

THE JEWELRY DESIGNER'S APPROACH TO COLOR *by Warren Feld, Jewelry Designer*



Abstract

Color is the single most important Design Element, whether used alone, or in combination with other Design Elements. Yet jewelry creates a series of dilemmas for the colorist not always anticipated by what jewelry designers are taught in a typical art class. This article reviews the basic concepts in color theory and suggests how to adapt each of these to the special requirements of beads and jewelry. Special attention is paid to differentiating those aspects of color use we can consider as objective and universal from those which are more subjective. The fluent designer is one who can maneuver between universal understandings and subjective beliefs when selecting and implementing colors, color combinations and color blends. This involves managing the sensation of color light value (balance), the sensation of color contrasts (proportion), and the sensation of simultaneous color contrasts (context) among designer, wearer and viewer.

RETHINKING THE TEACHING OF "COLOR" IN JEWELRY DESIGN

You cannot paint with beads and other jewelry components.

I am going to repeat this: *You cannot paint with beads and other jewelry components.*

When you take color class after color class rooted in art, they are teaching you how to paint. You can't do this with jewelry and beads.

As frustrating as this can be, you cannot ignore the fact that *Color* is the single most important Design Element. Colors, their selection, use and arrangement, are believed to have universal powers to get people to see things as harmonious and appealing. Color attracts attention. A great use of color within and object, not only makes that object more coherent, it can be contagious, as well. Using colors that do not work well together, or using too many colors or not enough colors, or using colors which look good on paper but distort in reality can put people off.

Designers can learn the artistic basics of Color concepts and theories. They can reference this visual language of color to influence how they go about making choices, including those about picking and using colors. However, jewelry artists who are fluent in design will be very aware of the limitations this artistic, painterly language imposes on them. They will have to learn how to decode, adjust and leverage their thinking to anticipate how the bead and other related and integrated materials assert their needs for color, and how to strategically compose, construct and manipulate them.

Jewelry, unlike painting or sculpture, has certain characteristics and requirements which rely on the management and control of color, its sensation and its variability with a slightly different emphasis than learned in a traditional art class. Jewelry is a 3-dimensional object, composed of a range of materials. Jewelry situates, moves and adjusts in relation to the human body and what that body is doing at the moment. To get the attention their jewelry deserves, jewelry artists must become fluent with color selection and application from their own disciplinary perspective. We must understand color in jewelry as the jewelry is worn, and worn in a particular context or situation.

Beads [*here I use 'beads' as a stand-in for all the component parts and stringing materials used in a piece of jewelry*] are curved or faceted or otherwise shaped, and the shape and texture and material and dimensionality affect the color, its variation and its placement and movement on the beads surface. They affect how light reflects and

refracts, so depending on the angle at which you are standing, and how you are looking at the bead, you get some unexpected, unanticipated, sometimes unwanted colors in your piece of jewelry.

Additionally, you need to anticipate how the bead, when worn, can alter its color, depending on the source of light, the type and pace of movement of the wearer, and how the eye interacts with the bead at any point of time or positioning. There are many gaps of light between each pair of beads, and you can't paint these in. The colors don't blend, don't merge, don't spill over, don't integrate. You can't create the millions of subtle color variations that you can with paint.

I'm not suggesting that beaders and jewelry makers be afraid of colors. Rather, they should embrace them. They should learn insights into understanding colors. They should be inspired by colors. They should express their artistic and creative selves through color. They should use color palettes to their fullest. They should recognize how their various audiences see and claim and interact with color.

It is most important that jewelry designers understand color, its use and application from their own disciplinary standpoint. In some sense, however, the approaches of most bead artists and jewelry designers too often remain somewhat painterly – too routed in the Art Model. The Art Model ignores things about functionality and context. It diminishes how the individuality of the designer, and the subjective responses of the wearer and viewer affect each other. In many respects, these are synergetic, mutually dependent and reciprocal. The Art model understands the success of jewelry as if sitting on an easel, not as it is worn.

As a result, color theories get oversimplified for the jewelry artist. "Value" is barely differentiated from "Intensity". Color selection focuses too much on *harmony*, and too little on *resonance* and *edginess*. Color training too often steers jewelry designers towards a step-by-step, paint-by-number sort of approach to color selection and application. The co-dependent relationship between Color and other Design Elements is downplayed and glossed over. This is a major disservice.

So, I've tried to re-think how we could and should think about and teach "color" to jewelry artists. Not easy. Art and Design Theory suggests that, in order to teach designers to make good choices, we need to break down color concepts and theories into teachable and digestible groups of skills. And then show how the next set of skills builds upon the first.

We need to show jewelry artists what kinds of color choices they will be making as they create pieces of jewelry, and then put them in situations where they are forced to make these kinds of choices. We need to think of colors as "building blocks", and the process of using colors, as one of creative construction. Creative construction requires focusing on how color (and multiple colors) is (are) sensed, and sensed by various audiences which include the artist him- or herself, and the wearer and the viewer, and the exhibitor, collector, and the seller, if need be.

So, that's where I'll begin with color: Delineating the types of choices that the jewelry artist needs to make, starting with choices about picking colors.

Picking Colors

As a design element, *color* is used to attract attention. It aids in grouping some objects and setting boundaries between others. It can emphasize and focus. It conveys meaning and value. Usually color enhances the aesthetics and appeal. Color can be used as an organizing tool and create segments, components, rhythms, movement, dimension and hierarchical arrangements within your jewelry composition. Color can affect the figure/ground relationship of the composition.

There are many different kinds of choices involved, when using Color:

Choices about colors based on our understanding of...

- Personal strategies for picking colors or finding inspirations for colors
- Color theories and concepts
- How the bead (and related jewelry materials) asserts its (their) needs for color

- How color affects the viewers of color
- The process for designing jewelry with color
- The situation or context within which the jewelry is to be worn

Part of picking colors is very personal and subjective. And part of this is very strategic and must be managed. That is, part of picking colors is about anticipating more universal understandings about how various audiences will sense and pick colors. How do you actually go about picking your colors, and then deciding on your final colors for your piece? What kinds of things influence you in choosing colors? What inspires you? Where do you look for inspiration? Do you have favorite colors and color combinations? Or colors and color combinations that you detest? How do you anticipate how others will view and evaluate the colors you pick?

Choosing Colors is an involved exercise. Most people avoid this kind of exercise, and settle for a set of colors that match. But, in design terms, Colors are used by the designer to clarify and intensify the effects she or he wants to achieve.

What does it mean to "clarify and intensify" the effects you might want to achieve? For example, the artist may use color to clarify and/or intensify any of these kinds of things...

