

# Measuring Preferences and Framing Effects on Preferences

ERASMUS UNIVERSITEIT ROTTERDAM

Faculteit der Economische Wetenschappen

Supervisor: W.E. Van den Berg

Name:	Gerben Plaisier
Studentnr.:	304920
Email:	gerbenplaisier88@hotmail.com
Thesis:	Master
Master:	Marketing
Date:	28-07-2011

## Abstract

Preferences are in the basis of a targeting strategy. This thesis introduces and tests a new method for measuring preferences, in which a competition is played between eight products. The new testing method was found to be a strong and valid method, clearly able to validly map a preference hierarchy of eight products. Several variables in the preference hierarchy formation were examined, including the time to make a choice, gender and the position of the options, in terms of left or right. Additionally, the influence of framing on people's preferences is being researched. Three types of framing are examined, including sensory observation in the form of *colors*, (2) influences based on people's feelings and/or cognition towards certain *product characteristics*, and (3) influences based on the reputation of certain *brand names*. Significant framing effects were found for all these three types of framing.

# CONTENT

---

1. Introduction .....	5
2. Literature background and theory development .....	7
<b>2.1 Introduction</b> .....	7
<b>2.2 Framing</b> .....	7
<b>2.3 Colors</b> .....	9
<b>2.4 Brand Names and Product Characteristics</b> .....	11
<b>2.5 Measuring Preferences</b> .....	11
<b>2.6 Problem Statement and Contribution</b> .....	12
3. Methodology .....	13
<b>3.1 Preference measuring method</b> .....	13
<b>3.2 Tool</b> .....	14
<b>3.3 Hypotheses</b> .....	18
<b>3.4 Statistical analysis</b> .....	20
4. Results .....	21
<b>4.1 Data description</b> .....	21
<b>4.1.1 Data collection</b> .....	21
<b>4.1.2 Demographic variables</b> .....	21
<b>4.2 PART ONE: Preference Measuring Method</b> .....	22
<b>4.2.1 Number of levels</b> .....	22
<b>4.2.2 Left – Right</b> .....	23
<b>4.2.3 Time</b> .....	23
<b>4.3 PART TWO: Effects of Framing on Preferences</b> .....	24
<b>4.3.1 Scores in the different framed tests</b> .....	24
<b>4.3.2 Gender</b> .....	25
5. Discussion .....	26
<b>5.1 PART ONE: Preference Measuring Method</b> .....	26
<b>5.1.1 Gender</b> .....	27
<b>5.1.2 Left – Right</b> .....	27
<b>5.1.3 Time</b> .....	28
<b>5.2 PART TWO: Influence of the framings</b> .....	29
<b>5.2.1 Colors</b> .....	29
<b>5.2.2 Product Characteristics and Brand Names</b> .....	30

<b>5.2.3 Gender</b> .....	32
6. Conclusion.....	33
<b>6.1 Part one</b> .....	33
<b>6.2 Part two</b> .....	33
7. Managerial implications.....	35
8. limitations & future research.....	36
9. Literature.....	37
Appendixes .....	41

---

# 1. INTRODUCTION

---

---

*“PREJUDICES AND PREFERENCES EXIST AND WILL CONTINUE TO. WHEN YOU LEARN HOW TO MARKET YOURSELF, YOU BECOME LESS OF A VICTIM.”- LAVRENTI LOPES*

---

For marketers, it is of great importance to know their customers' preferences, and, ideally, how to influence these preferences. A marketer who is unaware of the preferences of his target group might position his brand in the wrong way, or might even pick a target group that does not fit his brand (Neal et al., 2002). Marketers spend a lot of time and research on preferences. Preferences have been measured lots of times (Hoeffler, 2003). Marketers attempt to influence preferences all the time. Or, as Richard Hatch once said:

---

*“PROGRAMMERS AND MARKETING PEOPLE KNOW HOW TO GET INTO YOUR SUBCONSCIOUS - THEY SPEND MILLIONS OF DOLLARS RESEARCHING COLORS, SHAPES, DESIGNS, SYMBOLS, THAT AFFECT YOUR PREFERENCES, AND THEY CAN MAKE YOU FEEL WARM, TRUSTING, LIKE BUYING. THEY CAN MANIPULATE YOU.” - RICHARD HATCH*

---

A well-known and widely used way of influencing people is through framing. Framing is generally understood as the presentation of the problem (Tversky and Kahneman, 1986). Framing is controlled by the manner in which the choice problem is presented, and by the norms, habits and expectancies of the decision maker (Tversky and Kahneman, 1986).

Measuring preferences is a topic of major importance for marketers (Hoeffler, 2003). Various methods exist to measure preferences, including interviews and asking respondents to rate a number of issues on a certain scale. This thesis introduces and tests a new and innovative way to measure preferences. Are people able to construct realistic preference rankings of eight products? More specifically, is this new testing method

reliable? And, more interestingly, can the method be used to measure the effects of *framing* on preferences? A number of possibly influential framing effects are introduced to the tests, to measure their effects on people's preferences.

The aim of this research was to (1) test a new preference measuring method and (2) explore and measure the influence of framing on people's preferences. To achieve this, a testing method was used in which a competition was played between eight products. Eventually, this resulted in a preference hierarchy of the eight products. The first part of this thesis consists of the evaluation of this testing method. This is needed because the method is new and no data is available proving the validity and the strength of the method. Moreover, it has led to interesting findings concerning the process by which preferences are being formed. In this first part, the strength of the testing method will be examined, together with several other aspects that exist in the formation of preferences. The second part of this thesis describes the research on the effects of several test framings on people's preferences. More specifically, it describes whether and how the framing of one test influences people's preferences. This research focuses on three types of influences, including (1) sensory observation in the form of colors, (2) influences based on people's feelings and/or cognition towards certain product characteristics, and (3) influences based on the reputation of certain brands.

Before presenting the current research and its results, a literature overview is given to acquire insights in the topic and to better understand the current research.

---

## 2. LITERATURE BACKGROUND AND THEORY DEVELOPMENT

---

### 2.1 INTRODUCTION

---

Over the past years, marketers have shown a growing interest in environmental cues to influence people. Williams and Bargh (2008), for instance, showed that experiencing physical warmth, in the form of for instance hot coffee, promotes interpersonal warmth, in the form of trust or interpersonal judgments. In their first study, they found that participants that briefly held a cup of *hot* coffee judged a target person as having a warmer personality, compared to participants that briefly held a cup of *iced* coffee. In their second study, participants were given the choice to either choose a gift for *themselves*, or a gift for a *friend*. They found that participants that were holding a *hot* therapeutic pad were more likely to choose a gift for a friend instead of for themselves compared to participants that were holding a *cold* therapeutic pad.

Ackerman et al (2010) showed that touch also has an influence on social judgments. They conducted six experiments, in which participants held heavy or light clipboards, solved rough or smooth puzzles and touched hard or soft objects. They found that holding heavy objects made job candidates appear more important. Furthermore, they found that holding rough objects made social interactions appear more difficult, and touching hard objects increased respondents' rigidity in negotiations.

### 2.2 FRAMING

---

Environmental cues, like warmth, touch and colors, might have *framing* effects on people's preferences as well. Framing effects are an important tool to influence opinions. For instance, citizens' opinions about a Ku Klux Klan rally may depend highly on whether elites frame it as a free speech issue or as a public safety issue (Druckman, 2001). In general, the *presentation* of a problem or issue influences dynamic preferences (Gibbs, 1997). Gibbs (1997) distinguished three aspects of problem presentation.

First, *manipulating the task-procedure aspect*. For example, when subjects are given the task to choose between two monetary gambles, they tend to prefer one gamble.

When their task is to specify cash equivalents for those gambles, they tend to prefer the other gamble (Lichtenstein and Slovic, 1971; Tversky, Slovic, and Kahneman, 1990).

Second, *manipulating the contextual option aspect*, which occurs when subjects' tendency to prefer one option over another option is affected by the presence of surrounding options that share attribute dimensions with the two options. For instance, option *a* is preferred over option *b* when the options are presented alone, but option *b* is preferred over option *a* when they are presented together with option *c*. (Gibbs, 2003; Huber, Payne, and Puto, 1982; Simonson and Tversky, 1992; Tversky and Simonson, 1993).

Third, *manipulating the problem-description aspect*, which refers to the description or presentation of the problem (Gibbs, 2002). According to Gibbs (2002), manipulating the problem-description aspect can produce framing effects. For example, Tversky and Kahneman (1981), found that subjects preferred the risky alternative when outcomes were described in terms of lives lost, but preferred the riskless alternative when the same outcomes were described in terms of lives saved.

Three types of framing effects can be distinguished, *attribute framing*, *goal framing* and *risky choice framing* (Levin et al., 2002). These three types are distinguished on the basis of their operational definitions, their typical results, and the likely underlying processes (Levin, Schneider & Gaeth, 1998).

*Attribute framing* occurs when the evaluation of an object or event is more favorable when if a *key attribute* is framed in positive rather than negative terms (Levin et al., 2002). For instance, Levin et al. (2002) gave subjects an attribute framing task, in which they were asked to rate ground beef that is either labeled "80% lean" (positive) or "20% fat" (negative). They found that subjects were willing to spend 8.2 cents more for a one-pound package of ground beef when it was labeled "80% lean" compared to when it was labeled "20% fat". So, respondents appeared to be willing to pay more when the product was framed positively compared to when it was framed negatively.

*Goal framing* occurs when outcomes differ depending on whether the test stresses the positive *consequences* of performing an act to achieve a particular goal or the negative consequences of *not* performing the act. Meyerowitz and Chaiken (1987), for instance, found that women were more willing to engage in breast self-examination (BSE) when they were given information stressing the *negative* consequences of *not* engaging in BSE compared to a situation in which information was given that stressed the *positive* consequences of engaging in BSE. So, respondents were more willing to do a certain



activity when they read about the *negative* consequences of *not* doing it, compared to when they read about the *positive* consequences of doing it.

*Risky choice framing* occurs when the willingness to take a *risk* depends on whether the outcome is framed positively or negatively. Levin et al. (2002) gave respondents the task to choose between two programs related to treating high levels of cholesterol. The options were either positively or negatively framed. They found a significant effect of more risk taking in the negative frame in comparison to in the positive frame. So, the framing (positively or negatively) was found to have an influence on risk taking. When the message was positively framed, respondents were more willing to take risks.

Whilst the abovementioned and well-known examples of framing only work with positive/negative issues, framing might also have a broader influence. For instance, focusing on certain names or characteristics might frame respondents in a certain direction. Therefore, this research attempts to take framing into a broader perspective. It describes framing as the whole set of attributes that can be used in the layout and description of a problem or issue, by which respondents are being directed into a certain direction, without being aware of this influence. For instance, when a certain color is used throughout the whole presentation of a problem, it might be possible that this color influences respondents into a certain direction. Furthermore, when a certain characteristic that is highly present in the first option, and not or only a bit present in the second option, is repeatedly mentioned in the presentation of a choice problem, respondents might tend to prefer the first option over the second option.

## 2.3 COLORS

---

One way of framing is through the use of colors. A wealth of knowledge is available describing the role of color a marketing cue. In general, color is considered a potent cue for product and brand differentiation (Schmitt and Pan, 1994), and for creating and sustaining corporate identities (Garber et al., 2000; Madden et al., 2000) and consumer perceptions (Grossman and Wisenblit, 1999).

### *Product and category imagery*

Color signals a product's attributes for merchandise, thereby influencing perceptions about price and quality (Kerfoot et al., 2003). For instance, with regard to food, the color we see foretells the flavor we will taste (Downham and Collins, 2000). Yet,

color is the least expensive way of changing the product (Parmar, 2004), making it a crucial cue for marketers. Color can also be an important cue for brand recall. For instance, the Cheskin & Masten Inc (1987) found that red is associated with Coke, Sara Lee and Mickey Mouse, blue with IBM and Pepsi, pink with Barbie dolls and green with 7-Up and Canada Dry.

### *Product differentiation*

Marketers can launch a product color that is typical for the category. However, they could also differentiate from the category by using additional color cues or delinking the relationship between color and the product's perceived quality or flavor (Aslam and Mubeen, 2006). Apple, Gatorade and M&Ms, for instance, have used this effectively by launching novel colored product lines (Garber et al., 2000; Parmar, 2004). Pepsi, on the other hand, has left the traditional red color associated with soft drinks and tried to create new color associations by choosing blue as its color (Grossman and Wisenblit, 1999).

It is critical not to ignore culture-specific color associations. Use of adverse product colors in alien cultures can cause strategic failure. For instance, use of purple and black colors by Samsonite in Mexico (Parmar, 2004), ice blue color by Pepsi in Southeast Asia and wearing white carnations by concierges of United Airlines on its Pacific routes (Neal et al., 2002), where these colors symbolized death and mourning in the target markets, underscores the risk of not taking local perspectives on color into account. This stresses the importance of local adjustment of the marketing strategy or even a glocal strategy. Moreover, knowledge about cultural differences in color perceptions offers great opportunities. In Asian countries, where a white skin is associated with beauty and class and a dark skin is associated with hard labor, the Indian skin whitener market has shown significant growth rates (Kotabe and Helsen, 2001).

### *Self-image*

Trinkaas (1991) argues that people choose the colors of their cars, homes, clothes and even sports depending on how they wish to present themselves. However, to what extent a product, package or brand color influences a consumer's self-image and trial or adoption of a product remains to be explored further (Aslam and Mubeen, 2006).

Next to that, colors also induce certain feelings. Moser (2003) showed that pink in hospitals and schools has a passive, soothing effect, green has a calming effect and red has an intense, gripping effect on people. Madden et al. (2000) found that red was consistently associated with "active," "hot," and "vibrant".

---

## 2.4 BRAND NAMES AND PRODUCT CHARACTERISTICS

---

Next to colors, the mentioning of brand names and product attributes might be usable for framing as well. Little is known about the framing effects of these. However, there might be some influence. For example, seeing a brand name repeatedly is likely to result in higher brand awareness. A higher brand awareness is, subsequently, likely to affect people's preferences towards this particular brand (Nedungadi and Hutchinson, 1985).

