

## Understanding Aperture and Depth of Field

By Chuck Palmer

Most photographers understand the basic controls for exposure includes camera settings for ISO (Sensor or Film light sensitivity), shutter speed, and aperture. But using these basic controls for creative photography is not often applied to a particular situation effectively. In this article, let's look at aperture to better understand how controlling the opening in our lens can make a tremendous difference in the quality of our photographs.

For all lenses, we have our choice of lens openings. Depending on the lens, selecting small aperture numbers like 2.0, 2.8, 4, or 5.6 reflects the widest lens openings. The larger aperture numbers like 11, 16, or 22 suggests you are "stopping the lens down" or reducing the size of the opening of the lens. Of course, if we "open up" the aperture (f/4, f/5.6), we let more light in to expose our digital sensor or film. Likewise, if we "stop down" the lens aperture (f/16, f22), less light is let in to expose our digital sensor or film.

In addition to controlling light, an equally important function of the lens aperture is its ability to determine depth of field, or range of sharpness. Controlling the range of sharpness is one of the most important creative techniques to add interest to your picture. Professional photographers commonly use depth of field to their advantage when telling their story through their photographs.

At some risk of oversimplifying the range of possibilities to use aperture settings for controlling sharpness in our photographs, let's look at three photographic situations where our aperture setting can make a tremendous impact on the message we convey to our viewers.

**Tell the whole story** – By choosing a small opening aperture, you can easily call attention to the foreground, midground, and background of your image. Small opening aperture settings of f/16 or f/22 offer the greatest range of sharpness in our image. A small opening aperture set on any lens will provide the greatest range of sharpness. However, combining a small opening aperture with a wide-angle lens (14 – 24 mm, or 10 – 15 mm on a crop sensor camera) allows the photographer to really tell the whole story with sharpness that extends from about 3 feet to infinity.



*For this street scene in St. Emillion France, I was interested in capturing the texture detail in the cobblestone street in the foreground, the man with the red umbrella, and some of the scene details in the background to give a viewer a sense of place. I chose an aperture of f/16. With my camera's ISO set to 2000 in Aperture Priority Exposure Mode, my resulting shutter speed was a 1/125, high enough to stop the motion of the man walking away from me.*

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**Isolate your main character** – the second situation a photographer often runs into is where the main character or focal point is best shown if it is isolated from the background and/or foreground. In this situation, setting an aperture to a large opening like f/2.8, f/4, or f/5.6 shortens our range of sharpness considerably, isolating our main subject. Here sharpness is deliberately limited to specific area of the frame. Our viewers are immediately drawn to the area in sharp focus, eliminating unwanted distractions.



*At a recent family gathering, I captured my niece's daughter in the shaded light of the back porch. With a large opening aperture of f/4 the busy background was thrown out of focus, isolating Kaylee in the frame. With my camera at ISO 160, in Manual Exposure Mode, I adjusted my shutter speed (1/200) until the correct exposure was indicated.*

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**Aperture doesn't matter** – There are many photographic situations where the aperture really doesn't matter. If it is not a "tell the whole story" or "subject isolation" situation then depth of field really doesn't matter. If the elements in the frame, or in the majority of the frame are in the same focal plane then you could use almost any aperture to capture your image. In this situation, using an aperture that provides optimum

sharpness and contrast will certainly be preferred. Without going into the technical explanation, apertures of f/8 or f/11 will often yield the optimum sharpness and offer the greatest contrast in exposure. Use these mid-range apertures to optimize sharpness and contrast.



*As we drove around the corner on a Mesa Verde National Park road, the silhouette of the burned-out forest against the spectacular sunset caught my eye. Shooting from a tripod at a focal length of 300mm in Aperture Priority Exposure Mode, I set my aperture at f/11 for maximum sharpness and contrast, ISO at 1600, and dialed my exposure compensation +1/3 EV until the correct exposure was evident.*

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You can effectively create different messages in your images by applying a variety of compositional methods. Controlling your depth of field with a creative aperture is no doubt one of the most powerful. At your next photo opportunity, and before you snap the shutter, ask yourself. . . do I tell the whole story, or isolate my subject from distractions? If neither is appropriate, then selecting a mid-range aperture that optimizes sharpness and contrast is your goal. Create your own special message, and may the remarkable photos always be yours.

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