- delineation of segments, forms, themes, areas
- expressions of naturalism or abstraction
- enhancing the sense of structure or physicality (forward/recede; emphasize mass or lines or surfaces or points)
- playing with light (surprise, distort, challenge, contradict, provoke)
- altering the natural relationship between the jewelry and the situation it is worn in (context, clothing, setting)

Color is the primary Design Element designers choose to express their intent, establish unity, create rhythm, set movement and dimensionality in place, enhance shape, make points, lines and planes come alive, and the like. Alas, too few people apply this kind of thinking and make this kind of effort when choosing colors.

For myself, I know that as I start to play with my design arrangements, I also begin to identify potential color issues. Designs are imperfect. Beads are imperfect. Colors are imperfect. With each issue, I try to figure out solutions – other things I can do with colors to make everything work. My choices begin with scientifically proven color theories – shared universals that virtually everyone has about picking colors.

In literacy terminology, this is called *decoding*. Then I begin to personalize my choices so that my results show more of my individuality as an artist. Some of these latter choices do not necessarily reflect shared universal understandings about color, its sensation and its use. In literacy terminology, my ability to move back and forth between the objective and subjective is called *fluency*.

Bead Choices

The bead – its very being – creates a series of dilemmas for the colorist. And each dilemma is only overcome through strategically making and managing choices about color and design.

Such dilemmas include things like...

- Beads are not the same as using paints
- Can't blend beads
- Boundary issues
- Issues associated with shapes, faceting, edges, crevices
- Jewelry reflects and refracts light, and this may change as the wearer moves, or lighting changes, or perspective and angle of vision changes, or materials or material mixes change
- Limits in the range of colors (and color tones) you can pick from
- Issues associated with the fact that jewelry as worn, takes many shapes/positions, as the person moves, and the color appearance may change or vary

- Beads are parts in whole compositions, and juxtaposition of 2 or more beads may change or vary the colors' appearance
- Jumping from bead to bead within the composition, means the viewer's mind has to fill in where there are gaps of color to give the illusion there is a continuance of color throughout the composition

Yet most people do not recognize or anticipate these kinds of dilemmas.

Emotions, Moods and Choices

The emotional and psychological effects of color are undeniable. These effects are usually felt through processes of color comparisons and contrasts. The better designer anticipates the goals of the wearer, and what emotions and moods the wearer wants to evoke in all that see the jewelry as worn. This might be appeal, beauty, trust, power, wealth, intelligence, and the list goes on.

Designing With Color – Many Choices

The jewelry designer must be strategic with color, which comes down to..

1. Selection
2. Placement
3. Distribution
4. Transition
5. Proportion

Designers must be intentional, not only with the *selection* of colors, but in the *placement* of color within the piece, as well. The designer achieves balance and harmony, partly through the placement of colors. The designer determines how colors are *distributed* within the piece, and how colors *transition* from one color to the next. And the designer determines what *proportions* of each color are used, where in the piece, and how.

These kinds of choices affect movement and rhythm, dimensionality, and resonance.

Subjective or Objective Choices?

SOME TOOLS FROM ART THEORY

Many people are often skeptical that you can choose colors with any basis of rationality. Choosing colors is intuitive, subjective, personal. You can't teach people to be better users of colors, because you're either born with a sense of color, or you are not.

People seem to have cultural or social expectations about the meanings of some colors. When Vanderbilt students see black and gold, they associate it with school colors. When others see black and gold, they associate it with something else. The same goes for University of Tennessee Orange, and so forth school to school.

If we are to be able to teach jewelry makers and beaders to be more scientific in their choices of colors, and be able to anticipate how their various audiences respond to colors, then we would need to have some objective rules, rules that refer universally to just about everyone. Rules that inform people what colors are best. What colors go together, which ones do not. Rules that show how to manipulate color and its expression in perfect and predictable ways.

But everything seems so subjective.

When people see colors on the vertical, they may respond very differently than when they see these same colors on the horizontal.

Look at flags of countries around the world. Many flag colors are red, white and blue.

If you look at France's flag, you have red/white/blue on the vertical.



Russia's flag has red/white/blue on the horizontal.



You frequently find that people might like a color arrangement in a vertical organization, but feel very uncomfortable, or have much disdain for those same colors, when found in the horizontal.

COLOR TOOLS AND THEIR THEORETICAL BASIS

Sensation Management

Color research over the past 100 years or so suggests that there are many universals in how people perceive, understand and respond to colors. These universals provide the basis for several "*sensation-management-tools*" jewelry designers might use to help them manipulate various design elements and their arrangements within a jewelry composition. Some of the most useful color tools are those which designers use to control how to make one color relate to another. These have to do with creating and managing...

- A. Sensations of Color Balance (*Light Values*)**
- B. Sensations of Color Proportions (*Color Contrast*)**
- C. Sensations of Simultaneous Color (*Simultaneous Color Contrasts*)**

As jewelry designers, we need to know...

- What these color TOOLS are, and with which we can play

- What the special demands beads (and all other materials) place on our use of these TOOLS
- How we can *push* the limits of these TOOLS to achieve harmony, variety and emotional responses
- How *Far We Can Push* the limits of these TOOLS to achieve parsimony and resonance

Toward this end, we need to know a little bit about the research and theories these tools are based upon. We need to understand some things about perception and cognition. That is, we need to understand, as people interact with our jewelry, how the brain comes to see color, recognize color, and interpret color in context.

Theory / Research Underlying These Color-Sensation Management Tools

My favorite book on the research into the theoretical bases of these kinds of color management tools is by Johannes Itten ^[2] called *The Elements of Color*. The most important theories about color universals for jewelry designers, as detailed in his book, include,

- (1) After Images
- (2) Use of the Color Wheel
- (3) Color Schemes
- (4) Color Proportions
- (5) Simultaneity Effects

As a design element in and of itself, Color (and its attributes) are universally understood as if they were objective facts which comprise a visual grammar. It is important to understand how to employ universal understandings about color.

Universality, in and of itself, however, *is necessary but not sufficient* for understanding why some color use draws your attention, and others do not. Here aspects of subjective interpretations and reactions, given the

context, have great influence. The fluent, successful jewelry designer should understand both those universal and subjective aspects of color.

The initial discussion below, however, primarily concerns itself about color as a design element – that is, as something universal and objective.

(1) After Images

The first research had to do with **After Images**. If you stare at a particular color long enough, and close your eyes, you'll begin to see the color on the opposite side of the color wheel. So, if you stare at red, close your eyes, and you'll see green.

I know you want to do this, so stare away:



So our first color-sensation tools are based on **LIGHT VALUE**. Each color has its own energy signature. This seems to be universally perceived, and perceived in the same way.