Repeatedly mentioning a product characteristic might influence people to focus on this particular product characteristic and, hence, prefer the options that load highly on this particular characteristic.

---

## 2.5 MEASURING PREFERENCES

---

Preferences are present in all societies, in all groups and in each and every individual. According to Zajong and Markus (1982), preferences are influenced by both affective and cognitive factors. A particular kind of food, for instance, can be considered a delicacy in one culture, but entirely inedible in another culture. Dog meat is a delicacy in some parts of East Asia, but few Americans would find it appetizing (Zajong and Markus, 1982). For most American and European people, eating a chili pepper is a tough issue. Children in Mexico start eating chili peppers at the age of five years, even though it is clearly an acquired taste (Rozin and Schiller, 1980). These examples underscore the importance of measuring preferences.

A common manner to measure preferences is to present a number of informational issues, e.g. pictures, and to ask respondents to indicate which of those issues they like most, second, third, etc. Hoeffler (2003), for instance, recruited 36 MBA students to participate in his study, in which each respondent rated four products based on their newness. Other researchers use interviews to measure preferences.

The abovementioned techniques have some major shortcomings when applied to consumers' preferences. Interviews are rather time-consuming and, consequently, costly. The method used by Hoeffler (2003) does not measure the possibility that respondents' preferences are not perfectly *transitive*. According to Tversky and Kahneman (1986), transitivity is satisfied if it is possible to assign to each option a value that does not depend on the other available options. Hence, *linear transitivity* implies that if A is preferred over B and B over C, A must also be preferred over C. However, in reality it might be possible

that an individual prefers A over B and B over C, but C over A (*circular transitivity*). When preferences can be order on a nominal scale, for instance from one to ten, without multiple options being equally preferred, the preference hierarchy is linear. In a situation of a linear preference hierarchy, the preference must be perfectly transitive.

Another technique to measure preferences is through conjoint analysis. This method has received considerable academic and industry attention since the early 1970s (Green et al., 1990; Jain et al., 1979). In a conjoint analysis, buyers' tradeoffs among multiattributed products or services are measured (Green et al., 1978; Green et al., 1990). Hence, conjoint analyses can be used to measure people's preferences towards certain attributes of certain products or services. In essence, the problem the decision maker faces is how to trade off the possibility that option *a* is better than option *b* on attribute *x*, while *b* is better than *a* on attribute *y* (Green et al., 2001). So, conjoint analysis is a method that estimates the *structure* of a consumers' preferences. (Green et al., 1990).

---

## 2.6 PROBLEM STATEMENT AND CONTRIBUTION

---

Given the wealth of literature available on both framing and preferences, it is safe to assume that both topics are important in marketing. However, the link between the two topics is still rather vague. This thesis attempts to combine the two concepts of framing and measuring preferences. The research focuses not only on both separate topics, but also on the combination of the two topics. Hence, while previous research has given wonderful insights into the world of influencing people's *choices* and *attitudes* towards certain topics through framing, the attempt of the current research is to acquire insights into the world of influencing people's *preferences* through framing.

The main contribution of this paper is to give an overview of the influence of framing, in the form of repeatedly mentioning a color, brand name or product characteristic, on people's preferences. The results of this research can be used for a wide variety of marketing related issues. Grocery retailers can, for instance, frame (parts of) their brochures in a certain way, to influence their customers' preferences concerning certain products. Jewelry retailers can frame their in-store advertising in a way to make their customers prefer higher luxury.

---

## 3. METHODOLOGY

---

This research aims to (1) test a new preference measuring method and (2) explore and measure the influence of framing on customers' preferences. To test this, a tool will be used in which preferences are derived from pictures.

---

### 3.1 PREFERENCE MEASURING METHOD

---

In the tool, two pictures were shown at the same time from a pool of eight pictures. Respondents were asked to indicate which of the pictures they preferred. This was repeated until each combination of pictures had occurred. Hence, the test consisted of twenty-eight picture combinations. Eventually, the indicated preferences were used to construct a preference ranking. This ranking consequently showed the general preferences. Subsequently, another series of tests was executed. These tests attempted to influence respondents using different framings. The preference hierarchies of the separate tests were compared. Since the only difference between the tests was the possibly influential framing, this could be used to test the influence of framing on people's preferences. These tests were executed online.

In the first test, there were no consciously integrated environmental cues. This does not mean that there were no cues at all in this test, for the simple reason that it is not possible to exclude all cues from a test. One could, for instance, think of performing the test in black and white, to exclude the influence of colors. However, this assumes that black and white can not be a cue, which is unlikely. The first test together with the third test, in which the color black was being introduced, formed the basic ranking or hierarchy. The third test was added to the basic ranking in order to create more realistic results. Since in the third test black was being used, this test was still quite basic and, hence, provides more realistic results in comparison to a situation in which only the first test would have been used as a basic ranking.

In the subsequent tests, everything was held the same, except for the added framings. In the second series of tests -test two and four- several colors were added to the original test. All the pictures used in these series of tests were surrounded by a cadre in one color. Hence, participants were exposed to this color throughout the whole test. For

the second test, the color red was chosen; for the fourth test the color was yellow. Previous research on the influence of colors, as presented before, suggests both red and yellow are likely to be influential. In the third series of tests -tests five, six and seven- a brand name was repeatedly mentioned in the introduction and in the subtitle. So, again, participants were exposed to this framing throughout the whole test. In the fourth series of tests -test eight, nine and ten- a product characteristic was repeatedly mentioned in the introduction and in the subtitle.

Colors are sensory apperceived through the eye. The product characteristics framing focuses on feelings and cognition. The mentioning of certain brand names focuses on the reputation of the brand that is being mentioned. Thus, several framing effects are being researched. A more thorough clarification of the framings is found in the data description, chapter 5.

The pictures that were shown to respondents were pictures of cars. In those pictures, the brand name of the car was clearly visible. Hence, not only the product characteristics, but also the brand characteristics were integrated. Cars were chosen because cars are a relatively well-known product in the sample. A big proportion of the population knows a number of car brands and, consequently, has certain feelings and preferences about those brands.

---

### 3.2 TOOL

---

An innovative tool, develop by ISAM Neuroscience<sup>1</sup>, was used to execute the research. The pictures that were used had to meet some requirements. First of all, not only the car, but also the brand of the car had to be clearly visible. It was considered important to clearly mention the brand of the car, because respondent's feelings about the brands were of major importance for this research. Second, the same pictures had to be used in the different test rounds. Third, the pictures should show up to date cars, in models that are relatively well-known and typical for the particular brand. Eight car brands were chosen for the research. Those eight brands were all relatively well-known, yet sufficiently diverse brands. The process of selecting the eight brands is shown in appendix 1. The pictures used in the research are shown in appendix 2.

A total number of ten tests were executed, divided in four test rounds. The framings of each of the ten tests are presented in the table below.

---

<sup>1</sup> <http://www.isamneuroscience.com/>

<b>Test round</b>	<b>Test #</b>	<b>Framing</b>
1 - Basic	1	-
2 - Colors	2	Red
	3	Black
	4	Yellow
3 - Characteristics	5	Safety
	6	Power
	7	Looks
4 - Brand names	8	Volvo
	9	Ferrari
	10	Rolls Royce

Each of those test rounds are discussed below.

*Test round 1 –test 1*

In test 1, no consciously integrated framing was used. Hence, this test can be seen as the basis test. An example of a choice respondents were asked to make in test 1 is displayed below.



*Example of one choice in test 1*

*Test round 2 – tests 2-4*

In the second test round, three colors were used as a framing. This was executed by placing a cadre in one specific color around all the pictures in the whole test. Hence, in test 2 a red cadre was placed around all the pictures, a black cadre in test 3 and a yellow cadre in test 4.



*Example of one choice in test 4*



### *Test round 3 – tests 5-7*

In the third test round, several characteristics of cars were introduced as framings. These characteristics were mentioned in the introduction of the test, and in the subtitle. In test 5, the safety of a car was mentioned repeatedly, the power of a car in test 6, and the looks of a car in test 7. The introduction of test 5 is presented in the picture below. The text in the red cadre can be translated as “The safety of a car is, for instance, often very important. A lot of people choose for a car that is safe and reliable.” These two sentences were deleted in the other test rounds.

INTRODUCTIE

*Neemt u alstublieft deze introductie door voor u deelneemt aan de test.*

Wereldwijd bestaan er honderden automerken. Het ene merk is uiteraard populairder dan het andere. De keuze voor een bepaald merk is voor een groot deel afhankelijk van wat een persoon zelf belangrijk vindt. Zo is bijvoorbeeld vaak de **veiligheid** van een auto erg belangrijk. Veel mensen kiezen dan ook voor een **auto kiezen die veilig en betrouwbaar is.**

Het doel van deze test is het in kaart brengen van de voorkeuren van mensen wat betreft automerken.

*Klik hieronder op 'verder'*

**Verder >**

### *Introduction test 5*

### *Test round 4 – tests 8-10*

In the fourth test round, several car brand names were introduced as framings. All the brand names that were used as a framing, were also present in one the eight pictures. The brand name was mentioned both in the introduction and in the subtitle of the particular test. Volvo, Ferrari and Rolls Royce were introduced as framings in respectively test 8, 9 and 10. The introduction of test 8 is presented below. The text in the red cadre can be translated as “For many people, a Volvo is a very attractive car. A lot of people would rather drive in a Volvo than a car of another brand, etc.

*Neemt u alstublieft deze introductie door voor u deelneemt aan de test.*

Wereldwijd bestaan er honderden automerken. Het ene merk is uiteraard populairder dan het andere. De keuze voor een bepaald merk is voor een groot deel afhankelijk van wat een persoon zelf belangrijk vindt. **Zo is voor veel mensen een Volvo een zeer aantrekkelijke auto. Veel mensen zouden liever in een Volvo rijden dan in een auto van een ander merk, etc.**

Het doel van deze test is het in kaart brengen van de voorkeuren van mensen wat betreft automerken.

*Klik hieronder op 'verder'*

Verder >

### *Introduction test 8*

## 3.3 HYPOTHESES

---

The data should suggest certain hierarchies in the preferences. Eight hypotheses were formulated prior to the research.

The first hypothesis was formulated to examine the strength of the testing method. Moreover, it focused on the number of levels in the preference hierarchies of respondents. The number of levels refers to the number of different scores in the preference hierarchy. It was possible that two pictures ended up having the same final score. In a situation of linear ranking, the preference hierarchy would be transitive. In a perfectly transitive preference hierarchy, the number of rankings would have been eight, since there were eight pictures in the test.

*Hypothesis 1: H0: Respondents are unable to form transitive preference hierarchies.*

*H1: Respondents are able to form transitive preference hierarchies.*

The second hypothesis was related to gender. This hypothesis focused on the possible difference between men and women, with respect to the number of levels. It was formulated to test whether there is a difference between the degree to which men and women are able to form transitive preference hierarchies.

*Hypothesis 2: H0: There is no difference between men and women with respect to the number of levels*  
*H0: There is a certain difference between men and women with respect to the number of levels*

The third hypothesis was formulated to examine the influence of the placing of a picture on the number of times it was chosen. Hence, it was formulated to examine the difference between being positioned on the left hand side and being positioned on the right hand side, with respect to the frequency by which a picture on each side was chosen.

*Hypothesis 3: H0: There is no difference between left and right with respect to frequency.*  
*H1: There is a certain difference between left and right with respect to frequency.*

The fourth hypothesis referred to the relationship between the rank difference and the time respondents needed to choose between the two pictures. The rank difference is defined as the difference between the rankings of two pictures of a certain respondent.

*Hypothesis 4: H0: There is no relationship between rank difference and time.*  
*H1: There is a certain relationship between rank difference and time.*

The fifth, sixth and seventh hypotheses were formulated to measure the effect of the framings in the different tests. A separate hypothesis was formulated for the types of framing in each of the test rounds. The eighth and last hypothesis is related to gender, and was formulated to test whether men and women differ with respect to their preferences.

*Hypothesis 5: H0: There is no difference between the effects of the yellow framing versus the red framing.*  
*H1: The effects of the yellow versus the red framing differs.*

*Hypothesis 6: H0: There is no difference between the effects of the different product characteristic framings.*  
*H1: The effects of the different product characteristic framings differ.*

*Hypothesis 7: H0: There is no difference between the effects of the different brand name framings.*

*H1: The effects of the different brand name framings differ.*

*Hypothesis 8: H0: There is no difference between men and women with respect to preferences towards the pictures.*

*H1: There is a certain difference between men and women with respect to preferences towards the pictures.*

---

### **3.4 STATISTICAL ANALYSIS**

---

The first hypothesis was tested by analyzing the number of levels in all the tests, and by counting the frequency each number of levels occurred.

To test whether the number of levels differs significantly between men and women (hypothesis two), a chi square test was used, in which the number of levels measured with men was compared to the number of levels measured with women.

Hypothesis three was also tested using a chi square test, in which the number of times the picture on the left hand side was chosen was compared to the number of times the picture on the right was chosen.

The fourth hypothesis was tested using both a regression analysis and an ANOVA analysis.

The hypotheses five, six, seven and eight were tested using t-tests. The t-test calculations are presented in appendix 7.

Data were analyzed using SPSS version 18.0 (Chicago, IL).

---

# 4. RESULTS

---

---

## 4.1 DATA DESCRIPTION

---

---

### 4.1.1 DATA COLLECTION

---

A total number of 963 students were invited to participate in one of the tests. 224 students actually participated. Respondents were approached via email, in which they were asked to participate in one of the tests. The number of respondents per test depended on the response rate per test. Therefore, the total number of respondents differed per test.

---

### 4.1.2 DEMOGRAPHIC VARIABLES

---

To understand the selection of respondents, it is important to realize that the goal of this research is *not* to influence future or current car buyers through framing. The goal of this research is to explore and measure the influence of framing on peoples' preferences. Cars are chosen as the product category for this research, just for the reasons as described earlier.

