Official College and University Colors: Student Perception vs. Performance Realities

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Abstract

Each year rising numbers of prospective students begin their pursuit of a college degree. As of 2010-2011, the National Center for Education Statistics reports an estimated 4,599 degree granting institutions in the US alone (U.S. Department of Education, National Center for Education Statistics, 2013). This large pool of options leaves students grappling with how to select an institution, and what qualifiers to use. While commonly used qualifiers such as geographic location, academic ranking, athletic ranking, social environment, and cost of education have been explored in academic literature, anecdotal evidence suggests that other, atypical determinants might also be considered in the selection process. One such qualifier may lie within the university brand itself. Specifically, collegiate logos, mascots and other symbols convey an image of the institution to potential students. According to Silayoi and Speece (2004, 2007), these symbols contain "design elements, such as color, …used as a way to communicate with consumers and play a substantial role in consumer decision making when shopping time is limited." All students are "consumers", "shopping" for an educational institution. In an environment where the decision and application process can take months of commitment, students look to utilize these elements to inform heuristic-driven associations with existing attitudes and beliefs. If a school presents in a manner which incurs or creates a negative association in the minds of potential consumers, they fail to make it past the first stages of relevancy. Astoundingly, colleges and universities in the United States have been taking drastic measures to ensure they do not fall prey to this omission from the relevant choice pool. The past two decades have seen a substantial increase in educational institutions in the United States undergoing institutional transformation to attain such preferential associations (Morphew, C.C. , 2000; Owston, 2007); a staggering 785 experiencing name changes, alone between 1992 and 2001 (Owston, 2007). What if the key to retaining attention of target prospective students is as simple as waving the proper school colors? This research aims to isolate the effects of color associations on two of traditional qualifying factors, (a) academic performance and (b) athletic performance, and the subsequent beliefs about the success and credibility of the institution overall. Following the work of Ridgway (2011), this study was conducted with a mixed method of secondary and primary research. First, brand congruency is tested by comparing perceptions of official school colors with reputable ranking systems to determine the impact of color on perception of success. A combination of academic and athletic rankings was used in this section. These results are used to develop a consumer survey to determine societal color perception association to a series of generic logos in numerous color combinations. Results and implications are discussed.

Keywords: (Colors, Perception, Performance)

1. Introduction

Economic viability and desirability are closely linked concepts when business is approached through a marketing lens; it takes customer desire to drive an organizations success and continued viability. As educational institutions become ever more labeled as a unique sect of business and as the pool of college-bound consumers increases colleges and universities must differentiate themselves from competitors, taking considerable care to attract the right candidates.

This ushers the question "what is the right candidate?" That depends greatly on what outcome is desired and what product is offered. For University X this may mean searching for an intellectual focused, business minded student, while for the University Y this "right" student may be athletically inclined and someone who values physical strength and success.

Operating in a culture where news can be caught in 30-second recaps, where Twitter and Facebook are ingrained in the population, and where apps such as Tinder groom individuals to make snap judgments based solely on appearance, businesses, including educational institutions, must perfect their 30-second impression and capitalize on any unique determinants that potential consumers may be considering in the selection process.

In the past two decades, prevalence numbers of educational institutions in the United States have undergone institutional brand transformation in an attempt to reap the financial and market benefits (Morphew, C.C., 2000). When an institution rebrands, they are effectively motioning towards brand congruency, or "alignment of the organizations "… logo and brand personality [, which are] often key points of association for consumers" (Pittard, N., Ewing, M., & Jevons, C., 2007). One prominent factor in these associations is color. Official college/university colors are embodied in everything from mascots and logos, to key chains and institutional property. It is therefore crucial to align logo and brand personality not only with each other, but also with the desired consumers wants and needs.

This is where color takes the forefront of the process; it is often the first thing we see, and the strongest association we hold, serving as a means to "attract new [students] and to facilitate identification with the brand" (Grossman, R., & Wisenblit, J. Z., 1999). It is then of upmost importance to both understand which colors historically have performed the strongest, being athletic and academic performance, respectively. Building upon the foundation of these defined colors pools, research must further understanding of the perceptions most commonly associations with these colors limited in scope to the industry of higher education.

2. Purpose Statement

This research addresses two primary issues: (1) to isolate the effects of color associations on two traditional factors - academic performance and athletic performance - in institutions of higher education, and (2) the subsequent beliefs about the success and credibility of the institution overall as a result of these associations. This research supports further investigation into the impact of color associations on decision making processes by substantiating the information driving college and university rebranding. The conclusions drawn from this study may assist in providing institutions with information to effectively garner the attention and enrollment of desired potential students, bettering their institution through emphasized brand congruency.

3. Literature

Prefacing the study conducted there have been several sources of information from which this research draws, primarily that of Jessica Ridgway (2011). Collectively this prior research touches upon ideas that feed into the concepts of the proposed research, offering a base of knowledge and criteria with which to strengthen arguments for the importance of further investigation.