Some colors have a positive energy signature; other colors have a negative energy signature. The brain wants to balance these out and harmonize them into some kind of zero-sum outcome. Everyone seems to see after images and see the same after images. It seems that the eye/brain wants somehow to neutralize the energy in color to achieve some balance or 0.0 point. *The brain always seeks a balanced energy in light and color.* The human eye is only "satisfied" when the complementary color is established.

[This is the basis underlying the various color schemes below.]

If red had an energy of +10 (*I'm making up this scale*), and the eye/brain then convinced your psyche to see green, then I would suppose that green would have an energy of -10. Hence, we reach a 0.0 point ($+10 - 10 = 0$).

Again, the brain wants balance, harmony, beauty, non-threatening situations. The brain does *not* want edginess, tension, anxiety, fear, or ugliness. So, when you perceive red, your brain, in knee-jerk fashion, and in the absence of other information which might lead to a different interpretation of the situation, tries to compensate for the imbalance by also seeing green.

And we can continue to speculate that your eye/brain does Not want you the designer to overly clarify and intensify, should this result in a more resonant, perhaps edgy, composition. This takes you too far away from 0.0 energy, and starts to become threatening. It might excite you. It might revolt you. In either case you would react, feel, sense the power of color, but maybe not in a more balanced way the eye/brain would prefer.

But all jewelry designers need to know, and this is important, that their guiding star is "Resonance", and this can take you a little beyond the harmony the brain seeks. Creating a little "edginess" in your jewelry can't hurt, and might better help in achieving finish and success. But creating too much "edginess" might strike too forcefully at the heart of our

prewired anxiety response, and our brain will not let us go there. Your eye/brain *does Not* want you to push yourself and your jewelry too far to the edge with color. This countervailing force might create tensions with your artistic and design intentions.

The eye/brain wants balance, harmony, monotony. Red and green can seem so much fun at Christmas time. But if you put your red and green necklace on a copy machine, and took a photocopy of it, it would all look like one color of black. Red and green will always copy as the same color and shade of black.

And that is how we perceive them. And cognate them. We see red and green as the same. As the same color black. And if we assign red a +10 score, and green a -10 score, the eye/brain is happy to end up with a 0.0 score. This combination can be boring and monotonous. Combinations of red and green can feel unified and appear varied, yet somehow fail as choices in our jewelry designs.

And it is important to recognized that if, your composition only uses red, that in reality, when something doesn't balance off the color red, in this case, the brain will create its own after image – some sensation of green -- to force that balance. The brain wants to feel safe and in harmony and balance. Everyone's brain seems to operate similarly so that this aspect of perceiving color is universally employed.

How far the jewelry designer should fight this universal tendency is up for debate. However, when initially picking colors to combine in a piece, we might try to achieve this 0.0 balance score (thus, a point of harmony and balance), and then, by clarifying and intensifying, deviate from it a little bit, but always with an eye on that 0.0 – what anyone's eye/brain is driving it to do. We want the eye/brain to feel satisfied and "safe", but as a designer, we also want to give the jewelry a punch, a wow, an edge. There are many color tricks and techniques that the designer can apply here.

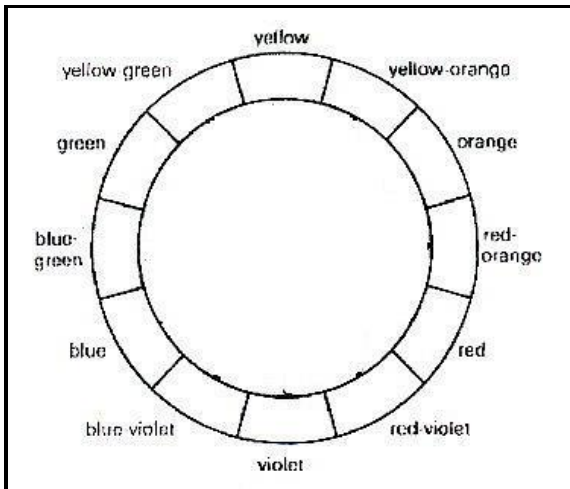
(2) The Color Wheel: A Spectrum of Light Values

Science and Art Theory have provided us with tools to help us pick and combine colors. One tool is the Color Wheel. With almost every book about color, there is a Color Wheel. Some are more detailed than others. Some are easier to turn and manipulate. They all have different colors at the North, South, East and West points, but it is the same series of colors, ordered in the same way, color to color.

It is important to understand how to use the Color Wheel. This curtain of color provides the insights for selecting and arranging colors that might go together well. The color wheel helps us delineate what color choices we can make, and which combinations of colors might work the best together, to achieve a perceived harmony and balance.

The Color Wheel is a tool and a guide. It's not an absolute. Beads don't always conform to the colors on the wheel; nor do they reflect light and color in ways consistent with how these colors appear on the wheel.

Look at this color wheel:



Get some color pencils, and color in all the colors around the wheel.

On the Color Wheel, there are 12 colors arranged into three families of color.

The **Primary Color** ^[3] family includes three colors: yellow, blue and red. These colors present the world as **Absolutes**. They are definitive, certain, and steady. They convey intelligence, security, and clarity.

The **Secondary Color** family includes those colors you can make by mixing any two primary colors. These three colors are: green, orange and violet. These colors present the world as **Contingencies**. They are situational, dependent on something, and questioning. They convey questioning, inquiry, risks assessed against benefits.

The **Tertiary Color** family includes six colors. Each of these colors is a mix of one of the primary colors and one of the secondary colors. These include: red-violet, yellow-orange, blue-green, blue-violet, yellow-green, red-orange. These colors show **Transitions**. These colors are useful for transitioning from one primary or secondary color to the next. They bridge, integrate, tie things together, stretch things out. They give a sense of before and after, lower then higher, inside and outside, betwixt and between. They convey ambiguity or a teetering on the fulcrum of a scale.

As you begin to pick colors, you will also want to manipulate them – make them lighter or darker, brighter or duller, more forward projecting or more receding, and the like. Expressions of color are referred to as *attributes*. Expressive attributes are the ways you use color as building blocks in design. So, here are some important building block/color terms/attributes and vocabulary.

