

Colors in Marketing: A Study of Color Associations and Context (in) Dependence

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Abstract

Mirroring an increasing awareness of the importance of colors, today marketing managers are paying increasing attention to the deployment of color in marketing as well as to the applicability of universal color associations. Two colors considered to carry several specific universal associations are blue and black. Consequently, the purpose of this study is to assess the contextual independence/dependence of consumers' associations with the colors blue and black. Associative learning theory was deployed to specify the hypotheses. The hypotheses were tested through a paired sample t-test. The results show that the universal associations with the colors are different from the associations with the colors when they are displayed in a specific context. The implications for further research and limitations of the study are presented. Managers may want to consider the associations colors have in the specific context rather than relying on universal associations of colors.

Keywords: color, associations, context, black, blue

1. Introduction

Human senses are fundamental to the human species. Our sense of smell, taste, touch, hearing, and sight play a critical role in our understanding of the world (Lindstrom, 2005; Myers, 2004). Indeed, it is through our senses that we become aware of companies, their offers and their brands (Hultén, Broweus, & Van Dijk, 2009). Mirroring the increased awareness of the significance of human senses, practitioners (Hall, 2013; Wyrley-Birch, 2013) (cf. Lee, Heere, & Kyu-soo, 2013) and researchers (Lee et al., 2013; Lindstrom, 2005) are turning increasing attention to human senses. So-called '*sensory marketing*' implies pleasing the customer's senses and influencing their perception and behavior (Hinestroza & James, 2014; Krishna, 2012). Among our senses, sight has been considered the most influential (Hultén et al., 2009; Lee et al., 2013). We learn to interpret visual impressions very early in life. Most consumers completely trust their sight sense; sight aids them in everything from managing everyday tasks to detecting differences and changes on packages in a store's interior (Hultén et al., 2009). Moreover, while visual information may be the most influential, research suggests that *color* is the most influential visual element (Jansson, Marlow, & Bristow, 2004; Kauppinen-Räsänen & Luomala, 2010). Certainly, it is widely recognized how colors can have psychological effects on consumers and different cultural and social meanings through associations (Caivano & López, 2007; da Pos & Green-Armytage, 2007; Hultén, Broweus, & Van Dijk, 2011; Marshall, 2010; Minah, 2008; Pogacar, 2012; Takahashi, 2012). Colors carry specific meanings and communicate information (Elliot & Maier, 2007). It has been noted by scholars how color helps us to create feelings and to activate and stimulate our memory, thought and experiences (Crowley, 1993). Indeed, careful deployment of colors can promote attitudes, feelings and moods and thus differentiate products. Specifically, it has been suggested by scholars that first impressions are derived from color (Chang & Lin, 2010) and that as much as roughly 65-90 percent of our assessment is built on colors only (Singh, 2006).

In the fifth century B.C. the Greeks referred to the opposite nature of black/white and light/dark. Later, medieval and Renaissance people related colors to the four elements of nature: earth with white, air with blue, fire with scarlet and water with purple (Mubeen, 2006). Since then, there have been several studies made that indicate the different associations with colors. These color associations have been said to be general (universal) and symbolic for the different colors (Jacobs, Keown, Worthley, & Ghymn, 1991; Luscher & Scott, 1969; Madden, Hewett, & Roth, 2000; Mubeen, 2006; Rohit & Radhika, 2006). For example, red is said to be associated with warmth, fire, or passion; while green is said to be associated with spring and country (Jacobs et al., 1991). Thus, different colors have on the one hand been considered to carry specific symbolic and general (universal) associations. However, on the other hand one can question if these associations apply to the colors independently of the contexts (cf. Takahashi, 2012). Colors are not perceived independently from objects in the brain. Indeed, it has been argued that companies cannot build their product color choices based on consumers' favorite colors, which may not be what those consumers perceive is suitable for a certain product context. Accordingly, consumers have different color preferences for different product categories, and these preferences are formed through associative learning (Grossman & Wisenblit, 1999), that is, through cues and outcomes (cf. Morís, Cobos, Luque, & López, 2014; Waldmann & Walker, 2005). Based on the associations that consumers have formulated from past experiences, they learn color preferences for specific products (Grossman & Wisenblit, 1999).

