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# The Effects of Photo Decoration Cues on Online Consumers' Affective Responses in Distribution Science

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## Abstract

**Purpose:** This study to seek to answer two research questions in distribution science: what photo decoration cues in online grocery stores could be identified? Could photo decoration cues significantly effect on the affective perception and behavioral intention of consumers? **Research design, data, and methodology:** his study conducted a laboratory experiment with a 2x2x2 factorial design to validate the proposed research model and test our proposed hypotheses. **Research design, data and methodology:** Two stages experiments were adopted in this study, among 360 voluntaries who have had an experience of online grocery shopping, 331 valid data had been collected and analyzed using MANOVA and PLS-SEM algorithm. **Results:** (1) both reflective surface and complementary goods layout lead to visual appeal and shopping enjoyment; (2) contrast color usage positively impacts on visual appeal while does not significantly affect shopping enjoyment; (3) consumers' affective responses positively impact attitudes toward product and store which in turn lead to purchase intention and store loyalty. Implications for research and practice are discussed. **Conclusions:** Using the media richness theory, visual rhetoric theory and visual design literature as the theoretical foundation, the study provides a solid foundation to comprehend the impact of photo design artifacts on consumers' affective responses when online consumers shopping online for fresh grocery.

**Keywords:** Cue, attitude toward Product, attitude toward Store, Distribution Science

**JEL Classification Code:** C91, D4, D7, D39

## 1. Introduction

As shopping online is sweeping across the world, both online grocery stores and consumers have been care about how product is presented as well as processed by customers (Burke, 2002). For example, research found that the detailed information of product presentation is significantly influence consumers' satisfaction (Szymanski & Hise, 2000). (Jarvenpaa & Todd, 1996) also argue that the understanding

of product is one of the essential elements influencing consumers' attitudes toward product and purchase behavior. For this reason, both researchers and practitioners strive to improve online grocery product presentations in distribution science.

Research has shown that the inadequate online product presentation is a main obstacle for e-commerce (Rose, 1999). In offline context consumers can directly access to the groceries as well as inspect them in order to make purchase

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decisions. In contrast, in the online shopping environment where consumers are unable to physically examine the product prior to purchase, hence, more information must be need to gather for consumers (Laroche, Yang, McDougall, & Bergeron, 2005).

To alleviate this concern, various photo process technologies have been adopted currently to enrich product presentations in most grocery stores. It's popular for most online stores to employ photos to present products' information which benefit consumers to generate a clear comprehension of products (Hoch & Deighton, 1989) and decrease consumers' uncertainty about the products (Shavitt, Lowrey, & Haefner, 1998). Product photos are usually applied to describe visual appeal of products (Lightner & Eastman, 2002), which is generally difficult depicted by verbal cues alone (Baggett, 1989). Many researchers investigated that the effects of photo details have played a role on the consumer reactions. For instance, the impacts of photo size on buying tendency and found that larger photos enable customers to collect more information and hence elevate their purchase tendency. (Lavie, Oron-Gilad, & Meyer, 2011) argue that the photos' warm colors are arousing and exciting and are usually connected with consumers' positive mood. (Li, Wang, & Chen, 2014) found that the photo with a warmer color and more social presences can well influence consumers' purchase intention.

In an attempt to further increase and optimize customer's experiences with grocery products, many online grocery store have made it possible for customers to understand product via present products' photo decoration cues. For example, at Tmall's online grocery store, the largest B2C Website of China ([www.tmall.com](http://www.tmall.com)), online customers can find some photos highlight the grocery's brightness and reflect lights by presenting products' reflective surface, which easily attract consumer to imagine that the grocery could be fresh. Some photos apply the contrast color between target product and background, which enable to grab consumers' attention on the target product. Some other photos allocate various complementary ingredients as a background layout of target product, which can inspire consumers' reaction and judgments. Experiencing those vivid photo performances with decoration cues, customers can be attracted and stimulated their imagining and affective reactions.

Hence, we devote efforts to answer two research questions. (1) What photo decoration cues in online grocery could be identified? (2) Could photo decoration cues significantly effect on consumers' affective perception (i.e. visual appeal and shopping enjoyment), attitude (i.e. attitude toward product and store), and behavioral intention (i.e. purchase intention and loyalty)?

Based on the theories of media richness and visual rhetoric, three constructs for grocery photo decoration cues

are conceptualized as well as how they might provoke affective responses are validated. The three photo decoration cues are: reflective surface, contrast color usage and complementary goods layout. The findings of this study will enrich online product presentation literature in distribution science, logistics, retail, wholesale and online shopping areas, and having important implications for website interface design, online product promotion and online advertising, among others.