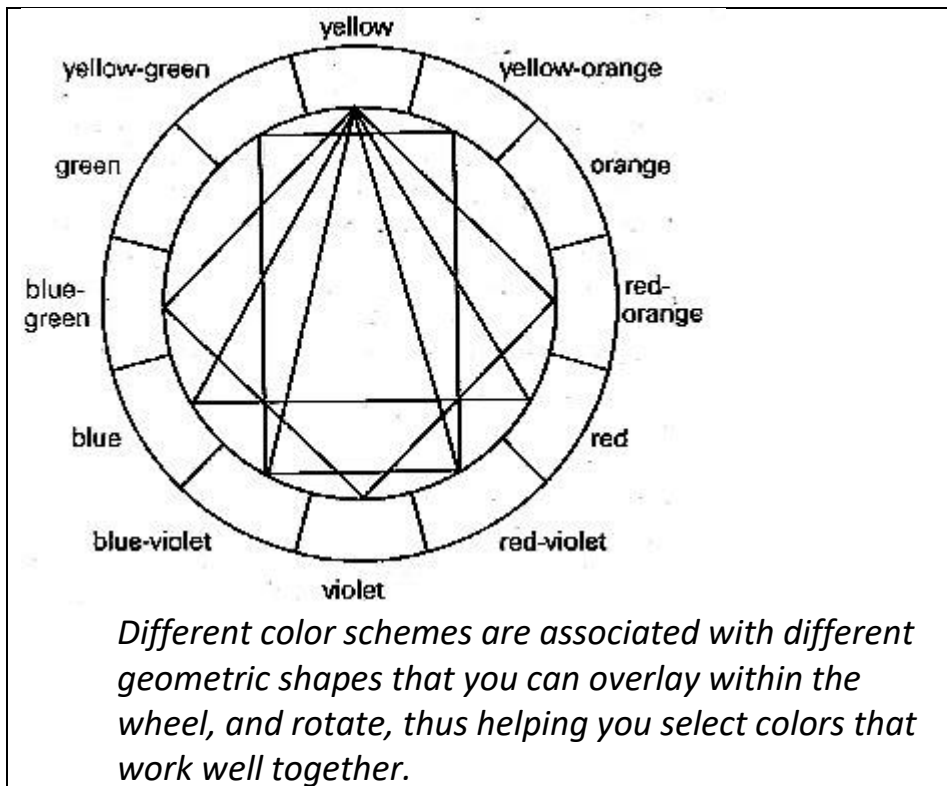
(3) Color Schemes – Rules for Balancing Light Values

Color schemes are different, universally recognized and proven ways to use and combine colors, in order to achieve a pleasing or satisfying result.

Good color combinations based on color schemes have balanced, harmonious tonal values – their light energy levels balance out at the zero-zero (0.0) point. Better designers like to tweak these combinations a bit, in order to evoke an emotional and resonant response to their work.

Color Schemes, then, as represented in a Color Wheel, are based on harmonizing (e.g., zero-sum) combinations of colors. Color schemes – like the split complementary scheme of violet, yellow-green and yellow-orange – are different combinations of colors the Light Values of which add up to zero, and achieve harmony.

You can place geometric shapes inside the Color Wheel, and rotate them, and where the points hit the wheel, you have a good color combination. For example, if you place an equilateral triangle (all sides are equal length) within the circle, as in the diagram below, the points touch Yellow, Red and Blue. If you rotate it two colors to the right, it touches Orange, Violet and Green.



With color schemes, you always need to think about things like:

1. Whether one color should predominate, or all colors should be more or less equal
2. Whether there should always be a "splash of color", as interior designers like to say -- a "drama" color to achieve exciting, focal, look at me first effects
3. If symmetry works with or against your color choices
4. If you need to adjust intensity (brightness) or value (lightness) in each color, to get a better sense of satisfaction
5. If you need to adjust the proportions or distributional patterns or arrangements of each color used; that is, experiment with same colors, different placement or different sizes or different quantities or different shapes or mixes of shapes

Let's look at the three most popular, often-used Color Schemes – **Analogous, Complementary, and Split Complementary.**

Analogous

The analogous color scheme is where you pick any 3 hues which are adjacent to one another on the color wheel. For example, you might pick yellow-green, yellow, and yellow-orange. This scheme is a little trickier than it seems. It works best when no color predominates. Where the intensity of each color is similar. And the design is symmetrical. I also think this scheme works best when you have blocks of each color, rather than alternating each color. That is, BETTER: color 1, 1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, 3 rather than WORSE: color 1, 2, 3, 2, 1, 2, 3, 2, 1, 2, 3, 2, 1.

Complementary (*also known as "true complementary" or "dyadic"*)

The complementary color scheme is where you pick any 2 colors which are the direct opposite on the color wheel. For example, you might pick yellow and violet. To use this color scheme effectively, you would balance the

contrast of the colors by value (lightness/darkness) and/or intensity (brightness/dullness). In this color scheme, one color has to predominate.

Split Complementary

This is the most popular color scheme. Here you choose three colors: a hue and the hues on either side of its complement. For example, you might choose yellow and blue-violet and red-violet (*thus, the two colors on either side of Violet – the complement*). In this scheme, one color needs to predominate. This scheme works well with both symmetrical and asymmetrical designs. You can use an isosceles triangle (*has two sides with equal length*) within the Color Wheel to pick colors.

One thing I like to do with this scheme is arrange all my beads, then replace one color with one of the others, and vice versa. Let's say you had 20 blue-green (aqua), 10 orange, and 5 red beads, which you had laid out in a satisfactory arrangement. You could change it to 20 orange, 10 blue-green, and 5 red beads, and it would look just as good.

A lot of people have difficulty using the color *orange* in jewelry designs, but find it easy to use *blue-green*. Here's a nifty way to trick them into using *orange*, and liking it. Do the composition with *blue-green* dominant, then switch out all the *blue-green* for *orange*, and any *orange* you used for *blue-green*.

There are many other color schemes. Some examples:

Analogous Complementary.(3 analogous colors, and one complement of one of these 3). Example: blue-violet, violet, red-violet with yellow-green.

Triadic: (3 tertiary hues equidistant on the color wheel.) Example: red-violet, yellow-orange, and blue-green. You can use an equilateral triangle within the color wheel to help you pick choices.

Tetradic: (Using 4 colors, a double complementary scheme). Example: Yellow-green, orange, red-violet, and blue. You can use a square or rectangle within the color wheel to help you pick choices.

Hexadic: (Using 5 colors). Can use a pentagon within the color wheel to select your colors.

Monochromatic: (A single hue, though with different intensities, tints and shades)

Achromatic: (black and white and gray (without color))

Neutrals: (mixes of hues to get browns (or grays))

Clash: (combines a color hue with a color on either side of its complement).

Example: blue w/red-orange or orange-yellow

There are many books, as well as free on-line color scheme designer apps to check out and play with.

(4) Color Proportions and the *Sensation of Color Contrasts*

Just because the colors picked conformed to a Color Wheel, doesn't mean that they will be successful within your jewelry composition. It turns out that making color choices based on Light Values alone are less than perfect. Colors do not occur in a vacuum. They appear next to other colors. They appear within a situation or context. They reflect and refract light and shadow differently, depending on setting, lighting, and context.