While some scholars contend that consumers' associations with colors are unchanging and general (universal), others maintain that they differ across a number of variables, including gender, age and culture (Singh, 2006). To what degree color associations apply independently of context is an important question. Colors are an integral part of marketing communications, and marketing practitioners use color consultants to help them determine which color or colors most appeal to their customers (Grossman & Wisenblit, 1999; Mubeen, 2006). However, research on colors in marketing is scarce (Labrecque & Milne, 2012) and the need for more research has been noted (Grossman & Wisenblit, 1999; Krishna, 2012; Singh, 2006). Two colors considered to carry several specific and universal associations are blue and black (Babin, Hardesty, & Suter, 2003; Bottomley & Doyle, 2006; Chang & Lin, 2010; Jacobs et al., 1991; Madden et al., 2000; Mubeen, 2006; Singh, 2006). Consequently, the purpose of this study is to assess the contextual independence/dependence of consumers' associations with the colors blue and black

2. Theory and Hypotheses

2.1 Associative Learning

Learning is a relatively permanent change in a person's behavior and is a result of experiences. Experience does not necessarily affect learning directly; indirectly, we can learn by observing events that affect others (Hoover, Giambasita, & Belkin, 2012; Obloj & Sengul, 2012). Associative learning implies any orderly association of stimuli to create a link between them (Grossman & Wisenblit, 1999). However, there are two basic principles of learning, operant and classical conditioning (McSweeney & Bierley, 1984).

Classical conditioning is a form of learning that is often used to explain the process of associations because associations are not directly observable. Consumers are not born with preferences for different colors; they learn based on associations that they form through their experience. Consumers can develop preferred color associations for a certain product category. This is because they learn, through association, that a certain color or colors are appropriate for certain product categories (Grossman & Wisenblit, 1999). Specifically, classical conditioning occurs when a stimulus that naturally elicits a reaction is coupled with a second stimulus that by itself and initially does not elicit such a reaction, but over time, the second stimulus elicits a similar response as the first as the two become associated (Bierley, McSweeney, & Vannieuwkerk, 1985; McSweeney & Bierley, 1984) (cf. Skinner, 1974). It has been noted by scholars how associative learning is a promising area when it comes to explaining consumers' responses to product colors (Grossman & Wisenblit, 1999). Indeed, classical conditioning has been deployed to alter the color preferred on certain products (i.e. Gorn, 1982) (cf. Baeyens, Eelen, Vandenberg, & G., 1990; Middlestandt, 1990). Color preferences have been altered by pairing specific colors with, for example, pleasant music. Consumers subjected to pleasant music paired with a specific color later preferred products with the same color (Grossman & Wisenblit, 1999).

However, within marketing more focus has traditionally been granted to operant conditioning (McSweeney & Bierley, 1984). In operant conditioning, learning takes place as organisms learn to associate behaviors with consequences. Simplified, the probability for behaviors or responses that are followed by (associated with) a

reinforcer increases (McSweeney & Bierley, 1984; Ruan & Wu, 2013; Shteingart, Neiman, & Loewenstein, 2013) (cf. Skinner, 1974). Put differently, our memory consists of information, but it also consists of previous experiences of something negative or positive (reinforcement) (Repkina, 2011; Sereda, 2011). Everything people learn can be described as the development of patterns, and every individual has his or her own set of patterns and associations that in turn will help make sense of the world. The patterns in consumers' brains are a result of the differing representations and relationships with the world (Grossman & Wisenblit, 1999). Associations between two things develop gradually, and repetition is an important factor when forming them. Accordingly, it is easier to form associations between items that have already been presented together previous times (Rock, 1957). That is, we look back at our memories and experiences in terms of positive and negative reinforcement that we have experienced. The association may take the form of a connection between such memories and positive or negative reinforcement.

Associative learning can be deployed as a lens through which human response to colors can be explained (Grossman & Wisenblit, 1999). Indeed, it has been suggested that color associations have been formed early in the history of man: dark blue was associated with night and therefore being passive; yellow with sunlight and arousal; red with attack and conquest; and green with self-preservation (Luscher & Scott, 1969) (cf. Marshall, 2010). Associative learning has also been deployed to explain how certain colors come to have certain meanings in different cultures (Grossman & Wisenblit, 1999).