3.1 Color

Colors are variations in manifestation of light. Light is carried on wavelengths, measured in nanometers, (Ridgeway, 2011) with visible light and associated colors falling between 400 -700 (nm). This wavelength is composed of six major divisions of color: red, orange, yellow, green, blue, and violet (Singh, 2006). Shorter wavelengths result in human perception of warmer colors; reds, oranges, and yellows. Longer wavelengths produce cooler colors; blues, greens, and shades of violet. While there are wavelengths extending past the natural sight range (ultraviolet and infrared), this research remains primarily concerned with those colors defined in the visible light spectrum.

3.2 Color Associations

By way of life experience there is often a natural accumulation of memories. Based on the theory of associative learning, these memories and subsequent associations hold the key to how individuals assess the world around them moving forward, be it strengthening a perception of a brand, or developing an inclination to favor one color over others. Color is often used as a method for information interpretation (Zelansky, Fisher, 2010), where each color holds associative meanings within a culture, and at times across cultures. For example, as outlined by Ridgway (2011):

> *"Red can be associated with fire or blood, (Grossman & Wisenblit, 1999) love and health, (Kargere, 1979) and courage (Birren, 1950). Red is also known as an appetite stimulant (Hynes, 2009). Green is associated with nature and growth (Birren, 1950) but can also be symbolic of jealousy (Kargere, 1979). According to Kargere (1979) orange is the color of wisdom while Birren (1950) sees it as the hue for strength and yellow is the color of intellect and loyalty (Birren, 1950). Blue is described as sincere and purple is associated with royalty (Birren, 1950)."*

Color, rich in associative meaning, is an influential marketing tool that significantly impacts consumer decision making and purchase (Hemphill, 1996). When applied to the business-consumer interaction of the higher education experience this potential for physiological effect on desired potential students' falls primarily into the realm of branding and proper color application.

3.3 The Institution of Brands and the Practice of Branding

Branding, as defined by businessdictionary.com is "… creating a unique name and image for a product in the consumers' mind…" ("What is branding?"). Branding is the culmination of brand elements including colors, logos, symbols, advertising campaigns, and brand representation; it is, effectively, the image and linked associations of the brand with the goal of differentiating an organization from market competitors and boosting memorable presence in consumers' minds.
A large part of this branding is reliant on creation of an effective logo. A logo is a visual representation of a brand, generally consisting of color, size, and font elements with deep intrinsic meaning and relevance to the company and or product. Logos may be beneficial to brands in two distinct ways: (a) by being used in conjunction with the brand name; (b) by being used in place of the actual name (Kohli, Suri, and Thakor, 2002; Ridgeway, 2011), each "helps to create associations that the consumer begins to recognize and helps to create a relationship between the consumer and brand" (Ridgeway, 2011).

3.4 Color as Brand Personality

Color is a principle component of logo design, contributing to the overall appeal and evoking an emotional response from viewers (Tractinsky & Lowengart, 2007). In a consumer's evaluative stage of aesthetic appeal rapid judgments are made resulting in either positive or negative feelings towards the brand (Tractinsky & Lowengart, 2007), based on associations and linked affect previously discussed. Due to the immediate nature of this evaluation process, businesses must vigilantly strive to choose visual elements that conjure a positive feeling. Color, being that it is so deeply linked with meaning and emotional weight, both positive and negative, when used correctly, is a manner of achieving the desired positive response and in turn build brand equity (Bottomley & Doyle, 2006).

4. Methodology

This study was completed in two parts. The first being secondary exploratory research utilized to develop our research instrument, and the second part being the administration and analysis of the survey instrument to measure student perception based on foundations set in preceding secondary research phase.

4.1 Secondary Exploratory Research: Developing Study Process and Sample Selection

This research drew findings from an exploratory observational research, where data was collected on institutions ranking on two pre-determined success standard lists a.) The 2012-2013 NCAA end of season rankings and b.) The 2012 Forbes Top 50 Colleges and Universities list. Forbes Top 50 serves as a reputable academic ranking of colleges and universities within the limits of the national boundaries of this research. For athletic rankings, in efforts to stabilize the swing of results limited to one sport, 2 sports were utilized forming two separate lists; one of more mainstream popularity, basketball, and a second of lesser media attention, cross country running. Both sports were examined and results recorded for both Men's and Women's, Division one and Division 3.

From these lists and exhaustive list of represented schools, respective NCAA division assignment and the state of location for each were generated. Official School Colors were then attached to each of these institutions in listed order as they appeared on the respective institutions Wikipedia page. For example, Notre Dame official colors were listed as Blue, Gold, and Metallic Gold. This resulted in a spreadsheet recording of Blue as the primary color, Gold as secondary, and Metallic Gold as tertiary, each color listed in corresponding separate columns. Colors that were only represented on the list once and had a close relative in hue (i.e. North Carolina blue and light blue) were renamed to the mainstream color and were represented as members of the modified color grouping.

Exhaustive lists of a) each individual color present across all represented schools and b) each color combination present across all represented schools were constructed for each of the three following defined groupings: academic ranking institutions, NCAA Basketball ranking institutions, and NCAA Cross Country rankings. A master list was generated by compiling results from the aforementioned three groups.

