

**Differences and Similarities in Hue Preferences
between Chinese and Caucasians**

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This paper focuses on both similarities and differences across two cultures, Chinese and Caucasians, in one specific domain: color. While existing research regarding similarities vs. differences in hue preferences as equivocal, we propose that under conditions where the hues are displayed prominently, there will be no cultural differences in hue preferences. Feelings elicited by the hues will mediate preferences, feelings that previous research suggests are elicited for biological reasons. We also suggest that when salient cultural norms are present for a given situation (e.g., the hue associated with a holiday occasion), then consumer hue preferences for that occasion should be driven by these salient cultural norms rather than general hue preferences. In the absence of salient cultural norms, consumer hue preferences for an occasion depend on their general hue preferences, which will be similar across cultures. The empirical findings of two studies support our perspective.

The question of whether or not color preferences are similar or different across cultures has intrigued color researchers over the years. The literature is mixed in providing an answer, finding both similarities and differences (e.g., Adams & Osgood, 1973; Cernovsky, Haggarty, & Kermeen, 1998; Choungourian, 1969; D'Hondt & Vandewiele, 1983; Kastl & Child, 1968; Madden, Hewett, & Roth 2000; Saito, 1981, 1996; Vandewiele et al., 1986; Wiegersma & De Klerck, 1984). We add to this literature by suggesting the conditions under which a similarity in preferences should be obtained and under these conditions examine the color preferences of two distinct cultures: Chinese and Caucasian North American.¹ We also examine the mechanism that should underlie a similarity in preferences across cultures. In addition, we investigate one specific context that could result in differences in color preference and/or choices, rather than similarities across cultures.

LITERATURE REVIEW

Cross cultural research on color has investigated a wide variety of responses to colors, e.g., the meaning of colors Jacobs, Keown, Worthley, and Ghymn (1991) and the memory for colors (Tavasolli, 2001). In this research we focus on color preferences, and specifically on hue preferences.² We next review the cross-cultural research on hue preference. Our goal in this review is to use the literature to point out the confusion that seems to exist regarding the extent to which color preferences are similar or different across cultures.

SIMILARITIES AND DIFFERENCES IN COLOR PREFERENCE ACROSS CULTURES

Many years ago Eysenck (1941) discussed this confusion. He contrasted Guilford's position and findings (c.f., Walton, Guilford, & Guilford, 1933) supporting a similarity in hue preferences across cultures with other research (Von Allesch, 1924) supporting cross-cultural differences in preferences. Eysenck's (1941) own research supported a similarities perspective, a perspective supported by other research as well; for example, research comparing the hue preferences of Vietnamese and American boys and girls (Kastl & Child, 1968) and research comparing Arctic Inuit vs. other Canadians (Cernovsky, Haggarty, & Kermeen, 1998). In marketing Madden, Hewett, and Roth (2000) also found primarily similarities in hue preferences across a number of different cultures.

Much research is in the opposite camp however, reporting primarily differences in hue preferences across cultures (Choungourian, 1968; Saito, 1996; Vandewiele, D'Hondt, Dillon, Iwawaki, & Mwamwenda, 1986). For example, the "blue phenomenon" (a strong preference for blue), while found in some cultures is not found in all cultures (see Wieggersma & Van Der Elst,

1988 for a review). Thus the confusion in the literature Eysenck noted many years ago seems to still be continuing to the present day.

Although it is not clear from a reading of the research studies reviewed as to why some of them found cultural differences and some cultural similarities, it might be expected from looking at the research on the mechanism underlying color preference that the literature should have found greater similarities across cultures. We next outline the mechanism underlying color preference and why that would lead us to expect similarities in color preference across cultures provided certain conditions described below prevail.

MECHANISM UNDERLYING COLOR PREFERENCES

Hue-Feeling Link

There is considerable evidence to suggest that colors elicit feelings. In some very early work, Guilford (1934, 1939, as noted in Mehrabian & Russell, 1974) showed that variation in hue systematically influenced feelings of pleasure. More recently, Valdez and Mehrabian (1994) also found that variations in hue led to systematic differences in feelings. They report that short wavelength hues (e.g., blue) will elicit greater feelings of relaxation compared to longer wavelength hues (e.g., red). As well, feelings of excitement will be higher for longer wavelength hues (e.g., red), compared to shorter wavelength hues (e.g., blue) (Antick & Schandler, 1993; Hardin, 2000). Gorn et. al. (1997) built on this research and showed that hues in an ad influenced feelings of relaxation and excitement.