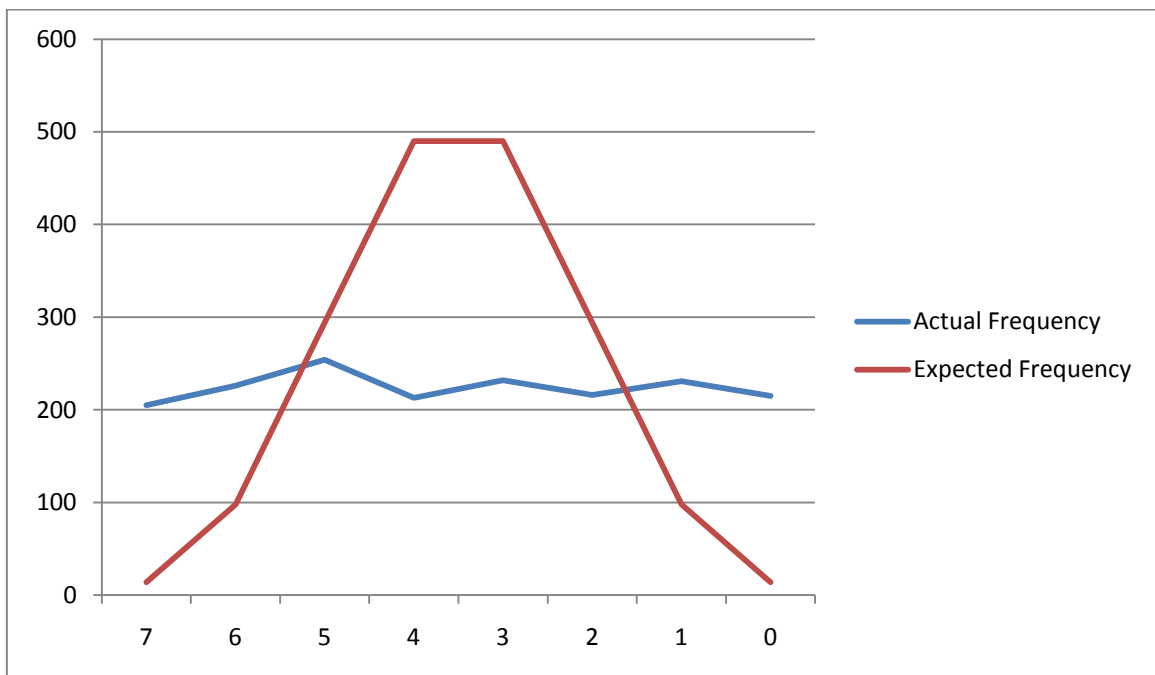
All participants were at the age of between 18 and 28 years old, in order to exclude possible deviations related to age. All respondents were Dutch students, to exclude possible deviations related to education, IQ, income or nationality. 34.8% of the respondents were female; 65.2% of the respondents were male. The number of respondents per test is presented in appendix 3, table 4.

## 4.2 PART ONE: PREFERENCE MEASURING METHOD

### 4.2.1 NUMBER OF LEVELS

Before the results of the tests can be analyzed, the validity of the testing method must be analyzed. Table 5 in appendix 3 presents the binomial probability of each individual score (zero to seven) to occur, the expected number of times of each score to occur, and the actual number of times each score occurred. The score is defined as the ranking of the picture on a scale of zero to seven, where seven is the highest and zero the lowest. The same results are graphically presented in the graph below.

*Graph 1 – Expected (bin. prob.) and actual frequency of each score, based on table 5*



The results in tables 6.1 – 6.12 indicate the number of levels in each test. The number of levels can be defined as the number of different scores in a test. For instance, a test with a preference ranking of 7-6-5-4-3-2-1-0 has eight levels; a test with a preference ranking of 7-6-4-4-4-2-1-0 has six levels.

In the basis test, which consisted of 30 cases with eight levels and 17 cases with either four or six levels, the presence of circular transitivity was measured. Circular transitivity was found in nine of the seventeen cases.

---

### 4.2.2 LEFT - RIGHT

---

The tests also measured the total number of times the left picture was chosen and the total number of times the right picture was chosen. The effects of the position of the pictures (in terms of left hand side versus right hand side) need to be examined, for this might disturb the effects that this research aims to measure.

Since twenty-eight preference points are divided between the pictures in each individual's score, the average total score for the left and for the right picture are both fourteen. The average score that was measured for the left pictures was 14,39286; the average score that was measured for the right picture was 13,60714.  $t$  was 0.022. Hence there was no difference found between the average scores of left and right.

---

### 4.2.3 TIME

---

The tests do not only attempt to measure a hierarchy of preferences, but also give an insight into the process of constructing this hierarchy. For each respondent in the first test, the rank difference between the two pictures that were shown is compared to the time the respondent needed to make the decision. The rank difference is defined as the difference between the rankings of two pictures for a certain respondent. A scatter plot of the time needed to make a decision with respect to the rank difference is presented in appendix 8.1. The rank difference was found to have a significant positive influence on the time respondents needed to make a decision. The regression analysis resulted in the equation below. The ANOVA analysis resulted in a p-value lower than 0.01.

$$\text{Time (ms)} = 3288.106 - 325.892 * [\text{Rank Difference}]$$

---

## 4.3 PART TWO: EFFECTS OF FRAMING ON PREFERENCES

---

---

### 4.3.1 SCORES IN THE DIFFERENT FRAMED TESTS

---

First, the individual preference scores were computed. These scores indicate, on a scale of zero to seven where zero is worst and seven is best, each individual's preferences when it comes to the eight pictures. The individual preference scores were used to compute the average scores per test. The results are shown in table 1. This table should be interpreted as follows. The numbers indicate the average score of each picture (BMW, Citroën, etc.) in each test (test 1, test 2, etc.), on a scale of zero to seven. So, for instance, in test 2 the BMW picture is, on average, preferred most. In test 5, the Rolls Royce picture is preferred most.

The separate numbers are, in fact, still quite meaningless. It becomes really interesting when the numbers in table 1 are compared to the basic hierarchy. The numbers of the basic hierarchy are shown in table 2.

Now, when the scores of each test, as presented in table 1, are compared to the scores in test 1, as presented in table 2, the deviations from the basic hierarchy are found. These deviations are presented in table 3, and can be used to acquire some first insights in the influence of framing on preferences. The numbers indicate the deviation of each score compared to the score of that same picture in the basis test (test 1). So, for instance, in test 2 the BMW picture scored, on average, 0,927273 higher than in the basis test (test 1).

However, these results seem quite peculiar. For the BMW and the Ferrari pictures every framing seems to work out positively, and for the Daihatsu and Volvo pictures every framing seems to work out negatively. This, of course, could be true, but it certainly is peculiar. No discriminant validity is measured. Therefore, it might be more useful to combine the scores of test 1 and test 3, in order to acquire a more reliable basis hierarchy, and to create discriminant validity. Test 3, in which a black cadre is placed around all pictures, is still quite a basic test. This way, the sample that the scores are compared to becomes bigger and, hence, the results become more reliable and more realistic. Moreover, this allows us to find discriminant validity.

The graphs showing the average scores in each test are presented in appendix 4, for each of the eight pictures. The total scores in the red and the yellow framed tests are presented in appendix 5, for each of the eight pictures.



---

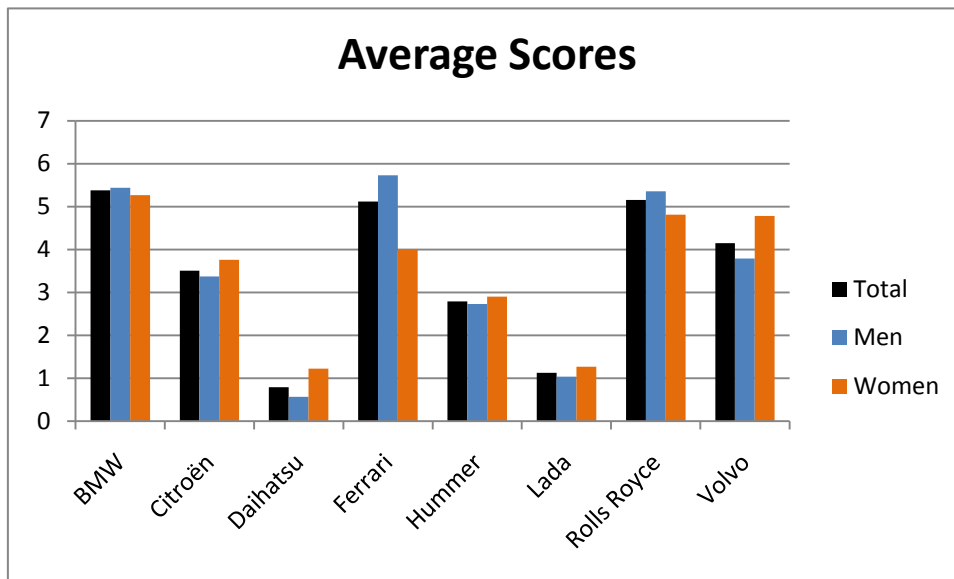
### 4.3.2 GENDER

---

It might be interesting to examine the influence of gender in the preference formation. More specifically, do men have other preferences than women? And is there a difference in the strength of their preferences, in terms of transitivity?

The results of this study are presented the table below, in which the average scores of both men and women for each of the eight pictures are presented.

The number of levels in the preference rankings of men and women are presented in table 6.11 and table 6.12. The scores per test per picture are presented in appendix 6.



*Average scores (for men, for women, and total) in each of the test,*

---

# 5. DISCUSSION

---

---

## 5.1 PART ONE: PREFERENCE MEASURING METHOD

---

*Hypothesis 1: H0: Respondents are unable to form transitive preference hierarchies.*

*H1: Respondents are able to form transitive preference hierarchies.*

Ideally, each respondent's individual test would result in an hierarchy of preferences counting from zero to seven. In this situation of linear ranking, the preference ranking would be perfectly transitive.

Whereas the 'expected frequency' line in graph 1 describes a curve with a top in the middle, the 'actual frequency' line is more or less a straight horizontal line. Hence, the results indicate a clear hierarchy of preferences.

In a situation in which the preference ranking of an individual would be perfectly transitive, the results would show eight levels. The number of levels can be defined as the number of different scores in a test. For instance, a test with a preference ranking of 7-6-5-4-3-2-1-0 has eight levels; a test with a preference ranking of 7-6-4-4-4-2-1-0 has six levels. The results in table 6.10 indicate that eight levels were found in more than seventy percent of the cases. Six levels were found in slightly more than one out of four cases. The remaining less than two percent consisted of four levels. This, again, demonstrates the power of the testing method.

Circular transitivity was, in the basis test, found in nine of the seventeen cases. Circular transitivity is found when, for instance, a respondent prefers *a* over *b* and *b* over *c*, but *c* over *b*. Hence, circular transitivity is not based on an *error* in the preference hierarchy, and still proves the strength of the testing method.

Apparently, people have quite clear and transitive preference hierarchies. Moreover, this testing method enables us to measure these preference hierarchies.

---

### 5.1.1 GENDER

---

*Hypothesis 2: H0: There is no difference between men and women with respect to the number of levels*  
*H1: There is a certain difference between men and women with respect to the number of levels*

To test whether the number of levels differs significantly between men and women, a chi square test was used.



These results give no reason to reject H0. Hence, there is no proven significant difference between men and women with respect to the number of levels in the preference rankings. Apparently, there is no significant difference between the degree to which men and women are able to construct preference hierarchies.

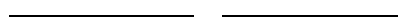
---

### 5.1.2 LEFT - RIGHT

---

*Hypothesis 3: H0: There is no difference between left and right with respect to frequency.*  
*H1: There is a certain difference between left and right with respect to frequency.*

A chi-square test was used to determine whether or not these figures differ significantly, using the numbers as presented in table 7.



The results give no reason to reject H0. Hence, there is no proven difference between the left hand picture and the right hand picture when it comes to the frequency left or right is chosen. No significant differences were found between men and women in this respect. Since the test randomly assigned pictures to either the left or the right hand side, the influence of the framings can be analyzed without paying attention to left or right.

---

### 5.1.3 TIME

---

*Hypothesis 4: H0: There is no relationship between rank difference and time.*

*H1: There is a certain relationship between rank difference and time.*

At first sight, there seemed to be no significant influence of rank difference on time, with a significance level of 0.473. However, when the cases that took more than ten seconds, which were thirteen out of 560 cases, were left out, a significant influence was found. The regression function that was found is described as:

$$\text{Time (ms)} = 3288.106 - 325.892 * [\text{Rank Difference}]$$

The rank difference was found to have an influence of -325.892 on time (in ms), with a significance level of 0.000. Hence, the greater the perceived difference between two pictures, the less time respondents needed to make a decision.

To confirm this finding, an ANOVA analysis was run. The average time (mean) of each rank difference is presented in appendix 8.2. A One-way ANOVA was used to compare these means. The calculation is presented in appendix 8.3. The null hypothesis (the mean is the same for all rank differences) can be rejected. This approves the earlier findings.

Both the regression and the ANOVA analyses give reason to reject H0. Hence, the rank difference is found to have a significant influence on the time respondents needed to make a choice.

---

## 5.2 PART TWO: INFLUENCE OF THE FRAMINGS

---

Using the average scores of each picture in each test, the influence of each of the framings can be conducted. The graphs showing the average scores in each test are presented in appendix 4, for each of the eight pictures.

