The Dark-Side of Humpty Dumpty

When we think of children's tales we think of happy writings with happy endings, but of course nothing could be further from the truth. Nursery rhymes in particular are full of many dark happenings and perils – Humpty Dumpty is no exception. However, in this article, the title 'The Dark-Side of Humpty Dumpty' is all about his shadow side and not about his psychological state. This Humpty Dumpty creation of mine (see Image 001) demonstrates a really useful but little-known lighting control over shadow darkness (aka shadow contrast) that all lighting mavens, whether tabletop shooters or portrait makers, should have in their lighting arsenal!

Let us first look at how I did the lighting, then dig deep into the lighting controls and principles involved so that you are more able to implement this technique in your own photographic lighting quests.

- Image 003A: A mono-block studio strobe light fitted with a seven-inch reflector acted as the main light. The reflector's front opening was covered with a frosted white translucent gel (Roscolux Tuff-Frost). This light was placed one foot from the camera-left-side of our egg-head subject.
- Image 003B: To lighten the shadows, a white card was positioned one foot away from Humpty on the camera-right-side of the small photo-set. It reflected some of the main light that was spilling past the subject back onto his shadow-side.
- Image 003C: To decrease shadow contrast (make shadows lighter), the main-light distance was doubled – moved to two feet away. The power on the strobe main light was turned up by two f-stops to make up for the two-stop light loss caused by doubling the main-light's distance. If I had altered the f-stop to make up for the loss of light, depth of field would have been changed, altering the degree of sharpness I was after.
- Image 003D: To decrease shadow contrast further, the main light distance was doubled again, moved to four feet away. Once again, the power on the strobe main light was turned up to keep the exposure constant at f8.0.
- Image 003C: Preferring the light quality and shadow brightness in Image 003C, the main light was moved back to two feet and its power readjusted.
- Image 002: To create separation from the background, another mono-block strobe, fitted with a seven-inch reflector and frosted white translucent gel, was placed three feet behind and to the camera-right-side of Humpty; it directed f5.6 (incident reading) amount of light onto the back edges of Humpty.
- Image 002: To complete the nursery rhyme story, an old 35mm slide-film image of marshland and trees was projected out of focus with a slide projector onto a white seamless backdrop paper six feet behind the set. To better match the projected image's colour (white balance) to the strobes, the projector had a blue colour correction gel (CTB – 3200˚K to 5500˚K), over its lens. The camera shutter-speed was set to 20 seconds for a pleasing exposure of the background at f8.0. This I figured out using a reflective 1˚ spot-meter reading off the brightest cloud area which read f16.0 at 20 seconds. This made the metered spot record two stops brighter than middle-grey (white with detail) when photographed at the f8.0/20 second camera exposure.

Exposure: f8.0 at 20 seconds, 100 ISO
Camera: Medium Format
Lens: 150mm

Looking back at Image 003C of Humpty Dumpty, it is obvious that the brightness of the shadow (shadow contrast) is affected by doubling the distance of the main light source from the subject. But why change the distance of the main light to alter shadow contrast when two other better known controls are available? The two better known controls I speak of are: changing the distance of the ambient source (in this case a white fill-card) or swap out the fill-card with an actual light. The answer is – it comes down to a matter of space, time, and gear. You see, I could not move the fill-card in any closer; if I had it would have appeared in the image frame. As for using a fill-light, I thought this would be over-kill; over-kill because in relation to the size of the subject, my fill-light is really big and would require a light-stand with boom-arm, making my tiny photo-set pretty cramped. Also, if I had opted for a fill-light placed further away, its wide spread of light would require extra time and equipment to prevent it washing over and desaturating the projected image background. You see, for this projected image background technique to work, the background white seamless paper has to read as black relative to the camera setting before the projected image can fully show off all its 'Kodachrome' glory.