Hue-Feeling Link across Culture

There are biological reasons why different hues elicit different feelings. Hue is a perceptual element which is associated with specific physiological structures.³ Recent research reported by Hardin (2000) suggests that the classification of hues as warm/exciting (e.g., reds) or cool/relaxing (e.g., blues) is linked to the physiological processes involved in color perception. Supporting evidence also comes from the work of Batra et al. (1998) that showed that the hue of the surrounding environment in which a simple experimental task was undertaken affected participants' galvanic skin response (GSR). A red environment was found to elicit GSR levels consistent with higher arousal compared to blue environments. Indeed, based on the physiological evidence linking hue to feelings, Sokolov and Boucsein (2000) have gone so far as to propose a neurophysiological model of emotion based on color space. Together, this evidence suggests a physiological basis for the link between hue and feelings, and therefore we should expect that the effects of hue on feelings will be similar across cultures as, notwithstanding cultural differences, we share a common physiology.

Feeling-Liking Link

There is also evidence that suggests that feelings are interpreted in the same way across cultures and, thus, hue induced feelings are likely to lead to hue preferences that are similar across cultures. Evidence for the similarity of interpretation of emotions comes from work on the underlying dimensionality of emotions. In this research, it is widely accepted that feelings can be represented by two dimensions: arousal and valence (Herrmann & Raybeck, 1981; Russell, 2003). This two dimensional view has been found to capture the variance in emotions across a wide variety of cultures. For example, using both facial expressions to capture emotions as well as words, Russell, Lewicka and Niit (1989) have shown that, across a set of heterogeneous

cultures (Estonian, Greek, Polish, Hong Kong Chinese), the variance in emotions can be captured using the two dimensions of valence and arousal. This finding has been further replicated using data from China, Croatia, India, Japan, Norway, Spain, and Vietnam (Herrmann & Raybeck, 1981; Russell, 1983). Importantly, this research shows that feelings, whether expressed in the form of facial expressions or words, are classified in the same way across cultures. Thus, for example, both excitement and relaxation are judged as being positive in valence across cultures. Furthermore, excitement is judged as high in arousal while relaxation is judged as low on arousal across cultures (Russell et al., 1989). Since the effects of feelings on attitude judgments are believed to occur through a transfer of the valence associated with the feeling, it would seem that similar feelings should have a similar impact on judgments across cultures. Thus, for example, feelings of relaxation should have a positive effect on attitude judgments, irrespective of culture.

Summary

The research reviewed above suggests that (1) different feelings are likely to be elicited by different hues, (2) the pattern of effects of hues on feelings are likely to be cross culturally similar (e.g., blue should elicit feelings of relaxation, across cultures), and (3) the effects of feelings on attitude judgments are also likely to be similar across cultures (e.g., feelings of relaxation elicited by blue should lead to it being evaluated favorably, across cultures). This would suggest that hue preferences are likely to be stable across cultures.

WHY THEN THE MIXED RESULTS IN THE LITERATURE?

Given this research, why do we find mixed results in the literature we reviewed on hue preferences? As already noted, it is difficult to come to a clear understanding of the reasons for the differences in results from a reading of the papers. One possibility that might account, at least in part, for the mixed findings relates to the way the various studies were carried out; specifically, the prominence of the hues. For example, in some of the studies finding differences (Adams & Osgood, 1973; Vandewiele et al., 1986; Wieggersma & Van Der Elst., 1988), no colors were shown while collecting responses and in Saito's (1981, 1996) work small color chips were used. It is possible that these conditions were not ideal for the elicitation of feelings.

Prominence of Hue

It would appear from the literature, however, that when the colors are more prominent or salient, they elicit feelings. For example, when the walls of a room are painted a relaxing color people in the room have been found to be less fidgety and less aggressive (Bennett et al., 1991; Profusek & Rainey, 1987; Schauss, 1985). Likewise, the effect of hue on feelings and preference in Gorn et al. (1997) was found in a context where the color was the predominant feature of the ad. Gorn, Chattopadhyay, Sengupta, and Tripathi (2004) also report the effects of hues on feelings, and in their studies participants are exposed to entire computer screens of a particular color.

We next report a first study which investigates whether we observe similarities across cultures when hues are salient. While previous research has looked at both feelings and preferences, to our knowledge, we are the first to examine feelings based mechanism for preferences by explicitly testing whether the feelings elicited by different hues play a mediating role in hue

preference formation. The study also examines whether the underlying mechanism is robust across cultures.

STUDY 1

METHOD

To make the hue prominent, Study 1 was conducted by projecting colors onto a screen at the front of the room. Colors on a screen appear more intense than colors in print because of the additional light source coming from the projector.⁴ We also projected large patches of the colors rather than small ones, to further increase their prominence.