2.2 Color in Marketing

Colors connote specific meanings and communicate information beyond simple aesthetic appeal (Caivano & López, 2007; da Pos & Green-Armytage, 2007; Hultén et al., 2011; Marshall, 2010; Minah, 2008; Pogacar, 2012; Takahashi, 2012). Consumers have different color preferences for different product categories, and these preferences are formed through associative learning. As mentioned, consumers' favorite colors might not be what they believe is suitable for a certain product context. That is, colors are not perceived independently from context, and accordingly, companies cannot build their product color choice based on consumers' favorite colors (Grossman & Wisenblit, 1999).

Certainly, colors on products may attract attention and convey information; in other words, color is an influential design element (Jansson et al., 2004; Kauppinen-Räsänen & Luomala, 2010). The colors companies choose on their brands contribute to their brands standing out from other brands (Caivano & López, 2007). Consumers use color to search for and identify brands (Kauppinen-Räsänen & Luomala, 2010). That is, color is valuable in logo design and brand personality (Caivano & López, 2007; Labrecque & Milne, 2012). "Indeed, color can be an important, controllable marketing variable for managing image standardization because a product's color can function not only as an immediate identifier of its brand but also its quality and price" (Singh, 2006, p. 787). Thus, on the one hand the right color can promote recognition of, for example, logotypes and products (Hultén et al., 2011), and it can maintain consumer's attention (Kauppinen-Räsänen & Luomala, 2010). On the other hand, the wrong color choice may hamper any communication between a company and its target market. Choosing the wrong color can hurt brand awareness and any attempt to build a sustainable brand image (Hultén et al., 2011). The importance of choosing appropriate colors may be especially salient within the store environment as colors can affect perceptions of the merchandise (cf. Crowley, 1993).

The focus of the present study is the colors blue and black as these are considered to carry several specific universal associations (cf. Babin et al., 2003; Bottomley & Doyle, 2006; Chang & Lin, 2010; Jacobs et al., 1991; Madden et al., 2000; Mubeen, 2006; Singh, 2006). In addition, both blue and black have been ascribed both common and contradictory associations: Black is said to be associated with dirt and grime. Blue, in contrast, is associated with hygiene and cleanliness (Bottomley & Doyle, 2006; Chang & Lin, 2010; Singh, 2006). At the same time, both colors are associated with trustworthiness (Jacobs et al., 1991). Moreover, the associations with these two colors are generally considered stable across cultures (Bottomley & Doyle, 2006) (cf. Babin et al., 2003; Madden et al., 2000; Singh, 2006); i.e., they are considered to connote the same associations across cultures.

2.3 The Color Blue

Several authors mark that blue is a generally calming and peaceful color (Babin et al., 2003; Bottomley & Doyle, 2006; Chang & Lin, 2010; Kauppinen-Räsänen & Luomala, 2010; Madden et al., 2000; Singh, 2006). The color blue is also generally associated with high quality, attractiveness, freshness, neutrality, effectiveness, and

trustworthiness (Jacobs et al., 1991; Kauppinen-Räsänen & Luomala, 2010; Madden et al., 2000; Miller & Khan, 2005; Singh, 2006). In addition, blue has been considered or perceived as a happy color, while at the same time it is considered to be a neutral color; it belongs to the neutral color group (cf. Singh, 2006). The color blue is considered cool and safe. It is also considered to be universally accepted; it is rare that blue receives negative reactions, and it is preferred across countries (Babin et al., 2003; Chang & Lin, 2010; Madden et al., 2000; Singh, 2006). As mentioned, blue is considered to be culturally unchanging; it has the same connotations across cultures (Bottomley & Doyle, 2006). In addition to being a calming, trustworthy, and stable color, blue can be perceived as (i.e. carries the associations of) depressive, sad, and cold (Chang & Lin, 2010). Moreover, blue can be perceived as powerful but also as expensive (Jacobs et al., 1991) (cf. Madden et al., 2000). See Table 1 for an overview.

2.4 The Color Black

Several authors mark that black is generally associated with powerfulness and expensiveness (Bottomley & Doyle, 2006; Chang & Lin, 2010; Jacobs et al., 1991; Madden et al., 2000; Mubeen, 2006) but also with trustworthiness, high quality (Bottomley & Doyle, 2006; Chang & Lin, 2010; Jacobs et al., 1991) and luxury (Bottomley & Doyle, 2006). Like the color blue, the color black is seen as culturally unchanging; it connotes the same things across cultures (Bottomley & Doyle, 2006). Moreover, the color black is in general associated with modernity, death, fear, anger, sadness, and mystery, and some of these associations may be explained by its connection to darkness (e.g., our evolutionary past and predators in the night) (Bottomley & Doyle, 2006; Chang & Lin, 2010; Jacobs et al., 1991; Madden et al., 2000; Mubeen, 2006; Singh, 2006). See Table 2 for an overview.

