

Digital Photography School

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Understanding Histograms



“I was flicking through my camera’s menu today and came across a little graph labeled ‘histogram’. What is it and should I take any notice of it? Is there such a thing as the ideal histogram? What should we be aiming for?” - Brent

What is a Histogram

Histograms are a topic that we could (and probably should) spend a lot of time talking about but let me give you a very brief answer to get you through in the short term.

Histograms are a very useful tool that many cameras offer their users to help them get a quick summary of the tonal range present in any given image.

It graphs the tones in your image from black (on the left) to white (on the right).

The higher the graph at any given point the more pixels of that tone that are present in an image.

So a histogram with lots of dark pixels will be skewed to the left and one with lots of lighter tones will be skewed to the right.

The beauty of a histogram is that the small LCD display on your camera is not really big enough to give you an great review of a picture and you can often get home to find that you’ve over or under exposed an image. Checking the histogram can tell you this while you’re in a position to be able to adjust your settings and take another shot.

Some Examples of Histograms

Let’s look at a couple of examples of histograms on shots I’ve taken over the first year of my son’s life (it’s his birthday this week so we’re going through some shots).

Compare these two shots and their corresponding histograms:



The above shot has a lot of light tones - in fact there are parts of the shot that are quite blown out. As a result on the right hand side of the histogram you can see a sudden rise. While there are quite a few mid tones - everything is skewed right and with the extreme values on the right hand side indicate an over exposed shot.



This second shot has a lot of dark tones. This is partly because of the black and navy clothes in the shot - but also because it's slightly underexposed shot. The resulting histogram is quite different to the first one - the values are skewed to the left hand side.

Is there such a thing as a 'good' histogram?

As with most aspects of photography, beauty is in the eye of the beholder and there's always a lot of

room for personal taste and different ways of expressing yourself as a photographer.

There is no such thing as the 'perfect' histogram - different subjects and photographic styles will produce different results. For example taking a silhouette shot might produce a histogram with peaks at both ends of the spectrum and nothing much in the middle of the graph. Taking a shot of someone at the snow will obviously have a histogram with significant peaks on the right hand side.... etc

Having said this (and to generalize) - in most cases you'll probably want a fairly balanced shot with a nice spread of tones. Most well exposed shots tend to peak somewhere in the middle and taper off towards the edges.

Using Histograms While Shooting

So now you know what a histogram is - grab your digital camera's manual and work out how to switch it on in playback mode. This will enable you to see both the picture and the histogram when reviewing shots after taking them.

Keep an eye out for histograms with dramatic spikes to the extreme ends of either side of the spectrum. This indicates that you have a lot of pixels that are either pure black or pure white. While this might be what you're after remember that those sections of the image probably have very little detail - this is a hint that your image could be either over or under exposed.

The histogram is really just a tool to give you more information about an image and to help you get the effect that you want. Having your camera set to show you histograms during the view process will tell you how your image is exposed. Learning to read them will help you to work out whether you're exposing a shot as you had hoped.

Another Example of a Histogram

Lets finish this tutorial by looking at one last example of a histogram:



You can see in this shot a much more even spread of tones. It's still not perfect and I'd do a little post production work but it's a much more evenly exposed shot and the histogram reflects this.

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47 Responses to “Understanding Histograms”

- [Collin Says:](#)

So, what would you do to the last photo? It looks pretty good as it is to me. The only thing I could think is using the Levels in Photoshop move the right slider left a little.

- [Raquel Paladino Says:](#)

Great explanation...short and sweet. As inferred in the article, once you have found your style you'll see a pattern to your histograms.

Thanks!

- [Aaron Says:](#)

For any readers interested in exploring histograms to an even deeper level, I wrote a visually-oriented explanation of how they're generated and how you can interpret them to (hopefully) improve your work. It's called (appropriately, I think), Histograms: Huh?

- [Jamie Says:](#)

Great article. The subject is often confusing yet you have explained it in nice simple terms. Thanks.

- Tom Jachmann [Says:](#)

Also a good thing about histograms is that you can see them on bright days as well. What I means is that especially on bright days it is almost impossible to judge a photo on a camera display if it is well exposed. Also judging the exposure of pictures at night (e.g. shots of skylines etc.) give most of the time the wrong impression. But after some training you will easily realize by looking at the histogram if the photo is "most likely" exposed correctly

- [Dean Says:](#)

The caption for the underexposed photo says the values are skewed to the right. I think it should say that they are skewed to the left.

Otherwise, very nice!

- Ryan Smith [Says:](#)

Thanks for the info. I've been trying to use it for a long time, but I never felt like I had a good idea what I was supposed to be trying to accomplish.

Great examples, too. I'd like to see more about histograms now.