---

### 5.2.1 COLORS

---

*Hypothesis 5: H0: There is no difference between the effects of the yellow framing versus the red framing.*

*H1: The effects of the yellow versus the red framing differs.*

When it comes to colors, an interesting finding is the contrary effect of red and yellow. While the data suggested a negative effect of the color red on the Citroën, Daihatsu and Lada pictures, it suggested a positive effect of the color yellow on these three pictures. Overall, a relatively large difference is found between the effects of red and yellow. This difference was particularly clear for the Hummer picture<sup>2</sup> and the Citroën picture<sup>3</sup>. For both, a significant difference was found between the effects of the red and the yellow framing (both significant on 10% level). The red framing resulted in a higher average score of the Hummer picture (3.227 in the red test compared to 2,409 in the yellow test). The yellow framing resulted in a higher average score of the Citroën picture (3,818 in the yellow test compared to 3,045 in the red test).

Furthermore, the data suggests that the red framing works out better for the BMW, Ferrari and Rolls Royce pictures, whilst the yellow framing works out better for the Daihatsu, Lada and Volvo pictures. However, these results were not found significant, and thus only suggest a direction.

Overall, the red framing appears to work out best for pictures that presented relatively expensive and higher-order cars, whilst the yellow framing was best for pictures that presented relatively cheap and lower-order cars. A possible explanation for this finding is found at Madden et al. (2000). They found that red was consistently associated with "active," "hot," and "vibrant".

---

<sup>2</sup> See Calculation 7.12 in Appendix 7

<sup>3</sup> See Calculation 7.13 in Appendix 7

Concluding, the abovementioned results give enough reason to reject H0. The effects of the red framing and the yellow framing differs significantly.

---

## 5.2.2 PRODUCT CHARACTERISTICS AND BRAND NAMES

---

*Hypothesis 6: H0: There is no difference between the effects of the different product characteristic framings.*

*H1: The effects of the different product characteristic framings differ.*

*Hypothesis 7: H0: There is no difference between the effects of the different brand name framings.*

*H1: The effects of the different brand name framings differ.*

Amongst other findings, a very interesting finding is that the effects of the framing ‘Safety’ and ‘Volvo’ are comparable. Both framings have a positive effect on the evaluation of both the Ferrari picture (‘Safety’ significant effect on 5% level<sup>4</sup>; ‘Volvo’ significant effect on 10% level<sup>5</sup>) and the Rolls Royce picture (‘Safety’ significant effect on 5% level<sup>6</sup>; ‘Volvo’ significant effect on 10% level<sup>7</sup>). The effects of the framings ‘Looks’ and ‘Rolls Royce’ suggest the same. Both framing seem to have a positive effect on the evaluation of the Ferrari picture and a negative effect on the evaluation of the Hummer picture. However, these results are not significant<sup>8</sup>.

Apparently, a framing in which the looks of a car are emphasized often has the same effect as a framing in which the brand name Rolls Royce is emphasized; and a framing in which the safety of a car is emphasized often has the same effect as a framing in which the brand name Volvo is emphasized. This same effect is, partly, found for ‘Ferrari’ and ‘Power’. A possible explanation for this effect is that people associate a Rolls Royce with a good looking car, a Volvo with a safe car and a Ferrari with a car with a lot of power. Hence, they might be considered equivalents by many people.

---

<sup>4</sup> See Calculation 7.1 in Appendix 7

<sup>5</sup> See Calculation 7.2 in Appendix 7

<sup>6</sup> See Calculation 7.10 in Appendix 7

<sup>7</sup> See Calculation 7.11 in Appendix 7

<sup>8</sup> See Calculation 7.4, 7.5, 7.6 and 7.7 in Appendix 7

Even though Volvo and safety are, apparently, considered equivalents, the safety framing appears to have little or no influence on the Volvo picture. Moreover, even though Rolls Royce and looks are considered equivalents, the 'looks' framing appears to have little or no influence on the Rolls Royce picture either. For Ferrari and power this lack of effect does not appear; the power framing seems to work out positively for the Ferrari picture. However, this effect is not significant either<sup>9</sup>.

This lack of effect is very interesting. The results of the brand name framing suggest the same effect. Repeatedly mentioning the Volvo brand name has no significant effect on the Volvo picture. The data even suggests a negative (yet not significant) effect. The Ferrari picture, again, does not seem to suffer from this effect. However, the positive effect that was measured was not significant.

A possible explanation would be that respondents do notice the framing (either consciously or non-consciously), but do not feel attracted to the particular characteristic or brand name. Consequently, they 'punish' the picture that loads high on the particular characteristic or brand name by preferring another picture.

Another possible explanation would be that respondents already associate Volvo with safety, and Rolls Royce with looks. Hence, mentioning this characteristic has little or no effect on the particular brand, even though this brand loads high on this characteristic.

However, these are merely *possible* explanations, not (yet) proven ones.

Given all the effects as presented above, it is safe to reject H0 in both hypothesis 6 and hypothesis 7. Lots of effects were measured, as described above.

---

<sup>9</sup> See Calculation 7.8 in Appendix 7

---

### 5.2.3 GENDER

---

It might be interesting to examine the influence of gender in the preference formation. More specifically, do men have other preferences than women? And is there a difference in the strength of their preferences, in terms of transitivity?

*Hypothesis 8: H0: There is no difference between men and women with respect to preferences towards the pictures.*

*H1: There is a certain difference between men and women with respect to preferences towards the pictures.*

The results, as presented before, indicate some clear differences in the preferences of men and women. The difference between men and women was found to be the greatest for the Ferrari, Daihatsu and Volvo pictures. The Daihatsu and the Volvo pictures were more preferred by women, the Ferrari picture was more preferred by men<sup>10</sup>. This difference seems to be the greatest in the Looks framed test. However, this difference was not found significant, due to the small number of respondents.

With the results as presented above, it is safe to reject H0. There appeared to be some differences in the preferences of men versus women.

---

<sup>10</sup> See calculations 7.13 - 7.15 in Appendix 7



---

## 6. CONCLUSION

---

---

### 6.1 PART ONE

---

Part one of this thesis consisted of the evaluation of the testing method. First of all, the results presented in this thesis prove the validity and the strength of the new preference measuring method. In more than seventy percent of the cases, eight levels were measured, proving a high degree of linear ranking and, hence, transitivity. In a test in which indifference between two pictures is not possible, this is a great proof for the strength of this testing method.

The difference between the rankings of two pictures was found to yield a significant influence on the time respondents needed to choose between the two pictures. The greater the difference, the less time respondents needed.

The position of one picture in relationship to the other picture, which could be either left of right, was found to have no influence on respondents' preferences.

The first part of this thesis was to introduce and test the new preference measuring method. The results of this part of the study prove the strength and validity of this method.

---

### 6.2 PART TWO

---

Part two of this thesis described the research on the effects of several test framings on people's preferences. Three types of framings were examined, including (1) sensory observation in the form of colors, (2) influences based on people's feelings and/or cognition towards certain product characteristics, and (3) influences based on the reputation of certain brands. Significant effects were measured for all three types of framings.

Significant differences were measured between the effects of the different framings within one type of framing. For instance, the effects of the colors yellow and red differed significantly for the Hummer and the Citroën picture.

The effects of Volvo and Safety were comparable, as well as the effects of Rolls Royce and looks, and the effects of Ferrari and power. A possible explanation would be that people consider those brands and characteristics as equivalents.

However, even though these might be seen as equivalents, a lack of effect was found. Volvo did not score higher in the Safety framed test, and Rolls Royce did not score higher in the Looks framed test. The same lack of effect was found in the brand names framings. Volvo did not score higher in the Volvo framed test, and Rolls Royce did not score higher in the Rolls Royce framed test. This lack of effect could be explained by possibility that respondents did notice the framing, but did not feel particularly attracted to the particular characteristic or brand name.

The aim of the second part of this thesis was to explore and measure the influence of framing on people's preferences. Several significant effects were measured for each of the three framing types that were investigated.

---

## 7. MANAGERIAL IMPLICATIONS

---

The results presented in this thesis can be very useful for managerial decision making. First of all, the introduced preference measuring method can be used in a wide variety of branches to measure preferences. Since it is very easy to use, cheap and takes relatively little time to execute (in comparison to former methods), it can be very usable for almost everyone who wants to measure the preferences of his/her customers or clients. Knowing the preferences of one's customers is in the basis of a targeting strategy. The tool presented in this thesis can be a strong and easy to use method for companies to measure the preferences of their customers.

Furthermore, the research on the influence of framings on preferences can be used by marketers in their decision making on how to communicate to their target group. Significant effects were measured for all three types of framing that were researched in this thesis. The preference measuring method as introduced in this thesis, enables marketers to easily access worthy information on how to frame their communications. Using this tool, managers could assess useful information suggesting which characteristics (or other properties) result in a higher preference of customers towards a certain brand. Moreover, managers can use this tool to determine which other brand names result in a higher preference of customers towards a certain brand. This could be used in advertising or other communications. The brand to focus on in communications might not be the number one rival brand, but might well be another brand. Using this tool, managers can get an insight into which properties or brand names could work out positively for their brand in customers' preference formation. Moreover, managers can use this tool to determine how to communicate several sub brands within one brand. Logically, the influence of framings may differ per product category and per culture. Managers can easily use this method to examine which framing would be ideal for the goal they pursue.

Managers can also assess information on which kind of framing particularly suits a certain group. For instance, significant differences were found between the preferences of men versus women. Managers could use this knowledge, and investigate which kind of framing makes this difference particularly great.

---

## 8. LIMITATIONS & FUTURE RESEARCH

---

A larger group of respondents is needed to confirm some of the findings in this research. Some of the effects of the framings that were found were not significant. A larger sample is likely to result in more significant results.

The effects of the Volvo framing and the Safety framing was comparable, as well as the effects of the Rolls Royce framing and the Looks framing. More research is needed to confirm whether these comparable effects are found on a broader range of brands and characteristics, and to investigate whether people actually see these as equivalents.

No effect was found of the Volvo framing on the Volvo picture and of the Rolls Royce framing on the Rolls Royce picture. This lack of effect needs to be researched. An interesting finding is that the Ferrari framing might have some effect (the effect was not found significant) on the Ferrari picture.

More demographic variables could be involved in the tests, to measure their effects on people's preferences. In this thesis, for instance, gender was found to have significant effects on people's preferences. The effects of other demographic variables could be researched as well.

---

## 9. LITERATURE

---

- Ackerman, J. M., Aslam, Mubeen M.(2006) 'Are You Selling the Right Colour? A Cross-cultural Review of Colour as a Marketing Cue', *Journal of Marketing Communications*, 12: 1, 15 — 30
- Baker, J., Parasuraman, A., Grewal, D., Voss, G.B. (2002) The Influence of Multiple Store Environment Cues on Perceived Merchandise Value and Patronage Intentions, *Journal of Marketing*, 66 (2), pp. 120-141
- Cheskin & Masten Inc. (1987) Color Information Package, a non-proprietary colour research report (Palo Alto, CA: Cheskin & Masten Inc.).
- Downham, A. & Collins, P. (2000) Colouring our foods in the last and next millennium, *International Journal of Food Science and Technology*, 35(1), pp. 5-22
- Druckman, James N. (2001) On the Limits of Framing Effects: Who Can Frame?, *The Journal of Politics*, 63, pp 1041-1066
- Garber Jr, L. L., Hyatt, E. M. & Starr Jr, R. G. (2000) The effects of food color on perceived flavor, *Journal of Marketing Theory and Practice*, 8(4), pp. 59-72.
- Gibbs, B.J. (1997) Predisposing the Decision Maker Versus Framing the Decision: A Consumer-Manipulation Approach to Dynamic Preference, *Marketing Letters* 8:1, pp. 71-83
- Green, P.E., Krieger, A.M. & Wind, Y.J. (2001) Thirty Years of Conjoint Analysis: Reflections and Prospects, *Marketing Engineering*, 31 (3), pp. S56-S73
- Green, P.E. & Srinivasan, V. (1978) Conjoint Analysis in Consumer Research: Issues and Outlook, *Journal of Consumer Research*, 5, pp. 103-123.

- Green, P.E. & Srinivasan, V. (1990) Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice, *The Journal of Marketing*, 54 (4), pp. 3-19.
- Grossman, R. P. & Wisenblit, J. Z. (1999) What we know about consumers' color choices, *Journal of Marketing Practice: Applied Marketing Science*, 5(3), pp. 78-88.
- Hoeffler, S. (2003) Measuring preferences for really new products, *Journal of Marketing Research*, 40 (4), pp. 406-420
- Huber, J., Payne, J. W. & Puto, C. (1982) Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis, *Journal of Consumer Research*, 9, pp. 90-98.
- Jain, A.K., Acito, F., Malhotra, N.K. & Mahajan, V. (1979) A Comparison of the Internal Validity of Alternative Parameter Estimation Methods in Decompositional Multiattribute Preference Models, *Journal of Marketing Research*, 16 (3), pp. 313-322.
- Kerfoot, S., Davies, B. & Ward, P. (2003) Visual merchandising and the creation of discernible retail brands, *International Journal of Distribution and Retail Management*, 31(3), pp. 143-152.
- Kotabe, M. & Helsen, K. (2001) *Global Marketing Management*, 2nd edition (New York: Wiley).
- Levin, I.P., Gaeth, G.J., Schreiber, J., Lauriola, M. (2002) A New Look at Framing Effects: Distribution of Effect Sizes, Individual Differences, and Independence of Types of Effects, *Organizational Behavior and Human Decision Processes*, 88 (1), pp. 411-429.
- Levin, I. P., Schneider, S. L., & Gaeth, G. J. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76, pp. 149-188.

