BUSINESS STRATEGY: RETHINKING COLOR CHOICES
STRATEGIC APPLICATIONS OF AESTHETIC SCIENCE

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1. INTRODUCTION

In 2012, major corporations positioned themselves with distinctive color stories, from Target's "Color Changes Everything" to Ford's "Inner Mustang" campaign. Color has traditionally been in a product designer's domain with product colors carried over into marketing materials. But as user-focused design strategy continues to infiltrate innovation planning, and consumers continue to use products to self-define, should color's highly visible role become more strategic? This paper investigates the relationship between color and business strategy, and looks at new research in the field of aesthetic science. Are business and design strategists equipped with the color knowledge needed to lead trends instead of follow them? And as the population ages, do long-term business strategies need to reflect consumers' extended history with color stories? Is there a better way for businesses to approach color decisions?

2. AESTHETIC SCIENCE: IS COLOR A NUMBER?

Color is a contentious subject, generally seen as a highly subjective product element and primarily decorative - an emotional prompter but unquantifiable. For centuries, people (primarily artists and philosophers) have studied color. In the 20th century, scientists and engineers researched color from a physiological perspective, creating much vision research data and defining technical properties of physical color reception. However, though most people will agree that color is somehow "important", there has been little research into "why people in general like some colors more than others" (Palmer and Schloss, 2011).

But recently there has been new research and growing interest at the intersection of cognitive science, psychology, and aesthetic studies, in elucidating the "why" behind human color preferences. A research team at the University of California, Berkeley, spearheaded by Professor Stephen Palmer, has been studying color preferences, along with other aesthetic properties, and put forth a theory in 2010 that, somewhat surprisingly, has been delivering consistent results. This cross-disciplinary field of inquiry, which they have dubbed "aesthetic science" could have long range influence on product design. If human responses to color are more easily predictable than previously thought, color choices become based less on intuition, risky trends and artistic premonition, and instead become strategic new product development and business growth decisions.

2.1. THE ECOLOGICAL VALENCE THEORY OF HUMAN COLOR PREFERENCE

After doing initial research into human color preferences, Professors Palmer and Karen Schloss devised what they call The Ecological Valence Theory of Human Color Preference. Simply put, "people like colors to the degree that they like the objects that are strongly associated with that color, and dislike colors to the degree that they dislike the objects that are strongly associated with that color." (Palmer, 2012) So, in theory, blues and greens would be well liked, as they are associated with clear skies and beautiful green pastures. Browns, dark yellows, and chartreuse greens would be disliked, as they resemble vomit, rotting food and human waste. Intuitively, this makes sense to most people. Empirically tested, the initial study results support the theory with impressive numbers. "The EVT [Ecological Valence Theory] provides a clear and plausible explanation of color preferences: The preferences are caused by affective responses to correspondingly colored objects" (Palmer & Schloss, 2010).
2.2. DELINEATING COLOR PREFERENCES

Before delving into the EVT research, Palmer's UC Berkeley group gathered data on general [American] color preferences. They used a simplistic spectrum of Red, Orange, Yellow, Chartreuse, Green, Cyan, Blue and Purple. (Note, here in this paper, the popular definition of the word "color" is used, and does not refer to extreme neutral colors such as black and white.) As they note, "the fact that the basic hue preference pattern [that they] measured largely agrees with earlier studies and with the pattern of looking biases found in infants suggest that at least some aspects of human color preferences may be universal." Though individual preference vary, for the purposes of this paper and its intended audience, the overarching preferences can be generally summarized as follows: Blue dominates consistently, regardless of saturation, though in general, saturated colors are preferred over light or muted colors. Greens, especially when they tend towards the Kelly, emerald or deeper tones, are well liked. Yellows and oranges are less popular. Purple, when it tends toward blue (indigos, royal purple, not magenta) did well. Yellow greens, chartreuse tones, dark murky golds and deep brownish oranges were liked the least. (Perhaps explaining the phrase "puke green" and the short-lived appeal of the 1970s' avocado colored appliances.) Red seems to be the wild card - responses to red varied more than the other colors, though deep, dark red got high marks for being appealing.

![Color preference data](https://via.placeholder.com/150)

Figure 1. Color preference data (Palmer, 2009/2012) using Red, Orange, Yellow, Chartreuse, Green, Cyan, Blue and Purple.

A larger, similar study was done in the early 1940s; note the similarities: "A combination of the data from 21,060 observers in 26 investigations on preference for single colors yields several results. A weighted-average order of preferences (from most to least preferred) for the six common hues based on the combined results of 26 investigations, in which there were considerable variations in results, is a follows: Blue, Red, Green, Violet, Orange, Yellow." (Eysenck, 1941, as cited in Burnham et al., 1963).