That means, perceiving and recognizing one or more colors is important information to have, but not enough information for the brain to determine if the object is satisfying or not, or safe or not. People do not yet have enough information to make an absolute choice whether to wear or buy a piece of jewelry, at this point.

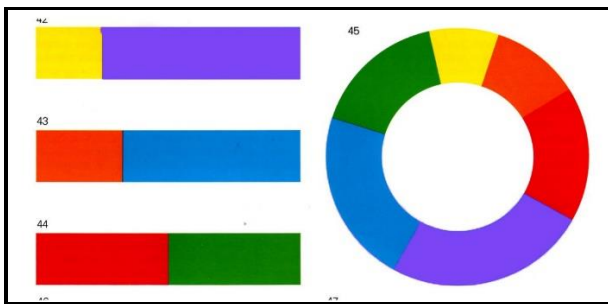
This brings us to the sensation of *Color Contrasts*. ***Colors appear together in different proportions.*** This also affects the brain's processes of trying to harmonize them – that is, achieve a light value of zero.

Another series of color research focused on the effects of *color proportions*. These scientifically derived proportions show the joint effect of 2 or more colors, if the brain is to score their sum as a value of 0.0. (*Again, I've made up this scoring, but you get the point about reaching equilibrium*). The brain would like to know, not only what color it is, but what proportion relative to other colors, we have before us.

As designers, to achieve a sense of harmony and balance, we are going to mimic what the brain does when seeing more than one color – we are going to vary the proportions so that, in combination, the sense of that perceptual and cognitive zero-sum game is still maintained.

And again, I'll make the point that not all compositions have to be perfectly harmonious.

Itten has a picture of the ideal and relative proportions of colors in harmony and balance.



Yellow to purple, 1:4 (This is read as "1 in 4", and means that *given 4 parts, 1 should be yellow and the remaining 3 should be purple.*)

Orange to blue, 1:3

Red to green, 1:2

Yellow to orange: 1:1.3

Choreographing Color Blending and Transitioning:
Playing With Proportions



ColorBlock Bracelet, Warren Feld, 2017 (playing with progressive proportions)

Every so often, you might want to create a rainbow, or some sequencing of colors, say from light to dark, where all the colors seem to emerge from the last, and bleed into the next. This is much more difficult with beads than with paints for all the usual reasons discussed above.

A "Random" selection or placement of colors doesn't usually work as well as selecting and placing based on some more mathematical formula. "Alternating" or "graduating" colors doesn't always work as well, either. You must create a more complex, involved patterning. You must choreograph the layout of colors, so that, from a short distance, they look like they are blending, and gradually changing across the length of your piece.



Monet's Garden Bracelet, Kathleen Lynam, 2013 (using math formula)

One of the easier mathematical formulas to come up with as a way to choreograph things, is to play with color proportions. Go bead by bead or row by row, and begin with the ideal proportionate relationship between two colors. Gradually manipulate this down the piece by anticipating the next ideal proportionate relationship between the next two colors that need to follow.

In fact, any kind of statistical or mathematical formula underlying an arrangement will work better than something random or intuitive, when managing color blending and transitions.

(5) Simultaneity Effects and the Sensation of Simultaneous Color Contrasts

It turns out there is even more to how the brain recognizes and tries to harmonize colors. Knowing (1) the color (*light value*) and (2) the relative proportions (*contrasts*) of color within the piece of jewelry is necessary, but still not enough for the brain to decide whether the piece of jewelry will be satisfying, finished and successful, or somewhat ugly, buyable or wearable.

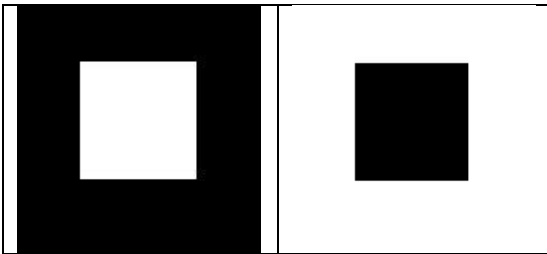
Some colors, when sitting on or near a particular color, are experienced differently, than when sitting on or near a different color. The line of research we are focusing on here deals with what are called **Simultaneity Effects**. *Colors can be affected by other colors around them (simultaneous color contrasts)*. Colors in the presence of other colors get perceived differently, depending on the color combination.

Simultaneity Effects are a boon to the jewelry designer. They are great tools for such things as...

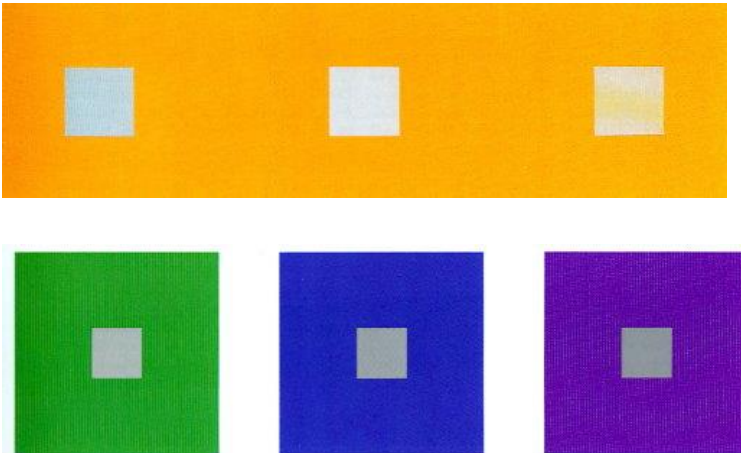
- Filling in the gaps of light between beads
- Assisting in the blending of colors or the sense of movement of colors along a line or plane

- Assisting in establishing dimensionality in a piece that otherwise would appear flat
- Harmonizing 2 or more colors which, on as a set, don't quite match up on the color wheel
- Establishing frames, boundaries or silhouettes
- Re-directing the eye to another place, or creating sense of movement

For example, a White Square on a Black background looks bigger than a Black Square on a white background. White reaches out and overflows the boundary; black contracts.



Gray always picks up some of the color characteristics of other colors around it.



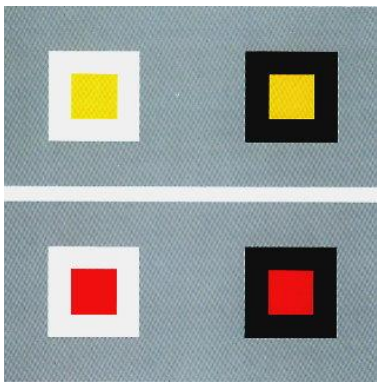
Existence of these *simultaneity effects* is a great piece of information for the designer. There will be gaps of color and light between beads. Many

bead colors are imperfect, particularly in combination. Playing with what I call "grays" [thus, *simultaneity effects*] gives the designer tools to overcome some of the color limitations associated with the bead.