The design was a 2X3 mixed design. Hue (blue vs. red) was the within subjects factor. We focused on blue and red since they are primary hues and also the most researched hues in the literature. They elicit the highest levels of relaxation and excitement. Culture was the between participants factor, with the following three groups: Caucasian Canadians, Chinese Canadians, and HK Chinese.

One hundred and sixty eight participants enrolled in undergraduate courses participated in this study for course credit. Subjects were randomly assigned to conditions. Of the 88 participants from Canada, 45 were classified as Caucasian Canadians while 43 were classified as Chinese Canadian. Data from 64 Chinese participants were collected in Hong Kong.

Participants were shown 2 slides with a large square patch of the specific hue in the middle, with a border of white around it. The specific hues used were Munsell 7.5 PB 4, 24 for blue and

Munsell 7.5R 5,16 for red. The two different colors were chosen on the basis of data collected by Gorn et al. (1997) that showed that these were the most preferred blue and red. Two different orders of presentation were used. While viewing each hue, participants rated their liking for the hue (three, 9-point rating scales anchored by good (+4) - bad (-4), nice - not nice, and like - dislike), feelings of relaxation (three, 9-point scales for the words relaxed, calm, and soothed on a scale anchored by not at all (1) and very much so (9)), and feelings of excitement (two 9-point scales for the words excited and active). These scales were taken from Gorn et al. (1997). Next, participants responded to questions about language spoken at home, country of birth, and a question asking about the purpose of the study.

RESULTS

Preliminary Analyses

Analyses of the data revealed that the items for each of hue preference, feelings of relaxation, and feelings of excitement, loaded on separate single factors, when they were subjected to principal components analysis. Further, all the scales were reliable (α 's > .79). Thus, the mean score across the items making up the rating scale measures served as the operational measure in the analyses reported below.

Feelings of Relaxation and Excitement

Our analyses of feelings investigated whether red and blue would elicit respectively feelings of relaxation and excitement not just in the Caucasian group as has been found in previous research, but in the two Chinese groups as well. Two ANOVAs were run: one with feelings of relaxation as the dependent variable and the other with feelings of excitement as the dependent variable. In

each case hue served as a within participant factor with two levels (blue and red) and cultural group served as a between participants classification variable. Both ANOVAs revealed a similar pattern of results. In each case, the main effect of hue attained statistical significance (Relaxed: $F(1,149)=236.97$, $p<.01$; $\eta^2=.61$; Excited: $F(1,149)=31.43$, $p<.01$; $\eta^2=.17$). Blue elicited greater feelings of relaxation (Mean: 5.56) compared to red (Mean: 3.18). Red elicited stronger feelings of excitement (Mean: 5.68) compared to blue (Mean: 4.68). The main effect for culture was significant in each case (Relaxation $F(2,149)=16.39$, $p<.01$, $\eta^2=.18$; Excitement $F(2,149)=7.87$, $p<.01$, $\eta^2=.10$). The interaction term was statistically significant for feelings of relaxation ($F(2,149)=52.21$, $p<.01$; $\eta^2=.41$) but not for feelings of excitement ($F(2,149)=1.49$, $p>.10$). An examination of the means, as a function of hue and cultural group, for feelings of relaxation, reveals that the difference in feelings of relaxation elicited by blue and red were greatest in the Caucasian group and smallest in the HK Chinese. Notwithstanding this difference, however, in each of the three cultures, blue elicited higher feelings of relaxation than did red (Means for blue: Caucasian Canadian=7.01; Chinese Canadian=5.52; HK Chinese=4.14; Means for red: Caucasian Canadians=2.83; Chinese Canadians=3.08; and HK Chinese=3.64; all p 's<.05). The combination of a main effect of hue on relaxation along with the non-crossover interaction between culture and hue for relaxation suggests that there is a strong effect of hue on feelings of relaxation in each culture, although we note some differences in the relative size of the effects, as exemplified by the interaction.

Hue Preferences

The rating scale measure of hue preference was analyzed next. An ANOVA with the preference rating measure as the dependent variable revealed a significant main effect of hue

($F(1,149)=113.59$, $p<.01$; $\eta^2=.43$). The means revealed that blue was preferred (Mean=2.37) to red (Mean=0.46). As observed for the feelings measures, the main effect of cultural group was significant ($F(2,149)=3.98$, $p<.01$; $\eta^2=.05$). The Caucasian Canadians judged all the hues more positively (Mean=1.79) than did the Chinese Canadians (Mean=1.31), who in turn were more favorable than the HK Chinese (Mean=1.15). The interaction between hue and cultural group was also significant ($F(2,149)=3.34$, $p<.05$; $\eta^2=.04$). As with the measure of feelings of relaxation reported above, an examination of the cell means revealed that, notwithstanding differences across culture indicated by the interaction, in all three cultural groups examined here, blue was significantly (p 's $<.05$) more preferred (Means: Caucasian Canadian= 2.96, Chinese Canadian= 2.35, and HK Chinese= 1.81) over red (Means: Caucasian Canadian= .62, Chinese Canadian= .28, and HK Chinese= .49). Thus, again, while blue is preferred to red in each of the cultures examined, the size of the preference difference between the two hues differs across the cultures.