4.2 Analysis of collected data: Phase 1

Percentages per official color level were then calculated from both the individual and combination color lists previously described (i.e. x% blue in primary colors, x% blue in secondary colors, and so on). This data was then translated into charts and subsequent donut graphs (shown below) representing the percentage of each colors prevalence in the reputable "success" lists and revealing color pockets and trends overall as well as within each grouping of interest (Academic, Basketball, Cross Country).

After this list of prevalence of colors present (reflected in percent) in the top performing colleges and universities was developed, colors were divided into 3 tiers of prevalence (High, Medium, Low) based in naturally occurring pockets of percentages found in the data. This process was repeated for primary, secondary, and tertiary colors and percentages were cumulatively analyzed as to result in 9 pockets each for academic, basketball, and cross country listings of color prevalence. These nine pockets were listed out from most prevalent to least and through use of a random number generator 3 colors were pulled from each category for representation on our survey instrument. Where the same color was randomly selected twice, a new random number was generated until a previously unselected color(s) was chosen. This process was repeated for color combinations.

## 4.3 Primary Data Collection: The Survey Instrument

The research instrument chosen to collect data on student perception was comprised of 5 sections: 1) A consent form 2) a brief color blindness test using a sample of the Ishihara colorblindness test, featuring number embedded images to test for both warm and cool color perception 3) color swatches pulled from 9 lists of 3 tiers explained above. This section asked students to rate the strength of their association between 6 traits and the presented color on a Likert scale of 1 to 5 where 5 signifies the strongest association and 1 the weakest association. The six traits in question were physical strength, high intelligence, wealth, success, status/prestige, and openness/friendliness. 4) Generic school logo containing the pre-determined color combinations derived from the above listed process. For this section one logo was presented per page to minimize the effects of comparison between logos on student perception of colors. Students were asked to use an identical Likert scale to rate their perception of association between an institution with presented colors and the same six traits presented in the single color portion of the survey. They were then asked to also rank the fake institution based on its supposed logo using 1, 2, and 3 only once each per logo to reflect their perceptions of the likelihood of the institutions presence on the 3 following ranked lists: (1) The Forbes Top 50 (2) NCAA End of Season Top rankings, or (3) The Princeton Review Top Party Schools. The final portion of the survey was demographics collection asking age, major, institution of attendance, etc. Students were also asked to self-report favorite professional sports teams, if any.

This survey was disseminated at a small, undergraduate, liberal arts school. The survey was given pencil and paper to eliminate the effect of variance in computer screen brightness and associated impact on color perception. Students took the survey in class. All years and variety of majors were represented. Thirty one useable surveys were collected; each assigned a unique test ID.

4.4 Analysis

Data was analyzed from an Excel spreadsheet recording rankings for each color/color combination and each trait, where each color has a group of 6 columns and each of the six columns represent each of the 6 traits asked about on the survey. Each row represents a different test ID. Once Likert rankings were assigned to corresponding cells for each useable survey, an average score for each color and each trait was generated. This average score was then documented as the assumed general student perception of the color(s) in relation to the corresponding trait. These averaged scores were categorized into blocks of incremental strength of association increasing by .49 on the 1 to 5 ranking scale. The classifications of strength of association were as follows:

Table 1. Classification of Strength of Association

Very Weak	Weak	Neutral	Minor	Strong	Very Strong
2.01-2.5	2.51-3	3.01-3.5	3.51-4	4.01-4.5	4.51-5
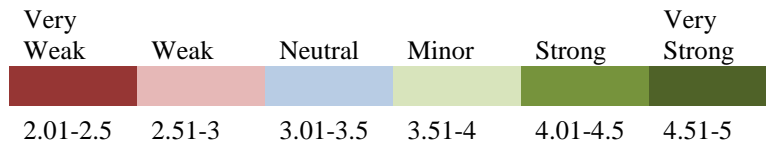
The highest and lowest scoring colors and color combinations were recorded for each trait and used to develop a Top 5, Bottom 5 chart depicting the most strongly associated colors for each trait and the least associated colors for the same traits being tested. A correlation matrix was generated to reveal any potential associations between perceptions attached to various colors and or color combinations.

Once perceptions were accounted for color pockets identified and mapped on sections of the United States. These sections were pulled from United States Census Bureau website as follows;

Table 2. Color Pockets Identified and Mapped on Sections of the United States.

North East	The South	The Midwest	The West
New England	South Atlantic	East North Central	Mountain Region
Middle Atlantic	East South Central	West North Central	Pacific
	West South Central		

Note: United State Census Bureau website.

These color pockets were identified by looking at geographical locations of schools with the same official institution colors. Groupings of 3 or more schools of the same color in the same section of the United States were mapped with coordinating color dots on a map.