When the distance of the main light changed on Humpty Dumpty, the amount of light that the fill-card projected onto the subject's shadow was affected. Why is this so? Let's figure it out: Shadow contrast is affected by ambient light sources. An ambient light source could be a wall, a ceiling or a fill reflector, or some other surface that reflects light from the main light into the shadow. Changing the distance of the main light from the subject will affect the brightness ratio between the lit side and the shadow side of the subject, even when the main light power or the camera aperture is left unchanged. When the main light was moved away from Humpty, I turned the power of the main light up to keep his actual tones (called diffused values) correctly exposed; I could have altered the aperture instead, but this would totally change the look I was getting with the f8.0 depth of field. Doubling the distance of the main light decreased the number of photons striking both sides of Humpty; in other words, both sides of Humpty got darker. However, the percentage of light loss on the lit side compared to the shadow side is not even; the

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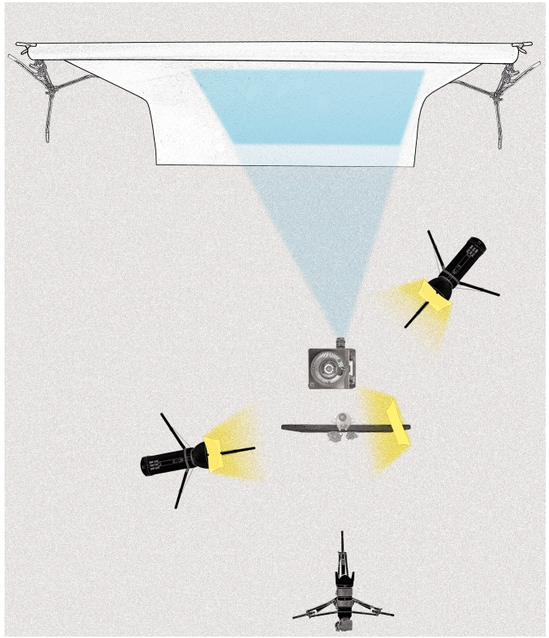

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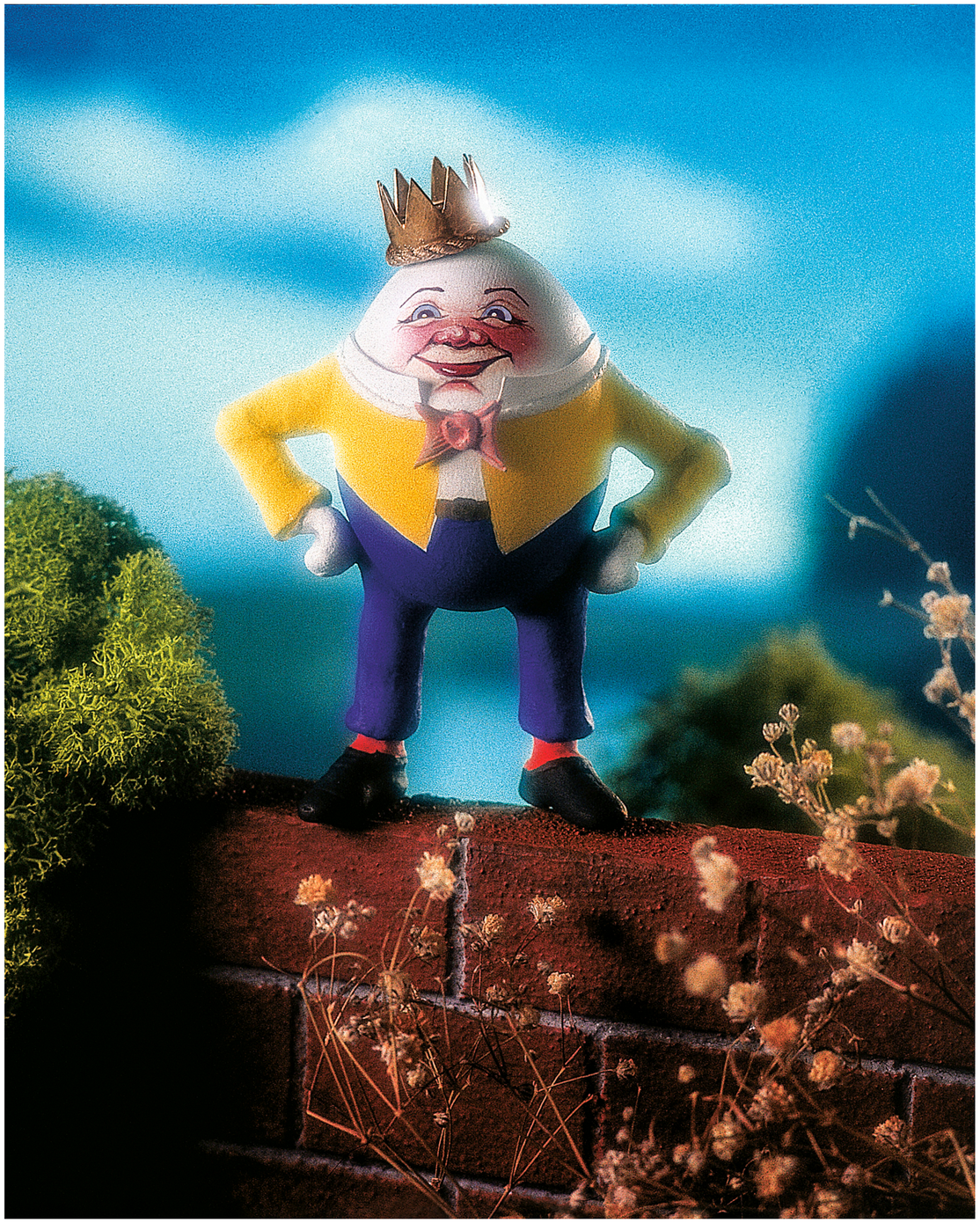


