

There is a long-standing myth in photography that focal length has an impact on the depth of field in your scene. I know this myth is long-standing because it's what I was taught, and it what I have, in turn, been teaching. In fact, the previous three editions of this book included this very myth. However, with a simple experiment, you can demonstrate that focal length has no impact on *actual* depth of field.

However, before you start dreading the need to re-learn a bunch of old habits, stop. While the theory that has been taught for the last 150 years or so might have been technically incorrect, the practical upshot has been completely valid. So, this article is not so much about changing your hands-on technique. Rather, it's simply presented to offer you a more accurate explanation of what actually happens to depth of field when you choose one focal length over another. Your everyday practice – use longer lenses to get *apparently* shallower depth of field – will still apply, but after reading this article, you might have a different understanding of why the depth of field appears different with different focal lengths.

Figure 1 shows two images that are framed the same way, but shot from different positions, using different focal lengths. The image on the left was shot using a 75mm lens at $f/5.6$. The image on the right was shot from farther away using a 235mm lens, also at $f/5.6$. In both images, the goal was to keep the top of the chimney roughly the same size.

Because of the changes in shooting position and field of view, the backgrounds in the images look very different. What's more, there appears to be less depth of field in the right-hand image than in the left-hand image.

Traditionally, we would say that the right-hand image has less depth of field because it was shot with a longer focal length, and longer focal lengths produce shallower depth of field.

However, if we zoom in to each image and take a look at some of the background detail, we'll see that the amount of softness and defocusing is not as different as it appears when viewing the image normally.

That tall brown building in the background is the Bank of America building. Next to it is the



Figure 1. The image on the left was shot with a 75mm lens, while the image on the right was shot with a 235mm lens. Both were shot at $f/5.6$. The image on the right appears to have shallower depth of field.

Transamerica pyramid. In Figure 2, we enlarged both images so that the Bank of America building is roughly the same size.

On the left, you can see the enlarged version of the wide angle image, while on the right you can see the enlarged telephoto image. Because the wide-angle image had to be enlarged more than the telephoto image, there are some very slight differences in visible detail and contrast. However, even with these differences it's obvious that both images are equally defocused. The telephoto image is *not* blurrier than the wide angle image, as you would expect if it were actually true that longer focal lengths yield shallower depth of field. So why does it *appear* as if the telephoto image has shorter depth of field?

When you use a longer focal length, the background elements in your image always appear larger

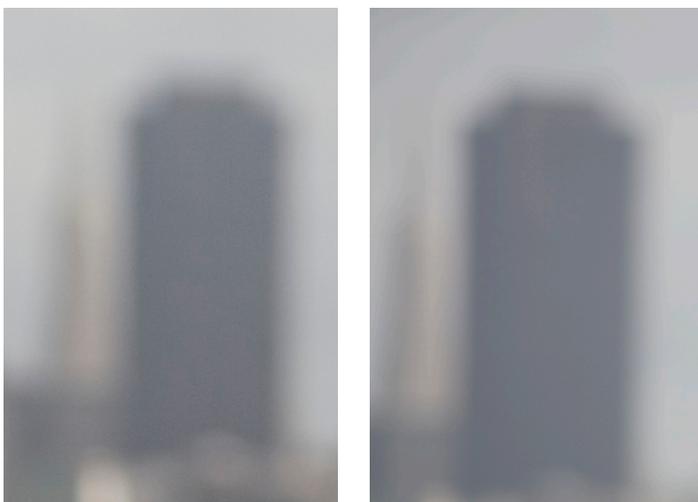


Figure 2. Here, we've enlarged the same background element from both images. There are some slight detail changes due to the fact that the wide angle image had to be enlarged more, but when viewed up close, you can see that there is no difference in the degree of defocusing.

than when you use a shorter focal length. Because they're larger, it's easier to see exactly how much they've been defocused by your aperture setting. When you shoot with a shorter focal length, background elements are usually rendered small enough that you *can't* see how much they've been defocused by your shallow depth of field.

There are really only two factors that impact depth of field: aperture choice and sensor size. At any given aperture, a smaller sensor will yield deeper depth of field than a larger sensor, just as a piece of 35mm film yields deeper depth of field than medium format. Obviously, you can't do anything to change your sensor size, so aperture choice is the only factor you have to control the *actual* depth of field in your image.

However, you can control *apparent* depth of field by paying attention to how much background is visible in your scene. To achieve a shallow depth of field look, make sure to frame your shot so that there are large background elements visible. Since it will be easy to see that these background elements are defocused, your image will appear to have very shallow depth of field. Of course, one of the easiest ways to do this is to use a long focal length. However, even when using wide angle lenses, if you can place a background element close to the end, you might be able to achieve a shallower look. In the end, you can stick with what you've already learned, but it's worth remembering this lesson when thinking about your final framing.

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