5. Data:

5.1 Color and Color Combination Prevalence in Academic Ranking Institutions:

1 color presence probability	1	2	3	TOTALS:	% Chance
Blue	21	3	0	24	48.00%
White	0	15	2	17	34.00%
Gold	4	9	1	14	28.00%
Black	1	7	1	9	18.00%
Red	9	0	0	9	18.00%
Grey	0	7	0	7	14.00%
Maroon	5	0	0	5	10.00%
Purple	5	0	0	5	10.00%
Orange	3	0	0	3	6.00%
Green	2	0	0	2	4.00%
Maize	2	0	0	2	4.00%
Brown	0	2	0	2	4.00%
Silver	0	1	1	2	4.00%

Color combination presence		%Chance
Blue/White	7	14.00%
Blue/Gold	4	8.00%
Blue/Grey	3	6.00%
Gold/Black	3	6.00%
Maroon/White	3	6.00%
Red/Black	3	6.00%
Red/Grey	3	6.00%
Maise/Blue	2	4.00%
Maroon/Gold	2	4.00%
Purple/White	2	4.00%
Purple	2	4.00%
Black/White	1	2.00%
Blue/Brown	1	2.00%
Blue/Gold/Metallic Gold	1	2.00%
Blue/Red	1	2.00%
Blue/Silver	1	2.00%
Blue	1	2.00%
Gold/Grey/Black	1	2.00%
Green/Gold	1	2.00%
Green	1	2.00%
Orange/Black	1	2.00%
Orange/Blue	1	2.00%
Orange/White	1	2.00%
Purple/Gold/White	1	2.00%
Red/Brown/White	1	2.00%
Red/White	1	2.00%
Red	1	2.00%

Figure 1: Figure one represents the level of occurrence (in percent) of single colors present in the academic ranking institutions list utilized in this study.

Figure 2: Figure two represents the level of occurrence (in percent) of color combinations present in the academic ranking institutions list utilized in this study.

5.2 Color and Color Combination prevalence in NCAA End of Season Basketball Ranking Institution:

1 Color Presence	1	2	3	4	TOTAL	% Chance
Blue	34	4	0	0	38	43.68%
White	0	26	9	0	35	40.23%
Gold	3	21	2	0	26	29.89%
Red	16	4	0	0	20	22.99%
Black	3	11	1	2	17	19.54%
Green	9	1	0	0	10	11.49%
Orange	4	3	0	0	7	8.05%
Purple	7	0	0	0	7	8.05%
Grey	0	7	0	0	7	8.05%
Maroon	2	0	0	1	3	3.45%
Silver	1	2	0	0	3	3.45%
Crimson	3	0	0	0	3	3.45%
Scarlet	2	0	0	0	2	2.30%
Yellow	2	0	0	0	2	2.30%
Cream	0	2	0	0	2	2.30%
Navy Blue	0	2	0	0	2	2.30%

Color Combination Presence		% Chance
Blue/Gold	10	11.49%
Blue/White	10	11.49%
Red/White	5	5.75%
Black/Gold	5	5.75%
Blue/Grey	4	4.60%
Green/White	4	4.60%
Purple/White	4	4.60%
Blue/Red	3	3.45%
Red/Black	3	3.45%
Blue/Orange	2	2.30%
Maroon/White	2	2.30%
Orange/Black	2	2.30%
Red/Black/White	2	2.30%
Red/Gold	2	2.30%
Scarlet/Cream	2	2.30%
Blue/Dark Blue/White	1	1.15%
Blue/Gold/Mettalic Gold	1	1.15%
Blue/Navy Blue/Burgundy/Maroon	1	1.15%
Blue/Navy Blue/White	1	1.15%
Blue/Red/White	1	1.15%
Blue/Silver	1	1.15%
Crimson/Black	1	1.15%
Crimson/Blue	1	1.15%
Crimson/Cream	1	1.15%
Gold/White	1	1.15%
Green/Blue/Gold	1	1.15%
Green/Brown/Gold/Black	1	1.15%
Green/Gold	1	1.15%
Green/Orange/White	1	1.15%
Green/Red	1	1.15%
Maize/Blue	1	1.15%
Orange/Grey/White	1	1.15%
Orange	1	1.15%
Purple/Gold/White	1	1.15%
Purple/Gold	1	1.15%
Purple	1	1.15%
Red/Gold/White/Black	1	1.15%
Red/Grey/Light Grey	1	1.15%
Red/Silver	1	1.15%
Silver/Gold/Black	1	1.15%
Yellow/Black	1	1.15%
Yellow/Green	1	1.15%

Figure 3: Figure three represents the level of occurrence (in percent) of single colors present in the NCAA basketball end of season ranking institutions list utilized in this study.

Figure 4: Figure four represents the level of occurrence (in percent) of color combinations present in the NCAA basketball end of season ranking institutions list utilized in this study.

5.3 Color and Color Combination prevalence in NCAA End of Season Cross Country Running Ranked Institutions:

1 Color Presence	1	2	3	4	TOTAL:	% Chance
White	0	26	6	1	33	35.11%
Blue	22	7	0	0	29	30.85%
Gold	4	23	1	0	28	29.79%
Black	5	11	3	0	19	20.21%
Red	12	3	0	0	15	15.96%
Orange	11	1	0	0	12	12.77%
Maroon	9	1	0	0	10	10.64%
Green	5	2	0	0	7	7.45%
Purple	7	0	0	0	7	7.45%
Grey	0	7	0	0	7	7.45%
Crimson	3	0	1	0	4	4.26%
silver	2	1	1	0	4	4.26%
Brown	1	2	0	0	3	3.19%
Cardinal	4	0	0	0	4	4.26%
Yellow	3	0	0	0	3	3.19%
Maize	2	0	0	0	2	2.13%
Scarlet	2	0	0	0	2	2.13%
Cream	0	2	0	0	2	2.13%

Figure 5: Figure five represents the level of occurrence (in percent) of single colors present in the NCAA Cross Country running ranking institutions list utilized in this study.