Feelings Elicited by Hues Mediate Hue Preference

The results thus far show that hue has systematic effects on both feelings and general hue preferences and that the patterns are similar across cultures, with some differences as noted above.

To examine the role of felt relaxation and excitement in mediating the effect of hue on liking, an ANCOVA was conducted with liking as the dependent variable, hue and cultural group as independent factors, and feelings of relaxation and excitement elicited in response to each hue as covariates. We included both the feelings of relaxation and excitement as covariates in a single

ANCOVA model as the two feelings are conceptualized as independent feelings (Apter, 1981, 1982; Thayer, 1986). According to Apter, there are two dimensions of arousal, one going from boredom to excitement, called feelings of excitement, and the other from relaxation to tension, called feelings of relaxation. Further, Apter argues that it is possible to experience feelings from both these dimensions simultaneously. For example, as elaborated by Gorn et al. (1997), one may feel relaxed but bored on a Sunday afternoon. On the other hand they may feel bored but tense, if there is an important event coming up shortly. One could also be excited but tense, for example on the first day at a new job. And, when on a vacation reading an exciting novel, one could be both relaxed and excited.

The analysis revealed that the effect of hue on liking was attenuated by 92% (η^2 reduced from .36 to .03), although it remained statistically significant ($F(1,145)=4.55$, $p<.05$; $\eta^2=.03$). As well, all four covariates were significant (red excitement: $F(1,145)=10.16$, $p<.01$; blue excitement $F(1,145)=21.69$, $p<.01$; red relaxation: $F(1,145)=22.49$, $p<.01$; blue relaxation: $F(1,145)=4.44$, $p<.05$).

DISCUSSION

The data show that there are differences in the pattern of feelings elicited by red and blue hues. Moreover, notwithstanding the observed interactions between hue and culture, blue was perceived as more relaxing and was more preferred compared to red, in each of the cultures examined. Further, feelings of excitement and relaxation mediate the impact of hue on liking. The small but significant residual effect of hue on liking suggests that there is additionally either a direct effect of hue on liking, or some other mediating variable(s) not captured in this research,

or both. It is also noteworthy that our results are inconsistent with an oft noted observation that red is the most preferred hue in the Chinese culture (e.g., Copeland & Griggs, 1986; Gunnenrod, 1991; Schmitt & Simonson, 1997).

A question that arises from these results is: would we observe bigger differences in responses across cultures in situations where cultural norms were important. Moreover, would these cultural norms influence the reporting of underlying preferences towards color or just change situation specific choices? We examine these questions in the next study. Study 2 also considers all four elementary hues, and not just red and blue, as done in study 1.

STUDY 2

Cultural norms sometimes specify particular hues for an occasion or context. For example, green is associated with St. Patrick's Day, everywhere it is celebrated. The same is true for black and orange during Halloween. Sometimes, there is a hue that is associated with an occasion in one culture but not another. Red, for example, is associated with Chinese New Year, whereas the celebration of the Western New Year has no particular hue associated with it. Whenever a cultural norm specifies a particular hue for an occasion then this norm should drive hue choice for that occasion more than any feelings that might be elicited by the hue for biological reasons. So, if there is a norm specifying a particular hue as appropriate in one culture but not another, and if that hue is not the hue that is preferred for biological reasons, then differences in hue preference for the occasion should emerge between the two cultures. This prediction of differences seems intuitively reasonable even under conditions where the hues are displayed prominently thereby maximizing their capacity to elicit feelings. When there are no salient norms

for an occasion in the two cultures, however, we would expect choice for the occasion to reflect general hue preferences. Consistent with Study 1, they should be similar across cultures, provided that like in Study 1, the hues are displayed prominently, which they were in Study 2 as well.

In Study 2, we also looked into another question. We examined whether making a cultural occasion that is associated with a specific hue salient influences the reporting of general hue preferences. Consider when red is made salient for a Chinese person by asking them to make a choice for a New Year occasion. Will that affect the hues they say they prefer in general or will the reporting of underlying preferences remain unaffected?