Table 1: Associations with the Color Blue

Association	References
Trustworthy	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Jacobs et al., 1991 • Chang & Lin, 2010 • Bottomley & Doyle, 2006 • Mubeen, 2006
High quality	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Jacobs et al., 1991 • Madden et al., 2000 • Bottomley & Doyle, 2006 • Mubeen, 2006
Calming	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Singh, 2006 • Chang & Lin, 2010 • Madden et al., 2000 • Bottomley & Doyle, 2006
Happy	<ul style="list-style-type: none"> • Singh, 2006 • Madden et al., 2000 • Chang & Lin, 2010
Neutral	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Singh, 2006 • Babin et al., 2003
Attractive	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Madden et al., 2000
Safe	<ul style="list-style-type: none"> • Babin et al., 2003 • Chang & Lin, 2010
Fresh	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Madden et al., 2000
Effective	<ul style="list-style-type: none"> • Kauppinen-Räsänen & Luomala, 2010 • Miller & Khan, 2005
Sad	<ul style="list-style-type: none"> • Chang & Lin, 2010
Stable	<ul style="list-style-type: none"> • Chang & Lin, 2010
Cold	<ul style="list-style-type: none"> • Chang & Lin, 2010

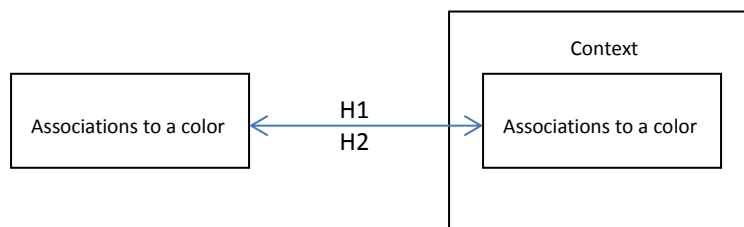
Table 2: Associations with the Color Black

Association	References
Sad	<ul style="list-style-type: none"> • Chang & Lin, 2010 • Jacobs et al., 1991 • Singh, 2006 • Madden et al., 2000 • Bottomley & Doyle, 2006 • Mubeen, 2006
Powerful	<ul style="list-style-type: none"> • Madden et al., 2000 • Jacobs et al., 1991 • Chang & Lin, 2010 • Bottomley & Doyle, 2006
Expensive	<ul style="list-style-type: none"> • Madden et al., 2000 • Jacobs et al., 1991 • Bottomley & Doyle, 2006 • Mubeen, 2006
Trustworthy	<ul style="list-style-type: none"> • Jacobs et al., 1991 • Bottomley & Doyle, 2006 • Chang & Lin, 2010
High quality	<ul style="list-style-type: none"> • Jacobs et al., 1991 • Bottomley & Doyle, 2006
Modernity	<ul style="list-style-type: none"> • Chang & Lin, 2010 • Mubeen, 2006
Fear	<ul style="list-style-type: none"> • Chang & Lin, 2010 • Mubeen, 2006
Angry	<ul style="list-style-type: none"> • Chang & Lin, 2010 • Singh, 2006
Luxurious	<ul style="list-style-type: none"> • Bottomley & Doyle, 2006
Deathly	<ul style="list-style-type: none"> • Chang & Lin, 2010
Mysterious	<ul style="list-style-type: none"> • Chang & Lin, 2010
Elegant	<ul style="list-style-type: none"> • Chang & Lin, 2010

To sum up, there have been a number of readings made that specify the associations with colors. On the one hand, these color associations have been said to be, in essence, universal and representative for the colors in question (Jacobs et al., 1991; Luscher & Scott, 1969; Madden et al., 2000; Mubeen, 2006; Rohit & Radhika, 2006). However, on the other hand and turning attention back to associative learning, it can be questioned if these associations apply to the colors independently of their immediate contexts. As mentioned, it has been argued that colors are not perceived independently from objects. Consumers may perceive that a certain color is suitable for a certain product (context). Such color preferences for different products (context) are arguably formed through associative learning (Grossman & Wisenblit, 1999) (cf. e.g. Moris et al., 2014; Waldmann & Walker, 2005). Based on the associations formed on the past experiences, consumers learn color preferences for specific products (Grossman & Wisenblit, 1999). Still, color preferences may not necessarily be the same thing as color associations. An important question thus concerns if the associations with colors are independent of context, therefore:

Hypothesis 1: The general (universal) associations with the color blue are different from the associations with the color blue when it is displayed in a specific context.

