

# Visual Perception Experiment Study on the Brand Effect - Comparison of Domestic and Imported Car Brand -

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## ABSTRACT

Conspicuous consumption is often investigated in Korea and consumers purchase a product to publicly display economic power or social status. The existing studies argue that brand loyalty and luxury brand preferences escalate conspicuous consumption, and it is important to identify different visual perception to understand irrational consumers' behavior. Car emblem as brands' visual identity represents the brand's image, mission and message. Irrational consumers thus are expected have different visual perception to the emblem or logo. To understand the impact of irrational consumer behavior on visual perception, this study explored how brand loyalty and luxury brand preferences impact on the visual perception of car emblems between Korean domestic brand and imported brand. This study used eye tracking technology to measure the respondents' attention on an emblem of the cars. Eye tracking tools analyze fixations and measure the attention on a specific area of interests (AOI). This study explored the maintaining time and frequency on AOI, as well as explored the size of pupil to identify the respondents' attention on the AOI. In this experiment, the logos of domestic cars (i.e., Hyundai and Kia) and foreign cars (i.e., Mercedes-Benz and BMW) were swapped to see how irrational consumer behavior impact on visual perception of car emblem.

**Key words:** Eye Tracking, Brand Effect, Visual Perception, Veblen Effect

## 1. INTRODUCTION

Classical economic theory assumes that consumers are rational. In the real world however, we often experience irrational consumptions in which decision making is based on emotional reasons rather than the utility and price of the products. The notable irrational consumption in Korea is conspicuous consumption[1]. The conspicuous consumption is to spend money on and the acquiring of luxury goods and services to publicly display economic power such as the income or the accumulated wealth[2]. The conspicuous consumers

regard the public display of discretionary economic power is a means of maintaining a given social status.

The irrational consumption however often results consumers' post purchase dissatisfaction. In addition, the irrational consumption is increasing due to the expansion of e-commerce[3]. The development of commerce enables to consume 24/7 at anywhere so that they are more exposed to the risk of irrational consumption[4]. The increasing interests has paid on the irrational consumption and consumers behavior to increase both consumers and brands' satisfactions[5].

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The irrational consumption is mainly caused by visual stimulation and the existing studies argue that the irrational consumers is expected to be stimulated by brand logo rather than the product's utilities[6,7,8].

This study therefore aims to investigate visual perception differences based on different consumer types. This study has two stages. The first is to identify the factors causing irrational customer behavior and the second is to investigate visual perception based on the brand preferences, brand loyalty and the preferences for luxury goods. This study divided into two groups for each test through pre-test survey, and used eye tracker to compare visual perception of a brand logo.

## 2. HYPOTHESIS DEVELOPMENT

The first purpose of this study was to investigate different visual perceptions according to brand loyalty. The different visual perceptions are expected for the consumers who has brand loyalty and the consumers who focus on price and functionality. Brand loyalty is expected consumers to more attend on a brand logo, while consumers who focus on a price and functionality are expected to have less attention on a brand logo. We hypothesized that:

**H1. Consumers who focus on a car brand on their consumption will have more attention on the emblem area of a car.**

The second purpose of this study was to investigate the differences of visual perception reactions according to luxury brands preferences. The consumers who purchase a luxury goods tend to be more conspicuous and sensitive to a brand logo, thus they will have more attention on luxury car brand logo. Thus we hypothesize that:

**H2. Consumer who prefer a luxury goods will have more active visual perception to the**

**emblem area of a luxury car than the area of economic car.**

The third purpose of this study was to investigate visual perception differences according to luxury car preferences. The preference to the luxury car will have different visual reaction to the emblem area of the car. When consumers prefer a luxury car due to a brand name rather than its functionality, they will have more attention on the emblem area of a car. Thus we hypothesized that:

**H3. Consumers who prefer a luxury car to an economic car will have more active visual perception on the emblem area of a car.**

## 3. METHOD

### 3.1 Eye tracking method

This study used eye tracking technology to measure the respondents' attention on a logo of the cars. Eye tracking system can record the exact spots that user watch and attention information of user recognition toward visual stimuli[9].