METHOD

Study 2 was a 3X3 between participants factorial design. Participants were from three cultural groups: Caucasian Canadian, Chinese Canadian, and Hong Kong (HK) Chinese. Their task was to choose the color they most preferred as wrapping paper for a gift that was said to be for a friend. The choice occasions were selected based on pretesting (birthday, New Year, or St. Patrick's Day), such that cultural norms pertaining to color either did or did not exist for one, two, or all three cultural groups. Specifically, there were no cultural color norms for birthdays for any of the three groups. Thus, in this condition, we expected similarity across cultures in terms of the hue of the wrapping paper chosen, and a similarity between general hue preference and choice of hue. For New Year, the color red was the cultural norm for both the HK Chinese and Chinese Canadians. However, there were no norms for Caucasian Canadians for the celebration of their New Year. Thus, we expected that the HK and Canadian Chinese would be influenced by the norm, and be more likely to choose red. We expected the Caucasian Canadians, to choose

colors in consonance with their general hue preference. For St. Patrick's Day, the cultural norm is green among Canadians. This should apply to both Caucasian and Chinese Canadians as the latter, being a minority community, would have assimilated the values of the dominant cultural group where they did not have a particular norm of their own. Thus, both Caucasian and Chinese Canadians are more likely to choose green in this condition. However, in the absence of norms, we expected the HK Chinese to choose in consonance with their general color preference.

PARTICIPANTS

Two hundred and forty five participants enrolled in introductory business courses, at major universities located in Hong Kong and Canada participated in the study. There were 91 Hong Kong Chinese participants, 69 Chinese Canadians, and 85 Caucasian Canadians. Subjects were randomly assigned to the three choice occasion conditions.

PROCEDURE

Each participant received a questionnaire that began with the instructions for the study. They were told that they had been "invited to dinner by a friend" and they had bought a gift to take with them. The task before them was to choose the color of the gift-wrapping paper that they would like for wrapping their gift. The instructions indicated that the occasion for the dinner was a birthday, New Year, or St. Patrick's Day.

A sample of colors was provided on a screen at the front of the room via a standard computer projection system. These included two samples of each of the four elementary hues (i.e., blue, green, red, and yellow),⁵ as well as single samples of black and white. The selection of specific

elemental hues was based on color preference data collected by Gorn et al. (1997). The two most preferred shades of each of the elemental hues from that data were used (Blue: Munsell 7.5PB 4, 24 and 7.5PB5, 18; Green: Munsell 7.5G 7, 10 and 2.5G 7, 12; Red: Munsell 7.5R 5,16 and 7.5R 5,14; and Yellow: Munsell 2.5Y 8,12 and 10Y 9,12).

The stimulus set appeared as a series of square boxes that contained the target colors, labeled from “A” to “J,” for easy reference. Participants were asked to choose the color sample they most preferred as wrapping paper, and then circle the matching letter on their questionnaire.

Participants then reported their general hue preference. There were two measures of preference: participants reported their favorite color from the set of 10 displayed, without reference to any particular purpose or occasion, and rated their liking for the four elemental hues on a 9-point scale (like very much (+4) - dislike very much (-4)), again regardless of any specific purpose. Additionally, subjects responded to a variety of questions pertaining to demographics, etc. Measures of feelings were not included in this study as our focus was not on the mediating mechanisms as in Study 1, but on the moderating influence of salient cultural norms on preference and choice.

RESULTS

Hue Choices for Particular Occasions

As might be expected, choice of hue for the gift-wrapping paper made by members of the three cultural groups was influenced by salient cultural norms: when New Year was specified as the occasion for the gift, the chi square test with the three cultural groups as one factor and the

choice from the six hue categories as the other factor,⁶ was significant ($\chi^2(8)=22.57, p<.05$).⁷ In this case, red was chosen in 77% of the cases by the HK Chinese, compared to only 33% of the cases by Caucasian Canadians. The Chinese Canadians fell in between with 55% choosing red (see Figure 1). For St. Patrick's Day, in accordance with the norm, Caucasian Canadians and Chinese Canadians were most likely to choose green (84% and 79%, respectively), while this choice was less likely for the HK Chinese (21% chose green; $\chi^2(8)=33.49, p<.01$). Interestingly, for birthdays, where no cultural norms existed for any of the cultural groups, the pattern of hue choice was similar across groups ($\chi^2(8)=6.37, ns$). Blue was the most preferred hue for gift-wrapping paper and red the second most preferred hue (blue=36% versus red=26%, yellow=25%, green=12%, white=1%).

Figure 1 About Here

General Hue Preferences as a Function of Choice Occasion

A chi-square analysis was conducted for general hue preference as measured by choice of favorite color from the 10 options presented, as a function of the occasion primed (birthday, New Year, and St. Patrick's). (Note: the choice of favorite color was not context specific). As in the previous analyses, instead of using all 10 choice options, they were recoded to five levels: red, blue, green, yellow, and white. Black was not a level as no subjects chose black as their favorite color. The analyses revealed no differences in general hue preference as a function of choice occasion primed ($\chi^2(8)=9.32, ns$). Blue was chosen as the most preferred hue (51%).