- Lichtenstein, S. & Slovic, P. (1971). Reversals of Preference Between Bids and Choices in Gambling Decisions. *Journal of Experimental Psychology*, 89, pp. 46–55.
- Madden, T. J., Hewitt, K. & Roth, M. S. (2000) Managing images in different cultures: a cross-national study of color meanings and preferences, *Journal of International Marketing*, 8(4), pp. 90–107.
- Meyerowitz, B.E. and Chaiken, S. (1987) The effect of message framing on breast self-examination attitudes, intentions, and behavior, *Journal of Personality and Social Psychology*, 52(3), pp. 500-510
- Maynard, M. and Y. Tian. (2004) Between Global and Local: Content Analysis of the Chinese Web sites of the 100 Top Global Brands, *Public Relations Review* 30(3). pp. 285-291
- Neal, C. M., Quester, P. G. & Hawkins, D. I. (2002) *Consumer Behaviour: Implications for Marketing Strategy*, 3rd edn (Roseville, NSW: McGraw-Hill).
- Nedungadi, P, Hutchinson, J. W. (1985) The Prototypicality of Brands: Relationships with Brand Awareness, Preference and Usage, *Advances in Consumer Research*, 12, pp. 498-503
- Parmar, A. (2004) Marketers ask: hues on first?, *Marketing News*, 15 February, pp. 8–10
- Schmitt, B. H. & Pan, Y. (1994) Managing corporate and brand identities in the Asia-Pacific region, *California Management Review*, 36(4), pp. 32–48.
- Simonson, I. & Tversky, A. (1992) Choice in Context: Tradeoff Contrast and Extremeness Aversion, *Journal of Marketing Research*, 29, pp. 281–295.
- Trinkaus, J. (1991) Color preferences in sport shoes: an informal look, *Perceptual and Motor Skills*, 73(1/2), pp. 613–614.
- Tversky, A. & Kahneman, D. (1986) Rational Choice and the Framing of Decisions, *The Journal of Business*, 59 (4), pp 251-278

Tversky, A. & Simonson, I. (1993) Context-Dependent Preferences, *Management Science* 39, pp. 1179–1189.

Tversky, A., Paul, S. & Kahneman, D. (1990) The Causes of Preference Reversal, *American Economic Review*, 80, pp. 204–217.

Williams, L. E. & Bargh, J. A. (2008) Experiencing Physical Warmth Promotes Interpersonal Warmth, *Science*, October 24, pp. 606-607

Zajonc, R. B. & Markus, H. (1982) Affective and cognitive factors in preferences, *Journal of Consumer Research*, 9 (2), pp. 123-131



---

# APPENDIXES

---

- Appendix 1** Consideration rounds on which picture to use
- Appendix 2** Pictures that were used
- Appendix 3** Various tables
- Appendix 4** Graphs per picture
- Appendix 5** Scores in the red and the yellow framed tests
- Appendix 6** Scores divided by gender
- Appendix 7** Various calculations
- Appendix 8** Calculation and graphs rank difference and time

## Appendix 1

<i>Consideration round 1</i>	<i>Consideration round 2</i>	<i>Consideration round 3</i>
Alfa Romeo (Italian)	Alfa Romeo	
Audi (German)		
Bentley (British)		
BMW (German)	BMW	BMW
Bugatti (French)		
Cadillac (American)	Cadillac	
Citroën (French)	Citroën	Citroën
Corvette (American)		
Daewoo (Korean)		
Daihatsu (Japanese)	Daihatsu	Daihatsu
Dodge (American)		
Ferrari (Italian)	Ferrari	Ferrari
Ford (American)		
Honda (Japanese)		
Hummer (American)	Hummer	Hummer
Hyundai (Korean)		
Jaguar (British)	Jaguar	
KIA (Korean)		
Lada (Russian)	Lada	Lada
Lamborghini (Italian)	Lamborghini	
Lancia (Italian)		
Mazda (Japanese)		
Mercedes (German)	Mercedes	
Nissan (Japanese)		
Opel (German)	Opel	
Peugeot (French)		
Porsche (German)	Porsche	
Renault (French)		
Rolls-Royce (British)	Roll Royce	Rolls Royce
Saab (Swedish)		
Skoda (Czech)		
Subaru (Japanese)		
Suzuki (Japanese)		
Toyota (Japanese)		
Volkswagen (German)	Volkswagen	
Volvo (German)	Volvo	Volvo

## Appendix 2

*BMW*



*Citroën*



*Daihatsu*



*Ferrari*



*Hummer*



*Lada*



*Rolls Royce*



*Volvo*



### Appendix 3 – tables

Table 1 – The average scores of each picture in TEST 2 - 10

AVERAGE SCORES	Framing	BMW	Citroën	Daihatsu	Ferrari	Hummer	Lada	Rolls Royce	Volvo
TEST 2	Red	5,72727	3,04545	0,5	5,45455	3,22727	0,77273	5,54545	3,72727
TEST 3	Black	5,7037	3,62963	0,96296	4,85185	3,18519	0,88889	4,66667	4,11111
TEST 4	Yellow	5,54545	3,81818	1,09091	4,72727	2,40909	1,18182	5,04545	4,18182
TEST 5	Safety	4,78261	2,73913	0,3913	5,65217	3,34783	1	5,86957	4,21739
TEST 6	Power	5,6	4,1	0,75	5,05	2,3	1,65	4,35	4,2
TEST 7	Looks	5,27273	3,5	1,09091	5,18182	2,40909	1	5,04545	4,5
TEST 8	Volvo	5,125	3,58333	0,58333	5,375	2,66667	1,08333	5,58333	4
TEST 9	Rolls Royce	5,42857	3,57143	0,95238	5,14286	2,61905	1,2381	4,95238	4,09524
TEST 10	Ferrari	5,73913	3,56522	0,52174	5,21739	2,43478	1,34783	5,26087	3,91304

Table 2 – The average scores in the Basic hierarchy (TEST 1)

AVERAGE SCORES		BMW	Citroën	Daihatsu	Ferrari	Hummer	Lada	Rolls Royce	Volvo
TEST 1	Basic	4,8	3,55	1,1	4,55	3,15	1,1	5,3	4,45

Table 3 – The deviations compared to the Basis (TEST 1)

Red = negative; Green = positive; White = little or no influence

DEVIATION FROM BASIS		BMW	Citroën	Daihatsu	Ferrari	Hummer	Lada	Rolls Royce	Volvo
TEST 1	Basis	-	-	-	-	-	-	-	-
TEST 2	Red	0,927273	-0,50455	-0,6	0,904545	0,077273	-0,32727	0,245455	-0,72273
TEST 3	Black	0,903704	0,07963	-0,13704	0,301852	0,035185	-0,21111	-0,63333	-0,33889
TEST 4	Yellow	0,745455	0,268182	-0,00909	0,177273	-0,74091	0,081818	-0,25455	-0,26818
TEST 5	Safety	-0,01739	-0,81087	-0,7087	1,102174	0,197826	-0,1	0,569565	-0,23261
TEST 6	Power	0,8	0,55	-0,35	0,5	-0,85	0,55	-0,95	-0,25
TEST 7	Looks	0,472727	-0,05	-0,00909	0,631818	-0,74091	-0,1	-0,25455	0,05
TEST 8	Volvo	0,325	0,033333	-0,51667	0,825	-0,48333	-0,01667	0,283333	-0,45
TEST 9	Rolls Royce	0,628571	0,021429	-0,14762	0,592857	-0,53095	0,138095	-0,34762	-0,35476
TEST 10	Ferrari	0,93913	0,015217	-0,57826	0,667391	-0,71522	0,247826	-0,03913	-0,53696

Table 4 – Numbers of respondents

TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6	TEST 7	TEST 8	TEST 9	TEST 10	TOTAL
20	22	27	22	23	20	22	24	21	23	224



Table 5 – Binomial probability, expected and actual frequency of each score

<b>Score</b>	<b>Bin. Probability</b>	<b>Expected Frequency</b>	<b>Actual Frequency</b>
<b>7</b>	0,007813	14	205
<b>6</b>	0,054688	98	226
<b>5</b>	0,164063	294	254
<b>4</b>	0,273438	490	213
<b>3</b>	0,273438	490	232
<b>2</b>	0,164063	294	216
<b>1</b>	0,054688	98	231
<b>0</b>	0,007813	14	215

Table 6.1 – Levels in the “basic” test (TEST 1 + TEST 3)

<b># Levels</b>	4	6	8
<b>Frequency</b>	1	16	30
<b>Frequency %</b>	2,1277	34,0426	63,8298

Table 6.2 – Levels in the “Red” test (TEST 2)

<b># Levels</b>	4	6	8
<b>Frequency</b>	0	2	20
<b>Frequency %</b>	0	9,0909	90,9091

Table 6.3 – Levels in the “Yellow” test (TEST 4)

<b># Levels</b>	4	6	8
<b>Frequency</b>	1	4	17
<b>Frequency %</b>	4,5455	18,1818	77,2727

Table 6.4 – Levels in the “Safety” test (TEST 5)

<b># Levels</b>	4	6	8
<b>Frequency</b>	0	8	15
<b>Frequency %</b>	0	34,7826	65,2174



Table 6.5 – Levels in the “Power” test (TEST 6)

<b># Levels</b>	4	6	8
<b>Frequency</b>	1	4	15
<b>Frequency %</b>	5	20	75

Table 6.6 – Levels in the “Looks” test (TEST 7)

<b># Levels</b>	4	6	8
<b>Frequency</b>	0	8	14
<b>Frequency %</b>	0	36,3636	63,6364

Table 6.7 – Levels in the “Volvo” test (TEST 8)

<b># Levels</b>	4	6	8
<b>Frequency</b>	0	7	17
<b>Frequency %</b>	0	29,1667	70,8333

Table 6.8 – Levels in the “Rolls Royce” test (TEST 9)

<b># Levels</b>	4	6	8
<b>Frequency</b>	1	4	16
<b>Frequency %</b>	4,7619	19,0476	76,1905

Table 6.9 – Levels in the “Ferrari” test (TEST 10)

<b># Levels</b>	4	6	8
<b>Frequency</b>	0	6	17
<b>Frequency %</b>	0	26,087	73,913

Table 6.10 – Levels in all tests

<b># Levels</b>	4	6	8
<b>Frequency</b>	4	59	161
<b>Frequency %</b>	1,7857	26,3393	71,875

Table 6.11 – Levels in all tests – only men

<b># Levels</b>	4	6	8
<b>Frequency</b>	1	33	112
<b>Frequency %</b>	0,684932	22,60274	76,71233

*Table 6.12 – Levels in all tests – only women*

<b># Levels</b>	4	6	8
<b>Frequency</b>	3	26	49
<b>Frequency %</b>	3,846154	33,333333	62,82051

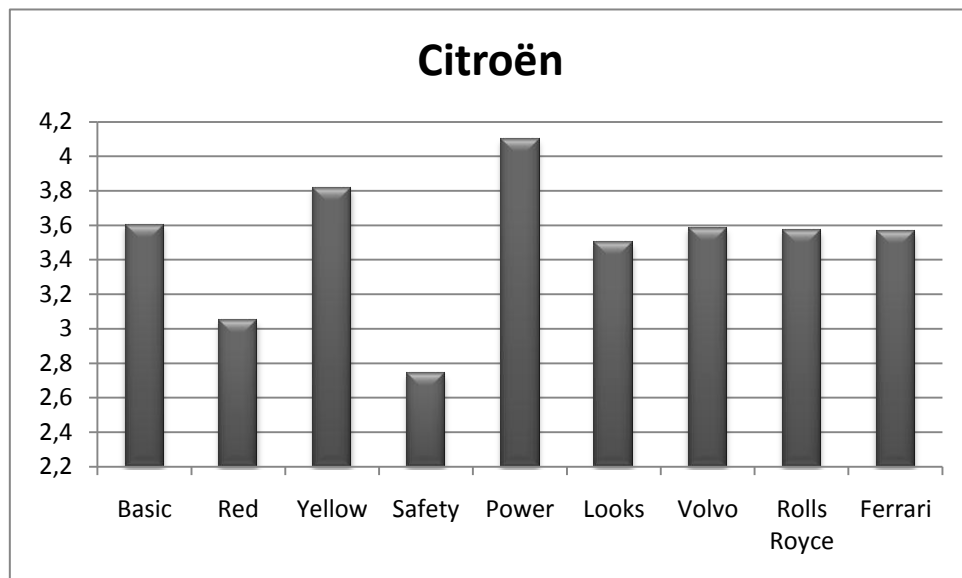
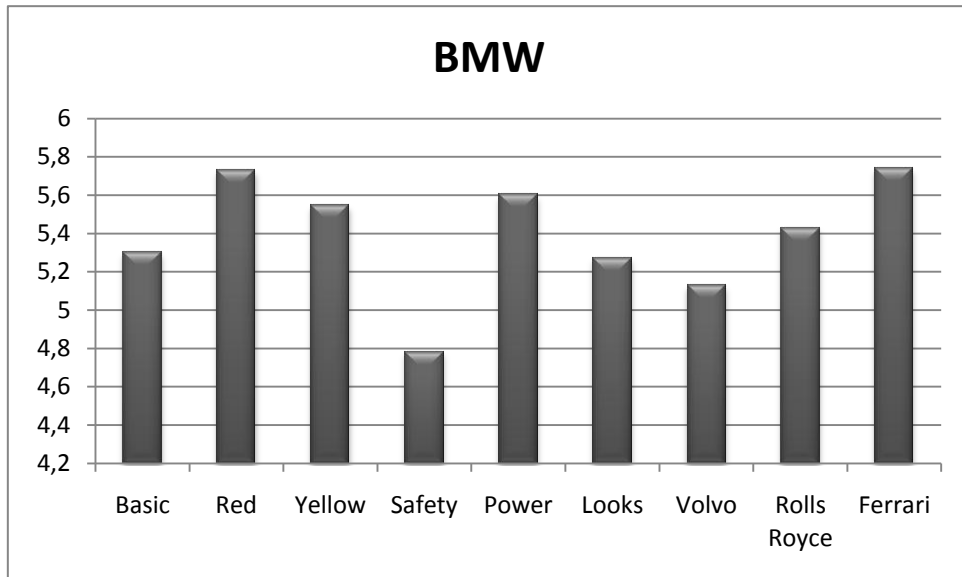
*Table 6.13 – Expected levels*