Eye tracking studies analyze fixations and measure the attention on a specific area of interests (AOI). The eye tracking tool follows the eyeballs' movements of the respondents and simultaneously analyses the size of pupil. The size of pupil, duration time and visiting count indicate individuals' attention, so thus eye tracking tool allows to identify respondents' attention on AOI. AOI statistics make eye-movement data easier to interpret and are used in multiple fields of research including marketing research[10]. This study explored the maintaining time and frequency on AOI, as well as explored the size of pupil to identify the respondents' attention on the AOI.

### 3.2 Experiment setting and stimulus

In this experiment, the emblem of economic cars (i.e., Hyundai and Kia) and luxury cars (i.e., Mer-



Fig. 1. Comparison Stimulus Set A: BMW vs. KIA.



Fig. 2. Comparison Stimulus Set B: Benz vs. Hyundai.

cedes-Benz and BMW) were swapped to see how the subjects perceived and perceived the brand, and how the evaluation of the brand was evaluated after excitation. The experimental stimuli used in this experiment are as follows.

The purpose of this study was to identify visual perception differences based on different consumption behavior such as brand focused consumption and functionality focused consumption. AOI (Area

of Interest) analysis was used to analyze the results of the eye tracking experiment of this study. AOI refers to a specific area of experimental stimulation. In this study, the front and rear emblem areas of each vehicle are considered as specific AOIs and the eye tracking data for these areas are analyzed as shown in the table below. There are two gaze tracking data for each AOI, one is the duration of stay in the area (unit: second) and the other is the number of fixation (unit: count).

Table 1. Experiment Participant Characteristics.

		Frequency	%
Gender	Male	24	
	Female	22	
Education	University Student	27	58.7
	Non Student	19	41.3
Age	20-24	25	54.3
	25-29	13	28.3
	over 30	8	41.3

## 4. RESULTS

### 4.1 Visual perception process and brand preferences

The first hypothesis was that consumer who concern brand name on their consumption tend to have more active visual reaction to the brand emblem area, while consumer who concern functionality and price than a brand name will have less

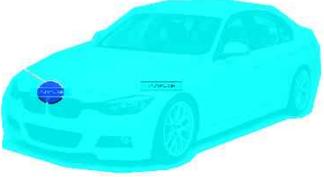
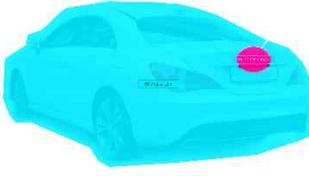
	Front emblem AOI	Rear emblem AOI	Car brand
Set A			BMW
			KIA
Set B			Mercedes-Benz
			Hyundai

Fig. 3. AOIs of Each Stimulus Set.

active visual reaction to the brand emblem area. This study to test the first hypothesis divided the subjects into the brand focused group who concern brand name and the non-brand focused group who concern functionality and price on their consumption.

For the first test using BMW and KIA, the subjects who concern functionality or price rather than a brand name tend to have longer fixation BMW emblem area (BMW front emblem gazing duration time, brand focused group: 0.6 sec vs. non brand focused group 0.86 sec). The same results showed for the KIA economic car brand (KIA rear emblem duration time, brand focused group: 0.48 sec, non-brand focused group: 0.83sec, Table 2).

For the fixation visiting count, no significant differences for the BMW. For the Kia, brand focused group has higher number of fixation visiting count than functionality focused group. (front em-

blem, brand focused group: 1.43 counts, non-brand focused group: 1.69 counts). This means that brand focused group tend to have longer visual latency on brand emblem for the luxury cars. This result similar to the rear emblem area. No significant differences was found for the visit counts. (Table 3)

The second set (Mercedes vs. Hyundai) showed similar results. Brand focus group has longer fixation than brand focused group (Front logo area, brand focused group 0.43sec vs. functionality focused group: 0.61 sec). For the visit count, functionality focused group has higher number of count on both front and rear logo area. (Mercedes front logo visit count, brand focused group: 1.0 count, functionality focused group: 1.38 count). Based on the findings, hypothesis 1 was rejected, meaning that there is not significant differences on visual reaction to brand logo between brand-focused group and functionality-focused group.

Table 2. Differences on AOI gazing duration on the BMW and KIA emblems by brand focused and non-brand focused groups.

