handbook, edited by Craig Silverman (European Journalism Centre, 2014); and Claire Wardle, Sam Dubberly, and Pete Brown, *Amateur Footage: A Global Study of User-Generated Content in TV and Online News Output* (Tow Centre for Digital Journalism, Columbia University, 2014)

II David Turner, “Inside the BBC’s Verification Hub,” *Nieman Reports* 66 (2012), 13.

III Kevin O’Connor, “FourMatch in an Image Authentication Workflow,” *FourandSix*, 9 October 2012, <http://www.fourandsix.com/blog/2012/10/9/fourmatch-in-an-image-authentication-workflow.html>

IV Storyful is an important player in the verification space. What Storyful looks for is detailed in Malachy Browne, “Storyful’s validation process,” *Storyful.blog*, 24 April 2012, <http://blog.storyful.com/2012/04/24/inside-storyful-storyfuls-verification-process/#.VCgc40v3c7E>

10 Conclusion

The purpose of this research was to record, as comprehensively as possible, what members of the photojournalism community are thinking about the issue of manipulation, and how they deal with it. The research found a de facto global consensus: that manipulation—meaning material change to an image through the addition or subtraction of content—is widely deemed to be unacceptable for news and documentary pictures.

At the same time, adjustments to photographs—such as limited cropping, dodging and burning, toning, color adjustment, conversion to grayscale—are accepted. This practice is usually described in terms of “minor” changes being permitted, while “excessive” changes are prohibited. What constitutes a “minor” versus an “excessive” change is necessarily open to interpretation. Respondents said they made judgments on a case-by-case basis, and suggested that there would never be a clear line demarcating these concepts. Given a more comprehensive understanding of digital photography as computational—a process in which there is no original image, and all images inescapably depend on processing—the research calls into serious question the continued validity of the dark-room analogy for directing contemporary debate about manipulation.

This research has been a mapping exercise to find out what the photojournalism community thinks and how it acts. It was not designed to impose or recommend standards that organizations should adopt, rather to record the standards that organizations might currently hold or practice, thereby encouraging industry debate on the integrity of the image, and informing World Press Photo of issues relating to manipulation that are relevant to its annual contest.

Appendix I

Research Questions

The research addressed nine questions:

1. What forms of manipulation are relevant to the integrity of the image?
2. Is manipulation generally a growing problem? If so, how and why?
3. Is post-processing itself a problem, or is post-processing a problem only when certain levels of changes are made? If so, how are the legitimate levels known or identified?
4. What ethical guidelines and protocols relevant to the integrity of the image are followed by media organizations in different countries?
5. What ethical guidelines relevant to the integrity of the image are promoted by professional media associations in different countries?
6. Are there national, regional and cultural differences in the ethical guidelines, accepted standards, and current practices relevant to the integrity of the image? Are there any points of consensus on manipulation regardless of geographical or cultural differences?
7. Are there different norms with regard to manipulation in different image genres? Are the norms for news and documentary the same as those for nature, sports, and portraits (staged and observed), or are there differences?
8. What are the most effective means for the detection of manipulation?
9. What sanctions exist with the media industry after manipulation is detected?

Appendix II

Formal Statements on Photographic Manipulation

This is a selection of publicly available, written guidance that deals directly or indirectly with photo-graphic manipulation.

American Society of Media Photographers,
<http://ethics.iit.edu/ecodes/?q=node/3666>

American Society of Newspaper Editors, Overview: Ethics (<http://asne.org/content.asp?pl=19&sl=236&contentid=236>)

The Associated Press
(<http://www.ap.org/company/News-Values>)

BBC, Editorial Guidelines: Stills Photographs and Images: Guidance in Full (<http://www.bbc.co.uk/editorialguidelines/page/guidance-stills-photographs-full>)

Canadian Association of Journalists
(<http://www.caj.ca/ethics-guidelines/>)

Consumers Union, Photo Manipulation Policies
(<http://consumersunion.org/research/photo-manipulation-policies/>)

Ethics Code for Journalists in Turkey
(<http://www.medyadernegi.org/wp-content/uploads/2011/09/medyaetiking.pdf>)

The Guardian (<http://www.theguardian.com/commentis-free/2011/sep/04/picture-manipulation-news-imagery-photoshop>)

Hong Kong Journalists Association, Joint Code of Ethics of the 4 Journalistic Organiza-tions (<http://www.hkja.org.hk/site/portal/Site.aspx?id=A1-602>)

National Press Photographers Association (US)
(https://nppa.org/code_of_ethics)

The New York Times (<http://www.nytc.com/who-we-are/culture/standards-and-ethics/>), and Guidelines on Integrity <http://www.nytc.com/wp-content/uploads/Guidelines-on-Integrity-updated-2008.pdf>)

Pew Research Journalism Project, Ethics Codes
(<http://www.journalism.org/resources/ethics-codes/>)

Photojournalists' Center of the Philippines
(<http://pcp.ph/pcp-code-of-ethics/>)

Reuters (http://handbook.reuters.com/index.php?title=A_Brief_Guide_to_Standards,_Photoshop_and_Captions)

Society of Professional Journalists (US)
(<http://www.spj.org/ethicscode.asp>)

The Washington Post (<http://www.poynter.org/uncategorized/15451/washington-post-policy-on-manipulation-of-photographic-images/>)

About the Author

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David researches documentary photography and photojournalism, the disruption in the media economy, and its impact on visual journalism, in addition to his long-term commitment to understanding international politics. David is the author of six books and more than 60 articles, and has produced visual projects on the Bosnian War, imaging famine, the visual economy of HIV-AIDS, Chinese labor migration, and asylum seekers and refugees in the UK. All his work can be seen at www.david-campbell.org.

In 2012 to 2013, David directed a research program for World Press Photo on multimedia practices in the new media economy, with the final report *Visual Storytelling in the Age of Post-Industrial Journalism* downloadable [here](#). In 2014, he was appointed secretary for the World Press Photo photo contest.

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About World Press Photo

The World Press Photo foundation is committed to supporting and advancing high standards in photojournalism and documentary storytelling worldwide. Its aim is to generate wide public interest in and appreciation of the work of photographers and other visual journalists, as well as to promote the free exchange of information. Activities include organizing annual photojournalism and multimedia contests, and global exhibition tours. The programs of the Academy strive to stimulate high-quality visual journalism through educational programs, grants and a variety of publications. World Press Photo is an independent non-profit organization with its office in Amsterdam, the Netherlands, where it was founded in 1955.

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www.worldpressphoto.org