Color Combination Presence		% Chance
Blue/White	8	8.51%
Blue/Gold	6	6.38%
Black/Gold	5	5.32%
Maroon/Gold	5	5.32%
Red/White	5	5.32%
Orange/Black	4	4.26%
Orange/Blue	4	4.26%
Purple/White	4	4.26%
Black/Red	3	3.19%
Maroon/White	3	3.19%
Blue/Grey/White	2	2.13%
Crimson/Cream	2	2.13%
Green/White	2	2.13%
Maize/Blue	2	2.13%
Cardinal/White	2	2.13%
Black/Garnet		1.06%
Black/White		1.06%
Blue/Brown		1.06%
Blue/Gold/Crimson		1.06%
Blue/Gold/Mettalic Gold		1.06%
Blue/Green/Gold		1.06%
Blue/Grey		1.06%
Brown/Gold		1.06%
Burnt Orange/White		1.06%
Cardinal/Grey/Black/White		1.06%
Crimson/Grey		1.06%
Gold/Black/White		1.06%
Green/Gold/Silver		1.06%
Green/Orange		1.06%
Green/Red		1.06%
Maroon/Grey		1.06%
Orange/Maroon		1.06%
Orange/Navy		1.06%
Orange		1.06%
Purple/Gold/White		1.06%
Purple/Gold		1.06%
Purple		1.06%
Red/Gold/Black		1.06%
Red/Gold		1.06%
Red/Grey		1.06%
Red/Silver		1.06%
Red		1.06%
Royal Blue/Dark Blue/White		1.06%
Scarlet/Brown		1.06%
Scarlet		1.06%
Silver/Black/White		1.06%
Silver/Gold/Black		1.06%
Yellow/Blue		1.06%
Green/Yellow		1.06%
Yellow/Red		1.06%

Figure 6: Figure six represents the level of occurrence (in percent) of color combinations present in the NCAA Cross Country running ranking institutions list utilized in this study.

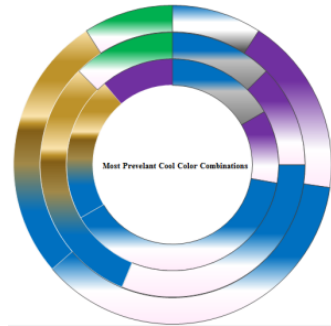## 5.4 Relative Color and Color Combination Prevalence and Color Classification:

Warm Colors				Cool Colors				Neutrals			
Color	Academic	BBALL	XC	Color	Academic	Bball	XC	Color	Academic	Bball	XC
Red	18.00%	22.99%	15.96%	Blue	48.00%	34.04%	30.85%	White	34.00%	31.91%	35.11%
Maroon	10.00%	3.45%	10.64%	Purple	10.00%	8.05%	7.45%	Gold	28.00%	30.85%	29.79%
Orange	6.00%	8.05%	12.77%	Green	4.00%	11.49%	7.45%	Black	18.00%	19.54%	20.21%
Maize	4.00%	1.15%	2.13%	Navy Blue		2.30%	1.06%	Silver	4.00%	3.45%	4.26%
Crimson		3.45%	4.26%	Dark Blue		1.15%	1.06%	Mettalic Gold		1.15%	1.06%
Scarlet		2.30%	2.13%	Royal Blue			1.06%	Light Grey		1.15%	
Yellow		2.30%	3.19%					Grey	14.00%	8.05%	7.45%
Cream		2.30%	2.13%					Brown	4.00%	1.15%	3.19%
Burgundy		2.30%	2.13%								
Cardinal			4.26%								
Burnt Orange			1.06%								
Garnet			1.06%								

Figure 7. Depicts the division of single colors present on all combined ranking lists into warm, cool, and neutral tones for analysis of color trends. These were utilized to generate the comparative donut charts below