			M	SD	f	p
Front Emblem	BMW	Brand focused group	.60	.196	22.016	.000***
		Non-brand focused group	.86	.449		
	KIA	Brand focused group	2.60	.394	2.539	.111
		Non-brand focused group	2.52	.550		
Rear Emblem	BMW	Brand focused group	1.02	.594	1.045	.307
		Non-brand focused group	.94	.644		
	KIA	Brand focused group	.48	.359	24.161	.000***
		Non-brand focused group	.83	.581		

Table 3. Differences on AOI fixation counts on the BMW and KIA emblems by brand focused and non-brand focused groups.

			M	SD	F	p
Front Emblem	BMW	Brand focused group	1.37	.486	1.871	.172
		Non-brand focused group	1.46	.499		
	KIA	Brand focused group	1.43	.497	12.931	.000***
		Non-brand focused group	1.69	.744		
Rear Emblem	BMW	Brand focused group	1.65	.481	1.664	.198
		Non-brand focused group	1.55	.643		
	KIA	Brand focused group	1.68	.471	29.474	.000***
		Non-brand focused group	1.35	.476		

4.2 Visual perception based on a luxury goods preferences

The second purpose of this research is to investigate the difference on visual perception based on a consumers' preference on a luxury goods. The consumers who prefer to purchase one luxury goods are supposed to have active reaction to the luxury car brand (i.e., BMW and Mercedes-Benz) rather than to the economic car brand (i.e., KIA and Hyundai). This study divided the subjects into luxury goods preference group and luxury goods non-preference group to test the second hypothesis.

For the first test set (BMW vs. KIA), consumers who prefer luxury goods tend to have longer duration time on the car brand emblem area. For the front emblem area, luxury good preference group gaze for 1.04sec, while luxury goods non-preference group gaze for 0.77 sec. For the rear emblem

area, luxury good preference group gaze for 1.09sec, while luxury goods non-preference group gaze for 0.88 sec. (Table 4)

For the second set of the test, luxury goods preference group has longer fixation time for the both luxury and economic car. For example, for the luxury car, luxury goods preference group gaze rear logo area for 0.94 sec while luxury goods non-preference group gaze for 0.64 sec. Similarly, for the economic car, luxury goods preference group gaze rear logo area for 0.85 sec while luxury goods non-preference group gaze for 0.58 sec. For the visit count, luxury goods preference group tend to have more active reaction to the luxury car. They have 1.74 visiting count for the rear logo area of the luxury car while luxury goods non preference group has 1.26 count. (Table 5)

The second hypothesis was partially supported.

Table 4. Differences on AOI gazing duration on the BMW and KIA emblems by luxury goods preference and non-preference groups.

			M	SD	F	p
Front Emblem	BMW	Luxury goods preference group	1.04	.371	34.632	.000***
		Luxury goods non preference group	.77	.434		
	KIA	Luxury goods preference group	2.69	.280	35.784	.000***
		Luxury goods non preference group	2.47	.584		
Rear Emblem	BMW	Luxury goods preference group	1.09	.787	15.426	.000***
		Luxury goods non preference group	.88	.553		
	KIA	Luxury goods preference group	1.08	.800	76.670	.000***
		Luxury goods non preference group	.68	.386		

Table 5. Differences on AOI fixation counts on the Mercedes-Benz and Hyundai emblems by luxury goods preference and non-preference groups.

			M	SD	F	p
Front Emblem	Mercedes-Benz	Luxury goods preference group	1.59	.756	39.787	.000***
		Luxury goods non preference group	1.30	.459		
	Hyundai	Luxury goods preference group	1.89	.866	.239	.625
		Luxury goods non preference group	1.86	.846		
Rear Emblem	Mercedes-Benz	Luxury goods preference group	1.74	.440	171.198	.000***
		Luxury goods non preference group	1.26	.438		
	Hyundai	Luxury goods preference group	1.46	.500	1.471	.226
		Luxury goods non preference group	1.52	.698		

The luxury good preference group tend to have higher fixation duration on luxury cars than on affordable cars. For the visiting count, the luxury goods preference group have higher count of visit to luxury cars than non-preference groups does, however there is no significant difference for the economic car.

