

Understanding Simultaneous Contrast For A Better Night's Sleep

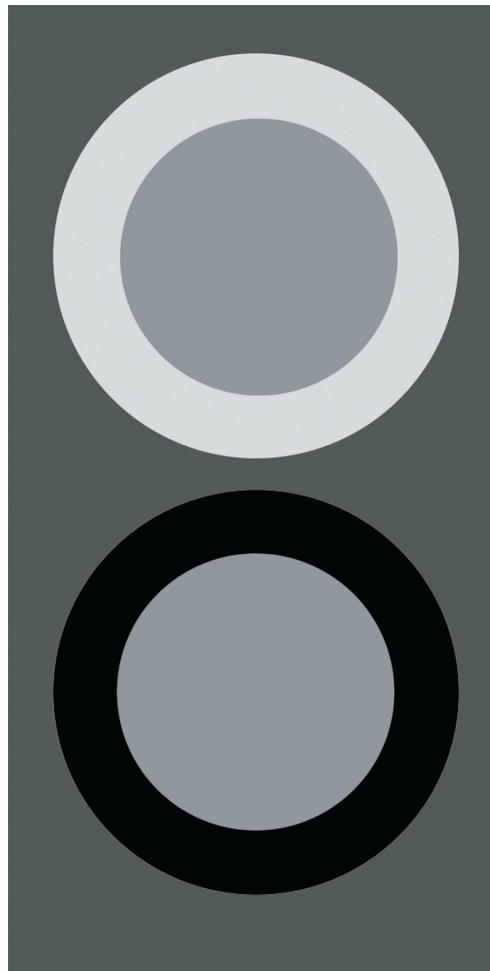
How many times have you returned to your lair to process your day's captures only to find that they look over- or under-exposed? Yet at the time of capture, they looked great on your camera's preview screen. That is a living anxiety dream and one I don't want to be in; I want to be 100% sure of my images at the time of exposure! This kind of front-end quality control is an important component of building a reputation of consistently getting the job done and done well so you get higher-end work and higher-end shooting fees. Compared to a photojournalist or a wedding photographer I have the luxury of time to create my images. I'm hired for my lighting ability or to put it more poetically and with a pinch of pretentiousness, I'm a light sculptor – I sculpt objects or persons with light then record my creation with my camera. That is how I market myself, I don't just capture moments, I create them from the ground up. Typical shoots for me are from two hours to two days with most of that time spent on set-up and fine tuning – exposure/lighting ratios are a big part of this. So, I really take to heart getting optimum exposures bang-on in studio and on location. Optimum exposures mean less post production time and less time means more time for other work, which means more money. Also, art directors and clients are notorious for changing their minds after the set is struck, so having a good capture gives you a lot more room to manipulate its tones without them breaking apart. In addition to this, I'm a bit of a bottom feeder ... when it comes to tone. I love dark and dramatic and so create a lot of images with subtle detail in the bottom end of the tonal scale. Making good exposures is paramount since this preference of mine pushes the limits of digital technology; digital is still somewhat weak in recording the bottom end of the grey-scale. This is because your digital camera assigns more bits to create bright tones than dark tones. A 14-bit encoded camera, like many newer 35mm-style cameras, can break down the grey-scale into 16,384 separate tones. Looking at the shadow side of my dramatic high-contrast side-lit headshot (see Image 001A), take note of how the shadow side of the model's face transfers gradually from full-on shadow to fully-lit flesh. In real life our eyes see this transition as continuous tone – an uninterrupted gradation from light to dark with no breaks or lines. A digital camera does not! It cannot reproduce continuous tone, it has to break everything it sees down into a bitmap. As in Image 001A, it creates the illusion of continuous tone using steps in brightness, each step is a discrete value rather than a gradual tonal progression – the more steps faking the progression, the better the bitmap 'scam' works! When we do have a course bitmapping conversion of continuous tone as seen in Image 001B, we see the gradation as a series of differing tones from light to dark or dark to light that only look continuous if you squint or stand back far enough or view it under darker conditions.

Getting back to the possible 16,384 tone capability of a 14-bit camera, those tones are not applied evenly. The brightest tone, white-with-detail (at the top of the grey scale), uses up half of the available tones – 8,192 tones. Each stop darker uses up half again until eight stops down from the top of the scale, you only have 64 tones to create the illusion of continuous tone, not a lot but enough – 64 tones is still enough to fool the eye into thinking it is seeing continuous tone, but only just. With 12-bit cameras, the story is much worse: 4,096 tones possible for white with detail and only 64 tones at just 6 stops down. This means that when you brighten darker tones, you cannot go very far before you run the risk of banding in darker transitions as we have seen in Image 001B. (Full transparency, Image 001A&B were shot on an older 12-bit camera, Image 001B had the banding exaggerated in Photoshop to make it really obvious for teaching purposes.)