## **2. Literature Review**

### **2.1. Media Richness Theory**

The media richness theory argues that media differs in the power to accelerate changes in understanding among communicators (Daft & Lengel, 1986), and media richness enable maximize knowledge of worker's task performance, because it can leads to the effective communication (Kahai & Cooper, 2003) and negotiation success (Zhenhui, 2007b). A rich media facilitate insight and promptly understanding (Daft, Lengel, & Trevino, 1987) by providing some cues. Cue conveying ability could be regarded as the essential element of media richness (Dennis & Kinney, 1998) and the impacts of media richness on the variety of cognitive and affective reactions had been validated in online shopping contexts. Research found that the media richness could enhance product knowledge, perceived diagnosticity, shopping enjoyment, attitudes toward both product and store, and finally purchase intention (Suh & Lee, 2005; Zhenhui, 2007b).

Based on the media richness theory, our study focuses on the cues' convey abilities in the grocery photo, and three decoration cues were adopted to convey grocery information and such that enable consumer to insight into the performance of online grocery.

### **2.2. Visual Design Artifacts**

Visual design artifacts as an e-commerce Website characteristic is typically graphic or image-based (Cyr, Head, Larios, & Pan, 2009; Garrett, 2003) which try to adopt lively visual effects to strengthen users' insights of product performs (Jiang & Benbasat, 2007a). The core compositions of visual design include photographs, colors, shapes, silhouette, pattern or fonts (Garrett, 2003) which plays a pivotal role to deliver some meaningful visual information to online consumers. Inasmuch as photos are essential contents of visual design, therefore, online grocery photos' visual design might have a significant effect on consumers' perception, attitudes and purchase intention. Based on the

above consideration, this study focuses on the visual design cues in grocery photos.

### 2.3. Visual Rhetoric Theory

Rhetoric is one kind of interpretive theory aims to enhance expressive force and persuasion which can be used for an interest party's try to impact audiences (Burke, 1969; Corbett, 1965). Under this metaphor condition, complex visual communication is easily informed to the viewers by photos which carry meanings to the audiences. In line with this theory, it's expected that the elements of focus, graphics, visual viewpoint and layout to be interrelated in a unique way to the message itself (Scott, 1994). If we planned to construe an advertising photo as a kind of rhetoric, then visual artifacts must provide some kind of abilities and features and three levels of visual rhetoric were identified as follow (Scott, 1994).

## 3. The Hypotheses Development and Research Model

Empirical researches suggest that well-presented products provide a positive affective reaction and judgment which further leads to purchasing behavior in physical store (Turley & Milliman, 2000). Similarly, in online store context, effective and efficient product presentation not only draws consumers to a Web site, but also accelerates the purchase decision-making in the short of direct product experiences (Yoo & Kim, 2014). Online grocery vendors usually try to employ some lively visual effects to provoke consumers to understand a grocery performance and visual design artifacts can afford sufficient information to the photo as well as influence consumers' affective reactions (Eroglu, Machleit, & Davis, 2003).

Visual appeal is defined as "the tangible aspect of the online environment which reflected the 'look and feel' or perceived attractiveness of a Web site" (Montoya-Weiss, Voss, & Grewal, 2003). Visual appeal connotes the attractiveness of the Web site, consisting of photos, colors, and fonts (Eleanor Terese Loiacono, Watson, & Goodhue, 2000; Eleanor T Loiacono, Watson, & Goodhue, 2007) which inspired by the design, beauty inherent and physical attractive appearance in the retail setting (Holbrook, 1994). Visual search research theory also suggests that the salience of visual objects can effortlessly evoke users' attention. Salience can be endowed by local contrast among the visual characteristics such as color or layout. The salient features draw human attention and shorten the search time can be found in various studies.

As mentioned above, the reflective surface possesses the higher salient property as it reflects the local appearance of

grocery surface by presenting product with brightness and lights, which can easily draw consumers' attention to the target product immediately. In line with (Scott, 1994), reflective surface represents the symbol of fresh and it can easily attract consumer to feel that the grocery could be fresh. Hence, we expect that the reflective surface can provoke consumers' visual appeal towards the grocery. Therefore,

**H1:** Reflective surface positively affects online consumers' visual appeal.

Visual design has the potential to elicit affective appeal for consumers (Garrett, 2003) and may be conveyed via photos or colors (Rosen & Purinton, 2004). Color as one design elements has a particularly strong impact on visual appeal (Knutson, 1998) and is known to be a strong predictor of a website's overall appeal (Brady & Phillips, 2003; Lindgaard, 1999; Mathwick, Malhotra, & Rigdon, 2001) argue that the adoption of color and image quality band together influence visual appeal. (Lindgaard, Fernandes, Dudek, & Brown, 2006) also suggest that certain fundamental aesthetic properties, such as color has been found to reliably predict overall visual appeal ratings across users. Color contrast on Webpage is usually conducive to decrease users' information processing load and to highlight the products' presentation (Budimir & Palmović, 2011), thus shorten and simplify the road from stimulus to visual appeal.

