Off Camera Flash

What is "Strobist" ?

Strobist is web-blog. by David Hobby. His stated goal on the introduction page states;

"This website is about one thing: Learning how to use off-camera flash with your dSLR to take your photos to the next level. Or the next ten levels.

Here, you'll find everything you need to know about how to more effectively use your small speedlights. There are more than 1,000 articles about lighting. Over two million photographers from around the world have learned small-flash lighting techniques from this site. We're thinking you can, too. "

http://strobist.blogspot.com/2006/02/welcome-to-strobist.html

Tonight's Agenda.

- Why take your Flash off your camera hotshoe ?
- Light angle
- Distance
    - Flash to subject distance
    - Relative distance (how to turn your background black)
- Apparent size of the light.
- Balancing flash and ambient
    - Exposing correctly for both
    - Set f-stop for correct flash exposure
    - Set shutter speed for desired ambient exposure.
    - Cross lighting (Sun & Flash)
- Gelling your flash.
- Light Modifiers. – what are they and why use them ?
- Equipment discussion and test drive. (8:30 – 9:20)

Please e-mail me if you have questions: gerry.allen1@gmail.com

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You can read the Detailed Lessons by accessing the Following Chapters on the Strobist Blog.

Light 102: Unit 1,1 Position (Angle)

Lighting angle reveals form in a three-dimensional object. To see how light from a particular angle will affect your subject, view the subject from the position of the light.

Light 102: Unit 1.2 Position / Distance

1. Light has depth of field.
2. With enough light, you can turn a white wall black.

Light 102: Unit 2.1 Apparent Light Size

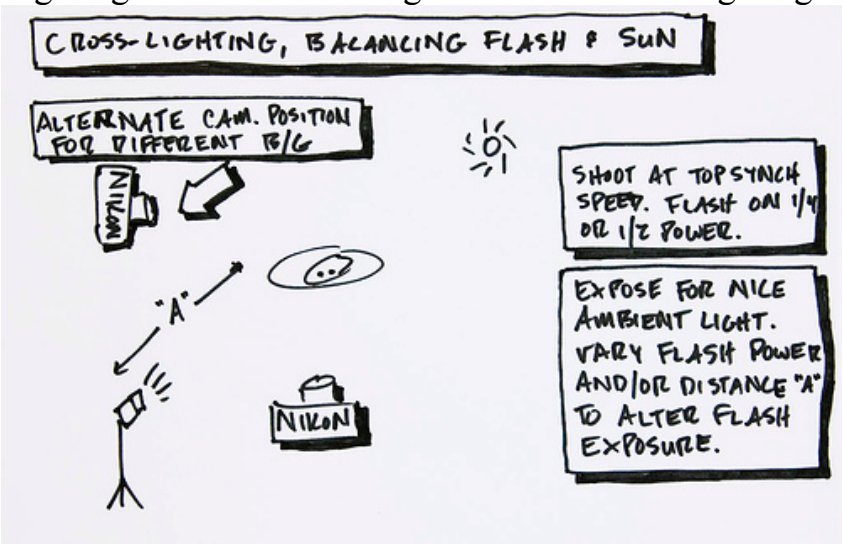
Light size is not what matters in determining softness. Apparent light size is what matters.

Lighting 102 – 3.1 Balancing Light: Twilight

Establishing a correct exposure on your primary subject allows you to do whatever you want with the exposure levels in the rest of the frame. And you can go far beyond the "correct exposure" range of an ambient-only, evenly lit scene

With flash, you can expose correctly for both. By adjusting the shutter speed and aperture to get exactly the desired tone in the sky and then filling the subject with flash sufficient to raise her exposure to the aperture you happen to be using,

Lighting 102: 3.2 Balancing Flash/Sun - Crosslighting



Lighting 102: Unit 1.1 - Position (Angle)

Summary: Lighting angle reveals form in a three-dimensional object. To see how light from a particular angle will affect your subject, view the subject from the position of the light.

We live in a world of off-axis light. The sun does not stay right behind us. Our lighting fixtures at home illuminate us from above and other various angles. And we are constantly exposed to imagery - both still and moving - that makes use of very sophisticated off-camera lighting techniques.