Hypothesis 2: The general (universal) associations with the color black are different from the associations with the color black when it is displayed in a specific context.

Figure 1. Conceptualization of Hypotheses

3. Method

The ratings of the universal (general) associations with the colors blue and black respectively were compared to the ratings of the contextual associations with the colors blue and black respectively when the respective colors were displayed in a specific context. A sample of 100 usable measures (100 respondents, see *Procedure* below) was collected at a Swedish state authority.

3.1 Context

Toothpaste was chosen as the specific context in which to display the colors because hygiene products, such as toothpaste, can be classified as relatively private (i.e. not seen by others) and inexpensive, that is, they can be considered low involvement products (cf. e.g. Kuenzel & Musters, 2007). Specifically, it has been argued that attributes such as color are important when purchasing low-involvement products (Prendergast & Marr, 1997). Two different versions of the instrument were created. In one version, a blue (chiefly #0090d9) toothpaste-tube was displayed. The other version featured a comparable tube but colored in black (chiefly #010101) (see Appendix I and II for the instruments; the toothpaste tubes are included with the permission of the manufacturer. The hues above refer to the tubes after printing and copying).

3.2 Universal Associations

A review of universal (general) associations with the colors blue and black (Table 1 and Table 2 respectively) generated a sample of universal (general) associations. Consequently, the associations in Table 1 were deployed to assess universal (general) associations with blue and the associations in Table 2 was deployed to assess universal (general) associations with black. An index for each color and universal and contextual associations respectively was formed by summarizing the scores and dividing the sums by the number of included scores.

3.3 Contextual Associations

In order to specify the contextual associations (with the blue and black colors respectively), four focus groups were completed. Each focus group consisted of six participants (cf. Powell & Single, 1996; Wibeck, 2010). Convenience samples of both men and women of various ages were gathered at a Swedish state authority. Two focus groups focused on specifying associations with blue in the context (blue toothpaste-tube). Two focus groups focused on specifying associations with black in the context (black toothpaste-tube). The transcribed material from the four focus groups was compiled and resulted in the contextual associations found in Table 3 (bold font highlights a degree of overlap between the contextual and universal associations).

Table 3: Contextual and Universal Associations

Associations to blue		Associations to black	
<i>Contextual associations</i>	<i>General (universal) associations</i>	<i>Contextual associations</i>	<i>General (universal) associations</i>
Fresh	Fresh	Bleak	Powerful
Mint/menthol	Trustworthy	Sad	Expensive
Hygienic	High quality	Un-fresh	Trustworthy
Clean	Calming	Disgusting	High quality
Fluor	Safe	Unhygienic	Mysterious
Happy	Sad	Licorice	Elegant
Cheap	Cold	Dirty	Modern
Effective	Neutral	Cheap	Luxurious
Functional	Effective	Luxurious	Deathly
Aesthetically appealing	Stable	Caries	Fearful
Icycrystals	Happy	Evil	Angry
Healthy	Attractive		Sad

3.4 Procedure

As mentioned, two different versions of the instrument were created, one version for each color. Items were developed drawing on the contextual (resulting from the focus groups) and general (universal) associations respectively. Specifically, the blue/black toothpaste tube was shown in a picture (on paper) together with the items (Appendix I and II). In order to pretest the questions, the questionnaires were sent to two experts in scale development, who both approved them. To allow for the comparison between the general (universal) associations and contextual associations, all items relating to each color were present in each instrument. Thus, both scales consisted of 21 questions. Items pertaining to universal and context-specific associations were presented in alternating order. A Likert scale of 1-6 was devised with 1 meaning “completely disagrees” and 6 meaning “totally agrees”. The number of choices in a scale is a matter of precision where more choices allow for greater precision as long as the respondents are able to discriminate between choices. Five to nine choices have been considered appropriate in most circumstances (Ebel, 1969; Spector, 1992). Each version of the instrument was completed by 50 respondents (i.e. a total of 100 unique respondents took part in the study), resulting in a total of 100 measures. The viewing/lighting conditions were indoors, with fluorescent lighting; compact fluorescent lamps casting light downward.