In this study, contrast color usage between the target product and background could easily attract customer to the target product. Therefore,

**H2:** Contrast color usage positively affects online consumers' visual appeal.

Goods layout refers to the design of space, allocation of items and grouping of products. In the grocery photo, complementary goods layout conveyed the information more imaginative and accessible by their holistic coordination effect than separating them does (Tan, Tung, & Xu, 2009). The grocery and matched ingredients that are laid out vivid and aesthetic will fosters consumers' concern, enjoyment and comfortable when consumer experience product (Tan et al., 2009).

In line with the theory of visual rhetoric, the arrangement accounts for the positioning of artifacts which can convey some metaphors and suggestions for attracting consumers (Scott, 1994) toward visual design. When groceries are surrounded by some complementary goods in the photo, this layout could easily stimulate consumers' reaction and imagine. (Scapin & Bastien, 1997) argue that layout can create a deeper impression on consumer. Therefore, in our study, we hypothesize that,

**H3:** Complementary goods layout positively affect online consumers' visual appeal.

Research found that visual design aesthetics in Website have important impact on consumers' enjoyment (Cyr, Head, & Ivanov, 2006). Multimedia presents product information through multiple cues and channels (Lim, Benbasat, & Ward, 2000), which jointly form a rich and attractive information presentation, thereby attracting consumers' attention.

The empirical evidence indicated that the usage of appropriate colors could enhance consumers' pleasant feelings in e-store (Wu, Cheng, & Yen, 2008). Using contrast color on webpage is usually conducive to reduce consumers' information processing load as well as to highlight the products' presentation (Budimir & Palmović, 2011), thus potential to shorten and simplify the road from stimulus to pleasantness. (Lo & Lin, 2013) found that Webpage's color contrast positively impact consumers' enjoyable experience.

The vivid product presentations with more information cues can portray more concretely product attributes (Nisbett & Ross, 1980) and thus provide consumers with sufficient attentions. When enhanced consumers' attention is combined with vivid multimedia product presentations, the feeling of enjoyment is enhanced (Webster & Ho, 1997).

Shopping enjoyment, as an affective assessment criterion of the shopping experience, refers to the shopping experience is full of enjoyment in its own right, exclude the received product's value and logistics (Cai & Xu, 2007). In our research context, when examine the grocery products with reflective surface, it provokes consumer to think that the target grocery must be fresh; contrast color usage can draw consumers' concentration on the target product; and complementary goods layout can stimulate consumer to imagining as well as to recall the way how consuming them. During the whole examine process, all those activities can help consumer to narrow their attention on the tasks (examine the target grocery) and consequently make them involved in information process. According to (Novak, Hoffman, & Yung, 2000), as the user concentration on a specific activity, he or she loses self-consciousness and involved in the task which induces a higher flow state.

Indeed, research found that responses to stimulation in shopping environment are positively related to enjoyment (Guido, Capestro, & Peluso, 2007). Zhenhui (2007b) also put forward that product with more information cues in presentation contribute to enhance consumers' shopping enjoyment. Therefore, it would be proper to expect that consumer evaluating grocery photo with three cues will have a more pleasant experience which can increased their enjoyment, concentration, pleasant feelings and deeply attraction toward grocery photo. Therefore, we hypothesize that,

**H4:** Reflective surface positively affects online consumers' shopping enjoyment.

**H5:** Contrast color usage positively affects online consumers' shopping enjoyment.

**H6:** Complementary goods layout positively affects online consumers' shopping enjoyment.

The attitude toward product refers to consumers' holistic assessments about product and the likelihood intention to complete purchases on a particular Website (Zhenhui, 2007b). Even small variation in a photo can cause an impact on consumers' attitude toward product assessments. For example, by slightly change the angle of camera to an advertised product, viewers attitudes were influenced (Meyers-Levy & Peracchio, 1992). When consumers were inspired by the beauty inherent and physical attractive appearance in the grocery photo, higher perceived visual appeal may enable consumers to insight into the positive product information more clearly and truly, thus increasing consumers' evaluation of products which further result in more positive attitudes toward the grocery. Therefore, we hypothesize that,

**H7:** Visual appeal positively affects consumers' attitude toward products.

Montoya-Weiss, Voss, and Grewal (2003) validated that visual gravitation is positively associated with perceived Website's quality. The visual design of online grocery store is important lie in its abilities to increase Website aesthetics and emotional appeal (Garrett, 2003; Liu, Arnett, Capella, & Taylor, 2001; Park, Lennon, & Stoel, 2005) which may in turn leads to more favorable attitudes toward online store (Fiore, Jin, & Kim, 2005).