The fashion industry also follows these patterns. "Staple colours are generally considered to be dark blues, greens and reds, black, white and light neutral colors, such as cream or beige and browns: these often seem to dominate the colour palette" (Diane and Cassidy, 2005). Trend, fashion or "fad" colors, tend towards light greens, magentas and yellow/orange spectrums. Fashion, because of its faster cycles, has a tendency to lead product goods in short color trends.

**Infant Color Preferences**

Color preferences seem to also be supported by research on infant color preferences. Babies' preferences cannot be recorded directly due to verbal communication limitations, thus current research looks at how long infants visually linger on certain objects. Very small children show a predilection for red, which gradually fades as they mature. Per a 2007 study (Zemach and Teller), the researchers "found that 12-week old infants looked longest at 'blue' and 'purple', least at 'yellow' and 'green', and had a moderate preference for 'red'.” These results
generally aligned again with Burnham, who noted in 1963 that "children's color preferences develop and shift with age, showing a tendency to move from warm to cool colors with increasing years."

Despite the consistency of responses across studies and time, all results are tempered by observations that "colour preference in adults appears to be not only determined by biological components, but also moderated by cultural context, as there are cross-cultural variations in preference" (Franklin, 2010). As discussed later in this paper, consumers' past context for color often anchors their response to it.

3. CURRENT STRATEGIC PARADIGMS: COLOR FORECASTING

Many large companies rely on color forecasting consultants to create color stories and design direction for their products. But much of "the colour forecasting process is based upon subjective tools such as intuition, inspiration and creativity. These aspects in general [are] considered to be little understood in themselves" (Diane & Cassidy, 2005). With today's advancing design research techniques, good forecasters aim to reveal cultural insights and define segment standards. However, there is, and has been, much debate over whether a color forecast is a crystal-ball of trend prediction or if it merely creates forced bubbles of color trends by putting pressure on industry output. Historically, direct consumer preference is generally overlooked in color and trend forecasting, despite the accepted knowledge that upwards of 80% of consumers say that color would or does influence their purchase decision.

3.1. PUSH VS. PULL DESIGN

As Diane and Cassidy note in their 2005 book, Color Forecasting, forecasting services were established "to deal with the problem of anticipating the colour demand/preferences of the consumer prior to the industry's production time plan (lead time)." It is essentially an issue of predicting demand so as to produce appropriate supply. Similar to push vs. pull marketing strategies, this structure pushes color decisions from the manufacturer to the retailer and eventually to the consumer. As human-centered design and user-customization grows, there has been more feedback from the retailers based on consumer preferences. Retailers have been "relaying their observations and evaluation of the needs of the consumer back to the manufacturers, shifting the influence on colour direction" back towards the point of purchase and the end-user.

Given what is known about innate color preference patterns, pull strategies - which require high consumer involvement and loyalty - may be more effective. At very least, business strategists should understand that promoting a chartreuse color story may require a push strategy, but a royal blue story might create a natural wave of pull.

3.2. DITCHING THE FORECAST: USER DRIVEN COLOR PREFERENCES OR "COLOR ON DEMAND"

Despite the efforts that go into color forecasting, "judging by the end-of-season sales..., consumers' needs are still not being met successfully. This may be due to the fact that observations of consumer desire reflect colours already available; one cannot observe the general public [choosing] colours not available to purchase" (Diane & Cassidy, 2005).

But crowd-sourcing and design-on-demand products are slowly filling this gap between user-preferred color choices and industry driven options. Putting the consumer in the driver's seat allows them greater influence over color. Companies such as Spoonflower.com, which allows consumers to design and purchase small quantities of fabric, and ModCloth, where consumers can "Be the Buyer" and vote up favorite products, are growing rapidly. Design-on-demand products (mostly found online) should be carefully watched for color trends. Here the user, outside of any manufacturers dictates, is choosing their own product colors.

When consumers are allowed to make their own color choices, their preferences, again, seem to follow the findings of Palmer and Schloss. Take, for example, the company Threadless, a fashion retailer whose product line is driven by user input. "Threadless designs are created by and chosen by an online community. Each week, about 1,000 designs are submitted online and are put to a public vote. ...Based on the average score and community feedback, about 10 designs are selected each week, printed on clothing and other products, and sold worldwide." (Wikipedia, June 2012)
A quick snapshot, shown below, of available t-shirts sorted by their website's Color selection tool, reveals that their product colors follow the same consistent preference patterns. Blues dominate, while orange and yellow are less popular.