For the second general hue preference measure, which asked subjects for an evaluation of each of the four elemental hues without reference to a specific instantiation of the hue, an ANOVA was conducted with the four elemental hue evaluations as a within participant factor and the

three choice occasion primes and three cultural groups as between participants factors. The analyses revealed neither a main effect of occasion ($F(1,236)=1.01$, ns) nor an interaction between occasion and general hue preference ($F(6,708)=1.16$, ns). The three way interaction also failed to attain significance ($F<1$). Thus, the results do not support salient cultural norms for an occasion having an effect on the reporting of general hue preferences.

To investigate whether hue preferences predict choice when cultural norms are not salient for the 10 displayed colors, we compared subjects' choices for a birthday gift with the hue they preferred in general. As expected, for a birthday gift, people's wrapping paper choice was consistent with their general hue preference (45% chose their favorite color). A comparison of the percentage of participants observed as choosing in consonance with their favorite color to the likelihood that the pattern might be observed by chance (chance level=17%), revealed a significant difference for each of the three cultural groups (binomial test: $p<.001$). Further, participants in the three cultural groups did not differ in their likelihood of choosing on the basis of their favorite color when choosing wrapping paper for a birthday gift ($\chi^2(2)=1.07$, ns). Thus, the data suggest that people choose on the basis of their favorite color when salient cultural norms do not prescribe a particular hue for the choice occasion.⁸

As already reported, hue choice is significantly influenced by the choice occasion, but general hue preference is not. Thus, when asked to choose in contexts where the occasion activates a hue specific cultural norm we would not expect general hue preference to predict choices. To test for the likelihood of choosing in line with general preference, we computed a binomial test for participants from the four groups where the primed norm suggested a specific hue choice: HK

Chinese and Chinese Canadians with the New Year prime and Canadian Caucasians and Chinese Canadians with the St. Patrick's Day prime. The binomial test was not significant ($p > .25$), as only 21% of respondents chose in line with their most preferred hue in general, compared to a chance level of 17%. For the two remaining groups, Caucasian Canadians with a New Year prime and HK Chinese with a St. Patrick's Day prime, conditions where the prime did not suggest a specific hue choice, the binomial test revealed that these two groups chose a hue consistent with their general hue preference at a much greater than chance level ($p < .001$; 56% choice consistent with general hue preference, compared to 17% by chance).

General Hue Preferences as a Function of Culture

A chi-square test of consumers' favorite color across the five hue levels (no one chose black as their favorite color) as a function of cultural group revealed an overall similarity in hue preferences between the Hong Kong Chinese, Chinese Canadians, and the Caucasian Canadians ($\chi^2(8) = 14.89$, ns). These results support what was found in Study 1. Blue was the most preferred color across the groups with 51% of respondents reporting it as their favorite color. The dominance of blue as the favorite hue across cultural groups is striking. In all three cultural groups, significantly more participants reported blue to be their favorite color than would be observed by chance (HK Chinese: 41.2%; binomial test $p < .001$; Chinese Canadians: 54.4%; binomial test $p < .001$; Caucasian Canadian: 57.4%; binomial test $p < .001$). Further, the proportion of participants for whom blue was the favorite color did not vary as a function of cultural group ($\chi^2(2) = .98$, ns).

A similar pattern of results was obtained for the rating scale measure of the four elemental hues. The ANOVA reported earlier with cultural group and choice occasion as between participants factors and the evaluation of the four elemental hues, red, blue, green, and yellow, as a within participant factor, revealed that the main effect of cultural group ($F < 1$) and the hue by culture interaction ($F(6,718)=1.98$, ns) were not significant. The effect of hue was the only significant effect in the analyses ($F(3, 236)=64.09$, $p < .001$, $\eta^2 = .21$). The cell means show that blue was the most liked hue (mean=3.02), followed by red (mean=1.99), followed by green and yellow, which were virtually equally liked (1.34 and 1.31, respectively). Follow up analyses, using a contrast comparing liking of blue to each of the other three hues, revealed a significant effect in each instance (blue vs. red: $F=56.23$, $p < .01$; vs. green: $F=165.03$, $p < .01$; vs. yellow: $F=166.36$, $p < .01$). These results are consistent with the results obtained for the choice of favorite color reported above. Taken together they provide strong evidence that while general preference for hues varies significantly across hues, this pattern of general preference for hues (i.e., blue is most preferred, and so on, as above) does not vary across cultures.