Higher visual appeal can easily make consumers better recognize products and make safer purchase decisions, consequently, facilitate them their shopping goals which will further enhance their attitudes toward shopping at that grocery store. Therefore,

**H8:** Visual appeal positively affects consumers' attitude toward online grocery store.

Previous study verified that consumers' shopping behavior has been significantly influenced by their perceived shopping enjoyment in physical shopping experiences (Babin, Darden, & Griffin, 1994). Similarly, research in online context has also confirmed that consumers' shopping enjoyment is a critical aspect of their online shopping experiences (Jarvenpaa & Todd, 1996; Koufaris, 2002). With greater enjoyment consumers are more likely to examine products and more actively process the information provided (Andrews & Shimp, 1990; Griffith,

Krampf, & Palmer, 2001), resulting in a greater likelihood to accelerate consumers’ product understanding, which will affect their attitude toward product and improve their acceptance intention of grocery. Therefore,

**H9:** Shopping enjoyment positively affects consumers’ attitude toward products.

Most prior studies have established that perceived enjoyment could positively influence consumers’ attitudes toward Websites (Childers, Carr, Peck, & Carson, 2002; Lee, Cheung, & Chen, 2005; Perea y Monsuwé, Dellaert, & De Ruyter, 2004). Evidences show that the enjoyable experience from e-commerce environments has a direct effect on the consequent responses when online shopping (Eroglu, Machleit, & Davis, 2003; Fiore, Jin, & Kim, 2005; Menon & Kahn, 2002). Menon and Kahn (2002) found that consumers who experienced higher levels of pleasure from the website displayed higher levels of approach responses towards the Website, including revisit tendency.

Raney, Arpan, Pashupati, and Brill (2003) have suggested that entertainment features that helpful in promoting consumers’ shopping enjoyment improve their attitudes toward purchasing at a Website, and thus increase their revisit intention of the Website. Subsequently, researches have proved that enjoyments can obviously impacts consumers’ attitudes toward online vendors and their Websites (Childers, Carr, Peck, & Carson, 2002; Lee, Cheung, & Chen, 2005; Van der Heijden, 2004). (Zhenhui 2007b) also proposed that shopping enjoyment positively effects on consumer attitudes toward a Website. Specific to our study context, we hypothesize that,

**H10:** Shopping enjoyment positively affects consumers’ attitude toward online grocery store.

Most research works associated with consumers’ purchase behavior have supposed that purchase intention is decided by consumers’ attitude toward product. We assumed that consumers’ purchase intentions are determined by two essential elements: consumers’ attitude toward product and attitude toward store. Usually, positive attitudes toward a product result in higher intention to purchase just because consumers can feel the benefits of consuming the product (Fishbein & Ajzen, 1975). (Zhenhui, 2007b) suggest that attitude toward product positively impact consumers’ intention to purchase from a Website. A vivid grocery product presentation with decoration cues potentially evoke consumers’ interest and intense impulse which may be changed into increased purchase intention. Such that, in our research context, we hypothesize that,

**H11:** Consumers’ attitude toward product positively affects their purchase intention from a grocery store.

Similarly, Zhenhui (2007b) announce the concept of consumers’ attitude toward Website, which refers to consumers’ general evaluations of a shopping experience toward a specific Website. Positive attitude toward shopping in a Website cloud be potential to elicit consumers to perform shopping behavior, which enhances the possibility for purchase (Jarvenpaa, Tractinsky, & Vitalec, 2000; Van der Heijden, Verhagen, & Creemers, 2003). Zhenhui (2007b) verified that consumers’ attitude toward shopping at a Website significantly affect their intention to purchase product. Therefore, in our research context, we hypothesize that,

**H12:** Consumers’ attitude toward grocery store positively influences their purchase intention.

Consumers’ online loyalty has been regarded as a “consumer’s intention to purchase” from a given Website and consumers will dislike switch to another Website (Flavián, Guinaliú, & Gurrea, 2006). Cyr, Bonanni, Bowes, and Ilsever (2005) depict consumers’ online loyalty as the tendency to revisit a Web site, or to intend to buy from it again in the future time. (Lam, Shankar, Erramilli, & Murthy, 2004) validated consumers’ loyalty in a B2B service environment, and the finding shows that loyalty is the repeating visit an online Website as well as more willing to recommend shop owner to other consumers. Consistent with the preceding, in this study, consumer’s loyalty toward grocery store is defined as the intentions to revisit or use a grocery store to plan purchasing from it in the future.

In line with the theory of reasoned action (Fishbein & Ajzen, 1975), human’s attitudes are among the direct determinants of their behavior intentions. (Zhenhui, 2007b) confirmed that consumers’ attitude towards shopping at a Website positively influence their revisit intention. Therefore,

**H13:** Consumers’ attitude towards grocery store positively affects their store loyalty.

Based on the literature review, we proposed a research model demonstrated in Figure 1.

