

Portrait Lighting

By Robert Lay

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Objectives

The purpose of this document is to provide a general description of studio lighting for portraiture using two lamps. The lighting arrangements that are described herein are primarily for purposes of establishing a framework of positioning of lamps and terminology for discussing the lighting arrangement. Examples of the effects of different lighting arrangements are provided for the purpose of illustrating the effects of light position, strength and characteristics. In that context, the primary light characteristic other than its strength and positioning is the question of whether it is a harsh or diffuse light. This document does not discuss color balance, hair lights, backdrop lighting, posing or composition. The primary objective is to show how modeling of the subject's features, 3-dimensionality and depth are enhanced by the lighting as provided by a 2-lamp arrangement.

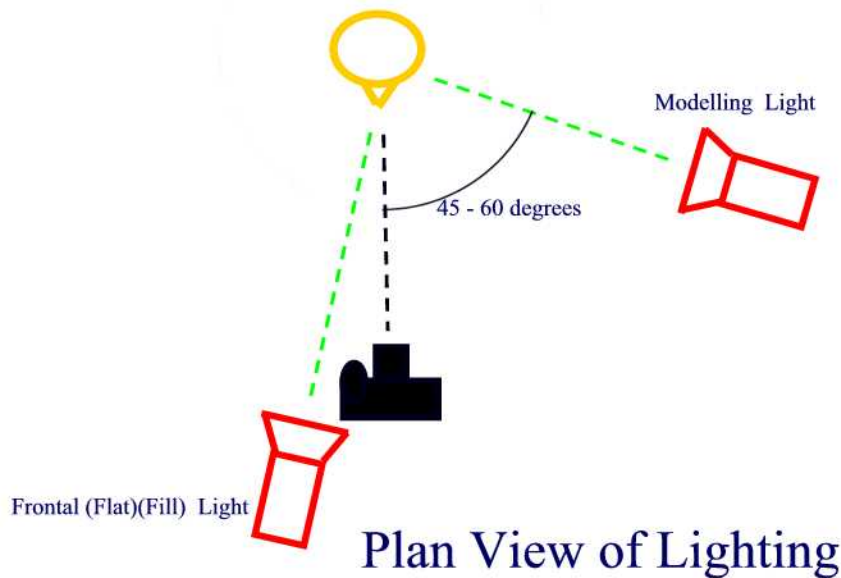
Terminology

In this document the two lamps are referred to as the Flat or Frontal light, which may also be thought of as "fill" light. Generally speaking that light is on the same axis as the camera (i.e., the light shines on the subject along the same line of direction, more or less, as the camera's line of direction). This usually implies that the light is fairly close to the camera, being alongside or immediately above the camera.

The second light is referred to herein as the Modeling light and is normally positioned to one side or the other of the subject and at an angle of elevation above the subject so as to cause shadowing of the facial features. The two figures to follow graphically depict the general arrangement although the choice of whether the Modeling light is positioned to the right or to the left of the subject is entirely arbitrary.

Plan View of Lighting Arrangement

BackDrop (Optional)



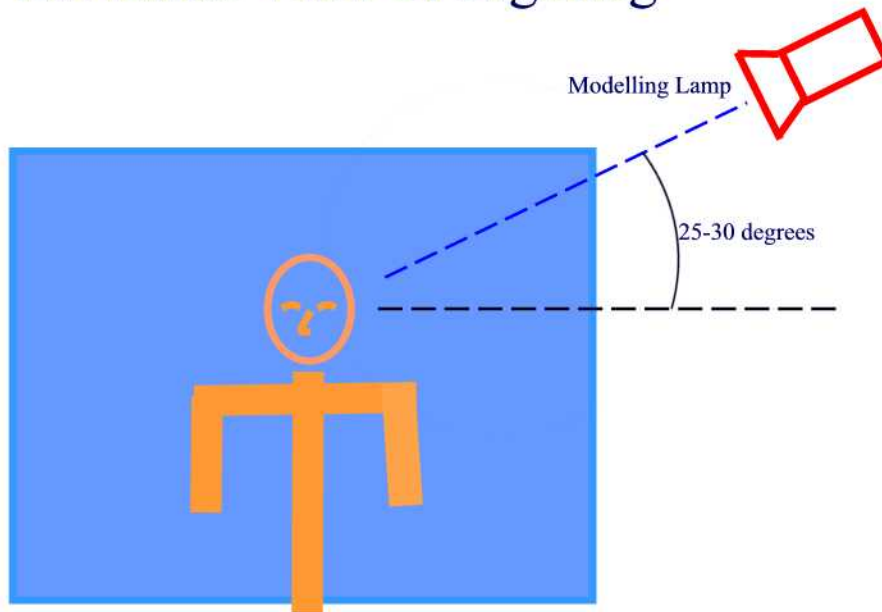
The above diagram shows a plan view the backdrop, the subject, the camera and the lights – in other words, it's the view of how things are laid out as seen from above. In that diagram we have labeled the lights in order to identify which light we are referring to in the text to follow. My choice of names for the lights is based on their purpose and effect. That is, the flat or frontal light provides illumination of the subject from the front but does not show the contours of the face. Therefore, the face will appear flat and featureless in this light.

The modeling lamp, however, provides side-lighting and brings out the contours of the facial structures through the resulting shadows formed. By virtue of the shape and darkness of each shadow the viewer easily recognizes the peaks and valleys of the facial contours.

The different heights of each object above the datum are not shown in the plan view.

Elevation View of Lighting Arrangement

Elevation View of Lighting



The Elevation View, above, shows how the modeling light is normally at a higher elevation than the flat or fill light and camera and subject. The reason for the modeling light being higher than the subject is in order to better emphasize the eye sockets, the brow and the contour of the eyeball itself. The nose and chin contours are also improved by virtue of the angle involved.