Yet so many photographers, when they take the time to compose and illuminate their photos, settle for the bland, flat, on-axis (i.e., on-camera) light. Because that is the path of least resistance.

The biggest failing of on-camera flash is that the light, which comes from a point very near to the camera's optical axis, does not have the ability to reveal the three-dimensional quality of the subject.

Granted, most flashes can be tilted to bounce the light off of walls or ceilings while still attached to the camera. But those are very limited choices out of a wide variety of lighting angles available to the off-camera lighting designer.

For the purposes of this discussion we'll think in terms of only hard, bare light from a typical electronic flash. (No worries, we'll be softening it up soon.) But the idea at this

point is not to create flattering light for a subject, but to explore the way off-axis light reveals and defines an object.

The first thing that you have to consider when visualizing (or pre-visualizing) the effects of off-axis light is to remember that there are two points of view in play. The first is that of your camera, which defines what you will be able to see in the photograph. But just as important is the second, which is the point of view of your primary light source.

What your *light* can see will define what is lit in your photo. If your light cannot see it, it will not be directly lit.

The ability to visualize the difference between these two points of view is the key to understanding how changing your light position will alter the way your subject appears.

Look, You Already Know This Stuff.

As we start this process, it is important to begin to merge the way you think about continuous light and the way you think about flash. We have talked about this stuff before, in Lighting 101. And I really cannot overstate the importance of learning to think of strobe the same way you think of continuous light.

Why? Because you are already a seasoned pro at dealing with continuous light. You experience it and react to it all of the time. You see a shadow and instinctively know where the light came from. You know by the edges of the shadow whether the light was hard or soft.

If you can learn to think about flash as a very bright, *continuous* light source, you will be able to make use of all of your experience with light that you have been subconsciously building for your entire life. Thinking of a flash as a very bright continuous light source is not so easy for some people. But it will get you past the math-anxiety-type fears you

may have about learning how to light.

Heck, even a little mouse munching on lunch in a field knows it had better haul butt when it is suddenly darkened by a shadow. It very well could be an approaching hawk. And the mouse likely knows which way to run when the shadow appears if it has a situational awareness of the lighting environment it is in.

Here is simple exercise that will improve your light visualization skills. Stand in front of a mirror, holding a (lit) table lamp in one hand. Move the light around so that it falls on your face from a series of angles and observe the results.

Yeah, you might feel (and look) a little goofy doing this. Oh, and you might want to have a good response ready for when your significant other pops in and gives you one off those *"What the...?"* looks, too. But I can vouch for the fact that it works very efficiently to train your eye to light.

Reverse Engineer Photos to Sharpen Your Perception of Light

Let's see what we can tell about the light in this photo just from studying the shadow:

1. Well, right off of the bat we know that the light is coming from camera right, because the shadow goes to camera left. (Don't get cocky. The mouse could have figured that out.)
2. We know the light is hard because the shadow edge is hard. (We're not there yet, but you know that info all the same.)
3. We know the light is slightly higher than the subject because the shadow goes slightly down.
4. We know the light is fairly close to side light (i.e., close to the wall) because of the length of the shadow.

(Note that there is a very dim secondary shadow at camera right. This is coming from the ambient light, which is not totally overpowered.)

It's just a dumb, quick little exercise. But the more you make it a habit to look at photos with an eye toward analyzing the light, the easier it becomes to create any effect you are looking for with your own light.

Here's a little home experiment to try without even making a photo. Position a household lamp so that it illuminates an object. Look at the object from the position of the lamp. See what the lamp sees. Now move away from the lamp and study the changes in your subject as the lamp reveals the object in relief while you move your point of reference further away from the axis of the light source.

Compare the lit portion of the object (as you move away from the lamp) with what you were able to see of the object from the position of the lamp. That's the first step to pre-visualizing light.

Do this kind of exercise enough, and you'll be able to know exactly how a subject will look when lit from any direction before you ever position your light. Better yet, when you pre-visualize a photo you'll know at what angle to position your light to get the effect that you want.