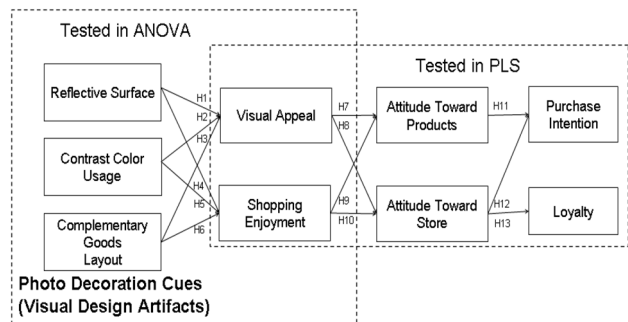


Figure 1: Research Model

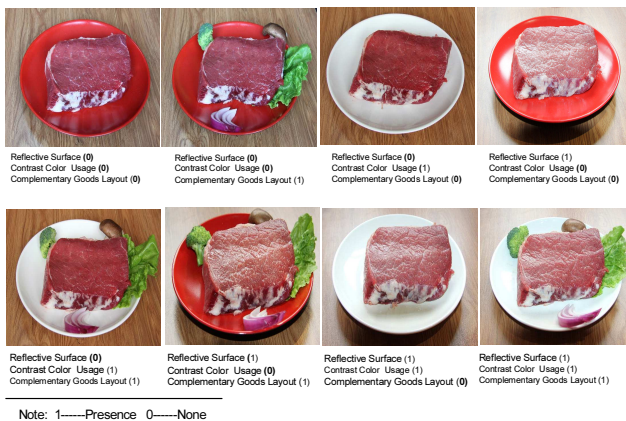
To account for other influences on the core dependent and mediating variables, three control variables, such as information deception detection, issue involvement, and issue expertise must be controlled. Besides, we decided the measure the privacy concern as the marker variables to access the common method bias (Song, 2012).

## 4. Research Methodology

### 4.1. Research Design

This study employed a laboratory experiment with a 2x2x2 factorial design to validate proposed hypotheses. A virtual grocery store was made of eight Webpages and each Webpage presents the same piece of beefsteak followed by different treatments. The experiment was conducted complete online and participants could perform the task from any computer or mobile phone which can connects with the Internet, thus increasing the online shopping credibility. After completing the shopping task, participants required to complete a questionnaire about their experiences on the above shopping process.

We manipulate each cue with two different levels: none and presence, the different treatments of beefsteak demonstrated in Figure 2.



**Figure 2:** Beefsteak with Different Treatments in Experimental Conditions

### 4.2. Participants

The target population consists of China consumers who have had an experience of online grocery shopping. We choose a Business University in China, where students and staff voluntary participate in the experiment, hence, they are deemed to be suitable participants for this study. We randomly assigned respondents to one the experiment groups, each group with 45 participants, which resulted in 360 respondents attending the experiment. At the end of the

experiment, each student or staff was offered \$8 to encourage their participation in the experiment.

### 4.3. Measurement

Measurement items for visual appeal were adapted both from and (Mathwick, Malhotra, & Rigdon, 2001). Items for shopping enjoyment drew from (Koufaris, 2002) to fit the online context. Attitudes toward store were measured by adopting an established items (Coyle & Thorson, 2001; Grazioli & Jarvenpaa, 2000). Items for attitude toward product draw from Zhenhui (2007b). Items for purchase intention draw from Coyle and Thorson (2001), Gefen and Devine (2001), and Zhenhui (2007b). Items were adapted from previously verified study on loyalty - Coyle and Thorson (2001); Gremler (1995); Zeithaml, Berry, and Parasuraman (1996) respectively.

### 4.4. Pilot Test and Measurement Items

Before the formal survey applied, a pilot test was conducted with the initial version of the instruments. Four information systems Professors and three marketing experts reviewed the instruments for face validity. The original version of the instrument was pretested by six Professors who come from a Business University, each holding rich expertise in the electronic commerce research area. After gathering the feedback from those experts, the measurement items of visual appeal, attitude toward store and loyalty were adapted.

## 5. Data Analysis and Results

Because we could not directly measure the photo decoration cues of the independent variables, therefore, we assigned the binary data type to each independent variable. Consequently, we perform 2-steps approach to analyze the results. First, we challenge to perform ANOVA to validate H1-H6. Next, we try to perform the structural equation model analysis using PLS to validate the left hypotheses. Data analysis was conducted with SPSS 21.0 software and the structural equation modeling was tested with smart PLS 2.0 software.

### 5.1. Control and Manipulation Checks

Subjects who failed to complete the experiment task were removed from the following statistical analyses and 331 valid data sets retained. Among the 331 subjects, 52.6% were females and 47.4% were males. The independent t-test was examined to show that there is no significant difference in gender toward visual appeal ( $t=-0.387$ ,  $MD=-0.06395$ ,  $p=0.699$ ) and shopping enjoyment ( $t=1.794$ ,  $MD=0.28745$ ,

p=0.074). ANOVA revealed there is no significant differences between the groups in terms of subjects' age (F=1.661, p=0.175; F=0.894, p=0.445) and the frequency of shopping grocery (F=0.371, p=0.774; F=0.385, p=0.764) toward visual appeal and shopping enjoyment. The experimental results demonstrated that the eight different treatment conditions significantly affect photo's reflective surface (p<0.01), contrast color usage (p<0.01) and complementary goods layout (p<0.01). Hence, manipulation check verified that the randomly assign of respondents to the experimental groups was successful.