![Graph showing color preferences for t-shirts on Threadless.com]

Table 1. Threadless.com's t-shirt selections, sorted by color in June 2012.

By changing the "choice architecture", consumers make subtle but impactful changes in choice behavior. Choice architects create incentives that consumers are easily attracted to - they make the choice easy (Thaler and Sunstein, 2009). Color, though somewhat intangible in function, plays a meaningful role in purchasing decisions - perhaps more often than consumers themselves recognize.

4. COLOR STORIES AND AGING CONSUMERS

Once color and trend forecasting is developed, the information is used by manufacturers and retailers to create annual or seasonal color stories. Color stories provide an aesthetic direction for product development and are designed to be part of a larger strategic picture - providing tightly woven themes, aligned with company branding and reflective of current cultural influences. As time passes, color stories can often be reflections of an era - for example, the electric colors of Pucci's 1960s' fashions, the avocado green of the 1970s' kitchen appliances, the Miami Vice pinks of the 1980s, etc. Once color themes have passed, we often refer to them as "dated".

4.1. "BOOMERANG" COLOR STORIES

Historically, color stories were fairly long lived. Consequently, within their lifetime consumers were only faced with new-to-them color stories. To put this in perspective, antiques have historically been defined as items over 100 years old. Vintage designation is looser, but generally refers to items at least 25 years old. But as fashions change more rapidly, due to a consumerist society, more advanced materials, social media, and improved delivery operations, the cycle of color stories is becoming shorter. At the same time, the average consumer's lifespan is lengthening. So, for the first time, consumers are experiencing color stories as they boomerang back into circulation. These echoic color stories - quite popular, given the current cultural fondness for "vintage" - are contextually loaded with both nostalgia and bygone connotations.

For example, I was recently talking with a woman in her late 60s at a local Crate & Barrel store. She was looking at their floor cushion pouf, a current 2012 product, covered with Marimekko's Unikko print, designed by Maija Isola in 1964. To a Millennial consumer, this is a brand new product, a fresh look. But this older consumer looked at it and said, with a hint of exasperation, "This is such an old print." and then continued on with a reflection on how her family had been "The Marimekko family of the 70s". Asked if she minded seeing an "old print", she thought for a moment and hesitantly said, "No... it is a classic, right?" Herein lies the key - "classic" is "good", "old" is "bad".
As the Crate & Barrel website notes, the Marimekko print has been “reproduced in infinite color combinations over its 47-year history, [thus] the pattern remains current while symbolizing the free spirit of its designer and those who admire it.” (And unlike originals, the 2012 fabric is “spun polyester that is weather and UV-resistant.”) Astute color choices have made this product both "new" and "classic" to a broad span of loyal customers. But great care should be taken to know your customer's history with color. If your market segment is Millennials, a scheme of colors reflective of the seventies may seem fresh (or vintage in a "hipster" way) but not "old" - they have no past associations with it. But if your market demographic is an older Baby Boomer, you should carefully consider if your consumer's past experiences would taint the product experience you are hoping to create.

4.2. REFLECTIVE DESIGN

Don Norman discusses the three levels of the cognitive and emotional system in his book *Emotional Design*: visceral, behavioral and reflective. "There is one other distinction among the [three levels]: time. The visceral and behavioral levels are about "now," your feelings and experiences while actually seeing or using the product. But the reflective level extends much longer -- through reflection you remember the past and contemplate the future. Reflective design, therefore, is about long-term relations, about the feelings of satisfaction produced by owning, displaying and using a product." As a consumer's relationship with old color stories is revived, the reflective element of design plays a larger role in their product or brand experience. Done well, this leaves opportunity for companies to create lifetime customers, even generational loyalties. Done poorly, and a company will be forever chasing (potentially fatal) new color stories, at the risk of raising customer churn rates. "Acquired responses due to training and experience are just as real as native (inborn) responses" (Burnham, 1963). Good product development will consider not only prevailing color preferences and aesthetic science, but also the product's color history and reflective elements. This is where design research and observational studies can tease out social, cultural, and emotional reactions to products (Kumar and Whitney, 2007).