There are actually two variables to consider when deciding where to position a light. The first is at what angle to light your object. The second is at what distance to light your subject. Each variable offers a different form of control for a photographer to exploit.

Let's Try it with Some Live Ammo

For the first little shooting exercise, we'll be dealing only with angular position of the light. This experiment is going to be so simple that many of you will not even want to do it. But I really hope that you do.

Take a person or object (in my case, Combat Camera photog Jason Robertson, from the DINFOS workshop earlier this month) and shoot it/him/her with the light very near the camera axis. You can even stick the flash directly fired on camera for the first shot. You should have a wall behind the subject (with a few feet of separation between the two) as a reference for any shadows.

As for exposure, try this method as a way to start to learn to light without a flash meter. Shoot in a normally lit, indoor room. Set your ASA on 200 and your camera at your normal max synch speed. For most of you, this will be somewhere between 1/125th and 1/500th. Set your aperture on f/5.6.

Start with your flash on manual at, say, 1/16th power, about five feet away from your subject. (If you keep the flash-to-subject distance the same as you change the angle, your

exposure will not change.)

Now do a test shot. You subject will likely be a little too light or too dark. Adjust the aperture on your lens until the exposure looks right. If this seems clunky, understand that working this way will soon turn your brain into a built-in flash meter. With a little experience, your first tries will get closer and closer and exposure adjustments will be more and more minor.

Back to the exercise.

After adjusting for a good exposure for your on-camera light, move the flash around the subject and shoot it from a variety of lighting angles. For the example above, I just put up a straight-on and a 45-degree lit shot. But you'll want to play with it more than that. Experiment with some hard angles, in addition to the normal stuff. Look at the different ways in which your light reveals the subject. Again, keeping the distance constant will help keep your exposure constant, too.

Try a shot with the light at about 45 degrees to one side. Have your subject look directly into the camera. (Or have your inanimate object continue to be inanimate.) Now, *keeping the subject looking in the same direction,* walk over to your light and shoot the subject from the perspective of the light.

Compare the two photos, noting what you see from the position of the light with what portion of the subject was lit in the straight-on photo when the light was hitting it at a 45-degree angle. This may seem like rote, boring stuff. But the goal is to learn to light in a more intuitive manner. And observing your subject from the position of your light source is a great first step in that direction.

Light Position: Distance

The Inverse Square Law still makes my eyes glaze over. Not that it is necessarily so hard to understand. (Although it is for many.) But because it just sucks all of the life and soul out of lighting.

Kinda like showing up at the hotel on your honeymoon night with one of those biological/plumbing textbooks from high school to make sure you can exactly figure out the precise plan for the evening's activities. Yeah, it may be *accurate*. But where's the creativity? Where's the experimentation? Where's the fun?

You gotta lose the math. Here is what you need to know about the inverse square law: The closer you are to the light source, the more powerful the light. Get real close and it gets really powerful. Get far away, and it gets weaker.

And here's the other thing: The closer you get to the light source, the quicker the lighting values change as you move in. When you get farther away, small differences in distance (from the light) become meaningless.

So, let's think about this in the context of a lighting scenario. Let's say that we have a subject about 6 feet from a light grey wall. Like, say, Jason, from last exercise:

In this case, the light was about five feet from him, and the wall was another ~6 feet behind Jason. As we moved the light around him for the first exercise, neither the light-to-Jason or light-to-wall distance changed much. So our wall is pretty consistently medium grey.

Now take two more shots of Jason, from the same setup:

In the first, we moved the light way back. This, of course made it less powerful. But we adjusted the aperture (opened up) to compensate for that. So Jason is properly exposed.

But look at the wall: It is lighter. Why? Because the flash-to-Jason distance is about 25 feet, and the flash-to-wall distance is about 31 feet. Relatively, those two distances are not very different. So the light does not fall off much between Jason and the wall.

But for the second pic, we brought the flash in close. Like about one foot from Jason. But the wall is ~7 feet from the flash.

Relatively, that's huge difference between the flash-to-Jason distance and the flash-to-wall distance.