### 5.2. Examination of Variation of Three Photo Decoration Cues

The ANOVA was conducted to verify the impacts of three photo decoration cues on two dependents variables and the results shown in Table 1, Table 2 and Table 3 respectively.

**Table 1:** Statistical Analysis on Visual Appeal and Shopping Enjoyment

RS	CCU	CGL	Group	Visual Appeal		Shopping Enjoyment	
				Mean	Std. Deviation	Mean	Std. Deviation
No	No	No	1	2.7667	.77007	2.6964	.79353
		Yes	2	4.3619	1.12899	3.4286	.91613
	Yes	No	3	3.8865	1.25215	2.7365	.71187
		Yes	4	4.8098	.97258	3.6646	.63396
Yes	No	No	5	2.9864	.90209	4.8693	.65700
		Yes	6	5.8150	.89028	6.0688	.64794
	Yes	No	7	5.0810	1.04910	4.6845	.63931
		Yes	8	6.1628	.55421	6.1570	.63626

For visual appeal, the ANOVA analysis results shown in Table 2. These three independent variables' p-values are confirmed significantly (p=0.000) across the total eight groups of participants. Therefore, H1, H2 and H3 are supported.

**Table 2:** Tests of Between-Subjects Effects on Visual Appeal

Dependent Variable: VA				
Source	Type III Sum of Squares	df	F	Sig.
RS	91.890	1	100.687	.000***
CCU	82.962	1	90.905	.000***
CGL	213.239	1	233.653	.000***
RS * CCU	3.947	1	4.325	.038*
RS * CGL	9.996	1	10.953	.001**
CCU * CGL	30.183	1	33.073	.000***
RS * CCU * CGL	5.960	1	6.531	.011*
Error	294.780	323		
Total	7385.120	331		
Corrected Total	742.534	330		

In terms of shopping enjoyment, the ANOVA results showed that the p-values of reflective surface and complementary goods layout are significant (p=0.000) across the eight groups of respondents. Therefore, H4 and H6 are supported, but the effect between contrast color usage and shopping enjoyment was not significant (p>0.10). Therefore, H5 was not supported. See Table 3.

**Table 3:** Tests of Between-Subjects Effects on Shopping Enjoyment

Dependent Variable: SE				
Source	Type III Sum of Squares	df	F	Sig.
RS	441.762	1	874.096	.000***
CCU	.166	1	.329	.567
CGL	96.826	1	191.586	.000***
RS * CCU	.717	1	1.418	.235
RS * CGL	5.280	1	10.446	.001**
CCU * CGL	1.135	1	2.246	.135
RS * CCU * CGL	.031	1	.061	.806
Error	163.242	323		
Total	6858.188	331		
Corrected Total	703.980	330		

### 5.3 Measurement Model

Exploratory factor analysis (EFA) was performed and results displayed that the measurement items loaded heavily on their respective construct and slightly on other factors, each item with the loadings above 0.7, the value of KMO is 0.866 (the standard level>0.7). The result indicates adequate convergent and discriminant validity (see Table 4).

**Table 4:** Loadings and Cross-Loadings of Measures

Con-struct	Item	Component									
		1	2	3	4	5	6	7	8	9	10
LY	LY5	.884	.093	.097	.054	-.016	.167	.001	-.026	-.019	-.066
	LY4	.850	.094	.066	.021	.047	.123	-.029	.054	-.014	.021
	LY1	.835	.084	.087	.118	-.031	.207	-.048	-.037	-.018	-.007
	LY6	.830	.098	.163	.015	-.045	.179	.035	-.010	-.057	.034
	LY2	.794	.048	.117	.096	-.035	.149	-.014	.028	-.023	.002
	LY3	.794	.034	.148	.137	-.048	.080	.046	.094	-.026	-.030
PIN	PIN1	.039	.834	.086	.158	.031	.064	.001	.126	-.048	.086
	PIN2	.090	.807	.135	.064	-.024	.105	-.028	.049	.021	.003
	PIN5	.090	.798	.101	.104	.019	.060	-.009	.164	-.086	-.041
	PIN3	.134	.789	.071	.130	.019	.123	-.075	.185	.058	-.073
	PIN4	.105	.784	.163	.061	-.028	.117	-.027	.182	-.022	.030
VA	VA5	.130	.103	.810	.111	-.015	.159	.001	.074	-.044	.036
	VA2	.173	.131	.786	.127	-.023	.033	.006	.160	-.036	-.054
	VA3	.152	.102	.784	.211	.014	.081	-.006	.071	-.065	-.043
	VA1	.134	.129	.777	.176	.041	.100	-.071	.092	.020	.024
PC	SE2	.072	.128	.203	.811	-.027	.163	.050	.172	-.049	-.060
	SE1	.170	.114	.217	.780	-.015	.125	-.040	.047	-.054	-.018
	SE4	.085	.112	.161	.765	-.048	.183	-.027	.192	-.033	.023
	SE3	.121	.178	.197	.758	-.009	.092	-.020	.184	.061	-.026