Discussion

As might be expected, the findings suggest that hue choice is determined by relevant and salient cultural norms. Cross-cultural differences in situation specific color choices emerge when these norms are salient in one culture but not another as was the case with New Year's for the Chinese vs. the Caucasian participants. When no norms exist, as is the case for birthdays or St. Patrick's Day for the HK Chinese and New Year's for Caucasian Canadians, the specific choices for wrapping paper reflect people's general hue preferences. This study, thus, supported the thesis

that where the choice occasion does not have a specific hue prescribed by the culture, consumer choices are influenced by their general hue preference.

Our findings also suggested that while choice is affected when the choice occasion has a culturally prescribed hue, general hue preferences are not affected by making these norms salient. Red is both lucky and important in Chinese cultures. Despite this and despite our exposing Chinese participants to the New Years scenario, the general hue preferences of the Chinese participants were not affected and were similar to those of the Caucasian participants.

GENERAL DISCUSSION

We began this paper by pointing to the mixed findings in the literature on hue preferences across cultures. We noted that some of the studies finding differences didn't use actual colors. In those that did, it was typically difficult to tell how prominent the hues were from the description of how the studies were done (Vandewiele et al., 1986; Wieggersma & De Klerck, 1984; Wieggersma & Van Der Elst, 1988). Focusing on the mechanism underlying color preferences, we suggested that similarities in hue preferences should be expected provided that the hues are displayed prominently. They should be expected because feelings elicited by a hue are likely to be maximized when such is the case, feelings that are likely biological in origin and therefore similar across cultures.

While previous research already suggests that feelings and preferences are different for different hues (Mehrabian & Russell, 1974) to our knowledge, the role feelings play in hue preferences has not been explicitly tested in previous research. We proposed that under the conditions we ran

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our studies, conditions where the hues were made very salient by both using a large patch of the color and by projecting the color onto a screen, the hues will elicit feelings elicited and these in turn will have a strong influence on preferences. The results of Study 1 supported our perspective and found an overall similarity in the hue preferences of the three cultures examined. There was a general preference for blue across all three cultures. This was true in Study 2 as well. While it is always difficult to know why previous cross-cultural research has sometimes supported the “blue phenomenon” and sometimes not supported it, our results do seem to suggest that if the hues are made salient, preferences are likely to be similar. Salient hues are more likely to elicit strong feelings, and if strong feelings are elicited, they should in turn influence preferences. Future research might test this idea by examining experimentally the role of feelings in hue preferences as a function of hue salience.

Study 2 examined more hues and, as might be expected, found that even when hues were displayed prominently, salient cultural norms regarding an appropriate hue for an occasion dominated hue choice for the occasion. When there were no such norms then general hue preferences influenced hue choices for the occasion. For the norm free occasions, consistent with Study 1, hue preferences were similar across cultures.

While norms affected situation specific choices, general hue preferences were not affected. Thus there was no evidence of any biasing effect of situation specific choices on the reporting of general hue preferences, even though the two measures were back to back. Perhaps the bluntness of the priming of the hue associated with a particular occasion in a culture accentuated the distinction in a participant’s mind between their preference for that occasion and their general

hue preference, lessening the likelihood of any biasing effects. Consistent with this possibility, previous mood research suggests that if a mood state is primed, it won't affect subsequent attitude judgments when subjects are made aware of the prime before they are asked for their attitude judgments, by for example asking them about their mood state first (Schwarz & Clore, 1983).

Despite the overall similarity in responses between cultures in our research, we recognize that there are differences as shown by the significant interactions we observed. For example, we observed an interaction between hue and culture for feelings of relaxation and preference. However, these effects do not influence either the ordering of preferences or the propensity of one hue to elicit greater feelings of excitement compared to relaxation, as a function of culture. Moreover, we only studied two cultures, even though the cultures compared are very different from each other (Nisbett, 2003). Thus, we recognize that we should offer our perspective emphasizing similarities when hues are displayed prominently, with caution. Future research on other cultures would be needed to determine the generalizability of our results. In addition, we focused on the hue dimension in this research. Future research might examine cultural differences in preferences related to the two other dimensions of color, chroma and value.

The results of Study 2 suggest that consumers are likely to choose socially prescribed hues when norms exist, even if they are not their preferred hues. While we only studied norms for occasions, other norms are also likely to have similar effects; for instance, color norms for product categories. To the degree this is true, making appropriate color choices requires understanding the underlying general hue preference of consumers as well as norms that may

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apply to the specific category, choice occasion, and the like. Future research could explore whether a broader set of norms have similar effects. Future research could also examine whether the effects of norms on the expression of general hue preferences depends on the level of subtlety with which the norms are made salient. For example, if before being asked for their general preferences, Chinese people were subtly primed with the concept of New Year by being asked to read a story about Chinese New Year or by subliminally priming the concept would that increase the likelihood of them reporting a general hue preference for red?