We close down the aperture to compensate for the brighter, closer light. So Jason is exposed correctly. But our light grey wall is now about 7 times further away from the light than is Jason. So it goes dark.
Jason is very close, where the light is powerful. The wall is at an intermediate distance, where the light is less powerful. As I move the light close to Jason - without even gobo'ing the flash to block light from the wall, I could easily make that wall go the rest of the way to black.

So, with my subject a few feet away from a light grey background, I can make the background black simply by moving my light in close to the subject.

NOTE: If little bells aren't going off in your head as to some of the doors that this light-distance variable opens up, keep knocking it around. This is a major thing.

So, moving in gives control *and* power. The light, in effect, has very shallow "depth of field," which is to say that the exposure that is correct for the close-in subject drops off very quickly behind him. Jason may be at f/11 or f/16. But just a few feet behind his head, you are already down to f/5.6 or f/4.

You gain the ability to light one plane without contaminating the other one. Sort of like selective focus, but with light. Expressed differently: Shallow lighting depth of field.

I could stick another flash on the background and light the two areas independently. That is control.

But sometimes you want a lot of depth of field to your light. Group shots, for instance. You want the front row and the back row to be in the same neighborhood, exposure-wise. Even though they may be a few feet away from each other. So you give up power in favor of even lighting.

So, here is the first of our actual lighting control sliders, for lack of a better term:

• Light Placed Closer = more powerful, and control of the depth of the correct exposure.
• Light Placed Further = less powerful, and a broader zone of even lighting exposure.

In other words, lighting has depth of field if you know how to exploit it.

And with enough light - and adjusting the exposure to compensate for the increased power - you can drop the exposure on a nearby white wall to black.

Trust Me, You Want to Actually Do This One

1. Find a nice lighting angle. Set the light a modest distance away - 5 or 6 feet. Shoot at max sync speed with your flash at say, at 1/8 power on manual. Adjust the aperture to get a good subject exposure with the light at the moderate distance.

2. Move the light back. Way back if you can. You may need to pump up the power to get a decent exposure. Maybe to 1/4 or 1/2 power. Adjust the aperture until the subject looks good, then note the background. It should be getting lighter.

3. Now move the light in tight. Real tight. As in one or two feet away. You'll probably have to dial your flash way down to compensate for the distance. Adjust your aperture for a good subject exposure. Note what happens to the background. It should get darker.

What you should find is that you have a surprising amount of control of the depth of field of the light. And this is before restricting or feathering the light in any way. And we will get to that later.

You should also start to be getting more intuitive about where you need to set you flash power to get a good working aperture from a given distance. Keep this up. You are growing a free flash meter in your brain.

You would not believe how many shooters out there have a "standard" light-to-subject distance and just give up this wonderful means of control.
Don't be one of them.
To the beginners - does this light distance concept make sense to you? If not, did it after you tried the exercise?
To the more experienced - are you already thinking consciously of light distance in this way? If you approach it differently, how so?

Apparent Size of Light

Summary: Light size is not what matters in determining softness. Apparent light size is what matters.

Would you use a bare speedlight to illuminate a shiny, metal car? That's what I did in this photo.

To be fair, it is a Hot Wheels car. I have a six-year-old boy, which means we have about 3 billion Hot Wheels cars in the house. You work with what you got.

But a bare speedlight? Even with a piece of paper taped to it -- the same size as the fresnel head of the flash -- to knock down the intensity, isn't that a pretty hard light source?

Depends on who you ask. I think of it is a hard source. You probably do, too. But the car sees it as a huge softbox when the flash is about an inch above the car's roof. And what the car sees is all that really matters.

Take a look at the setup photo for the shot. One small speedlight head lighting the car. Another on the wall (with a blue gel) to create the background.

I made this photo to prove a point. A tiny light source can look big and soft. Conversely, a huge light source can look tiny and harsh.

Take the noon sun on a cloudless day, for instance. It is a huge sphere of light -- far bigger than our own planet. But it is 93,000,000 miles away. So it looks tiny. And harsh.

(*But, from control number one, distance, we know that it has the ability to light large objects evenly...*)

Back to light softness.

We tend to equate umbrellas with soft light and bare flashes with hard light. But that is not necessarily the case. It is all about how a light looks to the subject, not the light's actual size.