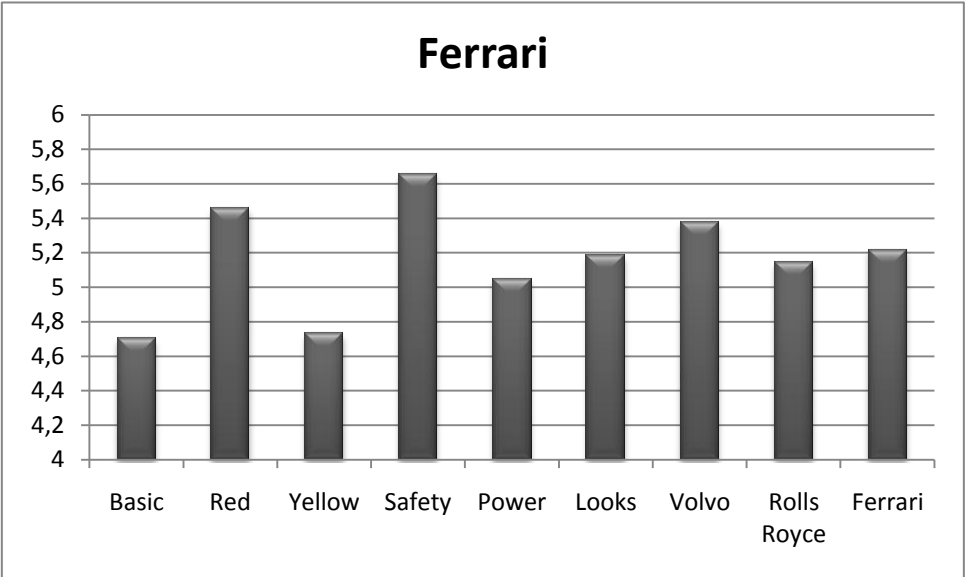
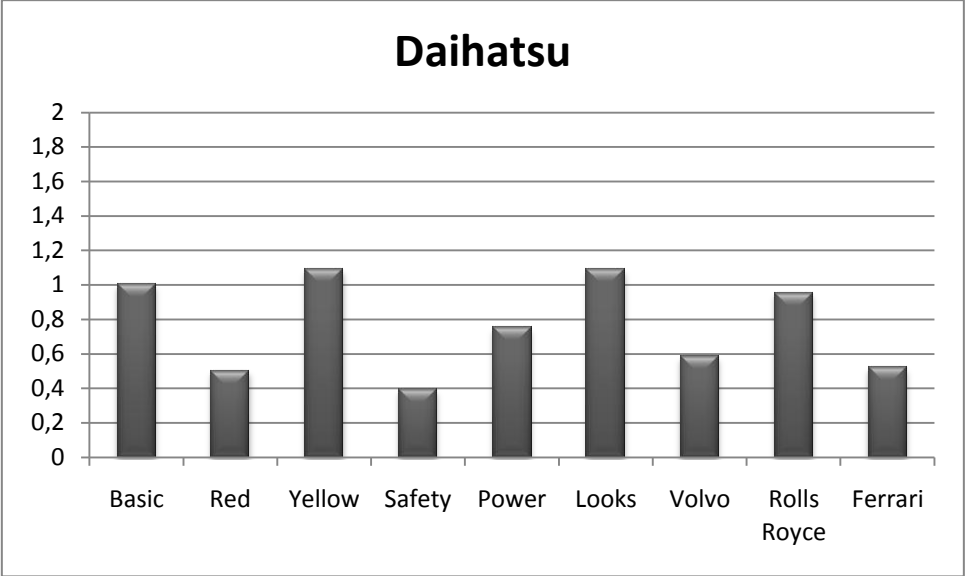
	<b>4</b>	<b>6</b>	<b>8</b>
<b>Men</b>	2,61	38,46	104,94
<b>Women</b>	1,39	20,54	56,06

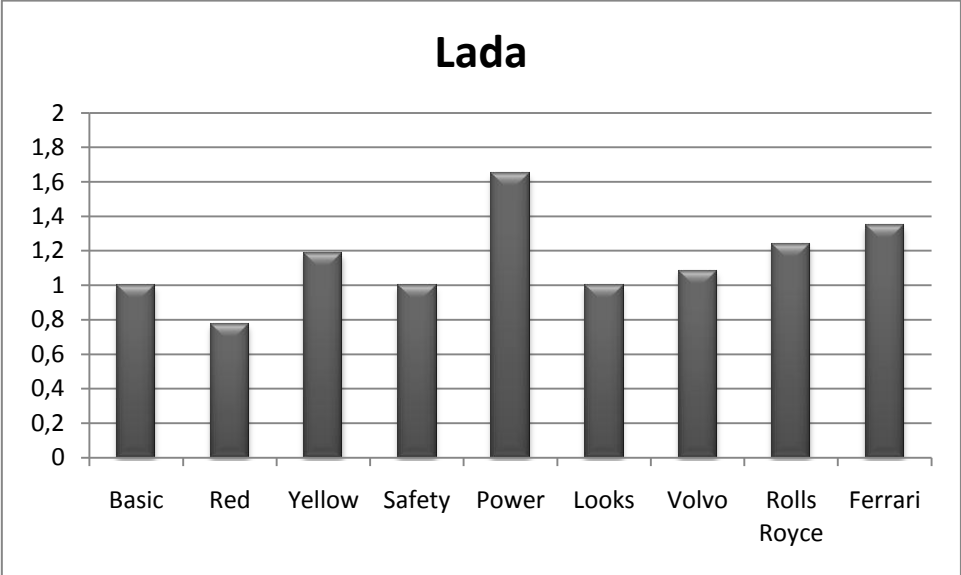
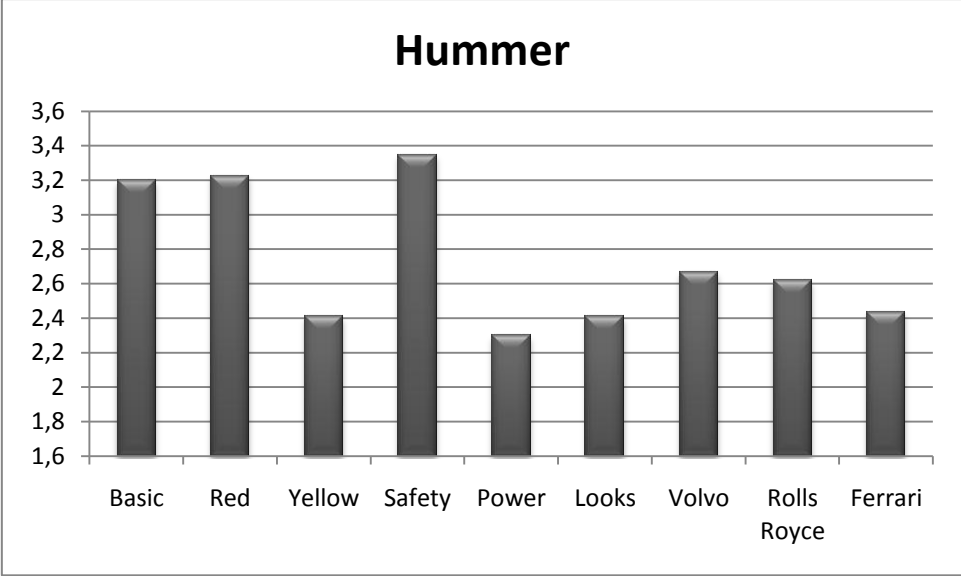
*Table 7- Left and Right – average number of times each side has been chosen per respondent*

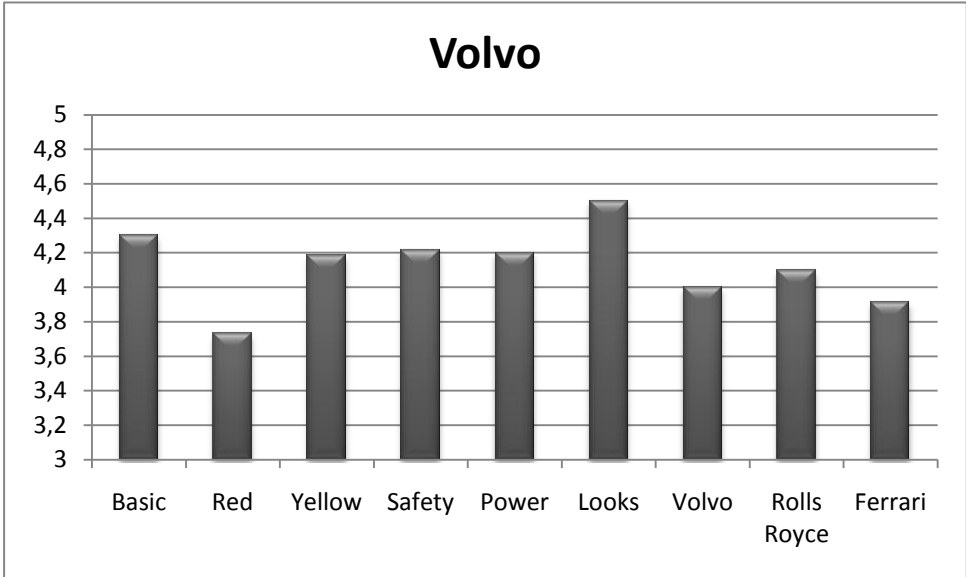
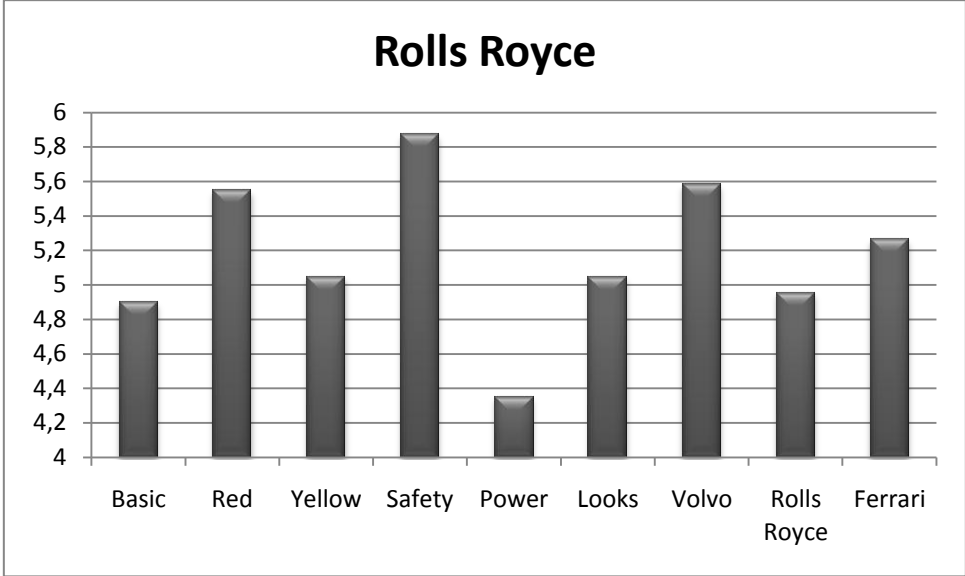
	Observed average	Expected average
Left	14,39286	14
Right	13,60714	14