Primarily WARM COLORS				Primarily Cool Colors				Neutrals				Warm/Cool Balance			
Color Combinations	Academic	Bball	XC	Color Combination	Academi	Bball	XC	Color	Academi	Bball	XC	Color	Academi	Bball	XC
Cardinal/White			2.13%	Green				Black/White	2.00%		1.06%	Green/Red		1.15%	1.06%
Red/Silver				Blue/MetallicGold/Gold				Black/Gold	6.00%	5.75%	5.32%	Blue/Navy/Burgundy/Maroon		1.15%	
Red	2.00%			Blue/Grey/White			2.13%	Silver/Gold/Black			1.06%	Blue/Red	2.00%	3.45%	
Crimson/Cream			2.13%	Blue/Grey	6.00%	4.60%		Brown/Gold			1.06%	Maize/Blue	4.00%	1.15%	2.13%
Orange/Black	2.00%	2.30%	4.26%	Purple/White	4.00%	4.60%	4.26%	Gold/Black/White			1.06%	Orange/Blue	2.00%	2.30%	4.26%
Maroon/Gold	4.00%		5.32%	Blue/White	14.00%	11.49%	8.51%	Silver/Black/White			1.06%	Yellow/Green		1.15%	1.06%
Red/White	2.00%	5.75%	5.32%	Blue/Gold	8.00%	11.49%	6.38%	Gold/White		1.15%		Blue/Gold/Crimson			1.06%
Maroon/White	6.00%	2.30%	3.19%	Green/White		4.60%	2.13%	Gold/Grey/Blac	2.00%			Green/Orange			1.06%
Red/Black	6.00%	3.45%	3.19%	Purple	4.00%							Orange/Navy			1.06%
Red/Gold		2.30%		Purple/Gold/White								Yellow/Blue			1.06%
Orange				Blue/Dark Blue/White								Blue/Red/White		1.15%	
Red/Grey	6.00%			Green/Blue/Gold								Crimson/Blue		1.15%	
Black/Garnet				Purple/Gold								Green/Orange/White		1.15%	
Burnt Orange/White				Blue/Brown											
Cardinal/Grey/Black/White				Green/Gold/Silver											
Crimson/Grey				Blue/Silver											
Maroon/Grey				Green/Gold											
Orange/Maroon				Blue/Navy Blue/White											
Red/Gold/Black				Green/Brown/Gold/Black											
Scarlet/Brown				Blue											
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Yellow/Black															
Orange/White	2.00%														
Red/Brown/White	2.00%														

Figure 8 depicts the division of color combinations present on all combined ranking lists into warm, cool, and neutral tones for analysis of color trends. These were utilized to create the comparative donut charts below

5.5 Relative color and color combination prevalence's in top performing schools

9. Most Prevalent Cool Colors
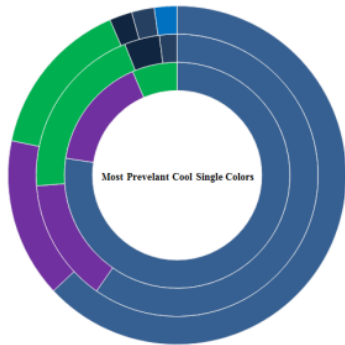

10. Most Prevalent Warm Colors
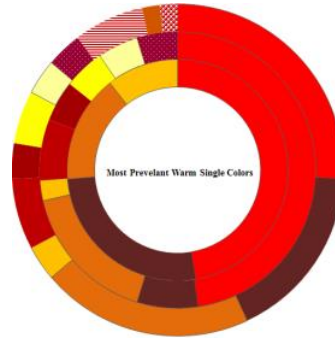

11. Most Prevalent Neutral Colors

12. Top 5 Overall Most Commonly Occurring Color Combinations
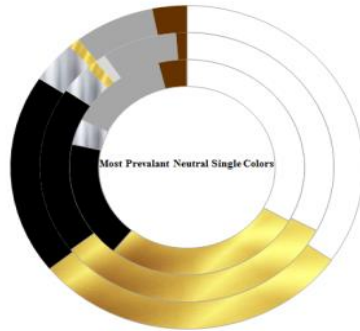
260

Figures 9-12 . Identify the relative proportion of color combinations present in the adhered to successful ranking lists utilized in this study. The charts identify color combinations with corresponding colors and are divided as follows where the outer ring represents Basketball institutions, the mid-range ring represents Cross Country institutions, and the inner most ring is indicative of academic institutions. *see chart above for exact percentages
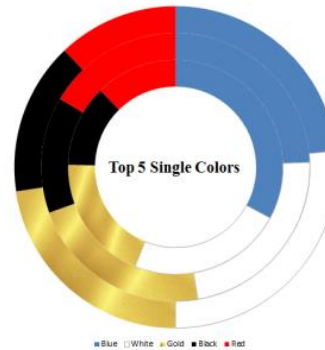
*13. Most Prevalent Cool Colors

14. Most Prevalent Warm Colors

15. Most Prevalent Neutral Colors

16. Top 5 Overall Most Commonly Occurring Single Colors

5.6 Top 5 Strongest and Weakest Color Associations as Derrived From Participant Surveys:

Figures 13-16 Identify the relative proportion of single colors present in the adhered to successful ranking lists utilized in this study. The charts identify color combinations with corresponding colors and are divided as follows where the outer ring represents Basketball institutions, the mid-range ring represents Cross Country institutions, and the inner most ring is indicative of academic institutions. *see chart above for exact percentages