4.4 Visual perception and luxury car preferences

The third purpose of this study was to explore the relationship between the luxury car preference and visual reaction to the car. Consumers who want to purchase luxury international car are supposed to have more active reaction to the luxury car brand emblem area. This study divided subjects into two groups which are luxury car preference group and economic car preference group to test hypothesis 3.

For the first set of the test, the affordable and domestic car preference group have higher fixation duration on the luxury car then the luxury car preference group. For the affordable domestic car, no consistent fixation duration showed for the front and rear emblem area.

For the visiting count of rear emblem area, affordable domestic car preference group have higher visit count for the domestic car, while luxury car preference group tend to have higher visit count for the luxury car (BMW rear emblem visit count: economic car preference: 1.37 vs. luxury car preference 1.56/ KIA front emblem area; economic car preference group: 1.77 vs. luxury car 1.38, Table 6).

The patterns were identified for the second test. The luxury car preference group have longer fixation duration on luxury car (Mercedes), while the economic car preference group have longer fixation

Table 6. Differences on AOI gazing duration on the BMW and KIA emblems by luxury car and economic car–preference group.

			M	SD	F	p
Front Emblem	BMW	Economic car preference group	1.37	.483	15.880	.000***
		Luxury car preference group	1.56	.497		
	KIA	Economic car preference group	1.77	.795	78.888	.000***
		Luxury car preference group	1.38	.486		
Rear emblem	BMW	Economic car preference group	1.45	.650	29.136	.000***
		Luxury car preference group	1.76	.625		
	KIA	Economic car preference group	1.15	.358	442.268	.000***
		Luxury car preference group	1.83	.377		

duration on economic car (KIA) than the other. (Mercedes front emblem fixation duration: luxury/international car preference group: 0.67sec, economic car preference group: 0.50 sec. For the Hyundai front emblem, luxury car preference group: 0.97sec, economic car preference group: 1.17 sec.)

The third hypothesis was supported. That is, the luxury car preference group tend to have more active reaction to the luxury car while the economic car preference group have more active reaction to the economic car such as KIA than the luxury car such as Mercedes-Benz.

### 5. CONCLUSION

This study explored the various irrational consumer behaviors and how these impact on visual reaction on brand logo or emblem. This study used eye tracking technique to measure visual reaction on the product and/or a brand logo. Two sets of tests were conducted and each set has three slides of international car and three slides of economic car. Two slides within each set has the swapped brand logo between a luxury car and economic car.

The first hypothesis was to identify the different visual reactions by the brand focused and functionality focused group, and tested whether the visual perception differently response to the emblem area of luxury car based on the different consumer group. Subjects have similar duration time and fixation in gazing the emblem area regardless

of their usual brand preference. The first hypothesis therefore was rejected.

The second hypothesis was to investigate the difference on visual reaction based on a consumers' preference on a luxury goods, and it was partially supported. The consumers who prefer luxury goods consumption tend to have active visual reaction toward luxury car emblem. The third hypothesis was to investigate the relationship between the luxury car preference and visual reaction to the car, and tested the higher the preference of luxury cars, the greater the visual perception response to the emblem area of the car than the response to economic car emblem area. The consumers who prefer luxurious car tend to have active visual reaction for the luxury car brand logo, while the consumers who prefer economic car tend to have active visual response to the economic car, thus it was fully supported.

These findings argue that consumers tend to have different visual perception towards a brand based on their consumer behavior. Although the brand emblem was swapped between luxury car and economic car, the subjects showed similar visual perception pattern to the emblem. In other words, people's visual preference for foreign cars is not due to the shape or design of the car, but the presence or absence of an emblem that symbolizes luxury cars. This supports so called 'Beblen effect' explaining consumers' irrational consump-

tion behavior.

This experiment used an expensive products such as automobiles, but we believe that the same phenomenon will occur for the luxurious fashion goods and brands such as Chanel and Gucci. While this study fills a gap in the literature in relation to the consumer behavior, a limitation of the study is the use of photo not the actual car. There can be a differences when the actual car is used. However, consumer search and explore information on the car through online and use photo, the findings is meaningful.

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