Simultaneity effects trick the brain into filling in those gaps of light between beads. Simultaneity effects trick the brain into believing colors are more connected and blended and mutually-supportive than they would, if separately evaluated. Simultaneity effects trick the brain into seeing satisfying arrangements, rhythms, and dimensionality, where, without them, things would be unsatisfying instead.

A final example of simultaneity effects has to do with how people sense whether colors are warm or cool. In one composition, depending on the color mix, a particular color might be felt as "warm". In a second composition, with a different color mix, that same color might be felt as "cool".

Here the yellow square surrounded by white feels lighter, brighter and a different temperature than its counterpart. The red square surrounded by the black feels darker, duller, and a different temperature than its counterpart.



Again, simultaneity effects give tools to the jewelry designer for intensifying and clarifying the design, without disturbing the eye/brain pre-wired fear and anxiety responses. These allow you to "blend" and build "bridges" and create "transitions." You have a lot of tricks to use here which enable

you to push the envelop with your designs. And still have your piece be judged as beautiful and appealing.

Simultaneity Effects are some of the easiest things the jewelry artist can control and manipulate, to fool the brain just a little bit. They let you bring in unexpected colors, and fool the brain into seeing color coordination and color blending. They let you convince the brain that the color proportions are correct when, in reality, they are not. They let you convince the brain to jump the cliff, which the gap between beads presents.

For the brain, gaps between beads – that is, areas with undefined colors, creates work for the brain, and is fraught with danger. The brain has to actually construct a color and meaning to fill in this gap. Without any clues or rules or assistance, it is more risky for the brain to *jump the cliff*, so to speak, and fill in the gaps with color, than it is for the brain to follow an easier pathway and simply define the jewelry as ugly or boring and reject it and move on. Similarly, simultaneity effects convince the brain to look around corners, go into crevices, explore and move around the whole piece from end to end.

It is at this point in the design process where the jewelry artist must be most fluent, creative and strategic in using color. *It is primarily and most often through establishing, and then managing, the sensation of simultaneous color contrasts where the artist begins to build that connection between audience and self, wearer and resonance, the wearing-of and the context, coherency and contagion.*

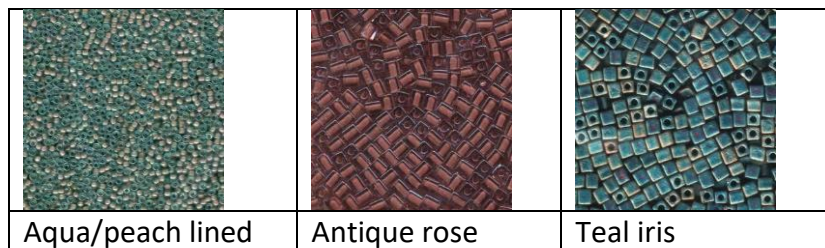
With Simultaneity Effects, colors begin to take on meanings and emotions. These can be as simple as sensations of warm and color, close and far, approaching and fleeing, soft and harsh. Or they can be much more complex, even thematic and symbolic.

**The Use of "GRAYS" (*simultaneity effects*) to tie things together –
Blending and Bridging**

With beads, the eye often needs to merge or coordinate colors, as it scans any piece. And then there are the gaps of light between beads. The eye needs help in spanning those gaps. The Artist needs to build color "bridges" and "transitions", so that the eye doesn't fall off a cliff or have to make a leap of death from one bead, across the *gap*, all the way to the next.

One easy technique to use is to play with simultaneity effects. One such effect is where gray takes on the characteristics of the color(s) around it.

In beads, there are many colors that function as "grays" - gray, black diamond, alexandrite, Montana blue, prairie green, fuchsia, Colorado topaz – colors that have a lot of black or gray tones to them. Most color lined beads result in a gray effect (*where the class encasing distorts the inside color*). Metallic finishes can result in a gray effect.



In one piece I made, for example, I used 11/0 peach lined aqua beads as a "gray" to tie in larger teal and antique rose beads together. While aqua is different than teal and the peach is different than the antique rose, in combination, the aqua/peach-lined beads acted like a *gray*. When close to the teal iris beads, the aqua took on the teal color; when close to the antique rose beads, the peach took on the antique rose color. Gray colors pull from one bead, and transition to the next in a very subtle way, that tricks the brain, but does not disturb it.

Expressive Attributes of Color and Color Contrasts: Important Color Terms and Vocabulary

Each color on the wheel is called a **HUE**. Hues are pure colors – any color except black or white. And if you look again, there is no black or white on the Color Wheel.

BLACK is the absence of color. We consider black to be opaque. Usually, when people see black, they tend to see shadows. With black, designs tend to feel older, more antique’y, richer, more traditional and solid, and seem to have a patina around them.

WHITE is all the colors merged together. When all colors in “light” merge, you get White. When all the colors in paints or pigments are merged, you get a neutral gray-black or beige. With White, designs tend to feel sharper, brighter, more contemporary.

INTENSITY and VALUE. Better jewelry designers are those who master how to play with **INTENSITIES** and play with **VALUES**. This means they know and are comfortable with manipulating bright and dull (*intensity*), and light and dark (*value*). They know the subtle differences among red, pink and maroon, and how viewers react to these. They know how to punctuate – BAM! – with Yellow, and EASE - with purple, and CALM - with blue.

The contrasts between *Bright and Dull* or *Light and Dark* are not quite the same. *Bright and Dull (intensity)* has to do with how much white, gray or black underlay the Hue or pure color. Low intensity is duller; high intensity is brighter. Think of a Stop Sign. It could have just as easily been Red, Pink or Maroon. Red is the most intense – the brightest of the 3 – and hence the sign is Red. You can see red from the farthest distance away. Red is “Bright (*intensity*)”, but not necessarily “Lighter (*values*)” than Pink or Maroon.

The contrasts between *Light and Dark* are called **VALUES**. A lower value is darker, though not necessarily duller (*intensity*). Pink has a higher value

than maroon, because it is lighter. Yellow is the lightest color; violet is the darkest. Yellow has a higher value than violet.

Unfortunately, in many texts and guides written by Bead Artists and Jewelry Designers, they combine the concepts of intensity and value into a single concept they refer to as "*Values*". Bead Artists and Colorists often write that the "secret" to using colors is to vary "values". When they refer to "values", they are actually combining these two color theory concepts – "values" and "intensities". Both are really different, so this combined meaning is a disservice to the bead artist and jewelry designer trying to learn to control color choices and color expression.