Most Strongly Associated	Physical Strength	avg perceptions core	High Intelligence	avg perceptions core	Wealth	avg perceptions core	Success	avg perceptions core	Status/prestige	avg perceptions core	Openness/friendliness	avg perceptions core
1	Gold	3.89	Gold	3.86	Gold	4.40	Gold	4.34	Gold	4.44	Blue	3.61
2	Red	3.89	Green	3.77	Green	4.09	Green	3.86	White	3.96	Purple	3.60
3	Black	3.50	White	3.66	White	3.44	White	3.71	Green	3.64	White	3.58
4	Crimson	3.45	Blue	3.23	Blue	3.23	Crimson	3.45	Crimson	3.41	Green	3.57
	Green	3.26	Purple	3.21	Yellow	3.09	Maroon	3.27	Purple	3.33	Yellow	3.55
Least Strongly Associated												
1	Grey	2.66	Red	2.98	Red/Grey	2.75	Maize	2.86	Black	2.75	Cream	2.68
2	Purple	2.60	Maize	2.88	Black	2.73	Grey	2.82	Orange	2.68	Grey	2.55
3	Braun	2.41	Black	2.84	Orange	2.64	Black	2.82	Grey	2.64	Braun	2.55
4	White	2.27	Cream	2.64	Cream	2.48	Cream	2.48	Braun	2.34	Red	2.54
5	Cream	2.00	Braun	2.48	Braun	2.41	Braun	2.41	Cream	2.30	Black	2.39

Most Strongly Associated	Physical Strength	avg perceptions core	High Intelligence	avg perceptions core	Wealth	avg perceptions core	Success	avg perceptions core	Status/prestige	avg perceptions core	Openness/friendliness	avg perceptions core
1	Blue/Gold/Meta	4.19	Blue/Gold/MetallicGold	4.23	Blue/Gold/MetallicGold	4.37	Blue/Gold/MetallicGold	4.21	Blue/Gold/MetallicGold	4.33	Blue/Gold/MetallicGold	3.49
2	Blue/Gold	3.9	Blue/Gold	4.07	Blue/Gold	4.19	Blue/Gold	4.12	Maize/Blue	4.05	Maize/Blue	3.42
3	Black/Gold	3.88	Maroon/Gold	3.7	Maroon/Gold	3.86	Maroon/Gold	3.86	Maroon/Gold	3.74	Blue/Red	3.4
4	Maroon/Gold	3.74	Blue/Gold	3.51	Black/Gold	3.51	Blue/Grey	3.81	Black/Gold	3.65	Purple/White	3.36
5	Blue/Navy/Burg	3.61	Red/White	3.51	Maize/Blue	3.49	Black/Gold	3.77	Blue/Grey	3.58	Blue/White	3.3
Least Strongly Associated												
1	Purple/White	2.79	Orange/Black	2.98	Purple/White	2.9	Purple/White	3	Green/Red	2.95	Orange/Black	2.86
2	Crimson/Cream	2.67	Green/Red	2.89	Green/Red	2.8	Orange/Black	2.98	Orange/Black	2.95	Cardinal/White	2.8
3	Orange/Black	2.57	Crimson/Cream	2.77	Red	2.77	Crimson/Cream	2.95	Crimson/Cream	2.91	Maroon/White	2.77
4	Red	2.57	Black/White	2.74	Black/White	2.74	Black/White	2.86	Black/White	2.86	Red	2.61
5	Green/Red	2.48	Red	2.64	Crimson/Cream	2.72	Red	2.8	Red	2.77	Black/White	2.49

Figure 17. Reveals the calculated average scores for the most strongly and least strongly associated colors for each trait listed at the top of each column with the relevant scoring colors.

Scores ranged from 1 to 5, where 5 reflects the strongest possible association between the color and the trait, and where 1 reflects the least strong association between the same two variables. Results are drawn from average scores the colors received during analysis of useable surveys.

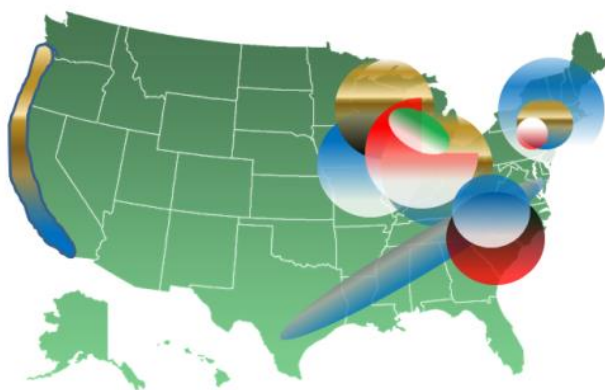## 5.7 Geographic clustering of color combinations found in top ranking institutions:

Figure 18. Shows pockets, defined as 3 or more schools within a defined geographic area*. Colors presented on the map are indicative of the official institutions colors for which they represent.

Major trends to note are Gold and Blue holding a prominent stake on the West Coast, White and Blue holding several pockets around major metropolitan areas, and the frequency of blue, red, and gold as power players of official ranking institution colors. *see end of methodology section for list of geographical areas

6. Conclusions

Drawing from the data collected through both phases of research exploring the question does school colors matter, the answer is yes. Through examination of colleges and universities that ranked in both DI and DIII, Men's and Women's NCAA athletics as well as institutions that ranked academically for the same years, it becomes clear that a small pool of the same colors are represented across the board of these elite schools (see figures 9-12, 13-16). When looking at single color prominence the overwhelming majority of these ranking institutions feature white, blue, red, black, and or gold. While color combinations for the same measurements show slightly more variation in prominence of color, there is still much congruency across the board, primarily showing use of combinations of the 5 most common single colors aforementioned.