5. APPLYING AESTHETIC SCIENCE AND REFLECTIVE DESIGN TO YOUR BUSINESS STRATEGY

Color can be a very divisive hot-button issue, often sidelined as "emotional", "intuitive" and non-critical to the "big picture". Business managers brow-beaten by enthusiastic product designers may think the color debate purely "decorative" and a minor strategic decision. However, aesthetic science potentially provides metrics for assessing the viability and potential success of color choices in a meaningful way. Why does this matter? Color choices are critical to product success and subsequent business triumphs. Color may be one of the most critical factors in product/consumer interactions - and yet it is possibly the most difficult element of a design to support, justify, quantify or verify. In 2010, the Design Management Institute and researchers at the University of Virginia’s Darden School of Business did a follow up study on how well designers and
business management were actually integrating at the strategic level. Not surprisingly, they found a continued gap in understanding across the domains:

You don't sell design in business organizations by telling managers to think like designers. Despite differences in definition and ownership, one nearly universal point of agreement emerged - the term design thinking was fraught with problems in all but the most design-savvy organizations. Managers, we were told, found the term confusing and off-putting. Many of our interviewees noted that executives often hear the word design and think only of the aesthetics of a physical object, or even the final stage in the development of a product - cake decoration, as one interviewee described it. So how do you sell design, we asked? "Talk like a strategist, not a designer:" we were told. Adopt business language; talk about business outcomes. Speak to customer impact, brand, revenue growth, and return on investment - things that are on managers minds. Tell stories of design's successes, and develop metrics to demonstrate them." (Carr et al.)

Aesthetic science has the ability to provide some metrics to demonstrate color's power and value. Note, the point is not to oversimplify the matter and say that color responses are entirely innate and all products should be, say, blue. Color is one component of a bigger picture. But combined with a customer-centered business focus and design research sensitive to consumers' history with color, color choices can be supported as strategic, rather than the outcome of intuitive (and unquantifiable) design insight. There can be huge financial repercussions from bad color decisions, not to mention brand degradation. Designers and managers do not always agree on "what sells" or why. Aesthetic science helps to address both of these unknowns in a manner that can support both design and business decisions.

"Strategy involves focus and, therefore choice. And choice means setting aside some goals in favor of others" (Rumelt, 2011). Color is often considered a choice without much verifiable impact. However, if producing a slightly darker blue toned green product, over a slightly lighter lime green product, will potentially garner a company 10-20% more purchase preference (and probable sales), that small shift could mean the difference between meeting or missing financial markers. As in all strategic forecasting, outcomes are essentially unknown. But by looking backwards (reflective design), understanding dominant preferences (aesthetic science), and making user-centered design an integral part of business strategy, companies are well positioned for positive outcomes. It is often said that "compromise" is code for "everyone loses"; professional negotiators promote logrolling choices, giving stakeholders the ability to create positive outcomes for everyone. Color should be a strategic tool, logrolled into big-picture corporate strategy, not a decorative afterthought.

The "White Shirt" Theory

Lastly, a word of caution: before detailing the "why" behind color choices, it is first important to decide if you need color at all. Today's consumer is inundated with choices, and often overwhelmed by the options and trade-offs. Depending on your company's product offerings, it is possible color will only serve to add confusion to purchase decisions (along with raising production costs and fulfillment complexities.) There are many examples of company's that have limited product color selections to their benefit. For example, Apple's current products, and stores, are predominantly neutral, leaving colorful item personalization up to consumers and accessory suppliers (in 1998 even the Apple logo lost its color) (Segall, 2012). Anne Fontaine clothing focuses on innovating around the white shirt; Chanel made the little black dress legendary. As Don Norman asserts, "the principles underlying visceral design are wired in, consistent across people and cultures. If you design according to these rules, your design will always be attractive, even if somewhat simple." As the saying goes, you can't please everyone all of the time, and product proliferation rarely creates market leaders. In a world driven by Technicolor experiences, it is interesting to note that the latest Academy Award winning film, The Artist, was in black and white. There are, of course, times when removing color has more impact than adding it.
Figure 3. A "colorful" American shopping mall (left) and *The Artist*, black and white Best Picture Academy Award Winner.

6. CONCLUSION

Color is, at the end of the day, still a highly subjective and emotional component of any product. It is extremely relational and should always be considered in context - aesthetically, historically and strategically. But as Jake Nickell, Co-Founder of Threadless, commented in *Inc.* magazine, "Why wouldn't you want to make the products that people want you to make?" Customer-centric business choices make sense - for both the designer and business strategist. Roger Martin, Dean of the Rotman School of Management at the University of Toronto points out that "designers make executives nervous by combining what appears to be a lack of interest in rigorous, quantitative analysis with the inclination to propose, with apparently reckless abandon, radical departures from the past." Aesthetic science, combined with hands on observational research and reflective design methods, has the potential to bring concrete clarity and strategic direction to pivotal color decisions.
REFERENCES