INTENSITY AND VALUES EXERCISE

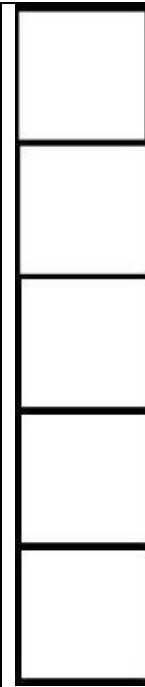
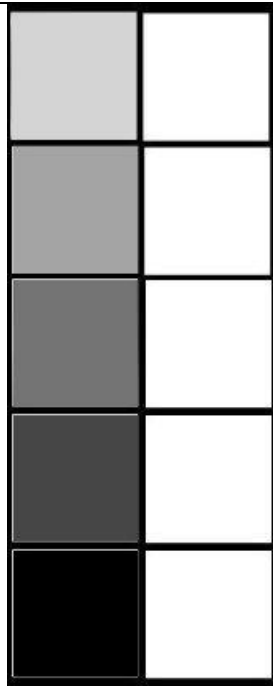
Intensity Exercise:

Use your Blue Pencil, as well as your White, Gray and Black Pencils, to color in the 2nd column. Start by coloring in all the squares with a medium shade of blue.

Using your white, gray and black pencils, now vary the darkness of the blue to approximate the darkness of the grays in the 1st column.

Values Exercise:

Using your Blue Pencil only, color in each cell in the table below, making the top cell the lightest (highest value), subsequent cells darker than the previous ones, and the last bottom cell, the darkest (lowest value). [Press lightly on the pencil when coloring in the first cell, and then harder and harder as you go down the column.]



So, as you work with people to create jewelry for them, you make choices about, and then manipulate:

- colors
- balance and harmony (distribution, placement, and proportions)
- intensities
- values
- simultaneity effects

Let's say you wanted to design a necklace with blue tones. If you were designing this necklace for someone to wear at work, it would probably be made up of several blue colors which vary in *values*, but *Not* in *intensities*. To give it some interest, it might be a mix of light blue, blue, dark blue and very dark blue. Thus, the piece is pretty, but does not force any power or sexuality issues on the situation.

If you were making this same necklace for someone to go out on the town one evening, you might use several blue colors which vary in *intensity*. You might mix periwinkles and Montana blues and cobalt blues and blue quartzes. You want to make a power or sensual statement here, and the typical necklace someone would wear to work just won't do.

Let's continue with some more important color building blocks or concepts.



TINT, **SHADE** and **TONE** are similar to values and intensities. They are another way of saying similar things about manipulating color Hues. **TINTS** are colors with white added to them. Pink is a tint of Red. **SHADES** are colors with black or gray added to them. Maroon is a shade of Red. And **TONES** define the relative darkness of a color. Violet is a dark tone and yellow is a light tone. Red and green have the same tonal value. "Tones" are what copy machines pick up, and the depth of the black on a photocopy relates to the tonal value of the colors on the original paper you are copying. Red and green photocopy the same black color. They have the same tonal value.

TEMPERATURE. Colors also have Temperature. Some colors are **WARM**. The addition of black tends to warm colors up. Warm colors are usually

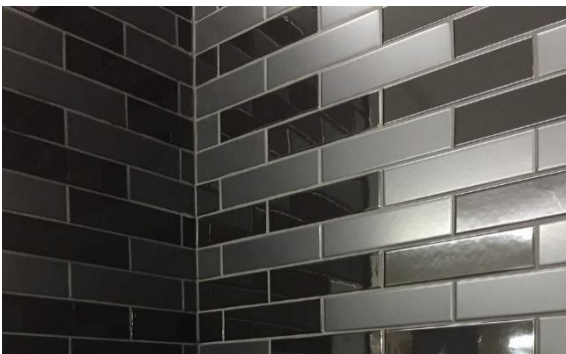
based in Red. Red-Orange is considered the warmest color. Warm colors tend to project forward.

COOL colors are usually based in Blue. Green-blue is the coldest color. Addition of white often cools colors. Cool colors tend to recede.

Given the other colors which surround them, however, usually warm colors may appear cold, and vice versa.



Juxtaposing colors creates **MOVEMENT** and **RHYTHM**. By creating patterns, you guide the brain/eye in its circuitous route around the piece, as it tries to make sense of it. Juxtaposing Warm with Cool colors increases the speed or sense of movement.



Some colors tend to **PROJECT FORWARD** and others tend to **RECEDE**. Yellow is an advancing color. Black recedes. You can play with this effect

to trick the viewer into seeing a more **MULTI-DIMENSIONAL** piece of jewelry before her. By mixing different colors and different finishes, you can create a marvelous sense of dimensionality.

- Faceted, Glossy beads will tend to look closer and capture the foreground
- Smooth, Glossy beads will tend to capture the middle ground
- Matte, Dull, Frosted, or Muted beads will tend to fall into the background

To Reiterate Some of The Key Ideas and Understandings

The color research begins to open up ideas about how the brain processes color, and which of these processes might be seen as universal, and which more subjective.

The brain first perceives, then tries to understand the color as a color. It senses *Light Values*.

The brain perceives, then tries to understand the color relative to other colors around it. It senses *Color Contrasts*.

At the same time, the brain perceives and tries to understand the color within some context or situation, to gauge more meaning or emotional content. It interprets *Simultaneous Color Contrasts* within the boundaries of a context, situation, personal or group culture.

The END RESULT is simple:

Should we consider the jewelry to be finished and successful?

Should we like the jewelry or not like it?

Should it get and hold our attention, or not?

Should we approach it, or avoid it?

Should we get excited about it, or not?

Should we comment about it to others?

Should we buy it?

Should we wear it?

All this perceptual and cognitive and interpretive activity happens very quickly, but somewhat messy. Some of it follows universal precepts. Some of it is very subjective. Our brain is trying everything it can to make sense of the situation. It tries to zero-sum the light values. It has to take in information about a color's energy signature. It has to take in information about how much of one color there is in relation to other colors. It has to take in information about emotional and other meaningful content the juxtaposition of any group of colors within any context or situation represents.

With any piece of jewelry, the artist and designer is at the core of this all. It is the designer, in anticipation of how others perceive, recognize and interpret colors in their lives, who establishes how color is used, and manages its expression within the piece. The jewelry designer is the manager. The designer is the controller. The designer is the influencer. The designer establishes and conveys intent and meaning.

DECODING COLOR AS A DESIGN ELEMENT



A composition in orange and blue.

