

Examining the Association Between Color and Mood: The Role of Color in Financial Service Commercials

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ABSTRACT

Color psychology has a historical discussion on the relationship between color and subjective experience, including mood. The association had been reported across cultures. Taking a new approach, this study investigated the color-mood association of viewers after perceiving financial service commercials. In the experiment, 16 subjects were recruited in Shanghai, China. Psychological mood of subjects was measured by Brief Mood Introspection Scale after receiving color stimulus, in a control condition (without color-adjustment), and four treatment conditions (Green, Yellow Blue, Red). In each trial, participants completed watching one-minute financial service commercial, controlling for average illuminance, saturation, and sound. The result of mixed analysis of variance found that pleasantness growth was significantly associated with color tone Red and Yellow, and was somewhat associated with Green and Blue, as well as negativity reduction. This has an implication in customer psychology study, also attitudinal and behavioral change campaigns design in financial service marketing.

Keywords: *Color-mood association, Commercial, Financial service marketing.*

1. INTRODUCTION

Color psychology literature could be traced to its application in aesthetics, while the experimental research studying psychological functioning and color is still new to the field [1-3]. Lately, researchers found that color could potentially affect purchase intention and liking. For instance, the blue package was considered healthier than the red package in China [4]. A similar effect of product color was revealed [5], while the effect of product color was not found in Japan [6]. Also, green in an eco-friendly advertisement is more effective in behavioral change than gray [7]; attitudinal change and purchasing intention were found to correlate with color temperature [8].

Besides, a wide body of literature has studied the association between color and mood. A positive correlation was found between mood positivity, and color luminance and saturation for adults [9, 10], pregnant women and their offspring [11], and children [12, 13]. Even rare, mood as a factor was also found to have an impact on color perception, in terms that negative mood leads to the perception of color as darker [14].

Numerous researchers conceptualized the relationship between cognition and affection, including visual perception and subjective mood. In the literature, cognition was defined as information-processing progress based on knowledge; affection refers to evaluation, psychological mood, and convictions [15-17]. Some studies indicated that visual perception and information processing could be influenced by subjective mood [18-20]. The association was reported mostly in psychology, while the current research took a new lens of customer psychology in financial service marketing.

In financial service marketing, the emphasis was transferred from mass-market to customer-feature-focused marketing, since Big Data Analytic allows companies to conduct e-customization through large datasets filled with user characteristics [21]. Marketing objectives of financial service carriers differ from those of other industries, instead of selling products for once, have transformed into building long-term customer-business relationships of trust [22].

Therefore, affective trust became more salient than ever in financial service marketing. Considering that trust-building of a brand is a cumulative process involving both cognition and affection [23], while

cognition is knowledge-driven which is likely to be presented in materials such as a quarterly report. Affection then turned out to be more vulnerable to emotional marketing and gradually became the trend of financial service commercials for branding [24, 25]. Emotional marketing aims at provoking ‘gut’ reactions and targets hedonic needs, this type of commercial often triggers a range of subjective experiences such as ‘mood, emotions, and physiological sensations’ [26].

However, the conventional research of financial service marketing has focused on the information-processing approach of commercials which emphasizing functional value and economic value of products, while the visceral perspective of both branding and product commercial is still awaiting to be enriched. Therefore, this study aims to investigate the experiential perspective of commercial properties. In specific, the current paper studies the psychological mood of viewers after being presented with a set of different financial service commercials. Based on the previous literature, we hypothesized that financial service commercial colors and psychological mood would change concurrently. To be specific, we expected that red and yellow might appear when the viewers are infused with a positive mood. Furthermore, blue and yellow might appear when the viewers have a relatively neutral mood.

2. METHOD

2.1. Participants

The participants were 16 adults (six women and ten men). All were recruited through online posts on WeChat. The participants' mean age was 31 years, ranging from 23 to 50 years. Each participant went through the comprehensive procedure of the experiment, with 5 trials, in Shanghai, China. All participants were compensated by choosing either partial experimental result or 500 RMB cash after completion.

2.2. Material

Participant psychological mood was evaluated by the Brief Mood Introspection Scale (BMIS) items which were measured through participants pressing keyboards (for example, see ‘happy’, and press ‘1’ for ‘definitely do not feel’, ‘4’ for ‘definitely feel’). Its BMIS Pleasant-Unpleasant, Arousal-Calm, Positive-Tired, and Negative-Relaxed subscales were calculated after coding reverse items in Excel sheets [27]. The trial was categorized by colors and manipulated by experiment design, the group with the un-interfered trial was considered as ‘control condition’. In marketing and psychological literature, researchers found that gender, educational attainment, income, and age have impacts on viewers’ moods [28, 29]. Therefore, they were

considered confounding variables and collected through surveys filled by participants.