4. Results

4.1 Descriptive Statistics

The distribution was evaluated with regard to normality based on skewness and kurtosis as well as on the Shapiro-Wilk and the Kolmogorov-Smirnov tests for each group of associations. There was no proof of abnormal outliers. The z values for skewness and kurtosis for universal associations (UA) and contextual associations (CA) (for both blue and black) were within +/-2,58 (cf. Hair, Black, Babin, Anderson, & Tatham, 2006); hence the data was considered normally distributed (see Table 4). Likewise, for the color blue, the skewness and kurtosis were 0,096 and 0,053 (universal associations), and -0,532 and 0,899 (contextual associations). For the color black, the skewness and kurtosis were 0,353 and 0,127 (universal associations), and -0,412 and -0,845 (contextual associations). The coefficients for the Shapiro-Wilk and the Kolmogorov-Smirnov test for all the groups fell within 0,200 and 0,695 (see Table 4).

Table 4: Descriptive Statistics

Color and Variable:	N	Min.	Max.	Mean	Std.	Skewness			Kurtosis		
						Statistic	Std. error	z	Statistic	Std. error	z
Blue UA	50	1,83	4,75	3,4333	0,6459	-0,096	0,337	0,640	0,053	0,662	-0,214
Blue CA	50	2,17	5,58	4,1067	0,6540	-0,532	0,337	0,263	0,899	0,662	-0,498
Black UA	50	1,37	4,53	2,5981	0,6725	0,353	0,337	1,258	0,127	0,662	1,444
Black CA	50	1,46	4,74	3,3169	0,8782	-0,412	0,337	0,949	-0,845	0,662	-0,565

4.2 Hypotheses

As the z values for both the skewness and the kurtosis for universal associations and associations (for both blue and black) were within +/- 2,58 (e.g. Hair et al., 2006) (the sig. values of both the Kolmogorov-Smirnov and the Shapiro-Wilk test were greater the 0,05), and as the variables were considered interval (i.e. they possess equal intervals between units, but no absolute zero point), a t-test for paired samples was deployed to test the hypotheses (i.e. in essence testing if the difference scores are a random sample with a mean of zero) (cf. e.g. Hair et al., 2006; Pagano, 1994).

Hypothesis 1 - Universal compared to contextual - the color blue

Hypothesis 1: The general (universal) associations with the color blue are different from the associations with the color blue when the color is displayed in a specific context.

The results reject H_0 (i.e. the null hypothesis; a statement of no difference) because there was a statistically significant difference in the scores for the universal associations ($M=3,4333$, $SD=0,64594$) and the contextual associations ($M=4,1067$, $SD=0,65401$); $t(49) = -8,683$, $p = 0,000$.

Hypothesis 2 - Universal compared to contextual - the color black

Hypothesis 2: The general (universal) associations with the color black are different from the associations with the color black when the color is displayed in a specific context.

The results reject H_0 (i.e. the null hypothesis; a statement of no difference) because there was a statistically significant difference in the scores for the universal associations ($M=2,25981$, $SD=0,67255$) and the contextual associations ($M=3,3169$, $SD=0,87829$); $t(49) = -4,490$, $p = 0,000$.

4.3 Additional Results

Mean and standard deviations for the contextual associations are shown in Table 5 (the color blue) and Table 6 (the color black). The combined results for blue and black (both colors together) again reject H_0 because there was a statistically significant difference in the scores for the universal associations ($M=3,0157$, $SD=0,77883$) and the contextual associations ($M=3,7118$, $SD=0,86662$); $t(99) = -7,864$, $p = 0,000$.