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FIGURE 1

Hue Choices When Norms are Salient:

As a Function of Cultural Group

Figure 1A: St. Patrick's Day

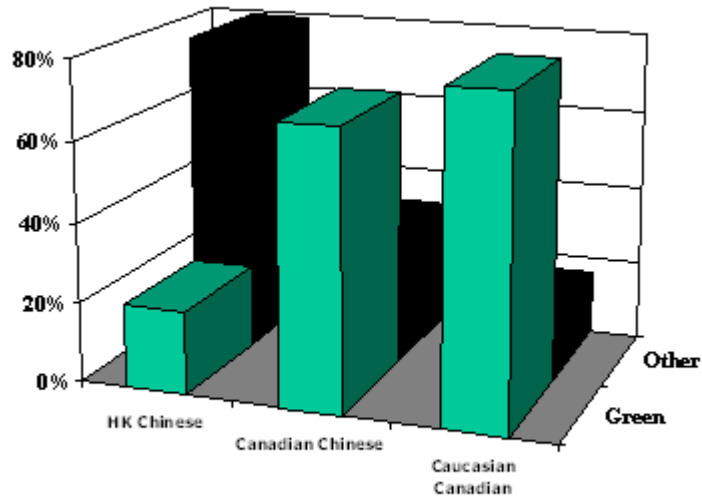
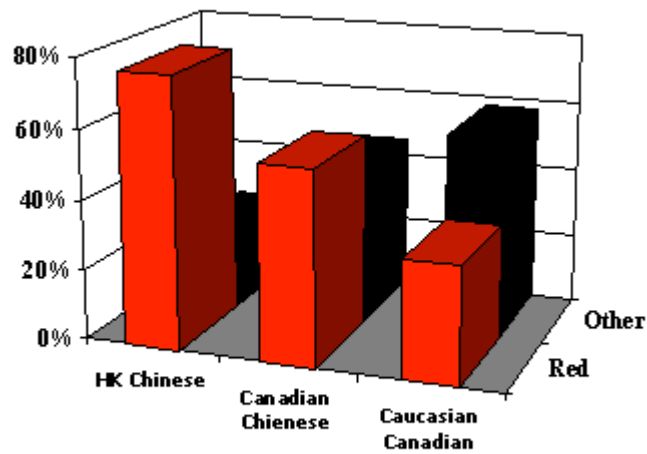


Figure 1B: New Year's Day



Endnotes

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- ¹ We use the terms Caucasian North American to refer to North Americans of European descent. We realize that the term Caucasian includes non Europeans, such as Indians, but preferred this term to White North Americans.
- ² Hue (e.g, red, blue) is the color dimension that has been the subject of the majority of the research and the dimension that has been of most concern to managers as well. The other two dimensions of color are: chroma (saturation) and value (the lightness-darkness of a color).
- ³ Human color vision is dependent on three types of cones in the retina (L, M, and S). Each cone type responds most strongly to light at a specific wavelength. The maximum excitation is reached for the cones at wavelengths that correspond to light perceived as blue, red, yellow, and green. Information from the retinal response travels along the optic nerve to the part of the brain called the lateral geniculate nucleus (LGN), which contains four specialized cells that are responsible for color vision. They respond to retinal excitation corresponding to red, blue, green, and yellow light (e.g., Abramov, 1997; Ratliff, 1976).
- ⁴ This is true for computer screens as well. Golding and White (1997) suggest that the additional light source from a monitor intensifies contrasts on a computer screen.
- ⁵ These are called elementary hues as there are specialized cells in the lateral geniculate nucleus (LGN; the part of the brain connected to the optic nerve), which detect these four hues. All other hues are detected through the simultaneous firing of combinations of the 4 cell types at different intensities. Thus, these four hues are distinct in that one cannot see any other hues in them as they are perceived through the unique activation of a single cell type in the LGN (e.g., Abramov, 1997; Ratliff, 1976).
- ⁶ We collapsed across each of the two shades of a specific elementary hue, thus the levels for the analysis we report could have had six levels: red, blue, green, yellow, black, and white. However, since none of the respondents chose black, we ended up with five levels of this factor in the analysis.
- ⁷ The chi-square has 8 degrees of freedom: four coming from the five levels of hue and 2 from the three levels of culture.
- ⁸ The rating scale measure of general hue preference was not appropriate for this analysis as this measure was with respect to the four elemental hues and did not map directly on to the choice from the 10 hues presented.