2.3. Procedure

All participants participated in an individual orientation session. Participants were guided to the meeting room of the laboratory. A research assistant blinded to the measurement and experimental goal introduced that the experiment aimed to study the relationship between commercial properties and their psychological mood. Participants were instructed to use only five keys on the keyboard to complete the experiment, to press ‘Space’ to continue, and press ‘1’, ‘2’, ‘3’, ‘4’ to report to a Likert scale. The same research assistant told each participant to look at the keyboard hint on the desk whenever they forgot the matching meaning of any key.

Following the learning phase, participants learned that they would watch a silent commercial lasting one minute and then filled a self-reporting Likert scale reporting their psychological moods. Participants were aware that watching-reporting progress would repeat sequentially five times, and the time length of the experiment lasted from eight to ten minutes. All illuminating or vibrating devices were left outside before entering a different room for the mood-induction procedure.

For the mood-induction phase, participants entered an experimental room and sat down in an office chair. A 30 by 21cm laptop screen presented the stimuli program made by PsychoPy, which was installed 40cm away from the participants. Participants were asked to put on headphones for noise-canceling purposes. No audio was played through the laptop nor the headphone. A camera monitoring the participants’ front, and a second camera monitoring the display were installed 100cm from the participants. The same research assistant who did not know measurement and experiment goal sat in the room corner, kept quiet and stared at her hands from participants sitting down to the end of the experiment.

During the mood-induction phase, participants watch five commercials in order of ‘neutral’, ‘green’, ‘yellow’, ‘blue’, and ‘red’, which were edited into the same brightness, saturation, and hue.

2.4. Statistical Analysis

Three participants were excluded from the study. A participant pulled of the headphone during the experiment and did not report own age, the other participant told the research assistant that a mistake was made reversing the matching meaning of the scale (remembered ‘1’ as ‘4’ and ‘4’ as ‘1’) for first three questions, and another participant mentioned that she had bad myopia and slightly pulled the screen towards

herself. Since they do not share any commonality, these observations (n=3) were excluded from statistical analysis.

The one-way analysis of variance was applied to color and scores on BMIS subscales across every trial in R Studio. To test for qualification of applying mixed ANOVA, the data frame was examined on the homogeneity of variance through Bartlett's Test of each BMIS subscales on color, and normality. Since the participants were randomly recruited, the observations were assumed as randomized and mutually independent. With a statistically significant p-value being reported, the Akaike information criterion was conducted to compare the model fitness.

3. RESULTS

To visualize the observations normality, four Quantile-Quantile plots of residuals were presented in Figure.1, showing the distance of real observations from a normal distribution of BMIS Pleasant-Unpleasant, Arousal-Calm, Positive-Tired, and Negative-Relaxed subscales. From the distribution of observed measures comparing to expected normally distributed measures, BMIS Pleasant-Unpleasant, Arousal-Calm and Negative-Relaxed observations approximately lined up with the theoretically derived norm values, and BMIS Positive-Tired observation residuals were lined-up but less precise. Since normality of observed measures was supported, Bartlett's Test was used to examine the null hypothesis that the group variances were equal, opposite to the alternative hypothesis that were not equal, as presented in Table 1. Since the p-value of all grouping methods are all over 0.05, therefore the test failed to reject the null hypothesis and accepted that variances were homogeneous.

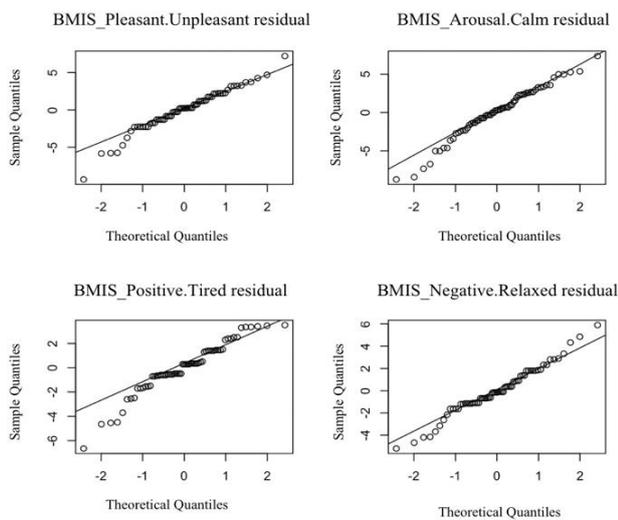


Figure 1. BMIS Pleasant- Unpleasant, Arousal-Calm, Positive-Tired, and Negative-Relaxed subscales Quantile-Quantile Plot of residuals