Why is this?

To explain, let's make the subject you. Here is a 43" Westcott Doublefold umbrella, from about 10 feet away. Not bad. Looks like a reasonably pleasing light source.

Now, here is the same umbrella from about 5 feet away. Looks bigger, right? Softer.

What makes a bigger looking light softer? To understand that you have to learn to think about your subject in terms of four different lighting zones. And we will be talking about three of them today.

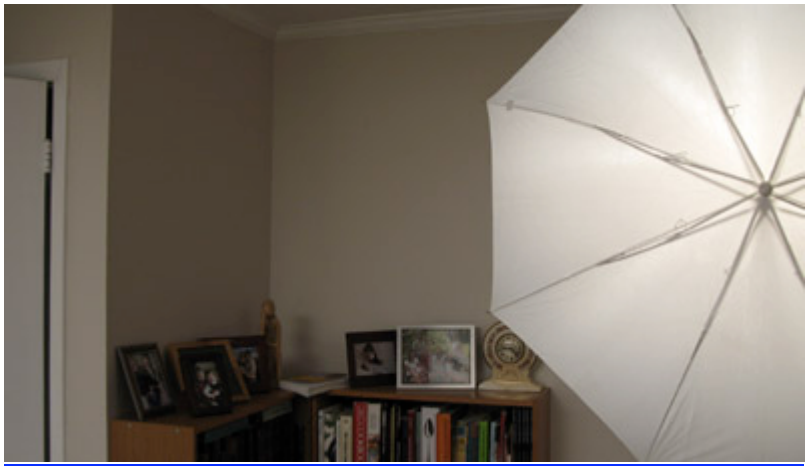
The first is what you normally think of as the lit area. This is the area of your subject that receives the light and scatters -- or diffuses -- the light back at the camera. The term for this area is the "diffused highlight."

The unlit area has a very technical name that I hope all of you will be able to understand: We call it the... shadow area.

But what about the boundary between the two? That is called the "diffused highlight-to-shadow transfer area." Big term, but it should make sense. That border zone, more than any other area, is what defines a subject as being lit by hard or soft light.

Think of yourself as the subject again. The lit portion of you can "see" all of the light source. The shadow portion cannot see any of it. The border zone - the diffused highlight-to-shadow transfer area -- can see part of it.

Like this:



That is why larger-looking sources make for broad, smooth transfer zones. They disappear more slowly as you wrap your way around the subject away from the light source.

Hard sources are more of a "now-you-see-them, now-you-don't" kind of thing as you rotate away from them. Thus, very abrupt transfer zones.

Now think for a second about the differences between a silver umbrella and a shoot-through umbrella. You might think that the silver would always be more efficient. Not so.

Remembering our distance discussion, not only does our light get softer as we get closer,

but it gets far more powerful. The actual light source of a shoot-through umbrella can be placed very close to your subject, making a huge, soft, powerful light source.

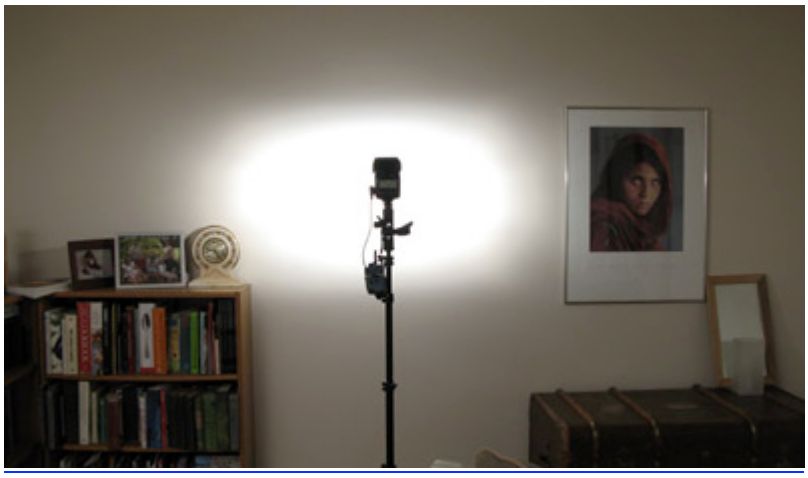
Not so with a reflector umbrella. Unless you want to skewer your subject's well-lit eyeball on that shaft.