main-lit side lost more of its original brightness than did the fill-lit side. Since we cannot leave Humpty underexposed, the power of the main light was increased to make up for the light loss. Now the main-lit side is once again its original brightness and the shadow side is, believe it or not, brighter than before (less contrasty). Don't believe me? Well then compare the shadow side of Humpty Dumpty in 003C to 003B.

You may be thinking, 'That's pretty weird, how is that possible?'. Perspective is the culprit. Perspective works like this, nearer objects are more profoundly affected by changes in distance than are far objects – as the light moves away from the subject, the subject's main-lit side gets darker at a faster rate than does the shadow side. To light the shadow side of Humpty, the photons travel a greater distance; they have to travel past the subject to strike the ambient source's surface (the white fill-card), then bounce off this surface and on into the shadow. You may be saying, 'Now wait a minute, the definition of a shadow is an area of the subject that receives no light from the main light source. But isn't the shadow being lit from this same source?' To which I answer, 'No.' The main light is not a source of illumination to the shadow side, the white fill-card is. However, since the main light is the origin of the source to the white fill-card, then everything becomes inter-connected. If you affect the main-lit side by altering the main light in some way, then to some degree the fill-card will be affected also, which in turn will have some effect on the shadow side. Keep in mind that the further light travels, the more the photons spread out and so less hit the object in question resulting in less brightness.

Don't want to geek out any further? Here it is in a nutshell: when you move the main light away from the subject, the shadows appear lighter once you correct the exposure with the main light power or with camera setting. Conversely if you move the light closer to subject, the shadows appear darker once the exposure is reset either with main light power or with camera setting.

For those of you who want to know why, here is the super geeky part that explains it: in 003B the energy from the main light had to travel one foot to light Humpty's lit side and three feet to his shadow side. How do I arrive at three feet to his shadow side? It's like this, the main light energy had to travel two feet from the strobe to the white fill-card, then had to reflect the energy an additional foot to strike his shadow side. An incident meter reading revealed that the light striking Humpty on his lit side read f8.0 and the light striking his shadow side read f2.0. So this four-stop difference – created by this 3 to 1 distance ratio – makes for higher shadow contrast (darker shadows).