Table 5: Individual (item) Associations - Blue

<i>Contextual associations</i>			<i>Universal (general) associations</i>		
	<i>Mean</i>	<i>SD</i>		<i>Mean</i>	<i>SD</i>
Mint/menthol	4,90	1,282	Fresh	4,72	0,991
Fresh	4,72	0,991	Cold	4,24	1,080
Clean	4,66	0,961	Effective	3,80	1,125
Fluor	4,54	1,216	Neutral	3,78	1,166
Hygienic	4,40	0,990	Happy	3,58	1,071
Icy crystals	4,34	1,042	Trustworthy	3,48	1,199
Effective	3,80	1,125	High quality	3,34	1,136
Health	3,70	0,953	Safe	3,32	1,362
Cheap	3,64	1,352	Attractive	3,04	1,228
Happy	3,58	1,071	Calming	3,00	1,212
Functional	3,58	1,341	Stable	2,92	1,368
Aesthetically appealing	3,42	1,372	Sad	1,98	1,332

Table 6: Individual (item) Associations - Black

<i>Contextual associations</i>			<i>Universal (general) associations</i>		
	<i>Mean</i>	<i>SD</i>		<i>Mean</i>	<i>SD</i>
Licorice	4,66	1,573	Sad	3,80	1,552
Bleak	4,22	1,516	Modern	3,50	1,216
Evil	4,14	1,629	Deathly	3,16	1,707
Sad	3,80	1,552	Mysterious	3,12	1,534
Un-fresh	3,68	1,571	Powerful	3,04	1,355
Unhygienic	3,50	1,502	Fear	2,94	1,463
Dirty	3,44	1,500	High quality	2,82	1,207
Disgusting	3,02	1,647	Expensive	2,54	1,417
Caries	2,78	1,595	Trustworthy	2,50	1,266
Cheap	2,72	1,565	Angry	2,50	1,529
Luxurious	2,38	1,413	Elegant	2,36	1,336
			Luxurious	2,38	1,413

5. Conclusion

This study has assessed the contextual independence/dependence of consumers' associations with the colors blue and black. The results show that consumers' associations with the color blue are dependent on the context (Hypothesis 1). Likewise, the results show that consumers' associations with the color black are dependent on the context (Hypothesis 2). That is, contextual associations scored higher than universal associations when their relevancy was assessed in context. Put differently, the general (universal) associations with black and blue respectively did apply to a lesser degree than the contextual associations with the researched setting being toothpaste tubes. In terms of additional results, the same pattern was observed when the colors (scores) were combined.

6. Discussion

This study contributes to our understanding of the contextual dependence/independence of color associations. It provides new insight into color associations in relation to a context. The results show that the universal associations are less applicable in the tested contextual setting than the contextual associations. In other words, the associations carried by colors appear to be dependent on or influenced by the context at hand. Importantly, however, this is not to say that universal associations are not valid or useful at all (see below). Moreover, some overlap between universal and contextual associations can be noted in Tables 5 and 6.

On the one hand, drawing on the notion that associations are formed through past experiences, innovations and novel or new products may be prime candidates for fruitful deployment of general (universal) color associations.

That is, a new product (a new context) implies that there are no previous (learned) experiences with color(s) in the same context; hence, consumers must rely on their general (universal) associations. Indeed, to assess if or to what degree universal color associations are what consumers rely upon in new contexts may be a fertile path for further research.

On the other hand, drawing on the notion that associative patterns are formed through repetition, it may be maintained that consumers create their color associations in different contexts based on how the colors have been previously conditioned or reinforced. The benefits of color associations could therefore be easier to realize in contexts in which the colors occur regularly, that is, through consistently and thoroughly deploying a color or colors ripe with associations. Such associations may be a result of the color(s) being used on established competing products and brands.

Moreover, drawing on the assumption that associations with colors are created based on the context in which they are displayed (and the associated conditionings and reinforcements), it can be contended that the more people who are exposed to colors in a certain context, the stronger will be the associations formed over time. In other words, marketing and the deployment of colors in certain context(s) may function as a self-fulfilling prophesy, building associations that in turn make others deploy the same colors in the same context because they are perceived to carry favorable associations in the same contexts (cf. Caivano & López, 2007). That is, it appears that context-specific associations can over time and in the end become general (universal) associations. Or rather, the general (universal) associations of colors are continuously being negotiated as the sums of the associations of each color in each context contribute to tweaking overall (universal) associations. An interesting avenue for further research may concern when (in terms of, for example, life cycle or age) consumers may be more or less susceptible to forming (new) associations with colors, or what role significant others (e.g. family) play in forming such associations.