Fulfilling the three requirements, a one-way ANOVA was conducted. Comparing to BMIS Arousal-Calm and Positive-Tired, Pleasant-Unpleasant ($M=41.785$, $SD=2.891$, $F=4.487$, $p<0.05$) and Negative-Relaxed ($M=14.154$, $SD=2.272$, $F=6.191$, $p<0.05$) significantly differs due to trial color. The impact of trial differences on BMIS subscales is presented in Figure 2 and Figure 3. Following a blocking-ANOVA, significant impact of age ($MS=53.200$, $F=5.703$, $p<0.05$), income ($MS=37.810$, $F=4.503$, $p<0.05$), and education ($MS=44.940$, $F=4.818$, $p<0.05$) were found on the relationship between color and BMIS Pleasant-Unpleasant score. A significant impact of education ($MS=32.360$, $F=8.165$, $p<0.01$) was found on BMIS Positive-Tired scores; the similar impact of age ($MS=17.829$, $F=4.436$, $p<0.05$), and income ($MS=28.247$, $F=7.028$, $p<0.01$) were found on BMIS Negative-Relaxed scores. Since gender appeared no significant impact on all four BMIS subscale scores, the gender variable was excluded from the model of interaction effect analysis.

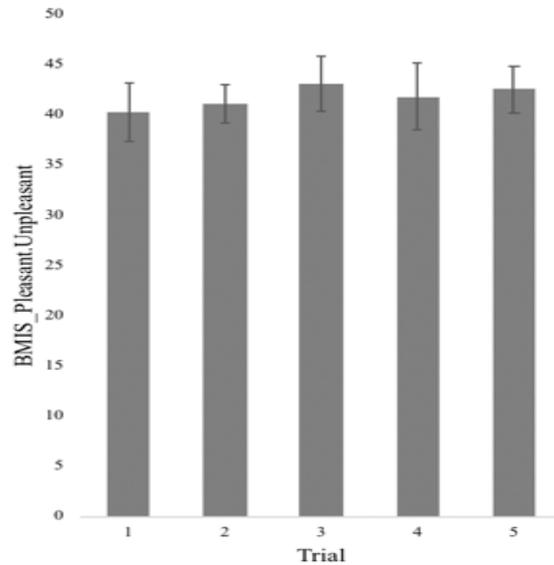


Figure 2. BMIS_Pleasant.Unpleasant Subscale Bar Graph

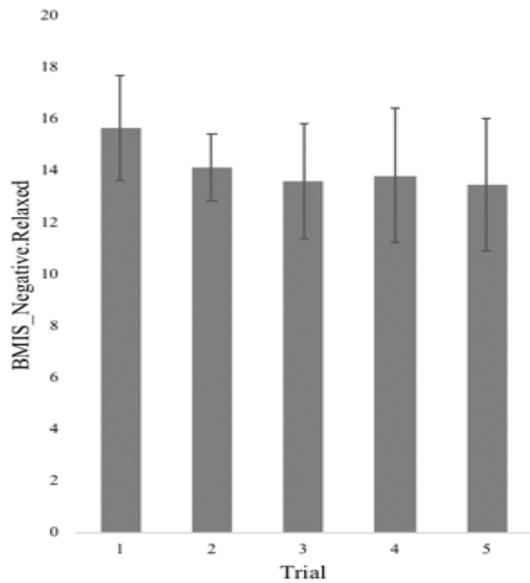


Figure 3. BMIS_Negative.Relaxed Bar Graph

The variation of BMIS Pleasant-Unpleasant scores could be partially explained by the interaction between age and income ($MS=34.430$, $F=4.899$, $p<0.05$); variation of BMIS Arousal-Calm scores could be partially explained by the interaction effect among color, income, and education ($MS=41.720$, $F=5.736$, $p<0.05$); variation of BMIS Positive-Tired scores could be partially explained by the interaction between color and income ($MS=17.340$, $F=4.826$, $p<0.05$); variation of BMIS Negative-Relaxed scores could be partially explained by the interaction between income and education ($MS=25.177$, $F=7.829$, $p<0.01$). Since targeted independent variable color was found to have significant impacts on BMIS Pleasant-Unpleasant and Negative-Relaxed scores only, three types of analytic models were compared by Akaike information criterion, the result turned out that the interaction effect model best fitted BMIS Pleasant-Unpleasant score and factors having an impact, while one-way model best explained the relationship between BMIS Negative-Relaxed scores and color.