Art and design theory informs us how to objectively use color. That means, there are universally accepted shared understandings and

expectations about what makes a piece of jewelry more satisfying (or dissatisfying) in terms of choices about color.

So, when we refer to our lessons above about color use, and examine the orange and blue necklace above, we can recognize some problematic choices about color.

The first is about color proportions. The most satisfying proportionate relationship between orange and blue is 1:3. That means, for every 3 parts, one should be orange and two should be blue. In our illustrated composition, the relationship is more 1:2 or half orange and half blue. To make this piece more attractive and satisfying, we would need to reduce the amount of orange and increase the amount of blue.

The second is about color schemes. Here we have a 2-color, complimentary color scheme. To make this piece more attractive and satisfying as a complimentary color scheme, we have learned that one of the two colors should predominate. Either we have to add more orange, or have to add more blue.

So, we have decoded our Color Design Element and we see that the proportions are less than optimal, and the color scheme chosen is less than optimal. To make the necklace more appealing, and in conformance with universally agreed upon understandings about good color use, we will need to increase the amount of blue and decrease the amount of orange, so that we get a 1:3 (orange to blue) proportionate outcome, and we allow one color to predominate.

Let's look at another example:



Composition in green, white and red.

First, white is not considered a color. We can ignore it.

Second, proportionately, there should be equal amounts of green to that of red. The relationship is 1:2, meaning for every 2 parts, 1 should be green and 1 should be red. Proportionately, in this piece, we are close to this proportionate relationship.

Third, we have, in effect, since we ignore white, a 2-color complimentary color scheme. We have learned that in this scheme, one color should predominate.

That means, in this composition, the current use of color will not and cannot work. It results in an unacceptable and unsatisfying use of color. Proportionately, both colors need to be equal. Color Scheme wise, one color needs to clearly predominate. We can't conform to both universally-accepted shared understandings about the use of green and red in a 2-color scheme.

DESIGNING JEWELRY WITH COLOR

Always remember that your choice of color(s) should be secondary to the choices you make about concept, theme, arrangement and organization.

Color should be used to enhance your design thinking. Color should not, however, be the design.

When we study color from a design standpoint, we think of color as part of the jewelry's structure. That means, color is not merely a decorative effect or object. It is more like an integral building component which has been organized or arranged within a larger composition. As a component, it is a "Design Element". Color is the most important Design Element. It can both stand alone, as well as easily be combined with other Design Elements. There are some universal aspects when color is objectively understood as an element of design. As part of an arrangement, we begin to treat color in terms of Principles of Composition, Construction and Manipulation. Color takes on some subjectivity. Its effects become much more dependent on the artist's intent and the situation in which the jewelry is worn.

Color is used to express meaning and enhance meaningful expressions. We use color to express elements of the materials used, like glass or gemstone. We use color to express or emphasize elements of the forms we are creating. We use color to enhance a sense of movement or dimension. We use color to express moods and emotions. We use color to influence others in sharing the artist's inspirations and aspirations.

As designers, we...

- Anticipate how the parts we use to make a piece of jewelry assert their needs for color
- Anticipate shared universal understandings among self, viewer, wearer, exhibitor and seller about color and its use
- Think through how colors relate to our inspirations and how they might impact our aspirations
- Pick colors
- Place and arrange colors
- Distribute the proportions of colors
- Play with and experiment with color values and color intensities
- Leverage the synergistic effects and what happens when two (or more) colors are placed next to one another
- Create focus, rhythm, balance, dimension and movement with color

- Create satisfying blending and transitioning strategies using color
- Anticipate how color and the play of color within our piece might be affected by contextual or situational variables
- Reflect on how our choices about color affect how the piece of jewelry is judged as finished and successful by our various client audiences
- Use color to promote the coherency of our pieces, and the speed and extent to which attention by others continues to spread

Fluent designers can decode color and its use intuitively and quickly, and apply color in more expressive ways to convey inspiration, show the artist's strategy and intent, and trigger an especially resonant, energetic response by wearers and viewers alike.

Don't get into a Color Rut

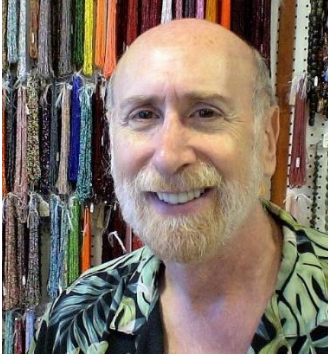
And a last piece of advice.

Don't get into a color rut. Experiment with different colors. Force yourself to use colors you usually do not use or avoid. If it's too psychologically painful, make a game of it.

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For Warren Feld, Jewelry Designer, (www.warrenfeldjewelry.com), beading and jewelry making have been wonderful adventures. These adventures have taken Warren from the basics of bead stringing and bead weaving, to wire working, wire weaving and silversmithing, and onward to more complex jewelry designs which build on the strengths of a full range of technical skills and experiences.

Warren leads a group of instructors at Be Dazzled Beads (www.bedazzledbeads.com). He teaches many of the bead-weaving, bead-stringing, wire weaving, jewelry design and business-oriented courses. He works with people just getting started with beading and jewelry making, as well as those with more experience. Many of his classes and projects have been turned into kits, available for purchase from www.warrenfeldjewelry.com or www.landofodds.com. He conducts workshops at many sites around the US, and the world.

Join Warren for an enrichment-travel adventure on [Your World Of Jewelry Making Cruises](#).

His pieces have appeared in beading and jewelry magazines and books. One piece is in the Swarovski museum in Innsbruck, Austria.

He is probably best known for creating the international [The Ugly Necklace Contest](#), where good jewelry designers attempt to overcome our pre-wired brains' fear response for resisting anything Ugly.

He is currently writing a book – *Fluency In Design: Do You Speak Jewelry?*

FOOTNOTES

[1] Pantone website <https://www.pantone.com>

[2] Itten, Johannes. *The Elements of Color: A Treatise on the Color System of Johannes Itten*, NY: John Wiley & Sons, 2001

[3] In reality, the selection of primary colors is arbitrary. The primary colors depend on the light source, the color of the background, and the biology of the color-sensing components of the eye. We choose red-yellow-blue when referencing painting or coloring on white background, like paper. We choose red-green-blue when referencing color placed on a black background, such as a TV or computer screen. We choose cyan-maroon-yellow-black when using overlapping inks to create color on a white background, and better reproduce true colors. We understand that the eye sees red-greenish yellow-blue-violet most clearly.

Color References Worth Checking Out

Rockport Publishers, *Color Harmony Workbook*, Gloucester, MA: Rockport Publishers, 1999.

Deeb, Margie. *The Beader's Guide to Jewelry Design*, NY: Lark Jewelry & Beading, 2014.