- [Andrew Ferguson Says:](#)

Paying attention to your histogram when you're shooting can really improve shots. It helps give you a better idea of whether you can expect to see lots of dark spots or blown out highlights when you finally get home and download your shots.

Knowing right away means that you can just adjust your setting a bit and grab a few more frames before moving on.

- [Darren Says:](#)

Dean - thanks - have made that change.

- [Dumitru Tira Says:](#)

Great article! This will definitely help me improve my photos, my point-and-shoot has a histogram but it looks kinda strange to me :O

- [PRH Says:](#)

Collin Says:

June 29th, 2007 at 4:15 am

“So, what would you do to the last photo? It looks pretty good as it is to me. The only thing I could think is using the Levels in Photoshop move the right slider left a little.”

You probably wouldn't do anything to that last shot. If you clip the highlights (on the right), you'll probably end up losing the beautiful detail in the face and overexposing the blanket at the bottom.

The best lesson to learn about Photoshop is when to leave well enough alone.

- [Elmo Says:](#)

As most cameras allow display of both picture and histogram. Look at the pictures you like and look at the corresponding histogram. No better learning experience.

About moving the end slider in photoshop on the last example. They seem good but moving the center marker might be in order.

Elmo

- [AC Says:](#)

Great article - good job in keeping the explanation simple and concise.

- [Billy Chia Says:](#)

Nice. Very concise and understandable. I've been teaching my 6 year old daughter about photography. I wonder if there's a way to break histograms down even further to make it understandable at a child's level?

- [kishore Says:](#)

A great feature expressed in simplest terms. I like it!!

- [Collin Says:](#)

@PRH: The best lesson to learn about Photoshop is when to leave well enough alone.

Indeed! Far too often I have pushed things too far when they didn't need them. Sometimes I manage to catch myself and stop, or my wife tells me "take it back".

Thanks for the info!

- SJKD [Says:](#)

A very quick and perhaps to "easy" way to check a histogram is to check if it is not touching either the left (dark) or the right (light) side. If it does you may lose details which cannot be recovered as they are simply either black or white. The Canon 350D furthermore shows hotspots if you press the info key until you see the picture.

Cheers. SJKD

- [Sybren](#) [Says:](#)

You might want to be careful when looking at your histogram. There are cameras that base the histogram only on the green channel! This means that under/overexposure in the blue or red channels won't show up on your histogram at all.

For more information, check out <http://www.kenrockwell.com/tech/yr gb.htm>

- Brandon Burns [Says:](#)

Great. One more little mystery solved for me. Maybe you can do one on ISO. I understand what it is but not why some people use 200/400/ etc.

- NJTrout [Says:](#)

Still a film photographer, but contemplating digital. My thought would be to bring the analysis of histograms back to old school photography terms. Over and under exposure. With all the advances in metering it should be simple to look at the scene you are ready to photograph, decide if you need to set exposure for the highlights or shadows and take your meter reading accordingly. Seems a much simpler concept than reviewing the histogram after the fact, and correcting on a computer. Practice the fundamentals of exposure, how it is used to control your creativity so you reproduce more accurately what your mind's eye sees in the image. When all else fails bracket your exposures.

- Jeannette [Says:](#)

Thanks for putting this one in plain English. I enjoyed it and I am sure that now I will use it.

- [Kayla Lamoreaux](#) [Says:](#)

Great article - thanks for the information it is very helpful.

- Bryan [Says:](#)

I tend to "avoid" things I don't understand. The Histogram setting on my camera was one of them. I often (somehow) get it set in the mode to display that instead of the full screen shot. I would then get frustrated and try to move back to the full screen display that made "more sense" to me.

But now with this explanation I've got a great new tool. Thanks for the great simple explanation of why I should use it more often.

- [shroticg Says:](#)

what i have noticed that 80 to 90% of the photographers do not understand the histogram. i hope after going thru this explanation their attention will be drawn on histogram and they will be benefitted from its inclusion in the camera screen. a good topic.

- [Darren Says:](#)

thanks everyone for the comments and feedback - there are some great suggestions and comments above that really enhance the article. Glad people enjoyed my explanation.

- [Michael Says:](#)

I usually check the histogram on about the first two or three shots and make adjustments to camera settings if necessary. Usually I don't have to check it again unless lighting conditions have changed or I have moved on to another subject and location. I don't delete the shot whose histogram didn't look good because it can often be fixed in Photoshop.

- [Pau Says:](#)

Newbies like me never bother to check what this graph is for.
Thanks for this article, its really helpful. :)

- [Jay Says:](#)

Nice summary. I'm used Photoshop quite a bit and even really knew what the histogram was in relation to PS, but I'd never really saw the use of the histogram function on my camera before (usually just thinking that I'd get a look at it once I got home). Thanks!

- [Audrius Says:](#)

Thanks. This was very useful.

