

The “M” word

Understanding metamerism can help design professionals avoid costly color mistakes

By KIMI EISELE

Gail Mayhugh believes paint color is alive. “It will change from morning to noon to night because of light coming through windows, or lights being turned on,” says the Las Vegas interior designer, a phenomenon that scientists refer to as color inconstancy.

But what if it “changes” on the way home from the paint store?

“A classic example is someone who chooses a berry red or bluish-pink color,” says color consultant Jill Morton, CEO of Colorcom in Honolulu, Hawaii. The paint appears to perfectly match a fabric or other sample. “Then, when they get it home, suddenly the color looks salmon.”

The paint hasn’t actually changed, of course. The perceived difference in color is caused by the phenomenon called metamerism, in which two colors appear to match perfectly under one light source but do not match at all under a different light source.

Color perception is the result of a complex interaction between the light reflected off a surface and the chemical properties of its color source. Technically, this is called the spectral reflectance curve. Metamerism occurs when colors respond differently to light because of the way they were formulated; their spectral curves are different.

Different pigments, different properties

“If you look around a room, all the objects you see — fabrics, ceramics, paint — have different types of colorants, dyes and pigments, each with differing properties,” says Roy S. Berns, professor of color science, appearance and technology at Rochester Institute of Technology in New York.

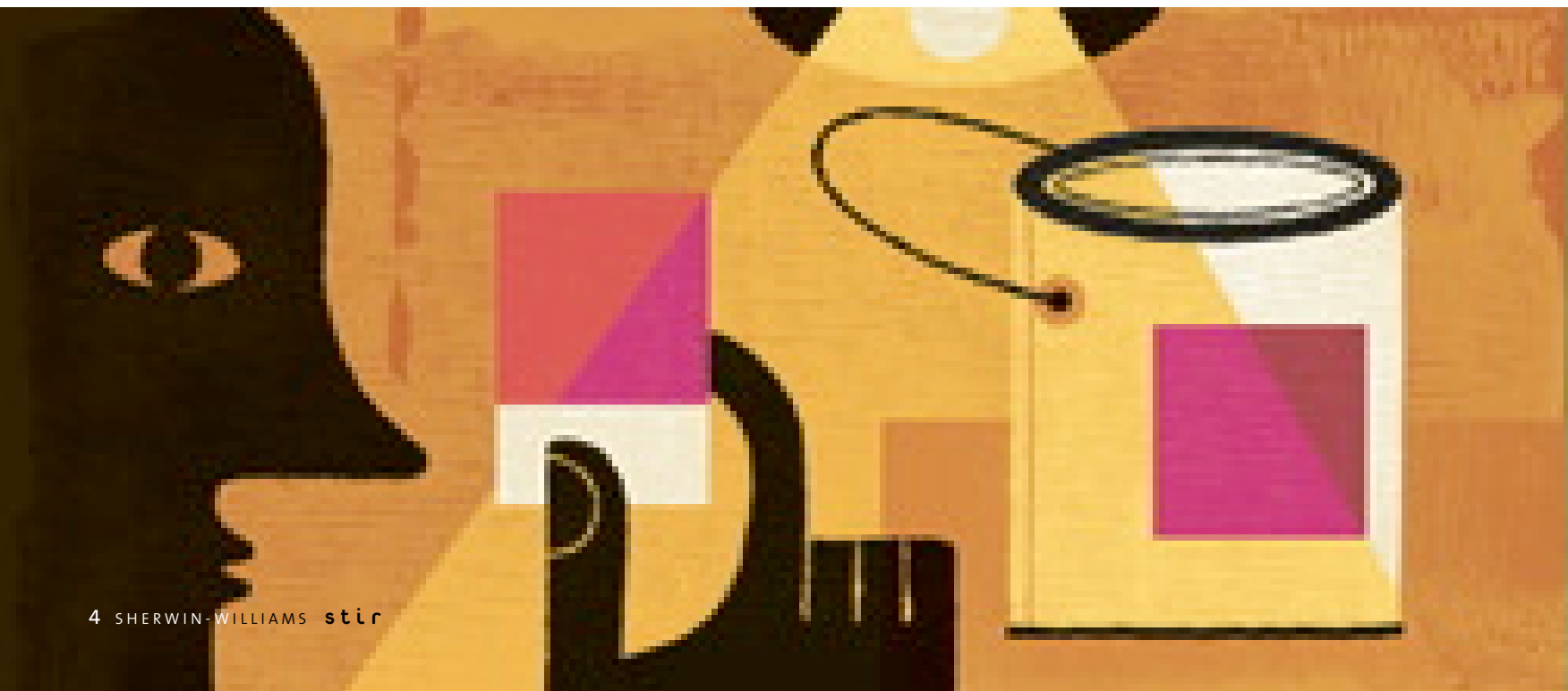
Unlike the way we hear sounds, which we sense at individual frequencies, we see color by transforming many wavelengths into just a

few signals, Berns says. “As a consequence, many combinations can result in the same color. If you had an infinite amount of time, you could make all colors match for one type of viewing condition for one person, but once you change the lighting, the different pigments and dyes will respond differently.”

Different light sources can result in different effects, says Thomas A. Hough, color science specialist with Whiterock Design in Tucson. “Light from a tungsten light bulb has more yellow content, while light from a fluorescent lamp has more blue content.” Colors that appear the same under one type of lighting can respond differently under another.

Mayhugh, owner of GMJ Interiors, has seen this effect firsthand. “I’ll be out shopping with clients, looking at fabrics in stores under fluorescent lights, thinking the fabrics match or coordinate,” she says. “Then we bring them home into incandescent lighting, and

ILLUSTRATION BY TIMOTHY COOK



maybe they won't work at all or not in the way we expected."

Color inconstancy tends to occur more often with complex color hues, says Morton, also the author of "Color Voodoo," a series of publications about color. "Purple, brown, puce, mauve, sage green, celadon green — those are the colors that are more likely to 'shift.'"

Finish also has an impact

Paint finishes also can affect color appearance. Because shinier surfaces reflect light in a single direction while flat surfaces reflect light in all directions, colors can appear different in matte versus gloss finishes, Berns says.

"To minimize problems associated with metamerism, it's best to use the same paint manufacturer throughout a project whenever possible," says Sheri Thompson, director of Sherwin-Williams' Color Marketing and Design. Different manufacturers use different

formulas of pigments or colorants to arrive at a specific hue. The fewer the pigments, the less likely the finish will be affected by changes in lighting.

It's also essential to view colors under the conditions in which they'll be used. Sherwin-Williams paint stores have special light booths that allow you to view paint samples under a variety of lighting sources. But that accounts only for indoor lighting. Outdoor light also can affect the way a color appears. "If you live in the desert, you might have beige light coming into your home. If you live in Hawaii, you'll have more greens," Morton says.

Both Morton and Mayhugh recommend testing paint color in the location where it will be used by buying small samples of color and painting poster boards, which can be moved easily from room to room for easy comparison with other design elements. "That's the key," Morton says. ■

Your Colors in Context

To ensure that the color you choose looks as good at your project site as it did on your presentation board, take advantage of Sherwin-Williams' COLOR To Go™ color-sampling program. COLOR To Go samples are mixed by request in small Twist-n-Pour™ containers. This try-before-you-buy program offers a virtually unlimited number of paint colors, including colors from the Sherwin-Williams palette and custom color matches. To purchase a COLOR To Go sample in the hue of your choice, visit your local Sherwin-Williams store.