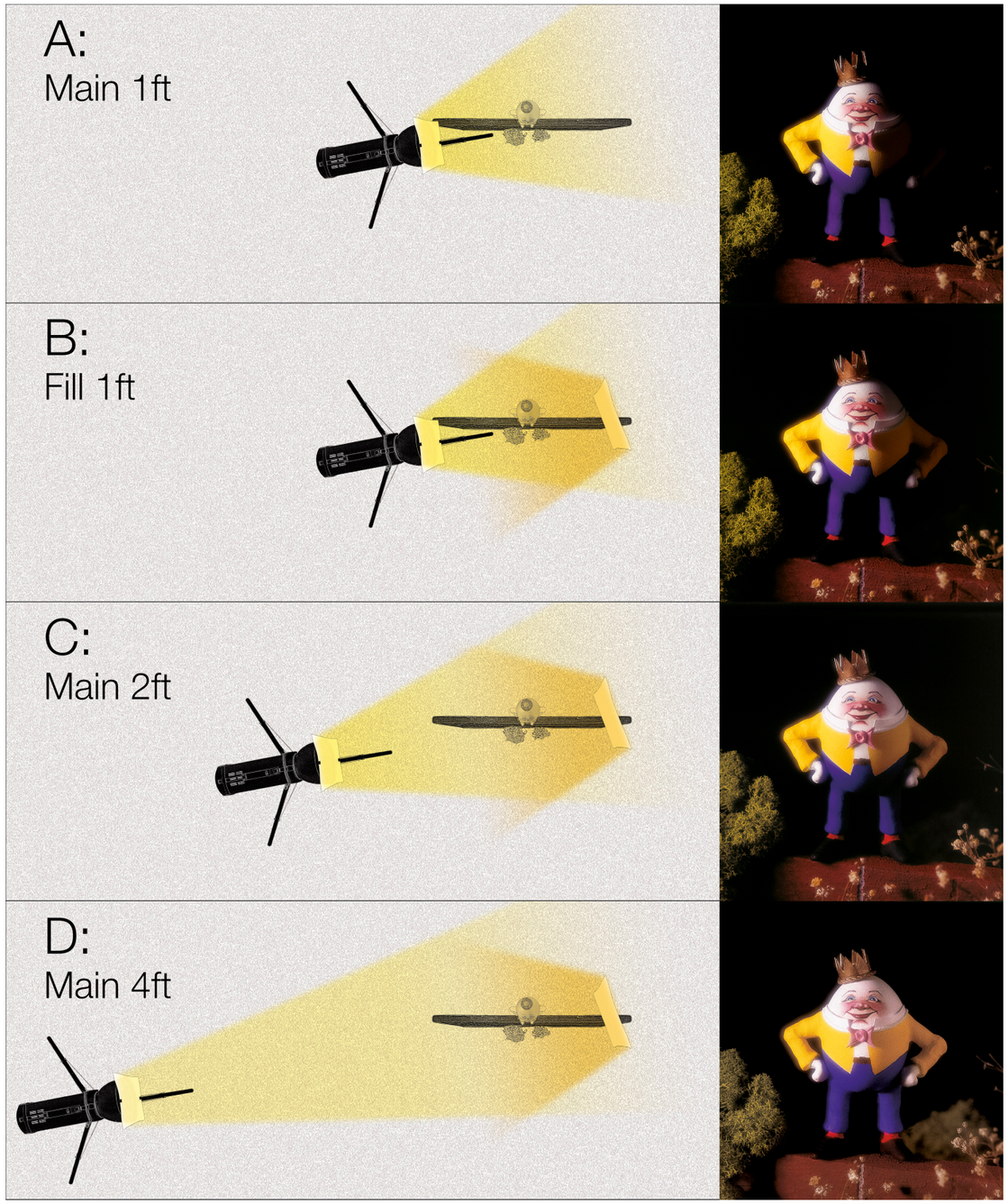
In Image 003C the energy from the main light had to travel two feet to light Humpty's lit side and four feet to his shadow side. How did I arrive at four feet? The light from the main light had to travel three feet to the white fill-card and then had to reflect the energy off this card an additional one foot to reach his shadow side. I then adjusted the strobe power to account for the light loss thus making the light striking Humpty on his lit side f8.0 (incident meter reading) and the light striking his shadow side f4.0; this two-stop difference was a result of this 2 to 1 distance ratio.

In 003D the energy from the main light had to travel four feet to light Humpty's lit side, and 6 feet to his shadow side. Incident meter readings revealed that the light striking Humpty on his lit side read f8.0 (once the power was adjusted to read so), and the light striking his shadow side read f5.6 – this 1.5 to 1 distance ratio made a one-stop difference.

To recap, every time you move the light further away, both the shadow side and the lit side become less bright. But, the main-lit side becomes less bright at a faster rate than does the shadow side and since the main-light has been moved farther away it is necessary to readjust the main light power setting to keep the exposure constant on Humpty's main-lit side. In the end, the shadow will appear brighter than before because it became darker at a slower rate than did the re-metered side. The law behind all of this craziness is the law of perspective.

This lighting control I use all the time when creating my signature dramatic portraits on location, more often than not I have to set up in small rooms with light-coloured walls, floors, and ceilings – not the best surroundings for creating dramatic high shadow contrast portraits. In these small rooms it is difficult to create dark shadows and you often come up against colour-contaminated shadows if these room surfaces are not a neutral colour. However, using the law of perspective to my advantage, I can work with the main light in close to the subject; this ensures that the stray main light energy that is bouncing off the light-coloured room surfaces will have much less effect on the shadow brightness and the shadow colour balance. This shadow contrast lighting control is officially called, 'MAIN LIGHT DISTANCE (TO SUBJECT) TO AMBIENT RATIO'. So, keep in mind:

- Moving the main light away from the subject decreases shadow contrast (lighter shadows).
- Moving the main light closer to the subject increases shadow contrast (darker shadows).



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.