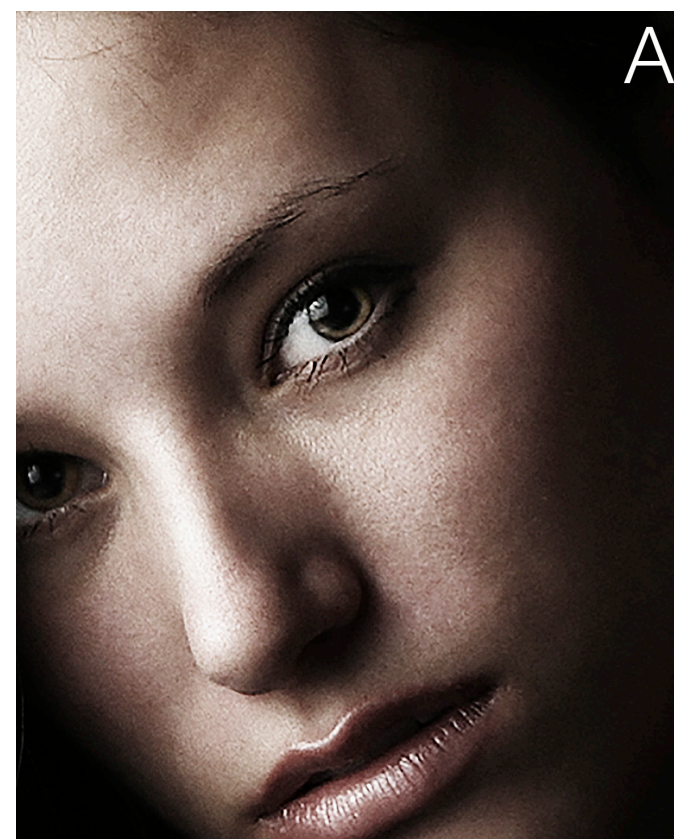
When professional digital cameras first came on the scene, the most exciting part for me was the instant preview – no more waiting on film processing to see what you really got. The preview screen on the

back of the camera was a godsend allowing me to work faster with the ability to see my fine tuning tweaks instantly. But is this godsend safe to judge your exposure from? Not really because our eyes are affected by a phenomenon called Simultaneous Contrast. Your perception of subject brightness is directly affected by what surrounds your subject or in the case of image preview, what brightness levels are like around your preview screen. Essentially your vision exposure system is set to 'A for Auto', just like some photographers' camera settings. Our eyes set 'exposure' by trying to average all the scene brightness values in their field of view and set this averaged brightness to the mid-point of the grey scale. For this reason if you put a light tone behind your subject, your subject will appear darker than if you placed a dark tone behind them. In Image 002 I've created a simple graphic to demonstrate this phenomenon. Of the two grey dots, which one is darker? Actually, they are the exact same brightness but because the top one is against white it looks darker, and because the bottom one is against black, it looks brighter ... and there's the rub. When you preview your image exposure on the back of your camera in a bright environment, it will appear darker than if you preview it in a less bright environment. In a darker environment the same image will look brighter. See my simulation of this effect in Image 003 B&C.

To get the most out of my sessions, I always meter and almost always shoot tethered. Now I know that this isn't practical for photojournalists, wedding photographers, and for many location portrait photographers,



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but for images that require great lighting, I think it is a must. First, I take readings with a handheld meter to set ratios and exposure, then capture a test shot and view it on my tethered computer. This test is compared with what I metered. If what it looks like and what it metered are in harmony then I know I've got it. If for some reason the readings and the capture do not jive, I double check to see what went wrong. If I can't get it figured out, I'll always favour the meter since it is less prone to telling lies. With this method I can get very close to perfect, avoiding any mistakes caused by simultaneous contrast. It is, however, possible to create good images without image preview; obviously this is how I did it for all the years before digital. When shooting film I would visualise how I wanted the lighting to look, then would set up my lighting to this visualisation and set my exposure and lighting ratios with my meter. Obviously, experience plays a part here, especially with creating ratios – I knew from testing and experience what different ratios looked like. Some photographers say they have learned to 'see the light'. To my mind, this is a bit of a fallacy, our eyes see differently than does a camera and the eye's exposure constantly changes depending on what you are concentrating on. And then of course we have flash and strobes – you have got to be quick to see that light! At any rate, meter readings ensure correct exposures, allowing you to set your lighting ratios faster than trial-and-error shooting and 'chimping'. The image preview can't guarantee perfect exposure but it helps you see the relationships of created brightness values to one another throughout the set, so that you have an actual image to look at rather than just a visualisation in your head. Ultimately, I like to be able to meter, visualise these readings, adjust, capture a test shot, view the image on a profiled monitor, and then use the Raw processing software's densitometer to double check key area brightness values as well as brightest/darkest significant image points. If the final use of the image is lithographic or photographic printing, then after the final image is finessed and completed in Photoshop I print out a test print on my pro-quality ink-jet printer. If I can do all this, I know my image will reproduce the best it can and that is really important to a worry-a-phobic like me!

Now I've gone on for quite a bit here about my preferred way of getting



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my exposures and ratios the way I want, and I figure some of you might be wondering why I don't use the image preview's histogram? (see Image 003D). I do see its benefit for 'Run and Gun' photography for a fast 'Have I got my exposure in the general range?', but to me it is a blunt instrument. The histogram in your camera preview is not a histogram for the Raw file but rather for a JPEG version of your image. Also, a histogram gives you no information about ratios. And, since my goal is, 'How good can I make this?', rather than, 'How fast can I take this?'; I need to remove all doubt about exposures/ratios by spending a little extra time up front, combining what the meter says with what I see on screen. This stress reducing approach is in line with my prime goal in life, 'Getting the ever-illusory perfect night's sleep!'

Bio

Dave Montizambert lectures internationally on lighting, digital photography and Adobe Photoshop. He is also a published author having written two books on lighting and digital photography (www.montizambert.com) plus numerous magazine articles on these topics in North America, Europe, Russia and Asia. Dave also creates lighting and Photoshop tutorial DVDs for www.software-cinema.com & www.photoshopCAFE.com/video and authors 'Dave On Demand' (www.montizambert.com) lighting tutorial based photo-training. Dave is available for lectures and workshops in your area and can be reached through www.montizambert.com.

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