   Drawing from this pool of colors, students who participated in a survey provided feedback on perception of colors. Top and Bottom ranking traits for each can be seen in figure 17. An interesting pattern emerged; students ranked their own institutions colors more favorably the longer they had attended said college or university. Freshmen, ranking the universities colors much lower on association to favorable traits tested appeared to have predisposed associations for the colors. For example, Southern Vermont College, where the study was conducted, had a large cohort from Chicago. This group, mainly freshmen from this group, ranked red and black, red and white, and red much more favorably that Southern Vermont's Official Colors. This may be linked to the prominence of the color red in the Chicago area (Figure 18). This suggests that environmental and geographic factors may be at play; however, further investigation is required to confirm these possible trends.

   Overall, darker, more subdued based hues ranked higher on more traditional success measures such as High Intelligence, Wealth, and Physical Strength. Brighter, more vibrant hues proved to be perceived as more friendly. Status/prestige was a category that resulted in a split basket, with a mix of bright and subdued colors reflected in its top and bottom ranking indicator colors.

   Colors, garnering underlying associations to student perception of success, may have great impact on the decision making process of students seeking educational institutions. Although each color holds variation in strength of

association to tested success measures, it may not be advantageous for institutions to drastically rebrand and reinvent with a novel set of colors, as it would fight the associations and the brand congruency students expect and are familiar with. According the concept of banding, rapid and drastic change may destroy the work already done in creation of memorability and costumer identification, perhaps the process of revitalizing a rejuvenation through finding the best version of the institutions' current official colors is the way to manage change responsibly and effectively without alienating current customers.

Further studies may explore linkages between a variety of demographic traits recorded and perceptions of colors tested to assist educational institutions in better determining and reaching target markets. Future works are open to further investigation of the correlation matrix, as well. This research hosts a wealth of collected data for more in depth analysis in new works. Research could potentially be expanded across the country to better test geographic regionalism in color perception and preferences.

7. References:

1. Birren, F. (1950). *Color Psychology and Color Therapy.* New York: McGraw-Hill Book Company, Inc.

2. Bottomley, P. A., & Doyle, J. R. (2006). The interactive effects of colors and products on perceptions of brand logo appropriateness. *Marketing Theory, 6*(63), 63-83.

3. Grossman, R., & Wisenblit, J. Z. (1999). What we know about consumers' color choices. Journal of Marketing Practice, 5(3), 78-88.

4. Grossman, R., & Wisenblit, J. Z. (1999). What we know about consumers' color choices. *Journal of Marketing Practice, 5*(3), 78-88.

5. Hemphill, Michael. (1996) "A note on adults' color–emotion associations." The Journal of genetic psychology 157.3

6. Kargere, A. (1979). *Color and Personality.* New York: Noble Offset Printers, Inc.

7. Kohli, C., Suri, R., & Thakor, M. (2002). Creating effective logos: Insights from theory and practice. *Business Horizons*, 58-64.

8. Morphew, C. C. (2000, May). A rose by any other name: Why colleges become universities. Paper presented at Higher Education Finance Roundtable.

9. Owston, J.M. (2007) Survival of the Fittest? The Rebranding of West Virginia Higher Education. Dissertation. Marshall University Graduate College. Huntington, West Virginia <http://www.newriver.net/dissertation-01.pdf>

10. Pittard, N., Ewing, M., & Jevons, C. (2007). Aesthetic theory and logo design: examining consumer response to proportion across cultures. International Marketing Review, 24(4), 457-473.

11. Ridgway, Jessica (2011). Brand Personality: Consumer's Percepitons of Color Used in Brand Logos (Unpublished doctoral dissertation). University of Missouri, Columbia, MO.

12. Silayoi, P., & Speece, M. (2007). The importance of packaging attributes: A conjoint analysis approach. European Journal of Marketing, 1495-1517

13. Singh, Satyendra (2006). Impact of color on marketing. Journal of Management History. Vol. 44 No. 6, 2006 pp. 783-789

14. Spencer, D. C. (2005). College and university name change: A study of perceived strategy and goal achievement. (Doctoral dissertation, University of Virginia). UMI No. 3161630.

15. Tractinsky, N., & Lowengart, O. (2007). Web-store aesthetics in E-Retailing: A conceptual Framework and Some Theoretical Implications. *Academy of Marketing Science Review, 11*(1), 1-18.

16. U.S. Department of Education, National Center for Education Statistics. (2013). Digest of Education Statistics, 2012 (NCES 2014-015) < http://nces.ed.gov/fastfacts/display.asp?id=84>

17. What is branding? definition and meaning. (n.d.). Retrieved June 13, 2015, from http://www.businessdictionary.com/definition/branding.html

18. Zelanski, P., & Fisher, M. (2010). *Color.* Upper Saddle River, NJ: Prentice Hall.