Construct	Item	Component									
		1	2	3	4	5	6	7	8	9	10
SE	PC2	-.011	-.034	.027	.056	<b>.873</b>	.038	.007	.014	.020	-.065
	PC1	-.062	.011	.008	-.044	<b>.865</b>	-.065	.018	.041	.007	.056
	PC4	-.040	-.002	-.021	-.030	<b>.848</b>	-.044	-.032	-.043	.017	-.029
	PC3	.017	.039	-.042	-.059	<b>.843</b>	.048	.027	.017	-.106	-.026
ATS	ATS1	.328	.130	.160	.169	-.018	<b>.752</b>	.022	.064	-.026	.013
	ATS3	.333	.139	.199	.153	-.026	<b>.734</b>	-.019	.044	.005	-.030
	ATS4	.389	.221	.139	.231	-.010	<b>.650</b>	.040	.048	-.097	.012
	ATS2	.404	.180	.202	.251	.033	<b>.611</b>	.036	.091	-.010	.031
IDD	IDD3	.014	-.065	-.025	-.018	-.063	.020	<b>.862</b>	.073	.047	-.043
	IDD2	-.002	-.045	-.030	.044	.027	.004	<b>.862</b>	-.083	.061	-.006
	IDD1	-.011	.004	-.004	-.054	.053	.012	<b>.861</b>	.017	.003	.020
ATP	ATP1	-.019	.274	.198	.208	.015	.073	.030	<b>.773</b>	.019	.000
	ATP2	.070	.331	.237	.200	.027	.068	-.010	<b>.756</b>	-.119	.001
	ATP3	.055	.290	.236	.283	.002	.050	-.010	<b>.732</b>	.032	.021
IV	IV1	-.044	-.029	-.026	-.046	-.038	-.024	.094	.013	<b>.931</b>	-.006
	IV2	-.077	-.031	-.064	-.010	-.021	-.041	.021	-.052	<b>.930</b>	-.053
EP	EP1	.008	-.030	-.006	-.042	-.043	.011	-.012	.016	-.018	<b>.917</b>
	EP2	-.037	.039	-.064	-.013	-.018	-.002	-.017	-.005	-.038	<b>.913</b>
KMO		0.890									
Bartlett's Test of Sphericity	Approx. Chi-Square	7533.175									
	df	703									
	Sig.	0.000									
Extraction Method: Principal Component Analysis.											
Rotation Method: Varimax with Kaiser Normalization.											
a. Rotation converged in 6 iterations.											

Composite reliability and Cronbach's alpha values are presented in Table 5. As all items' reliability are larger than 0.7 (Nunnally, 1978), thus the internal consistency standard are satisfied.

**Table 5:** Internal Consistency of Constructs

Item	Construct	Std. path loading	AVE	CR	Cronbach's alpha
ATP1	ATP	0.862	0.774	0.911	0.854
ATP2		0.896			
ATP3		0.881			
ATS1	ATS	0.842	0.713	0.909	0.866
ATS2		0.849			
ATS3		0.831			
ATS4		0.854			
EP1	EP	0.882	0.841	0.913	0.818
EP2		0.950			
IDD1	IDD	0.875	0.744	0.897	0.831
IDD2		0.878			
IDD3		0.834			
IV1	IV	0.923	0.884	0.939	0.872
IV2		0.957			
LY1	LY	0.879	0.741	0.945	0.930
LY2		0.825			
LY3		0.815			
LY4		0.857			
LY5		0.913			
LY6		0.872			

Item	Construct	Std. path loading	AVE	CR	Cronbach's alpha
PC1	PC	0.854	0.500	0.789	0.881
PC2		0.516			
PC3		0.486			
PC4		0.875			
PIN1	PIN	0.855	0.706	0.923	0.896
PIN2		0.813			
PIN3		0.850			
PIN4		0.844			
PIN5		0.836			
SE1	SE	0.8330	0.721	0.912	0.871
SE2		0.884			
SE3		0.835			
SE4		0.847			
VA1	VA	0.825	0.700	0.921	0.893
VA2		0.837			
VA3		0.838			
VA4		0.842			
VA5		0.841			

Usually, to evaluate the measurement model it requires checking its discriminant validity. As listed in Table 6, off-diagonal elements reveal all the latent variables' correlations, while the diagonal elements are the square roots of the average variances extracted (AVE) of the latent variables. In line with (Barclay, Higgins, & Thompson, 1995), for the adequate discriminant validity, any latent variable's average variances extracted (AVE) should be larger than the variance which shared between the latent variable and other latent variables. In another words, the diagonal elements should be larger than corresponding off-diagonal elements. Therefore, the data presented in Table 6 satisfy this requirement.