I used to shoot with mostly silver umbrellas, but I have come to think of the shoot-throughs as more versatile for the above reasons. Take a look at this shot (and the setup) of my daughter, for example. As you can see, I can bring that sucker right down close to her and make a beautiful light source.

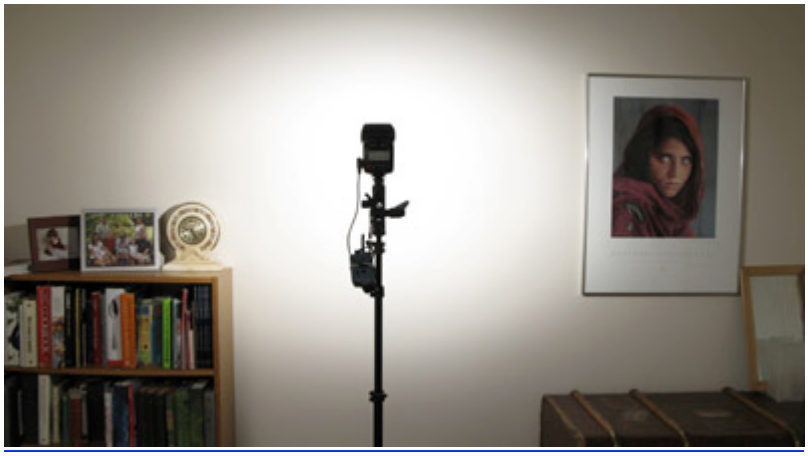
But umbrellas are not the only way to make a hard light softer. You can use walls and ceilings for that, too.

Your flash most likely zooms its head to compensate for different lens focal lengths. But that can also be used to control the size of the light hitting a bounce wall or ceiling. Which will alter the softness of the light, all other things being equal.

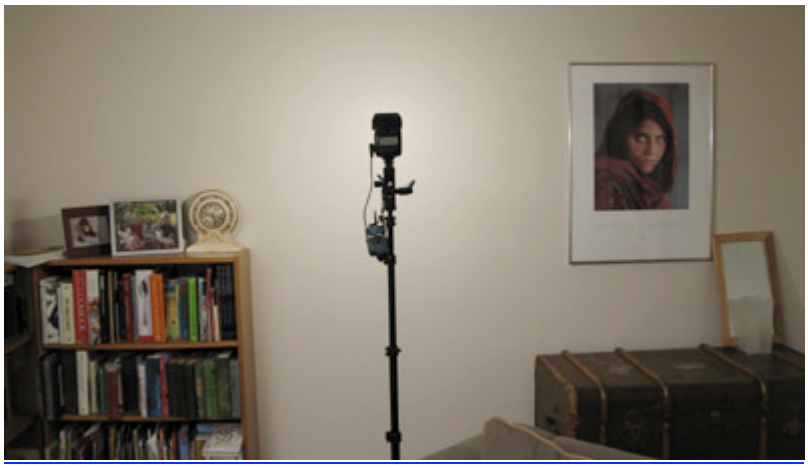
Here is a flash, about five feet from a wall and set on 85mm beam spread:



Here is the same setup with the flash on 24mm:



And just for good measure, the same flash with a diffuser, which approximates a bare-bulb flash:



(It is hard to tell because of the decreased intensity, but the whole wall is being lit by the flash.)

You can see how easy it is to alter the softness of your light source by using either an umbrella or a bounce surface in this way.

 By zooming a flash out to ultra-wide and bouncing it off of a wall, for instance, you can make a huge light source to get results like this wonderful portrait Why just bounce your flash off of a wall or ceiling, when you can put a little thought into it and get exactly the size and shape of light source that you want?

You can point a flash at a wall right behind you and get an almost softbox/ringlight look, for instance.

If you are working in tight, even a small diffuser will do the job

Size and distance are relative. But remember that the size/intensity/fall-off thing is always in play, too. More complex, more control.