Even with the limited sample in this study (and associated limited statistical power), it was possible to show how associations with colors are dependent on or mediated by the context at hand. However, further research may include larger samples and take into account demographic factors such as age, gender, and lifestyle. Certainly, further studies on additional colors should be performed. Our results are limited to the context studied (i.e. toothpaste tubes). Assessing the legitimacy of the results in different product categories, such as inexplicitly high-involvement products (e.g. products that are costly and visible to others and therefore associated with more information searching and or evaluation before a purchase) or services would further validate the results.

Appendix I: Scale for the Color blue

Please rank the following associations based on the degree to which you think it applies to the color blue on the toothpaste-tube.

- 1. Refreshing
Completely disagree 1 2 3 4 5 6 Totally agree
- 2. Trustworthy
Completely disagree 1 2 3 4 5 6 Totally agree
- 3. Mint/menthol
Completely disagree 1 2 3 4 5 6 Totally agree
- 4. High quality
Completely disagree 1 2 3 4 5 6 Totally agree
- 5. Hygienic
Completely disagree 1 2 3 4 5 6 Totally agree
- 6. Calming
Completely disagree 1 2 3 4 5 6 Totally agree
- 7. Clean
Completely disagree 1 2 3 4 5 6 Totally agree
- 8. Neutral
Completely disagree 1 2 3 4 5 6 Totally agree
- 9. Fluor
Completely disagree 1 2 3 4 5 6 Totally agree
- 10. Safe
Completely disagree 1 2 3 4 5 6 Totally agree
- 11. Happy
Completely disagree 1 2 3 4 5 6 Totally agree
- 12. Sad
Completely disagree 1 2 3 4 5 6 Totally agree
- 13. Cheap
Completely disagree 1 2 3 4 5 6 Totally agree
- 14. Cold
Completely disagree 1 2 3 4 5 6 Totally agree
- 15. Health
Completely disagree 1 2 3 4 5 6 Totally agree
- 16. Attractive
Completely disagree 1 2 3 4 5 6 Totally agree
- 17. Functional
Completely disagree 1 2 3 4 5 6 Totally agree
- 18. Effective
Completely disagree 1 2 3 4 5 6 Totally agree
- 19. Aesthetically appealing
Completely disagree 1 2 3 4 5 6 Totally agree
- 20. Stable
Completely disagree 1 2 3 4 5 6 Totally agree
- 21. Icy crystals
Completely disagree 1 2 3 4 5 6 Totally agree



Appendix II: Scale for the Color Black

Please rank the following associations based on the degree to which you think it applies to the color black on the toothpaste-tube.

1. Bleak									
Completely disagree	1	2	3	4	5	6	Totally agree		
2. Powerful									
Completely disagree	1	2	3	4	5	6	Totally agree		
3. Sad									
Completely disagree	1	2	3	4	5	6	Totally agree		
4. Expensive									
Completely disagree	1	2	3	4	5	6	Totally agree		
5. Un-fresh									
Completely disagree	1	2	3	4	5	6	Totally agree		
6. Trustworthy									
Completely disagree	1	2	3	4	5	6	Totally agree		
7. Disgusting									
Completely disagree	1	2	3	4	5	6	Totally agree		
8. High quality									
Completely disagree	1	2	3	4	5	6	Totally agree		
9. Unhygienic									
Completely disagree	1	2	3	4	5	6	Totally agree		
10. Anger									
Completely disagree	1	2	3	4	5	6	Totally agree		
11. Licorice									
Completely disagree	1	2	3	4	5	6	Totally agree		
12. Mystery									
Completely disagree	1	2	3	4	5	6	Totally agree		
13. Dirty									
Completely disagree	1	2	3	4	5	6	Totally agree		
14. Fear									
Completely disagree	1	2	3	4	5	6	Totally agree		
15. Cheap									
Completely disagree	1	2	3	4	5	6	Totally agree		
16. Elegant									
Completely disagree	1	2	3	4	5	6	Totally agree		
17. Luxury									
Completely disagree	1	2	3	4	5	6	Totally agree		
18. Modern									
Completely disagree	1	2	3	4	5	6	Totally agree		
19. Caries									
Completely disagree	1	2	3	4	5	6	Totally agree		
20. Deathly									
Completely disagree	1	2	3	4	5	6	Totally agree		
21. Evil									
Completely disagree	1	2	3	4	5	6	Totally agree		



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