The text in the following sections and the sample portrait images will illustrate the different effects as the angles of elevation and azimuth of the modeling lamp are changed. In the initial arrangements, the modeling lamp is not elevated as shown above.

Reference Portrait

Portrait 95, below is lighted by a single light source about 15 feet distant at an elevation of about 25 – 30 degrees about the horizontal. It is shown here only for purposes of comparison with the different lighting exercises to follow.



Portrait 95

The most important thing to be aware of in Portrait 95 is the flatness, or lack of facial contours and 3-dimensionality that is typical of flat or frontal lighting. In the absence of any side-lighting the contours of the face are effectively flattened. Actually, we are being generous in this particular example, because we could have made this example even worse by over-exposing the face so as to reduce what little color gradations and tone gradations that are present.

Using a Harsh Modeling Lamp at Face Level

Portrait 67, below, illustrates a one-lamp lighting arrangement using a harsh sidelight at about 45 degrees off-axis. In this setup the modeling lamp is at face level and not elevated as shown in the Elevation View of the lighting arrangement.



Portrait 67

The predominant shadows are located to our left of the nose and on her right cheek. There are also noticeable shadows modeling the mouth and chin to some extent. However, the eye sockets are very flat, showing no depth or contours. It should also be noted that the harshness of the lighting provides very deep shadows on her right side and a distinct profile on the backdrop. Although the range of tonalities is extreme, there are very few mid-tones.

Using a More Diffuse Modeling Lamp at Face Level

Portrait 72, below, illustrates a one-lamp lighting arrangement using a more diffuse sidelight at about 45 degrees off-axis.



Portrait 72

The predominant shadows are still in the same places as they were in Portrait 67. However, they are not as deep. In other words the shadows are softer and more moderate. Now, the range of tonalities is not as extreme and the shadows are more in the middle range.

Using a Harsh Modeling Lamp at a More Extreme Angle

Portrait 76, below, illustrates a one-lamp lighting arrangement using a harsh sidelight at about 70 - 75 degrees off-axis.



Portrait 76

In Portrait 76 we have returned to a harsh modeling lamp and have increase the off-axis angle to the point where the shadows almost completely cover her right cheek. This is, obviously, much too extreme for a one-lamp arrangement.

Using a More Diffuse Modeling Lamp at a More Extreme Angle

Portrait 76, below, illustrates a one-lamp lighting arrangement using a more diffuse sidelight at about 70 - 75 degrees off-axis.



Portrait 79

In Portrait 79, the softer modeling lamp now produces more reasonable shadows. Nonetheless, the modeling that we want for the eye sockets is still missing.

Using the Diffuse Modeling Lamp at a Higher Elevation

Referring again to the Elevation View of the lighting arrangement, we position the modeling lamp at an elevation angle of roughly 25 to 30 degrees, and we continue with the more diffuse version at the more extreme off-axis angle.



Portrait 81

In Portrait 81, there is a noticeable improvement in the eye sockets – especially in her right eye. It is now more obvious that the eye socket has depth because of the shadow caused by the brow. Note also that the highlight on her right cheek is substantially higher on the cheekbone, which gives the cheekbone more roundness than in the previous portraits.

Using the Harsh Modeling Lamp at a Higher Elevation

We next combine the higher elevation of the modeling lamp with its harsh configuration. The shadows are very deep, but notice that we can clearly see more 3-dimensionality in her left eye socket and the contours of her left cheek.



Portrait 86

In Portrait 86 we have arrived at the best arrangement of shadows for the purposes of emphasizing shape, 3-dimensionality, facial contours and depth. The range of tones is too extreme, but the shape of the shadows and their location has been optimized for the one-lamp configuration. When we say “optimized”, we do not wish to imply that every aspect of placement, intensity and quality are completely optimized. On the contrary, we could have tried many more off-axis angles and many more elevation angles before deciding that this was the “optimum” placement, and we have not made many changes to intensity or quality of the single lamp. However, based on a very simple comparison of Portrait 86 with Portrait 95, we can say that Portrait 86, with all its problems, clearly emphasizes the actual facial contours of the subject.

Using Some Flat Lighting in Combination with the Modeling Light

In portrait 88, below, we have added in a minimum of frontal lighting with the intention of filling in the deepest shadows and reducing their severity.



Portrait 88

In Portrait 88, the added flat lighting is from the lamp that was used in the reference portrait, Portrait 95. The effect of this additional light is almost nil in the highlight areas, but the effect on the shadow areas is to raise them from deep blacks to pleasing mid-tones. Note, however, that the desired effect of the shadows towards adding to the realism, depth and 3-dimensionality is in no way diminished. The only change is that the harshness of the arrangement in Portrait 86 is significantly relieved. One point to be emphasized here is that the modeling light in use here is still the one configured as “harsh” – not the diffuse configuration. The effect of adding frontal lighting has accomplished the same effect as changing the modeling lamp to a more diffuse configuration, but it has done it with more control, because we can now independently position it and control its intensity

Increasing the Frontal Lighting

In Portrait 90, below, we increase the frontal lighting by bringing it closer and lowering it to face level.



Portrait 90

By increasing the intensity of the flat lighting, as shown above, we *could* overpower the side-lighting completely.

Decreasing the Frontal Lighting

In Portrait 92, below, we decrease the frontal lighting by taking it further back.



Portrait 92

In Portrait 92, above, we have shadows that are as dark as we would want them, and in Portrait 90 the shadows are about as soft as they could be and still indicate the desired realism and depth that we want.

A final choice between Portrait 90 and 92 would be a matter of personal taste, but when you look at the flat, featureless image in the reference portrait, Portrait 95, there is no contest. The lighting style that you see here is based on the style of lighting made famous by Rembrandt van Rijn.