## Appendix 4

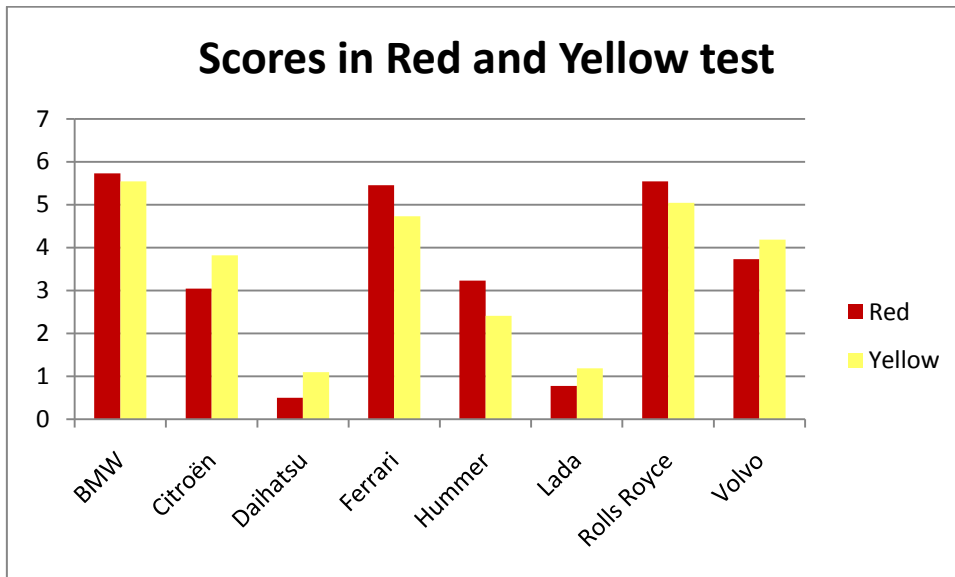




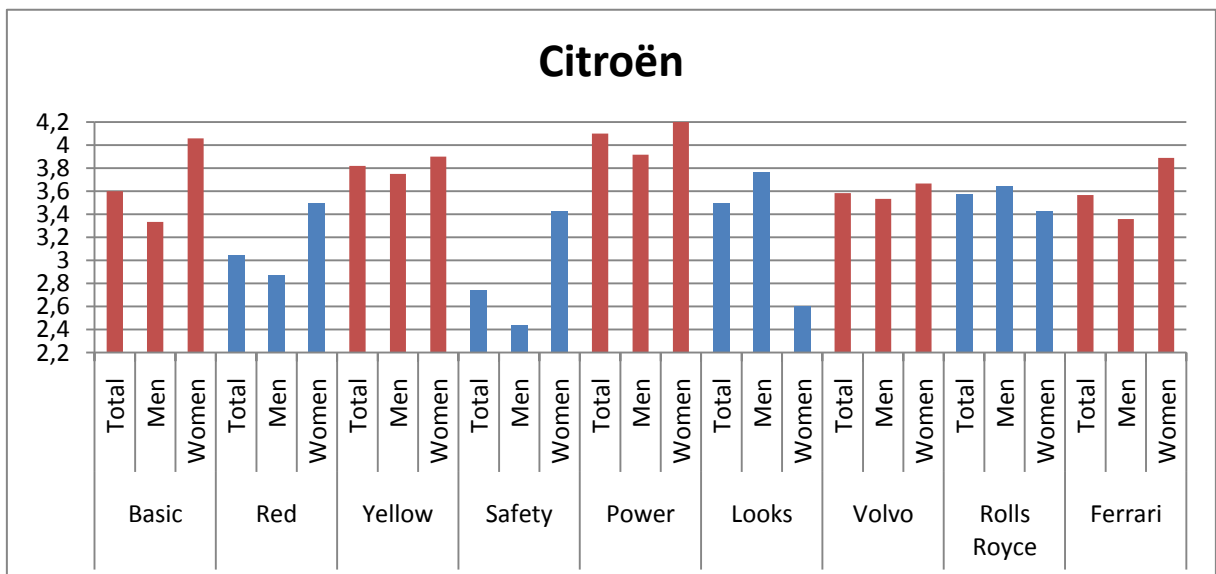
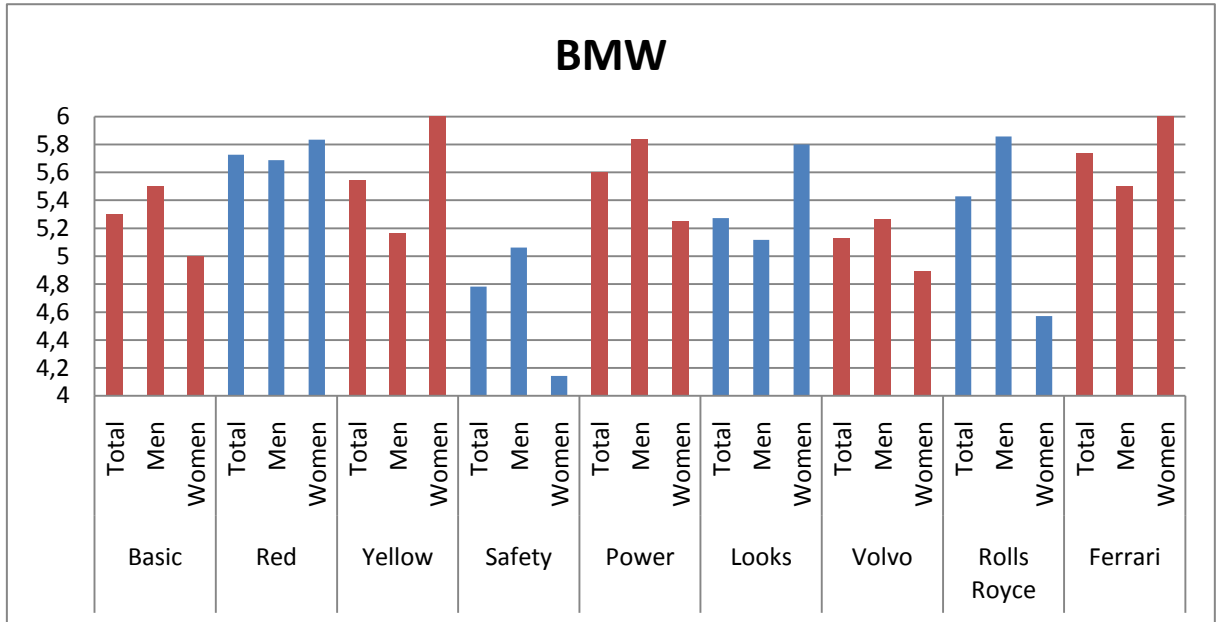




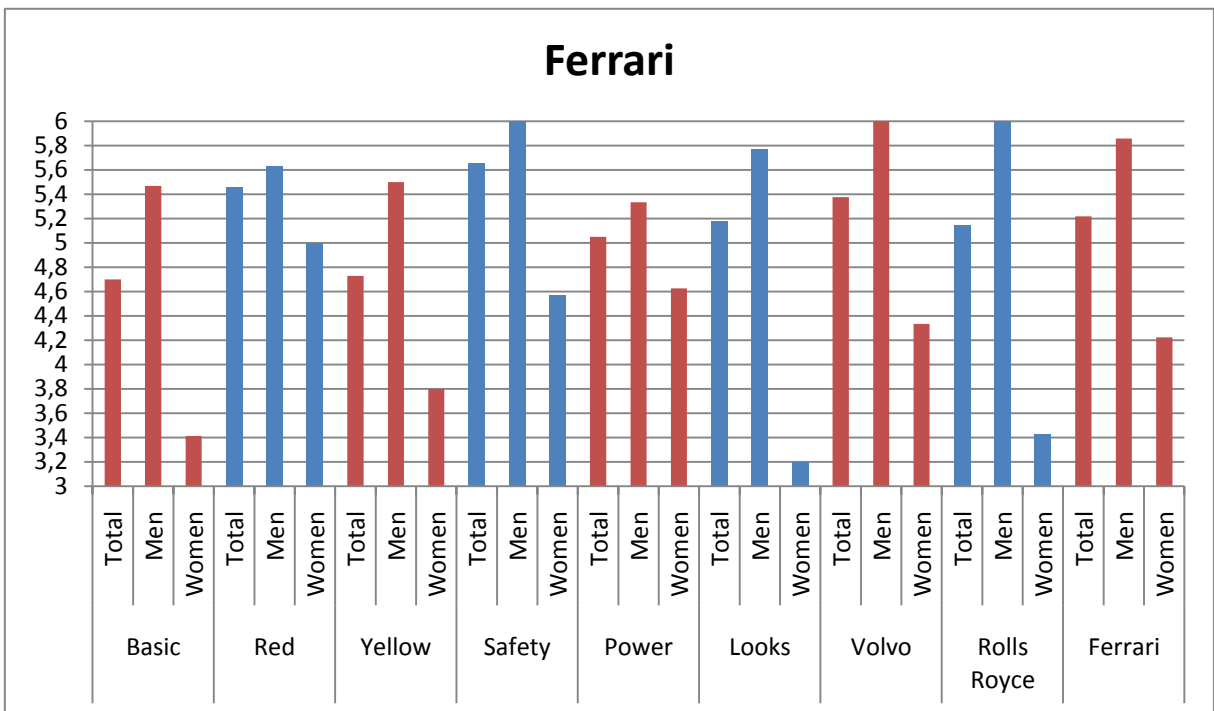
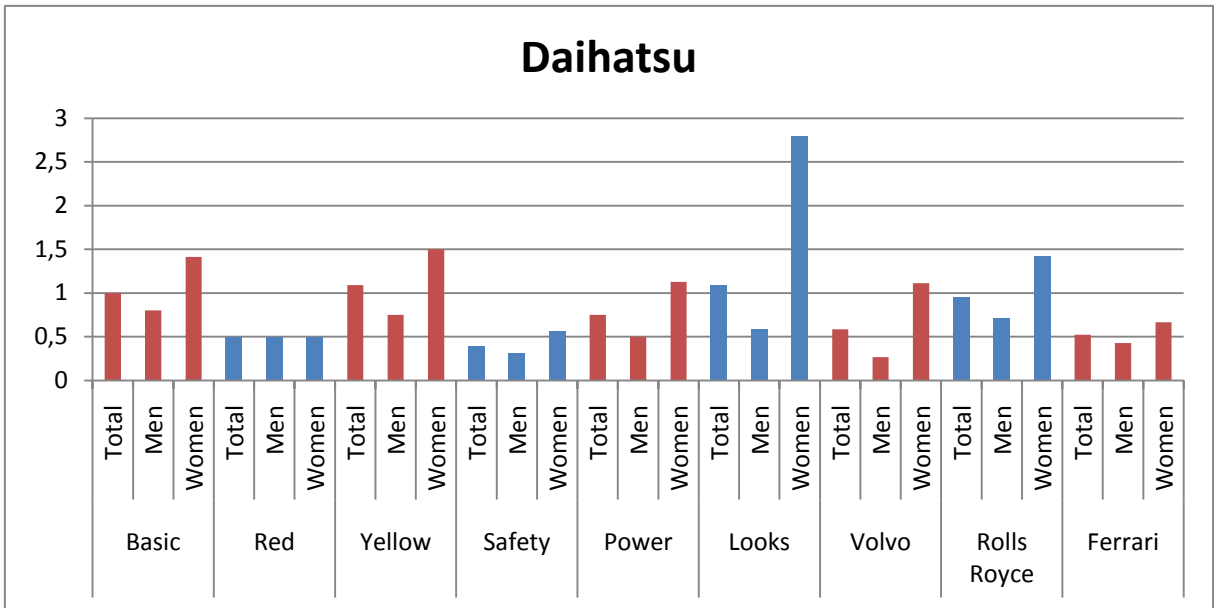
## Appendix 5

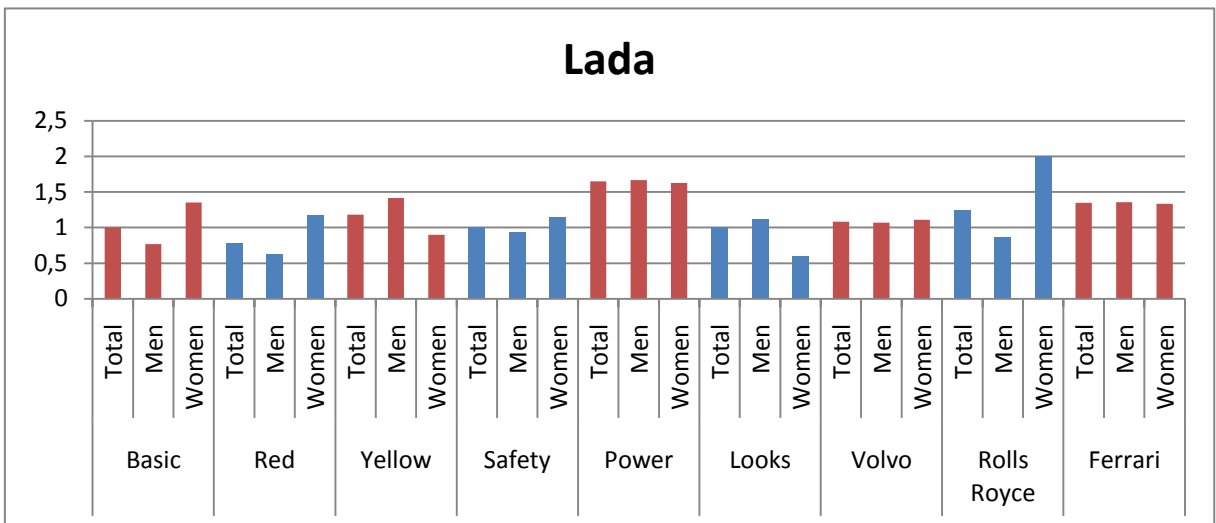
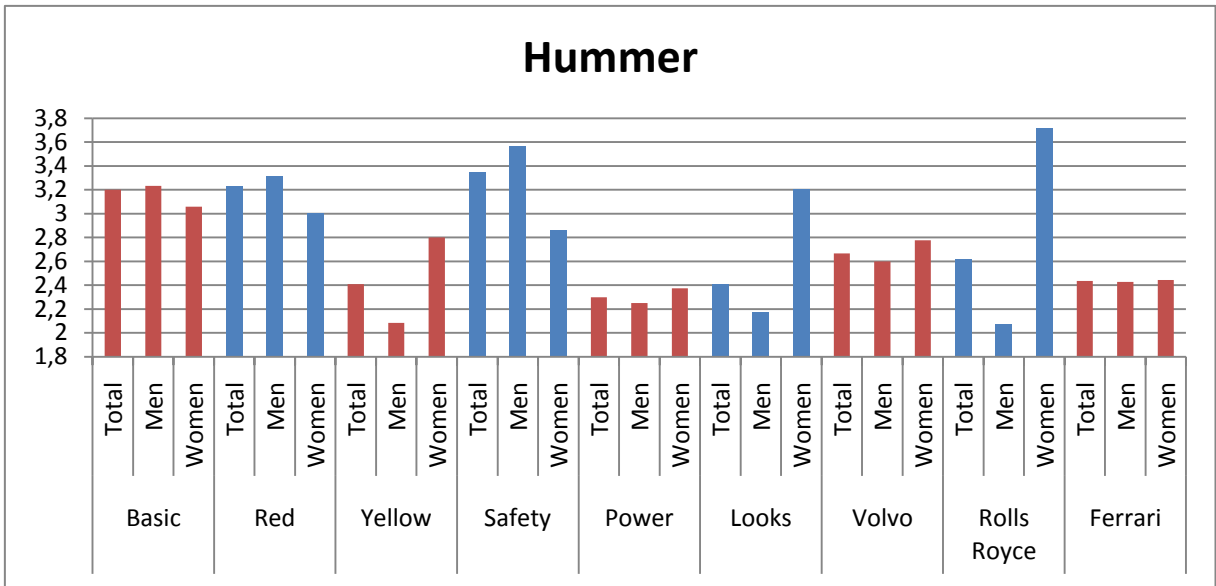