To further eliminate the common method variance (CMV), following the previous studies (e.g., Malhotra, Kim, and Patil (2006)), we created a marker variable, the privacy concern, and then we add it as the indicator of attitudes toward product and store. For each endogenous variable, pseudo-test was conducted to check whether the improved R<sup>2</sup> was significant or not (Subramani, 2004). The previous study argues that if the coefficient is under 0.10 at  $\alpha=.05$  level, the common method variance (CMV) is not significant (Malhotra, Kim, & Patil, 2006) and CMV is not a potential threat. In table 6, the results suggest that the original correlations among attitude toward product, attitude toward store and other variables do not differ significantly ( $\Delta r = -0.018$ ). Hence, we conclude that the path coefficients evaluation in our research model is not influenced by common method variance.

The results of Table 6 also suggest that there is no significant correlation ship between dependent variables and the control variables. Therefore, none of the control variables had a significant impact on the dependent variables in this study.



## 5.4. Structural Model

The right-hand part of our research model was estimated employing the partial least squares (PLS) algorithm (Wold, 1985) and the PLS outcome model is shown in Figure 3.

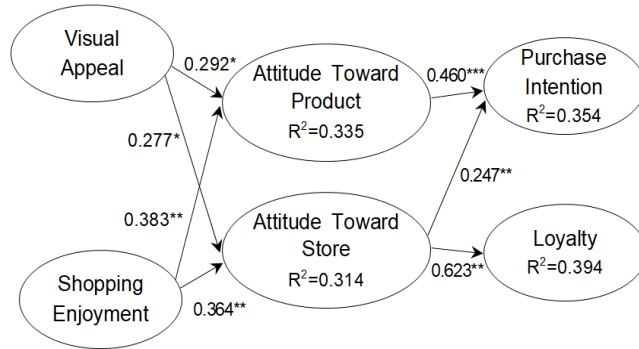


Figure 3: PLS Analysis Results

The structural model's explanatory power was explained by the value of  $R^2$  of the dependent variables. To verify the hypotheses, we calculated the t-statistics for gather the standardized path coefficient, and then we examined p-values based on the two-tailed test and significant level at 0.05 respectively. From Figure 3, we can see all hypotheses (H7---H13) were approved by statistically significant. Such  $R^2$  values of the dependent variables were calculated as visual appeal (0.537), shopping enjoyment (0.759), attitude toward product (0.335), attitude toward store (0.315), loyalty (0.394), and purchase intention (0.354). Based on the bootstrap resampling analysis, the path significant levels was performed on the structural model.

As regard to their relative influence power, through the comparison of their path coefficients, the results shows that reflective surface plays a higher influence than other decoration cues on shopping enjoyment (path coefficients: 0.793 versus 0.014 and 0.370), complementary goods layout performed a strongest influence on visual appeal than the other two independent variables (path coefficients: 0.536 versus 0.347, 0.339).

## 6. Conclusion and Discussion

The goal of this study was to seek to answer two research questions: what photo decoration cues in online grocery could be identified? Could photo decoration cues significantly effect on the affective perception and behavioral intention of consumers? Using the media richness theory, visual rhetoric theory and visual design literature as the theoretical foundation, the study provides a solid foundation to comprehend the impacts of photo decoration cues on consumers' affective responses in

distribution science, logistics, retail, wholesale and online shopping areas.

Our suggested research model examined the relationships among the different variables and the findings provide strong support for the proposed model, as expected, photo decoration cues are associated with consumers' affective actions, attitudes toward product and store which in turn, is positively affect consumes' loyalty and purchase intention.

All expected relationships are supported in the research model, except Hypothesis 5. The findings show that contrast color usage does not significantly affect consumer shopping enjoyment. This different from our initial expectations based on the literature. There are two plausible explanations for this finding. First, the respondents may have gathered the sufficient and critical information they are needed which elicits shopping enjoyment from other decorations cues, such as reflective surface and complementary goods layout, leading them to perceive few benefits and little relevance toward contrast color usage. Maybe the second reason come from the experiment stimulus, in other words, the white or red plate chosen in the experiment is relatively simple, which means that the plate's color has fewer characteristics, as a result, respondents cannot be stimulated enough to make their shopping enjoyment

Our findings indicate that the photo decoration cues are the important constructs and serve as the antecedents of consumers' affective responses. Therefore, an understanding of how to design photo artifacts which can influence consumers' affective responses will be great important which different from previous research results. Because most previous studies associated with product presentation mainly focused on the media selection among photo, text and other interactive way (e.g. 3D).

In addition, compared with previous findings, this study has demonstrated that the visual appeal and shopping enjoyment evoked by photo decoration cues have indeed a positive impact on the attitudes toward product and store. This implies that the more decoration cues used in designing online grocery photo, the more likely they will foster a positive attitude towards continue using them.

The findings of this study will increase the ever-increasing body of literature about online product presentation as well as serve as a reference for vendors to improve their grocery Websites design in distribution science area. Thus, by providing photo visual decoration cues, Website vendors can effectively stimulate consumers' learning about products. Also, the findings are will enrich the literature on distribution science, logistics, retail and wholesale.

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