- [Cheryl Says:](#)

thank you . still a very confusing topic for me.. but willing to keep learning :)

- [Rekha Says:](#)

Yesterday I said to myself, "Time to learn about histograms". This morning - I see this in my Netvibes feed. Thank you so much for keeping it clear and simple. I agree with an earlier comment that exposure should primarily be dealt with in the photo-taking, but some cameras don't always get it right - like my Canon Digital Rebel XTi. The histogram will help a lot.

- [Kelly Anne Says:](#)

This article is a prime example of why I love this website - it offers simple explanations of things that I already sort of knew about, but never bothered to really learn more about.

Knowing what things are, in plain English, is the first step to mastering a concept. If I wanted to learn more about histograms, now I at least know why they are important, and can go delve in further elsewhere. Thanks for being champs of the “plain English” approach. I added this website to my feeds as an afterthought, and now I look forward to each article. And recommend you, hands down, to other photographers.

- [Scott Hampton Says:](#)

Hey!

Thanks for the article. I was going through histograms today, as well. I hate them and never want to use them, but you really do have to respect them.

They come in handy when you can't see the LCD clearly. The LCD is great for checking COMPOSITION. Surely those little LCDs don't have the same capabilities as a Cinema display, so they currently can't tell you if you've got great exposure. And since the brightness of the LCD is adjustable, it confuses things more. Looking at the histogram gives you a sweeping overview of the tonalities, I think better than the LCD can.

And, true, some manufacturers only base the histo on the green channel. I believe Nikon does, not sure what Canon does. The three or four channel histo is very useful, too, but, alas, further complicates things.

You've done a great job on explaining the histogram. Thanks!

- [Mike Says:](#)

Thanks for the article. I've known about histograms for a while, they are one of the most useful tools my camera has.

I forwarded this on to my father and the “Oh, THATS what it's for” look on his face was priceless!

- [Mel Says:](#)

Keep teaching me this way and I will only get better. But quicker. Thanks Mel

- [Naj Says:](#)

another lesson learned from this site. thank you!

- [Ajith Says:](#)

Great explanation, simple and sweet. Now I know how it works. I was trying to understand it last couple of days. Thank you.

- [Larz Says:](#)

Your histogram explanation was the first one that actually made sense to me, thanks.
Question - if the histogram appears balanced/centralized yet none of the values reach very high (similar to a slight “frown”) - does this mean that the image will typically be rather “washed

out”?

This has happened to me a couple times and I do not recall ever getting a good shot w/ this type h-gram...

- [AlethiometerGal Says:](#)

Wow, that was great! =) As a two-year novice photographer who still enjoys running around taking shots, but becoming more and more interested with the more technical ideas behind pictures [not just point and shoot! =)] this has got to be the first easily accessible quick explanation of histograms. Kudos! =D

- [Atherton Says:](#)

Great article, even cuter kid.

- [Murali Says:](#)

I just bought a Canon XTi and was wondering why i was seeing the graph on the display. Thanks for enlightening me!
hope we have a lot more stuff like this for beginners like me.

- [Scott Hampton Says:](#)

Murali, if the XTi is anything like the XT I had, you can hide the histogram and/or show different views of it and the picture when the image is displayed by pressing the info button. HTH.
-Scott

- [Praveen Says:](#)

So I believe a histogram with peaks to both left and right means a lot of over and underexposed or probably dark and light portions of the image. So to take a Still/Portrait photograph I believe it's good to maintain peaks at both the ends, is this true? Ofcourse, I understand it depends on lighting, but then again... I believe these make good pictures.. don't they?

- [scoop Says:](#)

any info,ie answer to larz ?my nikon semms to measure 3 channels seperatly or together.back to larz's ? IS THEIR ANY REALIVANCE TO THE HIGHT OF THE BARS.
No you not wanr any bars at the extreem end!

- [subcorpus Says:](#)

so the annoying histogram on the back of the camera has some use ...
i've never used it ...
but i guess i'm gonna use it from now on ...
great info here ... thanks ...

- [photorider Says:](#)

Finally a simple explanation of what a histogram is all about. I will certainly understand what it's

telling me now....much appreciatedd

- Skyhunter [Says:](#)

Question on Histograms: What does it mean when a spike in the histogram goes beyond the top of the displayed graph. Does that simply represent a lot of pixels of that tone but they can't all be represented within the limits of the graph but they are displayed in the image, or is there some sort of clipping happening within the image?

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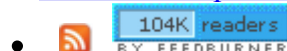
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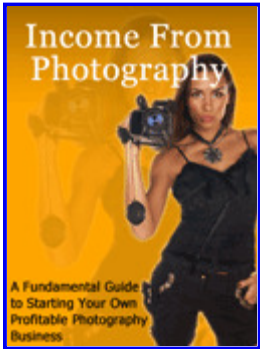
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