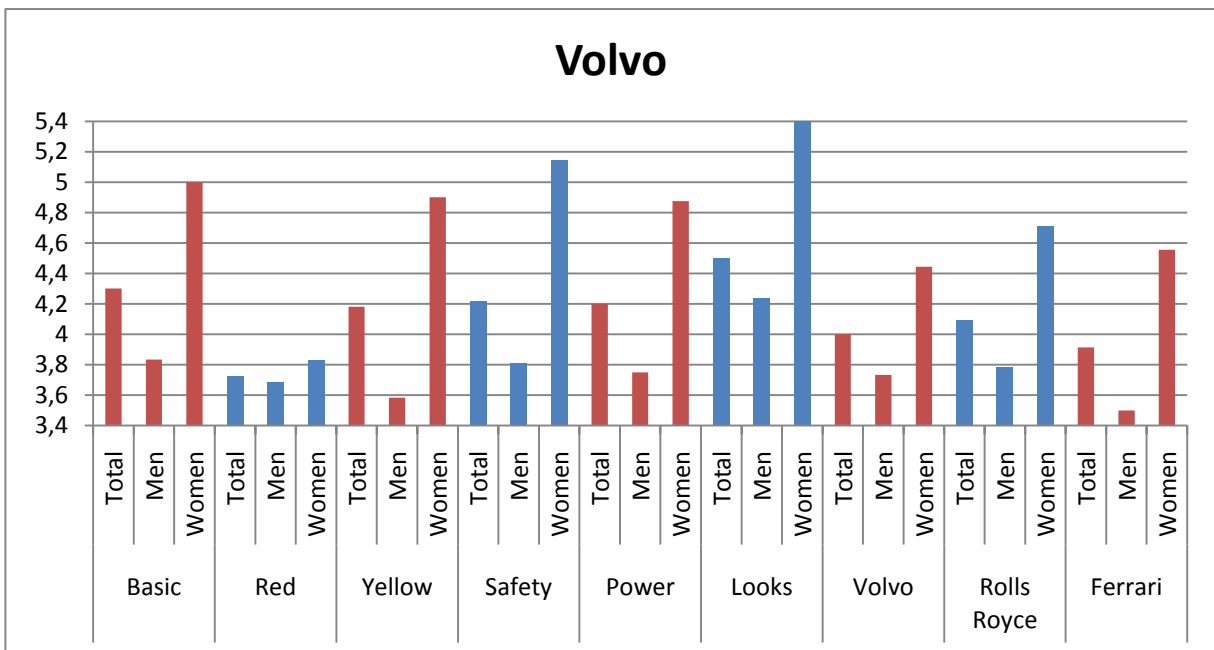
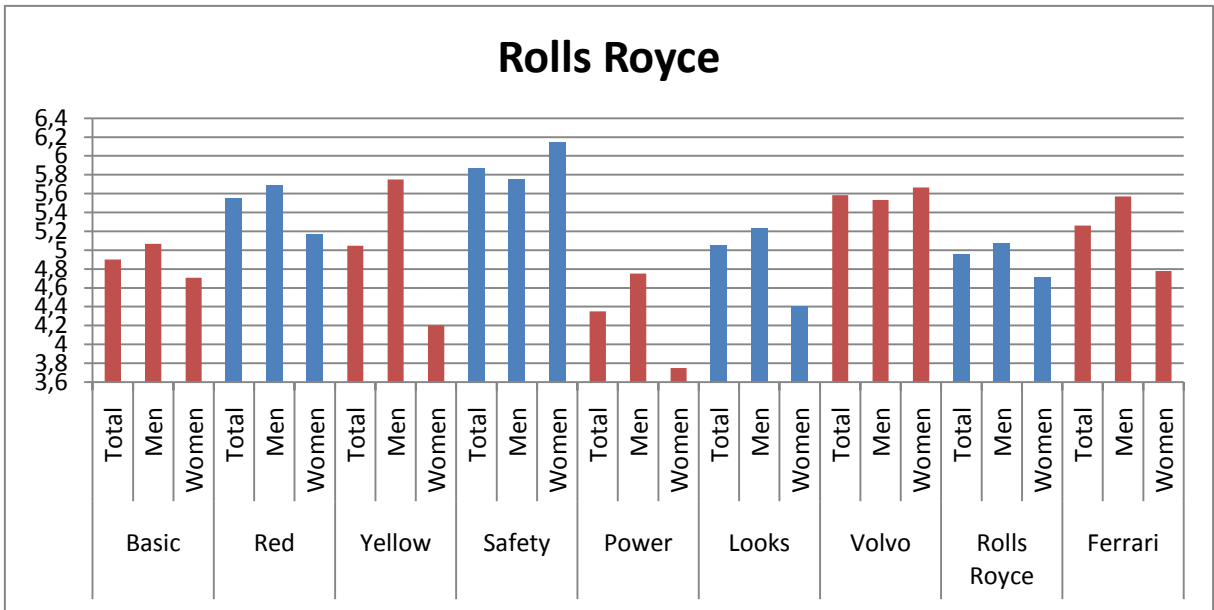
## Appendix 6











## Appendix 7

*This appendix presents the t-test results calculated for the differences between the outcomes of two tests. Hence, it presents the direction and the significance of the influences of several framings, compared to either the basis test or another framing.*

### Calculation 7.1

Picture: Ferrari

Framing: Safety

Compare to: Basis

Mean in Safety test: 5.65

Standard Deviation in Safety test: 1.34

Number of cases: 23

Mean in Basis test: 4.72

Standard Deviation in Basis test: 1.92

Number of cases: 47

$p=0.01093$

### Calculation 7.2

Picture: Ferrari

Framing: Volvo

Compare to: Basis

Mean in Volvo test: 5.38

Standard Deviation in Volvo test: 1.65

Number of cases: 24

Mean in Basis test: 4.72

Standard Deviation in Basis test: 1.92

Number of cases: 47

$p=0.07176$

### **Calculation 7.3**

Picture: Ferrari

Framing: Safety

Compare to: Volvo

Mean in Safety test: 5.65

Standard Deviation in Safety test: 1.34

Number of cases: 23

Mean in Volvo test: 45.38

Standard Deviation in Volvo test: 1.65

Number of cases: 24

$p = 0.73366$

### **Calculation 7.4**

Picture: Ferrari

Framing: Looks

Compare to: Basis

Mean in Looks test: 5,18

Standard Deviation in Looks test: 1.90

Number of cases: 22

Mean in Basis test: 4.72

Standard Deviation in Basis test: 1.92

Number of cases: 47

$p = 0.17602$

### **Calculation 7.5**

Picture: Ferrari

Framing: Rolls Royce

Compare to: Basis

Mean in Rolls Royce test: 5,14

Standard Deviation in Rolls Royce test: 2,1

Number of cases: 21

Mean in Basis test: 4.72

Standard Deviation in Basis test: 1.92

Number of cases: 47

$p= 0.21838$

### **Calculation 7.6**

Picture: Hummer

Framing: Looks

Compare to: Basis

Mean in Looks test: 2.41

Standard Deviation in Looks test: 1.47

Number of cases: 22

Mean in Basis test: 3.17

Standard Deviation in Basis test: 1.939

Number of cases: 47

$p= 0.96116$

### **Calculation 7.7**

Picture: Hummer

Framing: Rolls Royce

Compare to: Basis

Mean in Rolls Royce test: 2.62

Standard Deviation in Rolls Royce test: 1.81

Number of cases: 21

Mean in Basis test: 3.17

Standard Deviation in Basis test: 1.94

Number of cases: 47

$p = 0.86772$

### **Calculation 7.8**

Picture: Ferrari

Framing: Power

Compare to: Basis

Mean in Power test: 5.05

Standard Deviation in Power test: 1.75

Number of cases: 20

Mean in Basis test: 4.72

Standard Deviation in Basis test: 1.92

Number of cases: 47

$p = 0.24633$

**Calculation 7.9**

Picture: Ferrari

Framing: Ferrari

Compare to: Basis

Mean in Ferrari test: 5.22

Standard Deviation in Ferrari test: 1.64

Number of cases: 23

Mean in Basis test: 4.72

Standard Deviation in Basis test: 1.92

Number of cases: 47

$p = 0.13305$

**Calculation 7.10**

Picture: Rolls Royce

Framing: Safety

Compare to: Basis

Mean in Safety test: 5.87

Standard Deviation in Safety test: 1.19

Number of cases: 23

Mean in Basis test: 4.94

Standard Deviation in Basis test: 1.77

Number of cases: 47

$p = 0.00587$



**Calculation 7.11**

Picture: Rolls Royce

Framing: Volvo

Compare to: Basis

Mean in Volvo test: 5.58

Standard Deviation in Volvo test: 1.66

Number of cases: 24

Mean in Basis test: 4.94

Standard Deviation in Basis test: 1.77

Number of cases: 47

$p = 0.06978$

**Calculation 7.12**

Picture: Hummer

Framing: Red

Compare to: Yellow

Mean in Red test: 3.227

Standard Deviation in Red test: 1.535

Number of cases: 22

Mean in Yellow test: 2.409

Standard Deviation in Yellow test: 2.209

Number of cases: 22

$p = 0.07947$

**Calculation 7.13**

Picture: Citroën

Framing: Red

Compare to: Yellow

Mean in Red test: 3.045

Standard Deviation in Red test: 1.522

Number of cases: 22

Mean in Yellow test: 3.818

Standard Deviation in Yellow test: 1.669

Number of cases: 22

$$p = 0.05723$$

**Calculation 7.14**

Picture: Ferrari

Compare group Men to group Women

Mean in group Men: 5,706

Standard Deviation in group Men: 1,305

Number of cases: 146

Mean in group Women: 4

Standard Deviation in group Women: 1,994

Number of cases: 78

$$p < 0.0001$$

**Calculation 7.15**

Picture: Daihatsu

Compare group Men to group Women

Mean in group Men: 0,559

Standard Deviation in group Men: 0,716

Number of cases: 146

Mean in group Women: 1,218

Standard Deviation in group Women: 1,508

Number of cases: 78

$p < 0.0001$

**Calculation 7.16**

Picture: Volvo

Compare group Men to group Women

Mean in group Men: 3,709

Standard Deviation in group Men: 1,448

Number of cases: 146

Mean in group Women: 4,782

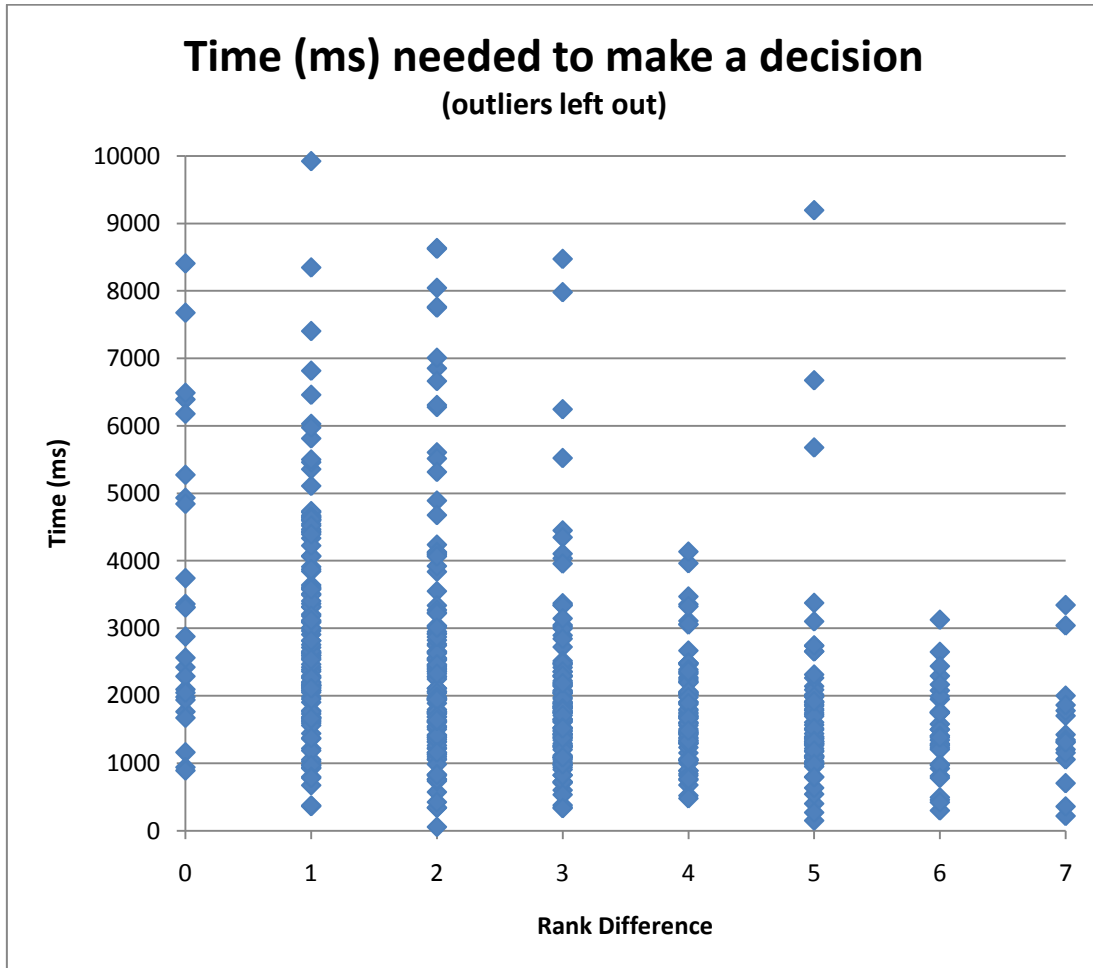
Standard Deviation in group Women: 1,598

Number of cases: 78

$p < 0.0001$

## Appendix 8

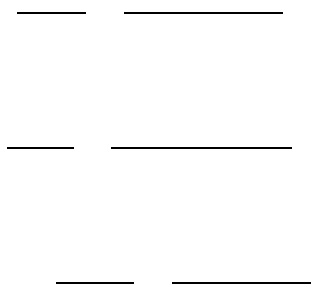
### 8.1



### 8.2

Rank Difference	Avg. Time	Number of observations
0	3541,56	25
1	3078,4286	112
2	2644,1017	118
3	2051,7864	103
4	1807,6234	77
5	1787,0952	63
6	1460,0606	33
7	1488	16
<b>Grand mean Total</b>	<b>2340,8135</b>	<b>547</b>

### 8.3 - Calculation ANOVA



The critical point at  $\alpha = 0,01$  for the F distribution with 7 degrees of freedom for the numerator and 539 degrees of freedom for the denominator is 2,64. Therefore, the null hypothesis can be rejected. Since 12,50 is greater than 2,64, the p-value is smaller than 0,01.