Digital imaging urban legends debunked

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What I'll cover

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• Why when shooting raw+JPEG, one isn't properly exposed!
ISO, Exposure and Noise

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• The ISO setting changes the value of the digital number of a pixel from a given voltage reported for that pixel by the sensor.

• On some cameras, a higher ISO will produce less noise than a lower ISO. ISO is post exposure amplification.
"Default" settings are not appropriate for this capture; they appear to bright!

Custom, normalized settings for the capture show better rendering, less noise as exposure was the same, ISO setting did reduces noise!

"Default" settings are more appropriate JPEG capture; they appear to "normal"!
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• Much of the information online about the so-called exposure triangle is factually incorrect.
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• The noise in an image depends on the Signal to Noise Ratio (hence the old ETTR concept; we'll get to that soon).
Resolution Myths

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• To find out the exact resolution of your display, measure the width of your display and divide that by the number of pixels it is displaying. For example, on my NEC PA272W, the width is 23.5 inches. Its resolution is 2560x1440. 2560/23.5=109 DPI.
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• The output resolution of printers & the PPI to send varies considerably. From a low of 180 PPI, to much higher (360 PPI+). In this case PPI refers to the **Pixels Per Inch**, the **resolution tag** you would set, not necessarily the DPI of a printer. An Epson printer can produce 2880 DPI but you would never send 2880PPI to such a device!
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  • Make a new document. Set Height and Width to Pixels and enter 500 in both. Enter 300 in resolution, Save.
  • Repeat the same thing but enter 72 in resolution, Save.
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• Test the “always use 72DPI for screen” myth in Photoshop:
  • Make a new document. Set Height and Width to Pixels and enter 500 in both. Enter 300 in resolution, Save.
  • Repeat the same thing but enter 72 in resolution, Save.
  • At 100% in Photoshop, the two are exactly the same size on-screen. Open them in another application (I opened them in Safari). They are identical in size.
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  - Make a new document. Set Height and Width to Pixels and enter 500 in both. Enter 300 in resolution, Save.
  - Repeat the same thing but enter 72 in resolution, Save.
  - At 100% in Photoshop, the two are exactly the same size on-screen. Open them in another application (I opened them in Safari). They are identical in size.

- Figure out the resolution of your display. Make two documents as above but enter that value. Both should be 1” in size on-screen!
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sRGB is all you need

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• Every printer I've examined has a color gamut that exceeds sRGB somewhere in color space.
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• sRGB is ideal for posting images to the web and mobile devices (today) and does not guarantee a visual match to anything without color management! IOW, sRGB is not immune to the need for a calibrated and profiled display or color managed apps.
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• Non color managed applications simply send the RGB numbers, as is, to the display without color management!
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• On a wide gamut display, without color management, sRGB looks wrong while Adobe RGB (1998) doesn't. Hence, you need color management!
No CMS on wide gamut Displays:

sRGB will appear poor while wider gamut working spaces like Adobe RGB (1998) will look acceptable on wide gamut devices.
Raw + JPEG and Exposure

• You really cannot produce **optimal** exposure for both at the same time!
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• The camera Histogram shows you the JPEG exposure data, NOT the raw data!
Exposure by camera for JPEG when shooting raw+JPEG.
ACR Histogram based on color space and current rendering settings above. This is NOT a raw Histogram!
RawDigger using raw Histogram to report under exposure (blue overlay) and percentage of pixels under exposed.
Exposed for raw (plus 1 EV)
Histograms that lie

Camera luminosity histogram shows massive clipping, no clipping in raw!
Histograms that lie

Camera histogram shows clipping, no clipping in raw!
Camera set to $+\frac{1}{3}$. Could have easily gone $+\frac{1}{2}$ without clipping.
Histograms and ETTR

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- Expect the initial rendering in a raw converter to appear too light but by normalizing the tone, highlight data you properly exposed will be seen.
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Thanks for your time