4. DISCUSSION

This study aims to test color-mood covariation by a video-stimulated Color-Mood Test with adjusted color stimulus. It also measures whether the participant's psychological mood differed from pleasant to unpleasant, arousal to calm, positive to tired, and negative to relaxed. The main finding is that yellow and red were associated with more positive mood gain and negative mood loss comparing to blue, but blue and green had only somewhat association.

Results of the current study have investigated the association between colors of commercials and psychological mood, indicating that yellow and red could be relevant in the growth of positive mood,

aligned with a reduction in negative mood. In studies of color-mood association, some attribute the relationship to color hues. For instance, red is relevant to excitement, yellow to happiness, green to peacefulness, and blue to calmness across cultures [30, 31]. On the other hand, some studies explained that mood difference is associated with color temperature [32, 33]. In another word, higher color temperature is associated with more agitated mental activity and vice versa. These approaches could both support the result of yellow and red relating to positive mood, including excitement and happiness, with higher color temperature. On the contrary, blue and green with lower color temperature, and its unique hues, leads to less reduction in a negative mood.

Mood variation along with commercials was considered correlated with viewers' memory, purchase intention, and decision-making. Positive mood leads to increased impulsivity and better marketing effect, vice versa, negative moods lead to decreased brand loyalty [34, 35]. Some research also found that color-induced mood is relevant with cognitive performance differences [36, 37]. In the present study, the findings resonate with pre-existing conclusions. Although all colors presented are associated with an increasingly pleasant mood compared to the control group, the Yellow group has the most apparent growth in pleasantness. The Red group has the next most gain of pleasant mood, followed by Blue group. Surprisingly, the Green group did not have much difference in pleasantness comparing to the control group. In addition, the Red group had the most reduction in negative mood, when the Yellow group had slightly less. The Blue group also showed a mean loss in negativity, and the Green group showed a somewhat reduction. Similar results were found in previous research.

Beyond the covariance between color and mood, the results left us to wonder what lead to such an association. A possible explanation argues that color perception of objects involves brain regions responsible for visual-semantic and visual-spatial processing [38]. It's possible that color-mood association in the experiment occurred at the attention level instead of the visual sensory bio-system. For further research, taking behavioral and neuroimaging approaches was suggested, drawn from the prior reports. For example, future research could implement fMRI to observe the brain activity during encoding colors naming, categorizing, and matching tasks.

It is worth noting that there are several limitations to this study. Despite that participants were randomly selected from online post respondents, the sample difference of those who responded to the post or not, was not investigated. Also, the study suffered from the risk of being underpowered as having a small sample size. These, together with the type of the experimental

materials as commercials in the financial service field, limited the generalization of results to a larger population located in different cities, and other industries. Another consideration is that going through five trials, each participant might suffer from fatigue effect, which could increase negative mood. With exhaustive attempts on preventing such bias, it could not be completely avoided in a laboratory. Therefore, the interpretation and implication of the result should be thoroughly considered.

The findings obtained in the present study could have an implication in the marketing strategies of financial service organizations. For instance, the high-temperature color tone could be applied to marketing commercials of brands with 'Energy' attributes (i.e. sportswear), when blue and green to brands with 'Mindfulness' (i.e. yoga class). Utilizing colors, the marketing effort is more likely to have a positive affective change associated with color-associated mood, and contribute to attitudinal favor. In addition, positive attitudinal change (i.e. purchasing intention) could lead to conditions favoring the brand, in terms of behavioral change (i.e. purchasing decision) [39].

5. CONCLUSION

The main contribution of this study is to investigate the association between color and mood. The color tone Yellow and Red of financial service commercials have shown an association on viewer's positive mood growth and negative mood reduction. Additionally, Blue and Green have shown less power in the relationship. These colors are widely used in financial service marketing content, including visual aids, brand inventory, etc. Financial service organizations embracing an adventurous spirit could apply yellow and red, while those that publicize investmental and growth steadiness could go for blue and green. For marketing specialists in financial service, Fin-Tech influencers, red and yellow commercials might attract larger traffic and trigger action-taking. Further studies are needed to investigate the relationship between color and mood in marketing materials.

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