As for the size/distance thing, I tend to think of a light source as reasonably soft if it's size is at least half of the measurement of the light-to-subject distance. That is to say that a 3-foot umbrella will be reasonably soft at up to, say, 6 feet from the subject. But that is just a rule of thumb. Your opinion may differ.

Balancing Flash and Ambient Light.

For the available-light photographer, the idea of exposure is a fairly simple and static concept.

There is a correct exposure for a given ambient light scene. Sure, you can tweak it, say, half a stop up or down. But go much beyond that, and you move beyond "artistic license" to "I screwed up."

But what is the correct exposure when your photo can have as many different zones of varying light levels as you have flashes? The correct exposure is what you say it is. And you say it by establishing a zone of (traditionally) correct exposure on your main subject using the flash.

If you are looking for a touchstone in this process, that's it. Establishing a correct exposure on your primary subject allows you to do whatever you want with the exposure levels in the rest of the frame. And you can go far beyond the "correct exposure" range of an ambient-only, evenly lit scene. And look like you knew what you were doing.

In short, "screwed up" becomes "artistic license" when you have established an exposure reference point with your light on your main subject. (More after the jump.)

To really understand the concept of balancing light, many of you will have to expand your concept of a so-called proper exposure. After all, you are creating a scene that has precisely the tonal range that you want it to. You can use this ability to compress the tonal range of a photo, or to expand it. It's up to you.

 Take this scene photo which includes long-time Strobist reader Ryan Brenizer. Exposing for the model, the sky is washed out. Exposing for the sky, the model would be too dark.

But with flash, you can expose correctly for both. By adjusting the shutter speed and aperture to get exactly the desired tone in the sky and then filling the model with flash sufficient to raise her exposure to the aperture you happen to be using, you get this:

 In addition to turning the water into diamonds with his flash, Ryan has compressed the tonal range of this scene to where everything fits in the histogram rather nicely, thank you.

So, is Ryan shooting at the correct exposure? Yes. Or no, depending on exactly how he wants the background to look.

Ryan shot this photo at 1/250th at f/3.2 at ASA 160. He could easily open his shutter speed up to, say, 1/125 and lighten the background. Or, he could up the power on his flash by a stop, close his aperture down a stop (to f/5.0 - a partial stop between f/4.0 and f/5.6) and reset his shutter to 250th to darken the background.

How does that work? Let's look more closely.

The background is lit by ambient light. It is controlled by a combination of the aperture and the shutter speed. The model is exposed by the flash. (She would be significantly underexposed without the flash.) So as long as the model is receiving the correct amount of light from the flash, the background can be placed at whatever tone the photographer wants.

What if Ryan cranked up the power on his flash 2 and 1/3 stops to where it lit the model to f/8? (He would then set his aperture to f/8 to correctly expose her.)

But what about the shutter speed? The new shutter speed to get the same effect on the background would be 1/50th of a second. (We simply open up the shutter 2 1/3 stops to neutralize the fact that we closed down the aperture 2 1/3 stops.) Thus, the exposure on the background has not changed.

We did this step to get away from our 1/250th of a second sync speed, and give us some "playing around" room with the shutter speed.

So now, imagine you are Ryan, wading in the water, shooting at 1/50th at f/8 and getting the same tones as we see above. Now, say you drop the shutter to 1/100th. What happens?

Model lady does not change. She wants f/8 from the flash and that is what she is getting. But the background gets one stop darker. You have just increased the contrast range of the photo. Darker, moodier and looking completely different. And I'm thinking those water diamonds are really popping now.

Drop the shutter down to 1/200th. Darker still -- but not black yet. Completely different feel to this photo than with the other two.

Which is correct? They all are -- just different. "Correct" is determined by the exposure on the model -- and that is set by the flash (and choosing the corresponding aperture that makes her look well-exposed.)

But the sky? That's up to you. Airy, normal, moody, black -- it's all good. And it is all available to you.

What you have is two different photos -- each with its own exposure -- being compressed into one scene. There is a flash exposure, which happens instantaneously and is controlled with the aperture. Then you have an ambient exposure which happens over time and is controlled by a combination of the aperture and the shutter speed.

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